ADDIS ABABA UNIVERSITY

COLLEGE OF SOCIAL SCIENCES

DEPARTMENT OF POLITICAL SCIENCE AND INTERNATIONAL RELATIONS

CHALLENGES OF COOPERATION IN THE NILE AND INDUS RIVER BASINS: A COMPARATIVE ANALYSIS

BY

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ADDIS ABABA, ETHIOPIA

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A THESIS SUBMITTED TO THE DEPARTMENT OF POLITICAL SCIENCE AND INTERNATIONAL RELATIONS, ADDIS ABABA UNIVERSITY, IN PARTIAL FULFILLMENTS OF THE REQUIREMENTS FOR THE AWARD OF MASTERS OF ARTS DEGREE IN INTERNATIONAL RELATIONS AND DIPLOMACY.

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Abstract

This thesis has made a comparative analysis of the Nile and Indus river basins in specific hydro-political characteristics, hindering factors and challenges to cooperation, and the current hydro-political dynamics in the respective basins. In conducting this particular research, a comparative research design and qualitative research method was employed. With regard to data collection, the research has benefited from various approaches of data collection mainly document analysis. The research has explored the various conceptual, legal, and theoretical frameworks about trans-boundary hydro-politics. Several legal and theoretical doctrines and principles about the use of trans-boundary waters have also been discussed. The researcher has made a comparison in the cooperative attempts made by the Nile and Indus river basins. The findings showed that the Nile and Indus river basins have both similarities and differences in their respective challenges to cooperation. The similarities observed include: prevalence of unilateralism, power asymmetry, colonial legacy, institutional inadequacy, conflicting water use doctrines/ principles, and recently environmental pressure. In some of the hindering factors and challenges to cooperation, there are unique features in the respective basins. While the downstream riparian state is a hydro-hegemonic power in the Nile river basin, the upper riparian state is the case in the Indus river basin. Whereas, political sabotage and proxy war is prominent in the Nile case, Prevalence of terror attack as a means of water security is observed in the Indus basin. In both river basins the possibility to reach conclusive cooperation is severely affected by the mistrust and suspicion of one another. And, the findings concluded that due to the numerous challenges that both the Nile and Indus river basins are faced with, they are both unlikely to attain genuine cooperation at least in the foreseeable future.

Key words: *Challenges, Cooperation, Nile Basin, Indus Basin, and Trans-boundary Rivers*

List of Acronyms

BCM	Billion Cubic Meters
CFA	Cooperative Framework Agreement
CIDA	Canadian International Development Agency
DRC	Democratic Republic of Congo
EPLF	Eritrean People Liberation Front
FAO	Food and Agricultural Organization
GERD	Grand Ethiopian Renaissance Dam
HYDROMET	Hydro-meteorological survey of lakes Victoria, Kyoga, and Albert
IWT	Indus Water Treaty
KPK	Kyber Pakhtunkhwa
MOFA	Ministry of Foreign Affairs
NBI	Nile Basin Initiative
ONLF	Ogaden National Liberation Front
SVP	Sutlej Valley Project
TECCONILE	Technical Cooperation Committee for the Promotion of the Development and Environment Protection of the Nile
UN	United Nations
UNDP	United Nations Development Program
UNESCO	United Nations Educational, Scientific and Cultural Organization
WMO	World Meteorological Organization

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Chapter One

1. Introduction

1.1. Background of the study

Trans-boundary Rivers across the world have become causes for conflict and cooperation. Due to the fact that water is a scarce resource, characterized by its spatial and seasonal variations has heightened both conflict and cooperation over a large number of international rivers. In some parts of the world, the competing demands over the waters of the shared rivers have escalated into tensions and disputes. Some of the disputes have led to open conflicts and defied resolutions for a long time (Salman and Uprety, 2003:3-4).

In the twenty-first century, the possibility over water conflict is huge since it has been ever growing given the changing climatic conditions and the rising demand. Close to 97 per cent of the water on the planet Earth is salty and doesn't for drinking or agricultural purposes. Only 2.5 per cent of the water stocks are freshwaters, even these are not evenly distributed spatially and temporally. Two-thirds of these freshwaters resources are locked in glaciers and ice caps. One of the prevailing realities of the early twenty-first century is the rising competition between states for increasingly scarce water resources. In addition, while the quantity of freshwater on the Earth is unchanging the global demography is on rise. Trans-boundary Rivers can become the object of disagreement, dispute, and even conflict when interest of one state contradicts to the riparian state (Kasymov, 2011). Rivers can also be sources cooperation (Salman and Uprety, 2003).

The Nile is the longest river in the world and traverses 6,700 kilometers through Africa countries – Rwanda, Burundi, DRC, Tanzania, Uganda, Kenya, South Sudan, Eritrea, Ethiopia, Sudan, and Egypt. These eleven Nile riparian states have a total population of 396 million, of which nearly half are directly dependent on the Nile for their survival (Swain & Jamali, 2011:12). The Nile river basin encompasses about three million km2 areas from the Equatorial Lakes region and Northeastern Africa. Comprised within the Nile basin are: one third of Ethiopia, a substantial portion of Sudan, almost the entire cultivated and settled lands of Egypt, the whole of Uganda, parts of Kenya, Tanzania, Rwanda, Burundi, DRC and Eritrea (Yacob, 2007: 25).

The transnational rivers are often the subjects of treaties providing for their shared use. States sharing common rivers often balance their policies for the purpose of creating agreed regimes. Unilateral use of the waters of such rivers by any riparian state can cause significant damage to the other states leading to serious international conflicts. However, discussions and negotiations leading to agreements for their shared use usually resolve such conflicts (Daniel, 1999:143).

The control of the Nile basin's shared water resources is characterized by a higher asymmetry brought about by factors including the different capacities of the riparian states to utilize, technically control and allocate the water resources. The riparian states also show contrasting levels of water utilization. Egypt is the largest regional water user, extracting far higher levels of water from the basin than its neighbors. The dispute over the Nile has continued almost for a century, since the colonial eras. Egypt followed by the Sudan has been the major beneficiaries of the Nile waters from using 1929 and 1959 agreements, whereas the remaining upstream riparian states have limited access to the Nile water (Mohammed, 2015).

On the other hand, the Indus river basin is one of the Asian largest rivers. From its source in the Northwestern foothills of the Himalayas-China, it flows through the Indian state of Jammu and Kashmir and along the length of Pakistan to the Arabian Sea (Nabeel, 2017:1). The Indus River originates from China and runs 3,200km across parts of India and the length of Pakistan before draining into the Arabian Sea. The Indus Basin embraces 1.12 million km2 with 47 per cent of the area falling in Pakistan, 39 per cent in India, 8 per cent in China and 6 per cent of which in Afghanistan (Alam, 2017). Approximately 300 million people are supposed to live in the Indus basin. The Indus River is especially the backbone of Pakistan, covering 520,000 km2 which substantially serves the Northern Areas, the Northwest Frontier Province, Punjab and Sindh province, and the eastern portion of Baluchistan (Siwakoti & Kathmandu, 2011:2).

Indus River is one of the Asia's oldest and largest irrigation networks. The Indus River basin was the object of serious dispute even before the partition of India and Pakistan. After partition in 1947, the most recent conflict broke out in April 1948 when India, in order to establish territorial claims, stopped the flow of water to Pakistan through the Indian canals. Pakistan had become alarmed that India, as the upper riparian state, had the capacity to turn West Punjab into a desert (Mandel, 1992:39).

1.2. Statement of the problem

From the discussion above, both the Nile and Indus rivers are shared by many countries. The conflicting interests of upstream and downstream states have historically been polarized and generated tensions that subdued cooperative efforts. Interactions among the riparian states are characterized by mutual mistrust, intimidation, and competition. In the last 20th century, the Nile River has been the source of political dispute and conflicts among the three of its major riparian countries namely Ethiopia, Egypt and Sudan (Swain, 2011: 687).

As regards Indus River, it is especially crucial to India and Pakistan as the water irrigates vast crop areas in both countries. However, Water conflict between India and Pakistan has made South Asia increasingly vulnerable to the extent of a breakout of war due the rise of population, industrialization and urbanization has increased the demand for water in the basin (Wani and Moorthy, 2014). "Lack of trust and mutual suspicion between India and Pakistan forced the split of the Indus River Basin" (Wirsing & Jasparro, 2006: 6).

From the above discussion concerning the Nile and Indus River Basins, there is no persistent solidarity among the riparian countries for common utilization in the Basin Rivers. So, there are challenges to cooperation in both river basins and this thesis explores those challenges in both river basins in a comparative way. As to the researcher's knowledge, no study was conducted regarding challenges to cooperation in Nile and Indus River basins in a comparative way.

With regard to related literatures concerning the comparative study of cooperation in shared river basins and factors hindering the cooperation efforts, Ahmed (2019**)** identified conflicts over water resources that are shared across political borders and assessed the gap between theory and practice in the field of trans-boundary water conflict resolutions regarding mechanisms for conflict resolution such as social plan[ing], water market, static, dynamic systems of engineering models, and negotiation analyses. The author didn't, however, assess what is the major cause of conflict among the riparian countries and also didn't see in a comparative approach over two or more rivers. And hence, this research fills the gap shown above by making a comparative study particularly, on the Nile and Indus river basins with regard to challenges of cooperation.

On the other hand, Stefano et al. (2017:35) assessed the trans-boundary river basins for potential hydro-political tensions, and argued that causes of conflict over the trans-boundary river basins including changes in terrestrial water storage, projected changes in water variability, per capita, gross national income, domestic and international armed conflicts, and recent history of disputes over trans-boundary waters. However, the authors failed to show the causes of conflicts and cooperation in a comparative way rather they only mentioned causes of conflicts. Therefore, this thesis bridges the gap of the above in the river basins particularly, on the Nile and Indus Rivers.

Tariku (2014) showed various factors of challenges to cooperation efforts in Euphrates-Tigris and Nile River basins in a comparative way according to which the unbalanced nature of water contribution and benefit accumulated between the riparian states, the role of colonial legacy, unilateral water use activities, adhering to the international water law doctrines, the existence of weak institutional mechanism, the role of power distribution between the riparian countries were the main findings. Nevertheless, this work didn't show challenges of cooperation between the Nile and Indus river basins. Therefore, this particular piece of work fills the gap addressing as to what are the similarities and differences in the magnitude of challenges to cooperation the Nile and Indus River basins in a comparative way.

Yeshareg (2014) in her study over the Nile and Rhine river basin found the existence of similarities and differences of hydro-political features. The similarity is in terms of arrangement of some states and existence of both strain and cooperation over the shared rivers as identified. Difference is observed from the existing variance in range and status of cooperative initiatives with respect to geographical, economic and political features between the riparian states of the two river basins. But, neither did this piece of work assessed Nile and Indus river basins comparatively. Therefore, this piece of work fills the gaps observed in the respective literatures.

1.3. Central argument/hypothesis of the thesis

The relations between the riparian countries both in the Indus and the Nile basins continues to suffer from lack of cooperation despite the attempts to fairly share the trans-boundary rivers.

1.4. Objectives of the study

1.4.1. General objective

The overall objective of the paper is to make a comparative analysis of challenges to cooperation in the Nile and the Indus river basins with the aim of understanding comparative hydro-political situations in the two river basins.

1.4.2. Specific objectives

Specific objectives of the study include:

- To study the specific hydro-political characteristics of the Nile and Indus basins.
- To compare and contrast the nature of the hindering factors to cooperation in the two basins.
- To make a comparative analysis of challenges to cooperation in the two river basins.
- To explain the current hydro- political dynamics in the two river basins.

1.5. Research questions

- What are the specific hydro-political characteristics of the Nile and Indus basins?
- What are the hindering factors of cooperation in the two river basins?
- What are the distinctive challenges of cooperation in the two river basins?
- What are the current hydro-political dynamics in the two river basins?

1.6. Research Methods and procedures

1.6.1. Research Design

A research design refers to plan and the procedure for a research that dictates the decisions from broad supposition to detailed methods of data collection and analysis. It also refers to what the researcher brings to the study; techniques of inquiry or strategies; and specific methods of data collection, analysis, and interpretation. The choice of a research design is also built on the nature of the research problem or issue to be addressed. It refers to the overall strategy that used to incorporate the different components of a study in coherent and consistent way, thereby ensuring the researcher will effectively address the research problem. It constitutes the design for collection, measurement and analysis of the data. It is a conceptual arrangement within which

research is conducted which constitutes the design for the collection, measurement and analysis of data. As such the design includes an outline of what the researcher will do from writing the hypothesis and its operational implications to the final analysis of data (De Vaus, 2001, Creswell, 2009, Kothari, 2004). In order to conduct this study, the researcher has therefore employed a comparative research design which is appropriate to study two or more different subjects about their similarities and differences in a comparative way (Yalew, 2017:40). So, the researcher has used a comparative research design so as to look at challenges of cooperation in the Nile and Indus river basins in order to achieve its objectives.

1.6.2. Research Method

In order to achieve this objective the researcher has used a qualitative research method which is used for exploring and understanding the meaning of individuals or groups ascribed to a social or human problem. Those who engage in this form of inquiry support a way of looking at research that credits an inductive style, focus on individual meaning, and the importance of interpreting the complexity of a situation (Creswell, 2009). This research method is concerned with subjective assessment of attitudes, opinions and behavior. Research method in such a situation is a function of researcher's insights and impressions (Kothari, 2004). Therefore, the researcher has in this particular research, employed a qualitative research method which helps qualitatively analyze and interpret different documentary sources of data and information accessed.

1.6.3. Data collection instrument

Data collection instrument refers to a means of data gathering tools in undertaking a research project. In this particular study, the researcher has collected the data and information by means of secondary data collection tools. Such instruments of data collection tools used in this particular research include: books, journal articles, and unpublished materials such as master theses and doctoral dissertations in order to achieve the objectives of the study.

1.7. Case Selection

The cases selected for this particular thesis is a comparative analysis in the study of the Nile and Indus River basins' challenges of cooperation. The reasons for selection of the above rivers cases are the prevalence of ranges of similarities and some dissimilarity between the two river basins that makes comparative analysis justifiable. Firstly, the factors hindering the cooperation efforts in the two River basins are nearly similar. Secondly, the two River basins are geographically located almost in similar climatic conditions in which water scarcity is growing at an increasing rate. Thirdly, in both river basins there has been a great tension on water utilization among the riparian states due to stressed historical relations. Moreover, hydro-political instability is the main characteristic features of the riparian states of the two river basins. Fourthly, in the two river basins the riparian states made efforts to cooperation despite the difference in their historical settings. Lastly, the cooperation efforts the two river basins of the riparian states despite their attempt of cooperation never realized their objectives. Therefore, the researcher has become interested to select the theme of this case to work at.

1.8. Significance of the Study

This thesis has several significances. One of the significances is that it serves as knowledge resources providing the necessary data and information to the reader in the study area of Hydro-politics. Secondly, it adds knowledge and new evidence by showing the gaps observed by making a comparative analysis in the hydro-politics situation of the Nile and Indus river basins. Thirdly, the study delivers additional knowledge to the field of Hydro-politics through presenting better understanding of the two river basins and factors impeding their cooperation.

1.9. Delimitation and limitation of the study

This thesis mainly concerns with the main causes of cooperative challenges and hindering factors to the Nile and Indus river basins. The thesis also incorporates the specific hydro-characteristics of the two basins along with the current hydro-political dynamics in the two river basins in a comparative analytic way. Since the comparative analysis of the Nile and Indus river basins is too wide, researcher is specifically confined to hindering factors and challenges to cooperation in the two river basins. When it comes to the limitation of this piece of work, the researcher has not

employed primary data though it was intended to employ key informant interview due to various reasons. From the potential key informants: the Pakistan Embassy had willingness to give the data and the ambassador assigned an expert about the Indus River though failed to provide the data needed for not picking up his phone. The second potential key informant interviewee was Indian embassy and showed willingness though given few data in written form the hand writing was too difficult to understand. But the embassy was not still willing to give a face to face oral interview on grounds of the outbreak COVID-19. The third potential key informant interviewee was that of Egypt embassy and the researcher repeatedly called and visited but it was reluctant to provide the data requested for unknown reason. The fourth potential key informant interviewee was the Sudan embassy; however, it was not willing to communicate with the researcher on the issue. The fifth potential key informant interviewee was the ministry of water, irrigation, and energy, but still failed to provide the data needed for unknown reason. Overall, the effort to obtain information through face-to-face interview has been impacted due the outbreak of COVID-19. However, despite the constraint, the researcher has made alternative means of data collection tools that can fill in the gaps of accessing data and information. To this effect, the researcher has taken the measure to exhaustively utilize the data which can be obtained through documentary sources.

1.10. Organization of the Study

This thesis is organized in five chapters. The first chapter includes background of the study, statement of the problem, research questions, and objectives of the study, hypothesis, methods, research design and sources of data, scope, significance, and organizations of the study. The second chapter is about literature review, conceptual and hydro political perspectives related to water cooperation and factors that promote or hinder cooperation and conflict. In the third chapter, the two River basins in terms of hydrological and physical nature are described and an attempt of the two basins. The fourth chapter explains the relations between the riparian states of two River basins. The fifth chapter contains factors and challenges hindering cooperation for the Nile and Indus river basins along with conclusion remarks.

Chapter Two

2. Related Literature Review: Conceptual and Hydro-Political Perspectives

This chapter discusses the concept of cooperation on trans-boundary waters and perspectives of different scholars on hydro political issues, by focusing on the cooperation perspectives of trans-boundary waters. The doctrine of International Water law on shared river basins and the experiences of cooperation over shared river basins are also elaborated. And then, political power dynamics in the trans-boundary river basins and international water law on the trans-boundary waters are discussed briefly.

2.1. Conceptual and Theoretical Perspectives

2.1.1. Meanings and Definitions of Cooperation on Trans-boundary Waters

Cooperation is vital concepts in the literature of shared river basins. Thus, in order to understand the cooperation in the Nile and Indus River basins, it is important to know their meaning. In fact different scholars define their own understandings. For instance, Barua et al., (2019:2) defined it as "[c]o-operation is a coordination between states, where they collaborate to achieve common interests with mutual benefits."

On the other hand, Qureshi (2017:46) defined cooperation as a procedure by which two or more parties or states work together to accomplish mutual goals that could not be achieved by one state unilaterally. The term water Cooperation implies an establishment of coordination among two or more parties or states over the distribution, utilization, and management of their shared water resources (Qureshi, 2017).

2.1.2. Perspectives on Hydro-Political Issues of Trans-boundary Waters

The study of hydro politics of trans-boundary waters initiates that watercourses are frequently shared by numerous nation states with their own different interests in how to use, abuse or keep water. It necessarily leads to conflicts or even violence or can be moderated through cooperation. So, there are two main perspectives about shared river basin of trans-boundary waters. These are water as source of conflict and water as source of cooperation (Schmeier, 2010:6).

A. Water as the source of conflict

The fresh water nowadays is scarce in many regions of the world resulting in severe ecological degradation, limiting on agricultural and industrial production, threatening to human health and increased potential for international conflict (Postel, et al., 1996:2).

> Water, like religion and ideology, has the power to move millions since the very birth of human civilization; people have moved to close to it. (…) People journey down it. People write, sing and dance about it. People fight over it. All people, everywhere and day need it (as cited in Ali, 2008:2).

From the remark above it reveals that water has strong potential for inducing conflict as it is the necessity for human life. Mason and Blank (2013) stated that water resources are becoming a source of tension across the world owing to climate change, physical water scarcity, economic water scarcity, unsustainable economic management and development practices. Conflicts over water resources creates unrest as water resources become scarcer due to growing water demand with increased precipitation variability associated with global climate change. The situation is even more complicated by the fact that a large portion of major freshwater basins in the world fall within the jurisdiction of more than one nation. Tensions over freshwater resources become more frequent as pressures on water resources rise due to increased demand and variability of rainfall (Uitto & Duda, 2002).

For instance, water has been a cause of political tensions and occasional exchanges of fire between Arabs and Israelis, Indians and Pakistanis, and Americans and Mexicans and among all riparian states of the Nile River for water is one of the few scarce resources for which there is no substitute, over which there is poorly developed international law, and the need for which is overwhelming, constant, and immediate (Priscoli & Wolf, 2009; Beach et al. 2000). Kramer (2004) also stated that the rivals of claims for limited water availability are the most known cause of water-related conflict. Tensions over water allocation rise when water is scarce. Conflicts arise from the use of common water resources. In order to understand such conflicts it is appropriate to differentiate between conflict arising through use, and conflict arising through pollution.

For example, conflict through use, the construction of a power-station on the upper-course of a river that increases conflict in such cases where this construction has harmful consequences

when it causes water scarcity to the downstream riparian states. The situation becomes more intense when the downstream states refuse their consent for such construction because of fears of, for example, water shortages. This situation even more gravitates where the construction of a dam on the upper course of a river, that not only serves the electrical needs but also the major irrigational works of the downstream states (Haftendorn 2000:3).

Water uses different purposes: drinking, transportation, irrigation and hydro-power generation. For this importance, there is conflict arising between the using parties, for example, constructing dams to generate hydropower by one party and affect the interest of other parties; and also diverting water flow from one area to another area without considering the interest of other parties. For instance, in the history of Malaysia and Singapore, Malaysia's rare threat to 'turn off the tap' was the endless source of insecurity for water-scarce Singapore which until recently depended on Malaysia's water supply. Thus occasional threats were a source of tension between the two neighboring states (Selina, 2017).

On the other side, conflict through pollution besides the production of electricity and transport, rivers and lakes also serve for industrial purpose. The water not only does serve as reservoirs for the supply of freshwater but also as a means of disposing of waste and industrial rubbish. With the increasing decline in the quality of the water crossing borders, the problem of cleaning the water leads to conflict between the water sharing states. This is particularly well demonstrated in the case of the Rhine, a river whose drainage area falls in the richest most highly industrialized area in Europe. Furthermore, the interests of the upper and downstream riparian states are particularly distinct as a result of their different uses of the Rhine. The primary cause of pollution is from the chemical industry in the upstream states of Switzerland, Germany, and French potassium mines in Alsace and the German coal works in the Ruhr and Lippe (Haftendorn 2000).

B. Water as the source of cooperation

States are more likely to choose cooperation over conflict and the riparian states often share common interest and are politically, economically, culturally interdependent for them moving to war over water would harm their national interests. Water *per se* creates interdependence among the riparian states sharing a trans-boundary watercourse this often goes as far as creating a joint institution for the management of shared resource (Schmeier 2010). Water has been a productive

way for developing cooperation and preventing conflict. It can be a catalyst for cooperation, if riparian states work together; and water has also proven to be a productive pathway for confidence building, cooperation, and arguably, conflict prevention (Carius, et al., 2004).

Mohammad (2011:7) states that cooperation over shared water resources is one of the most important things for sustainable social, political, environmental and economic development of the world. It can bring the stakeholders together by building trust and confidence among them and can serve as a venue for negotiation. Even though conflicts on water resources have been predicted in different areas, no incident so far appeared except minor clashes which generally remained at national level. Instead, cooperation over trans-boundary water achieved a long and successful history continuously out weighing conflicts (Carius, et al., 2004). In most cases, averting disputes is the strong political driver for initiating cooperation on trans-boundary waters, as riparian states always seeks to safeguard their common interests (Wolf, 2001). Indeed, history witness this fact as freshwater resources have been a powerful incentive for cooperation compelling stakeholders to reconcile even the most conflicting views. It offers a room for solving conflicting interests and trans-boundary impacts through adequate legal and institutional frameworks, joint approaches to planning and sharing of benefits and related costs (UN, 2008).

Effective cooperation over trans-boundary river basins have numerous benefits including in an increased food and energy production. Cooperation is also effective in easing tension among riparian states so as to create an improved economic integration. In addition, trans-boundary early warning systems can minimize loss of life in the event of floods. Thus, cooperation directly or indirectly contributes to international trade, economic development, food and political security, poverty alleviation and regional integration, and which also enables a better ecological management (UN, 2008).

Scholars such as Wolf and Dinar underscore that water can be used as a tool for cooperation among neighboring countries and is not necessarily a cause of war and violence. It is clear that incidents over water rights and water shortages happen but none of the incidents has led to major wars among nations. For example, there is always tension between Bangladesh and India over the quantity of water flow in the river Ganges during different seasons. But there has never been a war between the two nations over water. Mainly, research reveals that the only recorded

incident of an outright war over water was 4,500 years ago between two Mesopotamian city-states, Lagash and Umma, in the region of present southern Iraq. On the contrary, between the years 805 A.D. and 1984 A.D., countries signed more than 3600 water-related treaties. An analysis of 1831 international water-related events over the last 50 years has revealed that two-third of these encounters were of cooperative nature (Grover, 2007).

History has often revealed that the vital nature of freshwater is a powerful incentive for cooperation, compelling stakeholders to settle even the most divergent views. Water usually unites than divides societies. Cooperation is necessary to overcome issues like upstream and downstream impacts of water pollution, water allocation decisions, and water abstraction, infrastructure development, exploitation, and funding of water management (Unturbe, 2013).

When it is compared, despite the potential for dispute in international basins, the incidence of acute conflict over international water resources is overcome by the rate of cooperation. The last 60 years (1948−2008) have seen only 44 acute disputes, those involving violence, 30 of which occurred between Israel and one of its neighbors. The total number of water-related events between nations of any magnitude is also tilted towards cooperation: 759 conflict-related events versus 1,705 cooperative ones, suggesting that violence over water is neither strategically rational, nor is hydrographically effective, nor is economically feasible (UNESCO, 2017). Water can even be a key factor in negotiating the end of a conflict. Cooperation in the search for solutions to resource scarcity and mismanagement leads to innovation and the equitable sharing of costs, benefits and risks. For example Since 1948, there have been only 37 incidents of acute conflict between riparian states over water involving violence. In the same period, 295 international water agreements have been signed (Unturbe, 2013).

2.1.3 Doctrines of International Water law on Shared River Basins

There have been several theories across history which explains the utilization of water basins shared by two or more States. Some of these theories were not applied in practice, while others have functioned as the basis for the development of the legal principles which make up international water law (Aguilar & Iza, 2011).

2.1.3.1. The Doctrine of Absolute Territorial Sovereignty

The doctrine of absolute territorial sovereignty or what is called Harmon Doctrine, is a principle that states sovereign rights are reserved to make full utilization of all water resources flowing within its territory, despite the effects beyond its territorial jurisdiction (Yacob, 2007). The "Harmon Doctrine" is the most disreputable theory in all of international natural resources law. Based upon the opinion of Attorney General Judson Harmon issued a hundred years ago, the doctrine holds that a country is absolutely sovereign over the portion of an international watercourse within its boundaries. Thus that country is free to divert all of the water from an international watercourse, leaving none for downstream states (McCaffrey, 1996). Every nation can utilize the waters of an international river flowing on its territory, as it likes, regardless of the consequences in other countries and without the duty to consult. According to this theory, the upstream state is free to divert all the water from a shared watercourse without considering the need for downstream states (Rahaman, 2009).

States have historically implemented absolute sovereignty over the use of rivers and other natural resources located within its territory irrespective of the effects of the resource use on neighboring States. Under the Harmon Doctrine, an upstream State can freely deplete or utilize a rivers flow within its boundaries without considering the effect of its actions on a downstream State. This legal doctrine has, however, been disfavored as an outdated and narrow view for reconciling differences among opposing States where a shared natural resources is at issue (Lazerwitz, 1993). Many of the upper-riparian states invoke the Harmon doctrine, which holds that a state has the right to do whatever it chooses with the waters that flow through its boundaries, regardless of its effect on any other riparian state (Okoth-owiro, 2004).

Therefore, the doctrine of absolute territorial sovereignty favors upstream States allowing the unlimited use of the waters of a trans-boundary watercourse located within national borders regardless of any consequences that may occur on the downstream states. Based on this doctrine, an upstream state can freely divert or use a river within its boundaries. Thus, upstream States maintain the right to use unlimited quantities of the water resources that originate in their territories. In this context, upstream riparian states claims the right to doctrines of absolute territorial sovereignty over use of the Nile river Basin, without the consideration of interest of the

downstream countries like Sudan and Egypt. When it comes to the Indus river basins states, India has the right to use the river in its territories without considering the interest of Pakistan.

2.1.3.2. The Doctrine of Absolute Territorial Integrity

This doctrine advocates that no riparian state can alter the natural flow of a river. It is the rule of international law that no state is allowed to change the natural condition of its own territory to the disadvantage of the natural conditions of the territory of a neighboring state. For this reason, a state is not only banned to divert the flow of a river which runs from its own to a neighboring state, but also to make such use of the river as either causes damage to the neighboring state or prevent it from making proper use of the flow of the river (Yacob, 2007).

This doctrine is based on the assertion that the lower riparian of an international river has the right to a full flow of water of natural quality and interference with the natural course water by the upstream state require the permission of the lower riparian state. Therefore, the lower riparian has the right to claim the continued and uninterrupted flow of water from the territory of the upper riparian. Often, downstream states support this doctrine as it guarantees them the use of an international river in an unaltered condition (Rahaman, 2009). In this doctrine the lower riparian's have an absolute right to have an uninterrupted flow of the river from the territory of the upper riparian, no matter what the priority. This doctrine posits that a riparian state cannot develop a portion of shared river course if it causes harm to another riparian state (Lazerwitz, 1993).

The doctrine of absolute territorial integrity can be taken as the exact opposite of the principle of absolute territorial sovereignty. It advocates the right of downstream state whereby they may have a veto power on how the upstream state uses international watercourses. This doctrine is claimed by most downstream states in asserting their right to use. However, this doctrine also suffers from the absolute nature of sovereignty, that the doctrine of absolute territorial integrity is as primitive as the doctrine of absolute territorial sovereignty for it advocates veto power of the downstream state over development decisions of upstream states. Therefore, dependence on either of the above two doctrines will hinder cooperative and sustainable management of an international river as both of them offer the right to decide on development programs and manners utilization over such rivers solely to one riparian(Kebrom, 2011: 21).

Based on the above doctrine, Egypt and Sudan have the right to full use of Nile River without divert and interruption of the flows of the river by the upstream states like Ethiopia. In the cases of the Indus River, Pakistan has the right to full use of the river without the intervention of India, upstream states of the Indus River.

2.1.3.3. The doctrine of community of property in the water

This doctrine argues for a reasonable share or equitable use by all riparian states, not causing unreasonable harm to any other riparian state. And also international watercourses are the common property of all the states through which the waters flow and no state shall intervene to reduce the resource for others sharing it (Yacob, 2007). This doctrine advocates for the collective rights to river waters and international drainage basins by the riparian states. It is a concept derived from the hydrological unity of a river basin, which renders the position of sovereignty less important in relation to international watercourses (Kebrom, 2011: 22). The doctrine that has been the most widespread in practice is that of equitable use, according to which trans-boundary watercourses are shared natural resources that are subject to equitable use. This is based on the notion that States have equal rights and shared sovereignty over the watercourse, which suggests the need to find a balance of interests by taking into consideration the requirements and the uses of the water from all riparian States (Aguilar & Iza, 2011). Based on the above doctrine, the Nile River basins of upstream and downstream riparian states have the right to use the river in equitable and reasonable way without harming other riparian states. And also, when it comes to Indus river basins, upstream and downstream riparian states have the right to use equitable share of the water without harming the interest of the other party.

2.1.3.4. The doctrine of limited territorial sovereignty

The doctrine of limited territorial sovereignty restricts state sovereignty and binds riparian states to share water resources based on the criteria such as prior appropriation, arable land, and population. This doctrine further embraces that each riparian state, regardless of whether an international watercourse originates in or traverses its territory, has a vote in deciding what measures are adjusted within the watercourse as a whole. The state, however, which has been using the water the longest, has some priority (Yacob, 2007).

This doctrine is based on the assertion that every state is free to use shared rivers flowing on its territory as long as such utilization does not hamper the rights and interests of the co-riparian. In this way, sovereignty over collective water is relative. The co-riparian have reciprocal rights and duties in the utilization of the waters of their international watercourse and each is entitled to an equitable share of its benefits. This doctrine is also known as theory of sovereign equality and territorial integrity. The advantage of this theory is that it simultaneously recognizes the rights of both upstream and downstream countries as it guarantees the right of reasonable use by the upstream state in the framework of justifiable use by all concerned parties. Principles of equitable and reasonable utilization and obligation not to cause significant harm are the part of the theory of limited territorial sovereignty. Only this theory has gained wide acceptance and formed the basis of modern international water law (Rahaman, 2009).

This doctrine favors neither the upstream nor the downstream State, but rather the State that puts the water to use first, thereby protecting those uses which existed prior in time. All States along a watercourse thus be able to form prior rights to use a certain amount of water based on the date upon which that water use arose (Lazerwitz, 1993).

Based on the above doctrine, it more favors for Egypt in the case of the Nile river basins because this doctrine more emphasizes on the criteria such as prior appropriation, arable land, and population. So Egypt has historical advantage to use the Nile water and to some extent Sudan. So this doctrine gives more privilege to Egypt than Ethiopia. When it comes to Indus river basins, both India and Pakistan have the advantages of this doctrines based on prior use because in the past or starting from independence there is divide of water which is the eastern flows for India and the western flows for Pakistan though other criteria tilts to the advantages of India rather than Pakistan.

2.1.3.5. The Doctrine of Optimal Development of the River Basin

This doctrine advocates the development of a river basin without regard to national boundaries. This theory embodies the contestable notions such as: “optimal”, “reasonable”, and “equitable” allocation criteria. Moreover, the doctrine presupposes the existence of basin-wide institutions. This doctrine comes closest to an economic theory that aims at the most efficient use of water in a basin (Yacob, 2007).

Theory puts into practice the idea of optimal use of water between all of the riparian states part of a trans-boundary basin. This theory goes further than equitable and reasonable use, and offers the possibility for integrated development and joint regulation of the river and of its ecosystem. It also considers the establishment of supranational regimes or institutions to mediate the co-riparian states, which may vary in terms of composition, powers and responsibilities (Aguilar & Iza, 2011).

2.2. Experiences of Cooperation over Shared River Basins

The history of international water treaties dates back to 2500 BC, when the two Sumerian city-states of Lagash and Umma crafted an agreement ending a water dispute along the Tigris River bringing an end to the first water war in history. From then on a large amount of water treaties has developed. The Food and Agricultural Organization of the United Nations has identified more than 3,600 treaties dating from 805 AD to 1984 (Wolf, 1998).

While the majority of these relate to some aspect of navigation, an increasing number address non-navigational issues of water management, including flood control, hydropower projects, or allocations for consumptive or non-consumptive uses in international basins. Since 1820 more than 400 water treaties and other water-related agreements have been signed, more than half of which were concluded in just the past 50 years (Wolf, 2006).

Cooperation on trans-boundary water resources has evolved ever since international water law took its strongest roots after World War II. Important negotiations in the 1950s and 1960s, such as agreements made on the Mekong and Senegal rivers, helped gain experience and lessons were learned on how to make cooperation successful. While some of these were bilateral agreements, parties like the Tennessee Valley Authority, the World Bank, and United Nations were called upon to bring expertise and help in reaching a deal (Adeel et al. 2015).

2.3. Political Power Dynamics in the Trans-boundary River Basins

Although connecting institutions in the form of treaties and river basin organizations has the potential to create a more equitable power dynamic between riparian states, sometimes these institutions can reinforce or even strengthen disparities. Power inequalities are explained by relationships between basin riparian countries and, often, important actors outside the region. It

has been contended that uneven resources, often of a financial or political nature, bring about real-world inequities. These inequities are put within institutions, weakening their effectiveness (Petersen-Perlman et al. 2017).

Power relations between riparian states largely determine the control over water resources that each riparian exerts. Even the upstream/downstream dynamic is predicated on power; those upstream use water to get more power, and those downstream use powers to get more water. It is the more powerful side in a water interaction, especially when the competition is over scarce water resources, which achieves and maintains the upper hand. This is not to say that the stronger party will always use hard power in the attainment of self-serving objectives. Creating compliance through the use of soft power having a self-serving ideology freely adhered to by the weaker actor is a mechanism most often utilized by the stronger party (Hanasz, 2014).

Power asymmetry of a lesser or greater degree is usually present in water basins, and affects the water interactions that are established, thereby also influencing the outcomes of and approaches to water conflicts. In contexts of a relative balance of power, riparian states can decide together whether or not to collaborate on water projects or governance issues; but in an 'anarchic' basin, each state acts unilaterally and opts against communicating with its neighbors (Hanasz, 2014).

In unequal power structures, strong states have the option to select the approach consistent with their best interests, while significantly weaker states can rarely afford to choose cooperation or communication. Consequently, cooperation under these conditions can limit the room for maneuver of non-hegemonic powers. The Ganges River is an example. India has chosen to manage this multilateral river through bilateral means as opposed to multilateral accords, which has enabled the hegemon state to secure its interests and prevent Nepal and Bangladesh from offsetting its power (Warner & Zawahri, 2012).

Weaker and smaller upstream states can be even more rewarded by more powerful and larger downstream states desiring to exploit a river basin. While the weaker upstream country may have neither sufficient need nor capability to exploit the river basin to its advantage, the stronger downstream state does. Where regulation of the river for flood control and hydropower purposes is sought and the majority of the facilities need to be built, upstream states can take advantage of the situation. An upstream state agree to cooperate in exchange for some kind of compensation,

whether side-payments or in-kind through projects that will be largely funded by the downstream country. The upstream state will, therefore, incur little (if any) capital costs for the project but will gain particular benefits as a prerequisite for opening its territory to the project. The hydro-political relations between Nepal and India, and Bhutan and India, follow this scenario. Both Nepal and Bhutan are upstream of India, but have the capacity of satiating, at least some of, India's massive hydropower needs. By harnessing Nepal's and Bhutan's water resources and immense hydropower potential, India is able to vastly benefit from it. In fact, India has pursued bilateral agreements for hydropower generation with both Nepal and Bhutan (Dinar, 2008).

When the Nile basin riparian sates are seen in this lens, particularly Ethiopia as upstream state, in the past had little capability and interest to use the river Nile while Egypt the downstream state has had the capacity to use of the river Nile given the hegemonic and geographic advantage. On contrary, in the case of Indus river basin, India, an upstream state has had the capability and interest to use the river Indus undermining the interest of the downstream state, Pakistan, by virtue of hegemonic power even rejecting the mutual treaty signed in 1960, Indus Water Treaty.

2.4. International Water Law on Trans-boundary Waters

International water law regulates the uses of international watercourses that are situated partly in different States, which is a highly topical sector of law. In 2014, after a time when no general agreements were in existence in the field, two conventions covering the same subject matter entered into force globally: the 1992 United Nations Economic Commission for Europe Convention on the Protection and Use of Trans -boundary Watercourses and International Lakes, and the 1997 UN Convention on the Law of the Non-navigational Uses of International Watercourses. The process of codification of international water law dating back to the 1966 Helsinki Rules of the International Law Association has concluded into binding international agreements, which are mutually compatible and complement each other. The general principles of the two conventions, such as cooperation, equitable and reasonable utilization and the no-harm rule, relate to customary norms of international water law (Belinskij, 2015).

International water law provides a platform for identifying and integrating the relevant legal, scientific, and policy issues pertaining to the utilization of trans-boundary watercourses like traditional reference to all relevant factors and circumstances in determining equitable use. At

operational level, international law offers a range of tools and mechanisms for implementation through concrete rules containing specific rights and duties as well as procedures that can invoke to manage trans-boundary watercourse or resolving interstate conflicts (Wouters, 2013).

Determining worldwide conflicts done by legal means can prove problematic due to some jurisdictions taking to rely upon un-well defined water law or customary water law, insufficient enforcement instruments, and conflict resolutions. The International Court of Justice where the conflicting parties agree has to decide on jurisdiction and frames of situation before a case can be heard. This results in little international water conflicts existence in the International Court of Justice (Petersen-Perlman, et al., 2017).

2.5. Trans-boundary Water Resources Utilization Principles

There are different principles of trans-boundary water resources how to use water by considering judicial decisions, international treaties and international convention. These are listed as follows:

2.5.1. Principle of equitable and reasonable utilization

Equitable and reasonable utilization principle rests on the basis of shared sovereignty. In determining equitable and reasonable share relevant factors, such as the geography of the basin, existing utilization of waters, potential needs in future, climatic and ecological factors to a natural character and availability of other resources are taken into account (Rahaman, 2009). This principle involves a balance of interests that accommodates the needs and uses of each riparian state. It has substantial support in state practice, judicial decisions, and international codifications (Belinskij, 2015).This principle has vast acceptance in the Nile basin riparian particularly in the upstream states in this basin uses it to accept their principle for right to utilize the river. When it comes to the Indus river basins the upstream countries likes India accept this principle for reasonable utilization of the river.

2.5.2. Obligation not to cause significant harm

According to this principle, no state in an international drainage basin is allowed to use the watercourses in its territory in a way that would cause significant harm to other basin states or to their environment, including harm to human health or safety, to the use of the waters for beneficial purposes or to the living organisms of the watercourse systems. This principle is

widely recognized by international water and environmental law (Rahaman, 2009). However, the question remains on the definition or extent of the word ‘significant’ and how to define ‘harm’ as a ‘significant harm’. This principle is in fact incorporated in most modern international water conventions, treaties and agreements. It is now considered as part of the customary international law (Rahaman, 2009). As regards the Nile basin, the upstream riparian states such as Ethiopia accept it but the downstream riparian; particularly Egypt is totally unwilling to be abided by this principle claiming an absolute use the Nile water without sharing it with other co-riparian states in a way that would not cause significant harm to it in a way of misunderstanding. On the Indus basin context, the downstream riparian, Pakistan is in favor of this principle in contrast to India an upper riparian.

2.5.3. Principles of notification, consultation and negotiation

In this principle, each riparian state in an international watercourse is entitled to prior notice, consultation and negotiation if the proposed use by another riparian would cause serious harm to its interest. This principle is generally accepted by international conventions, agreements, and treaties. However, most upstream riparian countries often oppose this principle. It is interesting to note that during the negotiation process of the 1997 UN Watercourses Convention, this principle was opposed by only three upstream riparian countries: Ethiopia abstained (Nile basin), Burundi (Nile basin) and Turkey (Tigris–Euphrates basin). As per this principle, it is a responsibility for each riparian state of an international watercourse to cooperate and exchange data and information regarding the state of the watercourse as well as present and future planned uses along the watercourse (Rahaman, 2009). When it comes to the Nile basin, Egypt unquestionably supports this principle as it gives her advantage to get notified by the upstream states in prior to development of any plan of action in the Nile River by the upstream riparian states. In the context of Indus basin as well Pakistan is in favor of this principle rather than India.

2.5.4. Peaceful settlement of disputes

This principle advocates that all states in an international watercourse should seek a settlement of the disputes by peaceful means if concerned states cannot reach agreement by negotiation. Most modern international water conventions, treaties, and agreements incorporated this principle, for example, the 1966 Helsinki Rules (Articles XXVI–XXXVII), the 1997 UN Watercourses

Convention (Article 33), the 1960 Indus Waters Treaty (Article IX, Annexure F, G), the 1995 SADC protocol on shared watercourse systems (Article 7), the 2002 Sava River Basin Agreement (Articles 1, 22–24, Annex II), the 1996 Mahakali River Treaty (Articles 9, 11), the 1995 Mekong Agreement (Articles 18.C, 24.F, 34, 35), the 2004 Berlin Rules (Articles 72–73) and the 1992 UNECE Water Convention (Article 22, Annex IV). This principle is approved by modern international environmental conventions and declarations, for example, the 1992 Rio Declaration on Environment and Development (Principle 26) and the 1992 Convention on Biological Diversity (Article 27, Annex II) (Rahaman, 2009). As for the Nile basin, this principle is widely accepted by the upstream riparian including Ethiopia in contrast to the downstream states like Egypt. In the Indus basin, Pakistan accepts this principle more than India.

From the discussion above, it is possible to identify that in a given trans-boundary river basin, there is conflicting doctrines and principles to be preferred by upstream and downstream riparian states. When it comes to the Nile basin, for instance, Egypt is a downstream riparian state, and Ethiopia is an upstream riparian state. In the Indus basin case while Pakistan is a downstream state, India is an upstream riparian state. Therefore, both in the Nile and Indus river basins upstream and downstream riparian states do have preferences of quite different doctrines and principles that favor to the respective particular riparian states. For instance, in the Nile and Indus basin cases, the upstream riparian states namely: Ethiopia and India do respectively favor that of absolute territorial sovereignty doctrine and equitable and reasonable utilization principle. Whereas, the downstream riparian states in the respective basins namely: Egypt in the Nile and Pakistan in the Indus case favor absolute territorial integrity doctrine and obligation not to cause significant harm. This shows that the prevalence of different doctrines and principles out there causing conflicts to the upstream and downstream riparian states due to the diverse preferences.

Chapter Three

3. Trans-boundary Cooperation in the Nile and Indus River Basins

3.1. The Nile River Basin

3.1.1. The Physical and Hydrological Description

The Nile is the longest river in the world, its basin connecting eleven riparian countries namely: Egypt, Ethiopia, Sudan, South Sudan, Kenya, Republic of Congo, Burundi, Eritrea, Rwanda, Tanzania and Uganda. It is large both in terms of drainage area as well as in terms of the quantity of water it carries in its watercourse (Knaepen & Byiers, 2017). The Nile River flows 6,700 km with an area of 3 million km2 and the basins cover about 10% of Africa continent (Eilas, 2009). The Nile River originates from two physically and hydro-logically different sources: These are Abbay (called the Blue Nile in foreign literature) which originates from Gilgal Abbay in the highlands of Ethiopia, and the White Nile from Lake Victoria in the Equatorial Lakes region of eastern and central Africa (Elias 2009:13 & Swain, 2008:24).

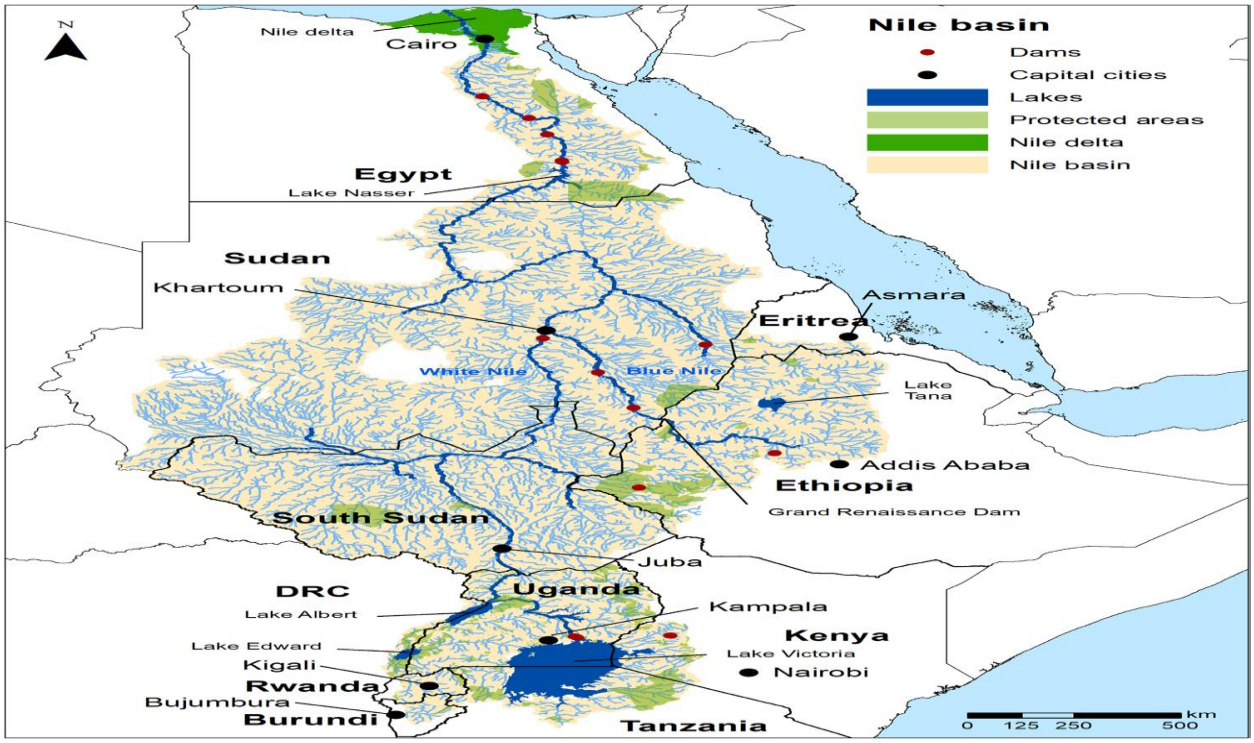
The White Nile has more or less regular flows throughout the year (mainly because of the natural regulation effect of the Sudd); while the Blue Nile is highly irregular, with about 60% of its annual flow coming during the flood season of July through September (Elias, 2009). These two main tributaries meet at Khartoum, in Sudan to form the Nile River which flows to Egypt and finally enters into the Mediterranean Sea. The Ethiopia highland provides 86 per cent of the Nile River out of which Abbay takes 59 per cent, Baro-Akobo/Sobat 14 per cent, and Tekesse/Atbara I3 per cent; whereas, the Equatorial Lakes region contribution of the Nile river is only I4 per cent (Swain, 1997& Daniel, 1999).

Table 1: The flow of contributions of the Nile River among co-riparian as measured at Aswan.

	Nile riparian country	Mean annual flow contribution (as measured at Aswan) Bill. Cubic Meters	% of Total
1	Egypt	0	0
2	Sudan	Negligible	0
3	Ethiopia	72.24	86
4	Upper white Nile riparian states	11.76	14
	Total	84	100

Source: Elias,2009

Based on the above table the bulk of the Nile River comes from the upper riparian states which contribute the lion share of the water to the Nile River, in contrast the downstream states. The water use prevailing in the basin is an unbalanced one favoring mainly Egypt and to a certain extent that of the Sudan. The Nile River flows through the highland regions with abundant moisture to lowlands with arid conditions, and supplying water to around 238 million people (Gabriel et al., 2014). The Nile water flows across varied climatic areas causing trans-boundary water management challenges with eleven countries sharing its water due to climate change and climate variability, and the amount of water in the Nile Basin fluctuates (Batisha, 2011).



Map 1: The map of the Nile river basin and riparian states. Source: Allan et al., 2019

The Nile river basin countries are characterized by environmental degradation, extreme poverty, high population growth and political instability. Despite the rich resources of the Nile many of the basin countries are poor, with a widespread conflict, and frequent natural disasters such as drought and famine. In addition to such threats unattainable and awkward national development plans in the basin are presenting an obstacle for the efficient management of the Nile River (Mohamoda, 2003; Wondwosen, 2008).

3.1.2. Nile Water Utilization Agreements among the Riparian States

The Nile river agreement for water utilization is characterized by lack of durability, inclusiveness and equitable share and benefit of the riparian states. The factors which contributed in shaping the history of water utilization, management, and development in the Nile basin has been the colonial legacy, particularly the British interest over the Nile River during the colonial era and the water security policy pursued by Egypt (Mohammed, 2004). The Nile river basin lacks any agreement binding the countries for an optimal and equitable allocation of water resources. Most of the agreements on the Nile water utilization were made either between former colonial States or bilateral agreement especially between Sudan and Egypt. The present tension in the basin is the result of the historical development of the colonial period. Most of the agreements signed on the use of the Nile water have been colonial agreements and these agreements were stimulated by Britain which managed to secure the water of the Nile for Egypt and Sudan particularly making Egypt the crucial beneficiary. The British had always moved to protect its colony's (Egypt) interest on the Nile River to protect its colonial economic interests (Kebrom, 2011).

This is witnessed in the Protocol signed in 1891 between Italy and the Great Britain, Ethiopia and British in 1902, Great Britain-Congo treaty in 1906, the tripartite treaty between Britain, France and Italy in 1906, between Egypt and Great Britain in 1929, and the post independent period agreement between Egypt and Sudan in 1959 (Kebrom, 2011). In the subsequent section each of the agreements listed above are presented in detail.

3.1.2.1. The 1891 Anglo- Italian Protocol

It was signed between Britain and Italy in 1891. The Protocol was primarily for delimitation of the colonial boundary of Britain and Italy in the Sudan and Eritrea respectively. This Protocol was not on the water of the Nile itself. The water of the Nile was stated under article III of the Protocol as an incidental issue. Article III of the Protocol prohibited Italy from undertaking construction work at the headwaters of the Nile (Mohammed, 2004). The Article states as follows: "The Government of Italy commences not to build on the Atbara any irrigation or other works that might modify its flow into the Nile." (Okoth-Owiro, 2004:14). Based on this Protocol the Italy government did not construct any dam on the Atbara River for irrigation purpose and the protocol did not include the upper riparian states, especially Ethiopia which has substantial

share of the water. What makes it absurd and irrelevant is the fact that the Nile River did not flow in the territory colonized by Italy, which was the basis for its claim to its water. However, from the obligation imposed on Italy, it is implied that the intention of the British government was to safeguard its colonial interest in Egypt. Thus, the Protocol manifests part of an imposing British strategy to fully control over the water of the Nile (Mohammed, 2004). The defining characteristic of this protocol was that it was exclusively a colonial powers treaty without the representation of any concerned riparian states of the Nile river basin.

3.1.2.2. The 1902 Treaty between Britain and Ethiopia

It was signed between Britain and Ethiopia in 1902 at Addis Ababa to determine the boundary between Ethiopia and the Sudan, Article III of this treaty reads as follows:

> The Emperor Menelik II, His Majesty, King of Kings of Ethiopia, engages himself towards the Government of Britain, His Majesty, not to build or allow to be constructed any work on the Blue Nile, Lake Tana, or the Sobat, which would arrest the flow of their waters except in agreement with His Britannic Majesty's Government and the Government of Sudan (Daniel, 1999:7).

Based on Article III of this treaty Ethiopia was prohibited to construct any dam on the Blue Nile River or headstream water of the Blue Nile like Lake Tana and any other tributaries of the river like Sobat without the consent of the government of Britain and Sudan as if Ethiopia were not the owners of the above mentioned rivers. This treaty was the most controversial in the history of Nile agreement as both parties claimed their own understanding, especially in the meaning of the word ‘’arrest’’ in the Amharic and the English versions. In the Amharic version, the requirement imposed on Ethiopia did not prevent the use of the water. What was outlawed was any scheme which would totally arrest the flow of water. There was no evidence indicating that Ethiopia had recognized the meaning of the word "arrest" as to not use the water (Mohammed, 2004). The unique and defining characteristic of this treaty was that it was the first ever treaty concluded between the colonial power and the riparian state in the history of the Nile River.

3.1.2.3. The Agreement between Britain and Congo in 1906

This agreement was signed between Britain and King Leopold II of Belgium in 1906, which prohibited any construction that would diminish the flow of the White Nile water reaching in Sudan (Swain, 2008). Article III of the Treaty states as follows:

> The Government of the Independent State of Congo carry out not to build or permit to be constructed any work over or near the Semliki or Isango Rivers, which would reduce the volume of water inflowing Lake Albert, except in agreement with the Sudanese Government (Okoth-Owiro,2004:15).

Based on article III, the colonial government of Congo did not construct on the Semliki and Isango River which would diminish the volume of water flowing to the Albert Lake without the consent of the Sudanese government. This article denied the right of Congo government to build on the river to achieve their national interest. The defining characteristic feature of this particular treaty was that it was concluded between the colonial power and personal colonial master.

3.1.2.4. The 1906 Tripartite Treaty

This treaty was signed among Britain, France, and Italy in 1906 targeting Ethiopia for a colonial arrangement. The objective of those powers was to set a legal framework and steps to regulate their sphere of influence following the anticipated succession problems in the aftermath of Menelik II's stroke. In Article 14 sub article (a) of this treaty, the three colonial powers agreed to act together to safeguard the interests of Britain and Egypt in the Nile Basin (Wuhibegezer & Sheferawu, 2014:7). The defining characteristic of this treaty was that this agreement neither included anyone party of the riparian countries nor fulfilled the elements of a valid treaty besides being a treaty of exclusively colonial powers. Based on the above treaty of Article 14(a) colonial powers Britain, France, and Italy agreed to protect the interest of Egypt and by extension that of the British interest.

3.1.2.5. The 1925 Anglo-Italian Agreements

This agreement was signed between Britain and Italy in 1925 which allocated with issues of the Nile water. Italy recognized the prior rights of Egypt and the Sudan on the headwater of the Nile and guaranteeing not to construct on the headwater and its tributaries any works that might sensibly modify their flow into the main river of Nile. Finally Ethiopia voiced its opposition against the treaty. Following Ethiopia's rejection, the British government renounced its position and admitted that the agreement was bilateral and was not meant to bind Ethiopia (Mohammed, 2004). This agreement was concluded by Britain with another European power Italy seeking to establish a sphere of influence, such as Ethiopia, they had common objective of securing recognition of the principle that no upper-basin state had the right to interfere with the flow of

the Nile, in particular to the detriment of Egypt (Okoth-Owiro,2004:15). The unique and defining characteristic feature of this treaty was that even though it was entered into agreement between colonial powers, Ethiopia a non-colonial power and the riparian state of the Nile basin, openly voiced against the treaty as a result of which Britain asserted as a non-binding bilateral treaty.

3.1.2.6. The 1929 Anglo-Egyptian Agreement

This agreement was signed between Egypt and Britain representing the Sudan. The objective of the agreement was at securing the Nile water for Egypt by limiting the rights of the Sudan and rejecting those of the other co-riparian states. The Agreement recognized the Sudan's right to use the water of the Nile as far as Egypt's natural and historic rights were protected (Mohammed, 2004). This agreement includes specific allocations of water 48 billion m3/year to Egypt and 4 billion m3/year to Sudan (12:1 allocation), which in total makes up the entire usable annual discharge of the Nile river. Ethiopia, the most important water provider in the basin, was not a signatory and refused to acknowledge it (Rosberg, 2014).The Article 4 (ii) of the 1929 agreement states that, "except with the prior consent of the Egyptian Government, no irrigation works shall be undertaken or electric generators installed neither along the Nile and its branches nor on the lakes from which they flow" (Yaekob 2011:24).

Up on independence, the other co-riparian states of the Nile river basin expressed their disagreement to the treaty and followed what came to be known as the Nyerere doctrine, which holds that colonial agreements are null and void except when they enshrine principles recognized by international law. This doctrine is related to what is known as the "tabula rasa" or "blank slate" doctrine where a newly independent state won't have the treaty rights and obligations of the old state out of the norms of customary international law (Kebrom, 2011). According to the 1929 Treaty, between Britain and its Egyptian colony, none of the upstream states was allowed to reduce the volume of the Nile flowing into Egypt and Sudan. The treaty stated that without the consent of the Egyptian government, no irrigation or hydroelectric works can be established on the tributaries of the Nile, if such works can cause a drop in water level harming to Egypt (Embiale et al., 2018).

The unique feature of this treaty was that it was concluded between downstream riparian states dictated by their colonial power ignoring other co-riparian states of the Nile river basin. Since

this treaty was not concluded in consultation with the upper riparian states, these days, none of the co-riparian states welcome it including Ethiopia.

3.1.2.7. The 1959 Nile Waters Agreement between Egypt and Sudan

This agreement was signed between Egypt and Sudan excluding all other Nile riparian states. Egypt and Sudan negotiated the 1959 Nile Water Treaty, which gave them the right to use 100 per cent of the Nile water resource and continued to retain the veto power over any upstream projects. Most importantly, the agreement was a pact between Egypt and the Sudan to act together against the upper riparian states of the Nile river basin (Embiale et al., 2018; Elias, 2009). The agreement was reached between two sovereign downstream states: Egypt and Sudan neither informing nor inviting the upstream riparian states while they negotiated and signed this agreement on the full use of the Nile waters (Yacob, 2007:103).

The agreement allowed the entire average annual flow of the Nile water to be shared between Sudan taking to 18.5 bcm and Egypt 55.5 bcm. According to this agreement, if any complaints come from the remaining riparian countries over the Nile water resources, Sudan and Egypt shall handle it together. If the complaint should prevail and a decision is reached to "re-share" the Nile water with another riparian state, Sudan and Egypt agreed to redistribute the allocated amount equally from each country's share, to be measured at Aswan (Wuhibegezer & Sheferawu, 2014:11).

3.1.3. Attempts of Cooperation among the Nile River Basin States

There have been, despite the conflict between upstream and downstream states, several attempts of cooperation in the Nile Basin. These are: Hydromet (Hydro- meteorological Survey of the Catchments of Lakes Victoria, Kyoga, and Mobuto Sese Seku or current name Lake Albert), Undugu, and TECCONILE (Technical Cooperation Committee for Promotion of the Development and Environmental Protection of the Nile Basin) are examples of inter-basin cooperative institutions. These attempts of cooperation have had little success though the Nile Basin Initiative (NBI), established in 1999, and initially showed more promise (Rosberg, 2014).

3.1.3.1. The Hydro-Met Survey Project (1967-1993)

The Hydro-Meteorological Survey (for short, Hydro-Met) is the first organization which was established in 1967 by the Great Lakes states in the aftermath of independence in the 1960s. This organization includes all Nile riparian states except Ethiopia and the Democratic Republic of Congo (DRC) with the support of United Nations Development Program (UNDP) and the World Meteorological Organization (WMO) (Yaekob, 2011). The purpose of this project was to evaluate the water balance of the Lake Victoria catchment in order to assist in any control and regulation of the Lake level as well as the flow of water down the Nile. This Project lasted for 25 years, but Ethiopia was not included in this project despite the fact that Ethiopia contributes the lion share of the water of the Nile River and the project was unsuccessful in its effort to develop an effective basin-based arrangement (Swain, 2011).

3.1.3.2. UNDUGU (1983-1993)

The "undugu" in Swahili language means "brotherhood". The Undugu forum was set up in Khartoum, Sudan, in 1983 by the initiation of Egypt. The founding members of this forum were Egypt, Sudan, Democratic Republic of Congo (DRC), Uganda, and Central African Republic (though Central Africa Republic has not been Nile basin country). The objective of the forum was to create cooperation in such common fields as: environment, culture, electric power, telecommunication, trade, and water resource development (Yacob, 2007). Ethiopia, Kenya and Tanzania chose an observer status in the forum. At an expert meeting held to evaluate the UNDP sponsored Undugu plan of action for the Nile basin, Ethiopia challenged Undugu that it had no legal standing or terms of reference as a legitimate body, and had no competence to submit a plan of action for the Nile basin. The forum therefore collapsed after its 10th Ministerial meeting held in Addis Ababa in 1993 (Yacob, 2007).

3.1.3.3. TECCONILE (1993-1999)

As the Hydro-met Survey in 1992 was completed the same year the water resource ministers from Egypt, Rwanda, Sudan, Uganda, Tanzania, and Democratic Republic of Congo (DRC) created a new organization called Technical Cooperation for the Promotion of the Development and Environmental Protection of the Nile Basin (hereafter TECCONILE) with a signing of an agreement at Kampala, Uganda supported by the Canadian International Development Agency

(CIDA). Ethiopia, Burundi, Eritrea, and Kenya participated as observers (Kibrome, 2011). TECCONILE aimed to assist member states in developing national master plans and their integration into a Nile development action plan and develop the infrastructure and build capacity in techniques required for the basin's water resources. And, what made the TECCONILE better from all other previous initiatives was its aim of declaring equitable entitlement. This long-term objective was given weight in this initiative as put by one of the projects that was designated as D3, which dealt with forging a cooperative framework that would in the last resort solve the problems of water allocation amongst the Nile riparian states (Ademnur, 2003). TECCONILE which was hoped to evolve into a permanent basin-wide institution yielded the Nile Basin Initiative to which the pending projects were ceded (Dereje, 2013).

3.1.3.4. Nile Basin Initiative (since 1999)

The Nile basin initiative (hereafter NBI) was launched in 1999 in Dare-salaam, Tanzania. It consists of the Council of Ministers of the Water Affairs of the Nile Basin States, a technical advisory committee, and a secretariat headquartered in Entebbe, Uganda. The NBI is assigned to develop a framework for regional cooperation of equitable distribution, integrated water resource planning, and reduction of potential conflict among the riparian nations of North and East Africa. The Council of Ministers of Water Affairs of the Nile Basin States created the NBI with a commitment of funding from donors, and multilateral institutions (Aaron, 2014).

The NBI intended to achieve sustainable socioeconomic development through the equitable utilization of, and benefit from, the common Nile Basin water resources. Its objectives include: developing the Nile Basin water resources in a sustainable and equitable way to ensure peace for all its peoples and ensuring cooperation and joint action between the riparian countries, and seeking win-win gains. This would be attained through sharing knowledge and encouraging regional cooperation among Nile Basin states on water resource management, hydropower, agriculture, irrigation, watershed projects and fishing. In terms of water uses, agriculture has been the dominant sector in most Nile basin countries (Knaepen & Byiers, 2017).

The Nile Basin Initiative was developed with assistance from UNDP and CIDA with the intention to help reduce tensions and create a framework for equitable sharing and cooperative development of Nile water resources. The NBI also serves as the funding channel for financial

institutions interested in the region. It now forms the most important basin-level approach to cooperative development of the Nile waters ever undertaken, and its significance extends well beyond the basin itself (Oloo, 2007).

The World Bank sponsored the Nile Basin Initiative, in collaboration with the Canadian International Development Agency (CIDA) and the United Nations Development Program. The present initiative has been encouraged by the ideas and direction of debate obtained from the Nile 2002 Conferences, which started in 1993 and have been held every year on a rotation basis among the basin countries. The NBI hopes to facilitate a cooperative enterprise between and among the riparian states. The four goals of NBI are: building confidence among the basin states; changing perceptions on the issues of the Nile waters; realizing that cooperation is more beneficial than confrontation; and knowing the extent of the water resource potential for inter-state collaboration. The explicit slogan of the NBI is: "Sustainable development of the River Nile for the benefit of all." The NBI structure has so far effectively facilitated active consultation and dialogue among the basin countries. As a result significant decisions have been taken at the basin and subsidiary levels (Yacob, 2007).

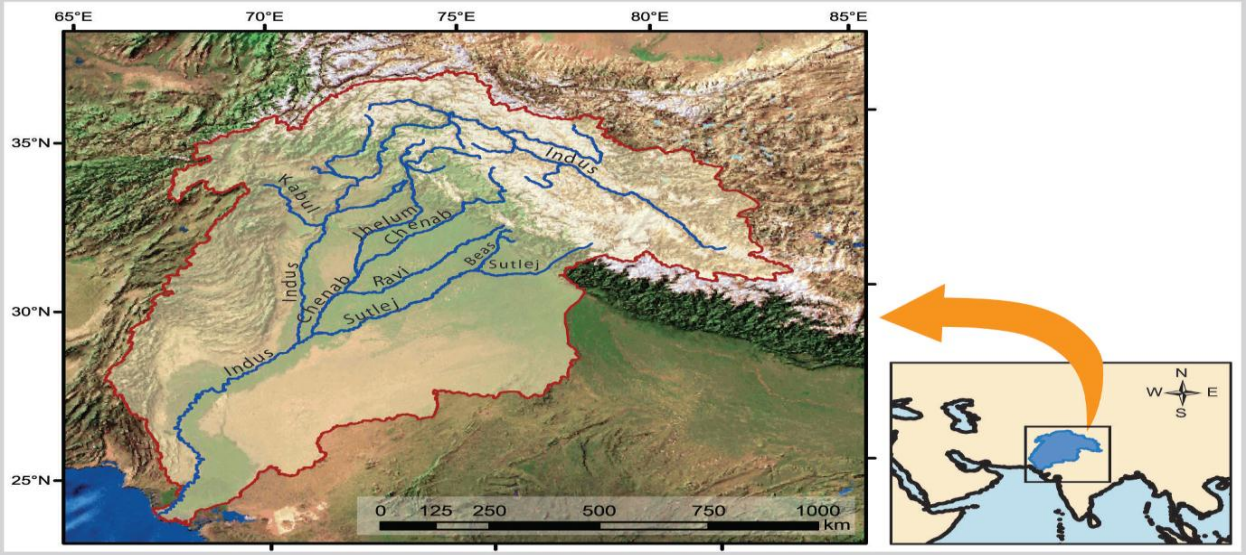
However, the negotiation for legal/ institutional framework is slow and still has a long way to go. Initial disagreements were already noted in December 1999 during the deliberation on the draft legal/institutional framework prepared by a UNDP consultant. The upstream countries insisted that a new framework must disregard all previous agreements to which their nations are not a party. On the other hand, the downstream countries hope that a new framework would take into account the previous agreements as an integral part of a new agreement. A mutually acceptable legal and institutional framework has, however, been difficult to agree upon. One disagreement that persists is that the downstream countries would like to hold on to the status quo, while the upstream countries insist on a fresh agreement (Yacob, 2007).

3.2. The Indus River Basins

3.2.1. The Physical and Hydrological Description

The Indus river basin is the largest basins in Asia with the length of 3,200km and the river flows through four countries in South Asia: India in the east, China in the northeast, Afghanistan in the north-west and Pakistan in the south (Mohammad, 2011). The Indus River Basin encompasses

1.12 million square kilometers (km2), with 47 per cent of the area falling in Pakistan, 39 per cent in India, 8 per cent in China, and 6 per cent in Afghanistan. Indus basin consists of six most significant tributaries: Chenab, Ravi, Sutlej, Jhelum, Beas, and the Indus itself which flow westwards through India before crossing into Pakistan (Iqbal, 2013). Around 69 per cent of the Indus River originates from India, 19 per cent from Pakistan and 12 per cent shares China and Afghanistan collectively (Khan, 2013). The main part of the Indusbasin lies in arid-to-semi-arid climatic zones; however, there is considerable temporal and spatial climatic variation across the area (Nepal & Shrestha, 2015). The climate is not uniform over the Indus river basin for it varies from subtropical arid and semi-arid to temperate sub humid. Annual rainfall ranges between 100 and 500 mm in the lowlands to a maximum of 2000 mm on mountain hills. Snowfall at higher altitudes (above 2500 m) accounts for most of the river runoff (FAO, 2011).



Map 2: Indus river basin. Source (Winiger, 2017).

As the map above shows the Indus river basin originates in the high Himalayan Mountains of China, Afghanistan, and India extends to the dry alluvial plains of Sindh Province in Pakistan in the south, finally draining into the Arabian Sea (Nepal & Shrestha, 2015).

3.2.2. Indus water utilization agreement among the riparian states

3.2.2.1. Sutlej Valley Tripartite Agreement (1920)

It was the first agreement among the Government of Punjab, Princely States of Bahawalpur, and Bikaner to share waters of Sutlej and Beas rivers for sharing of river waters. It was signed in 1920 in Punjab. It paved the way for the sanction of the Sutlej Valley Project and Sukkar Project in Sindh (Bhatti & Farooq, 2014). The defining characteristic of this agreement was that it was concluded between provinces.

3.2.2.2. Draft Sindh-Punjab Agreement 1945

After prolonged negotiations between Sindh and Punjab a draft agreement was drawn in 1945. It was subject to settlement of the financial phase of the dispute with respect to sharing of waters of Indus and Punjab's rivers. But the agreement could not be finalized. Ultimately it was decided to refer the matter to His Majesty's Government in England. Early in 1947, Government of India referred the case to the Secretary of State for India for a decision. The matter was still pending till the Indian Independence Act of July 1947 which created two independent states of Pakistan and Bharat on August 1947. Thus, due to the partition and its political and geographical effects, the water dispute remained unresolved (Bhatti & Farooq, 2014). The defining feature of this agreement was that it was a draft agreement involving colonial powers in the process.

3.2.2.3. Sindh- Punjab agreement in 1945

The water in the Indus River basin has been in place for irrigational use since the last several centuries. Originally there was a system of waterways which drew supplies directly from the river without any control structure across the river. These canals were known as flood canals and since the water level in the river kept on fluctuating, the withdrawals in such canals remained uninsured and unreliable. This objective was attained by building head works across the rivers, which helped in providing assured water supply on an almost regular basis. Such diversion works of engineering were first attempted on the tributary rivers because of simplicity of construction. Subsequently another Commission was appointed as a result of which a Sindh-Punjab agreement was signed in 1945 by Chief Engineers of the two provinces, but it was not

ratified by Government of Punjab for lack of settlement of financial issues (Muhammad, 2011). The defining feature of this agreement was that it was concluded between the provinces.

3.2.2.4. Standstill agreement in 1947

Soon after the partition of British India in 1947, the water disputes between Indian (East) Punjab and Pakistan side of (West) Punjab started. To resolve it, a Standstill Agreement was signed in December 1947 to maintain pre-partition-level allocation of water (Ranjan, 2016; Siwakoti & Kathmandu 2011). On December 20, 1947, chief engineers from west and east Punjab signed a Standstill Agreement, which sought to maintain the status quo prior to independence in the division and use of these canals. The agreement proved favorable to Pakistan, since it received the more developed farmlands of Punjab and was consuming more of the canal waters. The largely neglected eastern Punjab now belonged to India. As a result, India's leaders were worried to develop the agricultural potential of the region watered by the Indus River (Zawahri, 2008; Khan, 2013).

As India and Pakistan sought to develop the Indus tributaries, they were in continuous dispute and the lack of a third party to assist in negotiating a settlement resulted in a period of conflict. On March 31, 1948, the Standstill Agreement expired and on April 1, 1948, Indian east Punjab stopped the waters feeding the Upper Bari Doab and Dipalpur Canals. This action deprived Pakistan's important city, Lahore, of municipal water and hydropower. It also deprived irrigation water to 1.66 million acres of farmland and consequently, millions of people faced the ruin of their crops. After intense negotiations, India re-opened the canals on May 3, 1948. Yet, this experience resonated with Pakistani leaders as a constant reminder of their vulnerability and dependence. Such fears proved to be accurate because the flow of water in these canals was reduced in 1952 and 1953 (Zawahri, 2008; Khan, 2013). The defining characteristic of this agreement was that it was made in the aftermath of independence between India and Pakistan.

3.2.2.5 The Inter-Dominion or Delhi Agreement in 1948

In this agreement India agreed to the resumption of flow, but maintained that Pakistan could not claim any share of those waters as a matter of right. Pakistan contested India's position, which was aggravated by the Indian claim that since Pakistan had agreed to pay for water under the Standstill Agreement of 1947, Pakistan had therefore recognized India's water rights. Pakistan

refuted that they had the rights of previous appropriation, and that expenses to India were only to cover operation and maintenance costs. While these conflicting claims were not resolved, an agreement was signed, later referred to as Inter-Dominion or the Delhi Agreement, in which India assured Pakistan that it would not withdraw water without allowing time for Pakistan to develop alternate sources (Romshoo, 2014). Unlike Standstill Agreement, the Delhi Agreement recognized India's right to increase its consumption of the Indus River and it required that Pakistan pay India for operating the canals (Zawahri, 2008).

Furthermore, the city of Lahore was dispossessed of its municipal water and the electricity derived from the Mandi hydroelectric system was also cut off. This combined with the stresses or partition, triggered a decade-long water dispute that contributed to India and Pakistan being on the cliff of war until the World Bank intervened. The World Bank proposed water sharing agreements based on three principles: (1) water in the Indus Basin is sufficient to meet the needs of both countries; (2) all tributaries in the Indus Basin should be included in the discussion and (3) the negotiations should focus on technical rather than political issues. These agreements led to the ratification of the Indus Waters Treaty in 1960 (Alam 2002; Nax, 2016). The defining characteristic of this agreement was that it was made between the two most concerned riparian states of the Indus river basin and in this agreement one party, India, claimed the absolute ownership over its tributary that flows to Pakistan in the Indus River despite its willingness to let flow to Pakistan.

3.2.2.6. Indus Water Treaty (IWT) in 1960

This treaty was signed by the Government of Pakistan and India brokered by World Bank. The aim of this agreement was to solve the water related issues of both countries (Sohail, 2015). The Treaty allocated three western rivers (the Indus, Jhelum, and Chenab) to Pakistan, with some water apportions to India, and offered India exclusive rights to the three eastern rivers (Ravi, Sutlej, and Beas). India's rights to develop hydropower schemes on the western rivers are articulated in the Treaty (Ahmad, 2012). India was, however, permitted to irrigate 1.3 million acres of land from the western rivers. In return, India paid taxes to Pakistan for the exclusive rights on the rivers allotted to her and irrigation rights on the western rivers.

After the Indus Water Treaty was signed in 1960, it was thought that all water-related disputes between India and Pakistan would be permanently resolved, but not so. The disputes related to behavior of two riparian states over interpretation of the provisions of the Indus Water Treaty and construction of multipurpose hydrological projects evolved soon after the signing of the treaty. The allegations against upper riparian, which are not always incorrect, for regulation of water were being made by all lower riparian states. Usually, in their self-interests, the upper riparian states divert water during the summers and release more than the required quantity of water during non-water-requiring seasons. This creates drought in summer and floods in the monsoon season in the lower riparian areas. The degree of India–Pakistan hostility is such that although Indus Water Treaty is considered as one of the well drafted treaties between two arch enemies, it has failed to resolve water disputes between them (Ranjan, 2016:197).

3.2.2.7. Indus Water Accord (1991)

After several commissions and interim arrangements, the Nawaz Sharif government of Pakistan signed the Indus Water Accord in 1991 amongst the four provinces for the Indus system waters. The Interprovincial Water Accord was signed between the provinces of Pakistan, and the prolonged conflict of water between the provinces reached a settlement. The treaty was based on the expected average flow of 141 km3/ year in the Indus basin. According to this accord, the allocations were for Punjab 69.03 km3/year, Sindh 60.17 km3/year, KPK 7.13 km3/year, and Baluchistan 4.78 km3/year (Tariq et al., 2020). The Council of Common Interests approved it on March 21, 1991. This landmark Accord was a great achievement as it decided on a formula of water distribution of Punjab's twenty four canals, Sindh's three barrages and KPK's five canals. However, despite signing of this accord, problems emerged among provinces on water distribution (Khan, 2014). The defining characteristic of this accord was that it was concluded among the provinces of one country, Pakistan, for water sharing to their own needs.

3.2.3. Attempts of cooperation over the Indus river basin states

After the World War I, questions about water sharing arose because of increasing withdrawals of river supplies as several projects were proposed in different parts of the Indus basin. This situation called for the distribution of the rivers waters among several riparian states of the basin. Therefore, six significant attempts were made by the riparian states before the independence to

reach an agreement on water sharing in the Indus river Basin (Bhatti & Farooq, 2014). The controversy over water distribution of Indus River System between provinces started in 1921 when British rulers started developing irrigation system with construction of new barrages, canals and dams. Government of India selected several committees to resolve the water issue between provinces. Following committees and commissions were set up for apportionment of the Waters of the Indus River System between provinces (Khalid & Begum, 2013).

3.2.3.1. Indus Discharge Committee (1921)

The Government of India selected Indus Release Committee in 1921. A system of daily observation of river and waterway discharges at different sites on the Indus River basin and canals was initiated. Arrangements were also made between Punjab and Sindh to collaborate in discharge observation and in methods of keeping their record. Sindh also installed resident engineers in the Punjab to screen river discharges and waterway withdrawals. The Committee in its report suggested execution of Haveli Canal Project. But it pointed out that future projects in the Punjab were considered carefully with respect to likely impact on Sindh water rights. It also suggested study of Bhakra Dam on the Sutlej for storage of flood waters and reduction of flood flows (Bhatti & Farooq, 2014). The committee planned to spot daily discharge at various sites on the rivers and waterways in the Indus basin. To improve the availability of hydrological data for these and other projects under consideration, the Government of India recommended to the provincial government a comprehensive network of device and discharge observation sites at all important sites along the Indus and its tributaries (Khalid& Begum, 2013).

3.2.3.2. Sutlej Valley Project (SVP) Inquiry Committee (1932)

Operation of the SVP canals revealed that there was shortage of supplies because actual river flows failed to meet requirements. Committee was appointed in 1932 to investigate the problem of shortages. The committee recommended exclusion of some areas in Bahawalpur, construction of new feeder canals and adjustment in the command of certain canals (Bhatti & Farooq, 2014; Khalid& Begum, 2013). By the 1932, all the 11 SVP canals with four barrages and Sukkur Barrage project were completed. A number of problems rose with the action of these canal networks. Bahawalpur and Khairpur States required additional supplies. Punjab also requested for more water for Haveli project (Khalid & Begum, 2013).

3.2.3.3. Anderson Committee (1935)

In 1935, Government of India established Committee of the Central Board of Irrigation on Distribution of Waters of the Indus and Tributaries known as the Anderson Committee. It contained representatives of Bikaner, Khairpur and Government of India. It had eight experts to check out the matter and find a solution. The committee submitted its report in 1937. It raised irrigation supplies for Haveli and Thal projects. As regards Bhakra Dam, an agreement was already reached between the governments of Bombay and Punjab in 1934. The report revealed Haveli canal project was started in 1934 and completed in 1939. The building of Kalabagh Barrage and Thal canal was started in 1939. But because of eruption of World War II, it was not commissioned till January, 1947 (Khalid & Begum, 2013).

3.2.3.4. Rau Commission (Indus Commission) in 1941

In 1941, the Governor General of India appointed the Indus commission which is popularly known as Rau Commission after the name of its Chairman Justice B. N. Rau (Bhatti & Farooq, 2014). Rau Commission established priority of water allocation for Paharpur Canal and also confirmed allocation for the Thaland the Sukkar schemes as recommended by the Anderson Committee. The Commission submitted its report in July 1942 and also recommended that compensation should be paid to Sindh from the Punjab province for damages likely to result from upstream withdrawals. It also put down the proposed Dam at Bhakra, on completion so as not to cause material damage to the canals of the downstream province of Sindh. Its findings and recommendations were neither accepted by Punjab nor by Sindh (Bhatti & Farooq, 2014).

3.2.3.5. Rao Commission (1945)

After the execution of Government of India Act 1935, the development of river waters became a provincial subject. Provinces were free to plan and commence any work for development of river waters passing through its territory. The Governor-General could interfere only on receiving complaint by one province against the other. On receipt of complaint by Government of Sindh against Punjab's proposal for increased withdrawals from the rivers passing through its territory, Government of India appointed a Commission named Rao Commission in September 1941. The commission found that upstream withdrawals would adversely affect operation of flood canals in Sindh, especially during September. The best way to offset this effect was to construct barrages

at Guddu and Kotri. The Commission also endorsed that payment should be paid to the Sindh from Punjab province for costs likely to result from upstream withdrawals. At this stage negotiations were opened between the two chief engineers of Sindh and Punjab to find a solution and reach an agreement. After lengthy negotiations between Sindh and Punjab, a draft agreement was drawn in September 1945. It was subject to settlement of the financial phase of the dispute with respect to sharing of waters of the Indus and Punjab rivers (Khalid & Begum, 2013).

3.2.3.6. Akhtar Hussain Committee (1968)

A Water Allocation and Rates Committee were established by the Government of West Pakistan in May 1968, and which was called Akhtar Hussain Committee after the name of its chairman (Khalid & Begum, 2013). The committee was formed to review the barrage water allocations, use of ground water with respect to surface water deliveries and reservoir release patterns. The committee submitted its report on 30 June, 1970, and one unit was dissolved piercing West Pakistan into four provinces. However, this report could not attain any attention (Adeel, 2016; Khalid & Begum, 2013).

3.2.3.7. Justice Fazle Akbar Committee (1970)

The committee was set up by Pakistan Government in 1970, chaired by former justice Fazle Akbar of the Supreme Court of Pakistan and endorsed an apportionment formula for water allocation. It had to consider the Indus Water Treaty and also the requirements of provinces for industrial, agricultural and domestic uses. The committee was able to work on an ad-hoc distribution formula for Chashma Barrage and Tarbela Reservoir (Adeel, 2016). The Committee was to recommend apportionment of water allocations of groundwater and its coordinate use with flow supplies and reasonable water requirements of the provinces for agriculture and industry. The committee submitted its report to the government in 1971 but no decision was taken on the report. Seasonal ad hoc distribution of waters stored by the two reservoirs continued till coming into effect of Water Apportionment Accord in 1991 (Khalid & Begum, 2013).

3.2.3.8. Chief Justices' Commission (1977)

The Government of Pakistan in 1977 constituted a commission to examine water distribution. The commission included all chief justices of the four provincial High Courts and was chaired by

the chief Justice of Supreme Court of Pakistan. Its report however remained pending with the government till the Water Apportionment Accord came into effect in 1991 (Khalid & Begum, 2013).The commission's efficacy remained marginalized due to political instability (Adeel, 2016).

3.2.3.9. Haleem Committee (1983)

This commission directed the trial of the case within limited framework and submitted its report to the president of Pakistan in the end of the April 1983. The issue of water distribution could not be resolved and provinces received irrigation supplies through ad hoc distribution of Indus waters notified by central government for each period or season of the year (Khalid & Begum, 2013).

3.2.3.10. Permanent Indus Water Commission

A Permanent Indus Commission comprising of two commissioners, one appointed by India and another form Pakistan was set up to establish and maintain cooperative arrangements for the implementation of the Indus Treaty (Khan, 2013). The main objectives of the Commission was to promote cooperation between the parties in the development of the waters of the river, and in particular, to study matters relating to it for help, resolve questions concerning the interpretation or application of the treaty and to make tours of inspection (Khan, 2013).

From the discussion above about the Nile and the Indus river basins, several attempts of agreements and cooperation were taking place. However, despite ranges of agreements and attempts of cooperation were made between the riparian states in the respective basins, none of the cooperation attempts lasted for long. In the Nile as well as in the Indus river basins attempts of cooperation failed to achieve the intended objectives due to several associated challenges as elaborated earlier respective sections. In the Nile case Egypt has always been claiming unilateral use disregarding the rights and interests of the upstream riparian states. In the Indus case there is no mutual trust and willingness to cooperation between India and Pakistan on equitable and reasonable utilization of the Indus water. Particularly, India has not always been abided either by the bilateral treaty or by the Indus Water Treaty brokered by the World Bank as she has frequently been violating the treaty moving against the rights of Pakistan.

Chapter Four

4. Comparison of the Relations in the Nile and Indus River Basins

This chapter discusses the comparisons of the relationships between the Nile and Indus Rivers riparian states in general and water utilization in particular. It also discusses the prospects of riparian relations both in the Nile and Indus river basins. The relations between the prominent states in the Nile and Indus river basins particularly Ethiopia, Egypt, the Sudan in the Nile case, India and Pakistan in the Indus river basin case are the main focus of this section.

4.1. The Nile River Riparian Relations

Ethiopia, Sudan and Egypt are the three riparian countries which have huge roles in the existing water conflict in the Nile water. Agreement and cooperation among these countries is the key for finding a sustainable solution for the water conflict in the basin (Dagmawi & Weijun, 2015).

4.1.1. Ethio-Egypt Relations

The relations between Egypt and Ethiopia went back to the early times of the Axumite kingdom. These states have had a long relationship of harmony as well as conflict. This means they have been in a constant contact for centuries. Historically, the two most important elements in Ethio-Egyptian relationship have been religion and water. The former one relates to the relationship through the Orthodox churches of the two countries. Since the 4th century A.D. Ethiopia used to receive Abunas (bishops) from the Egyptian Coptic Church of Alexandria, Egypt. These were Egyptian Coptic bishops ordained for Ethiopia. The two Churches shared much in common despite language difference. While the Egyptian Church used the Coptic language, the Ethiopian Church uses the Geez language. This practice lasted until 1958, but which was terminated when the Coptic Church of Alexandria, Egypt, ordained an Ethiopian Patriarch as the spiritual head of the Ethiopian Orthodox Church upon the insistence of the Ethiopian Emperor Haile Selassie (Yacob, 2007:197-198).

When it comes to Ethio-Egypt relationship in water, the Nile River has served as a source of tension and mistrust in the relationship of the two countries. As history shows, Egypt under the leadership of Khedive Ismail Pasha had encroached into northern Ethiopia so as to control the source of Abbay/Blue Nile as a colony in 1875 and 1876. However, Emperor Yohannes IV of

Ethiopia successfully defeated Egypt at Gundet and Gura, respectively (Endalcachew, 2015). Even though Egypt was defeated in war, they formulated various strategies to create instability in Ethiopia supporting the rebel/insurgent groups such as the ONLF- the Ogaden Ethiopia, and the EPLF- Eritrea. This sabotage weakened the economic power of Ethiopia while the Egypt kept on growing in education, foreign relations, economy and military power (Miheretab, 2018). From then on, the two countries relationship continued in a form of hostilities, serious diplomatic and proxy war. The whole effect is that it created mutual suspicions, hostile perceptions, conspiracy between the peoples of Egypt and Ethiopia (Endalcachew, 2015). Therefore, the modern history of the Nile is illustrated by tensions and conflicts (Mohamoda, 2003).

In the context of the Ethio-Egyptian water relations, the two countries share a long history of water conflict. Even so, the hydro-political relations between Egypt and Ethiopia have been recently deteriorating over the Grand Ethiopian Renaissance Dam (GERD) project. The GERD project has been considered as catalyst that ignited water tensions between the two countries. The ups and downs in the nature of water relations between Egypt and Ethiopia raises many question over the future of the hydro-politics of the Abbay/Blue Nile, especially upon the GERD completion and operation (Atwan, 2018).

Currently, Ethiopia is building Grand Ethiopian Renaissance Dam (GERD) on the Abbay/Blue Nile close to the border with Sudan. Egypt acquires almost all of its water needs from the Nile, but with the dam being built, Egypt feels that their water resources are being threatened (Cruz, 2019). Ethiopia asserts that the GERD will not harm Egypt though it disagrees. Ethiopia claims its right to utilize one of its resources for national development under the principle of international law of water use in equitable and reasonable way on the trans-boundary water bodies. In the recently undertaken visit of Cairo, Egypt by Ethiopian Prime Minister Abiy Ahimed, his counterpart President Abdelfatah El Sisi, in a live broadcast, asked to swear before God and the people of Egypt that he would not hurt their share of the Nile waters. Abiy responded, Ethiopia would take care of the Nile and preserve Egypt's share and work hard to achieve it. Yet, despite these public assurances, diplomatic negotiations between the two states have failed and remained fruitless (Mehari, 2020).

Until recently, Ethiopia and other upstream countries have not been able to benefit from the Nile River. However the current move from Ethiopia and other upstream countries shaken the

stability of hydro-hegemony in the Nile Basin Region. The construction of the mega Dam in Ethiopia is a sign which indicates the end of Egypt Hydro-Hegemony while it is a sign of the emerging of counter-hegemony. Hegemony has a cyclic nature and there is a transitional period of stability to declination and then to crisis while there is also a transition period of crisis to rise. The action by Ethiopia building the GERD reveals that is a symbol of assertiveness in reclaiming a share of the Nile water resource (Miheretab, 2018).

4.1.2. Ethio- Sudan Relations

It is known that Ethiopia has a long historical relationship with the Sudan starting from the time of the states of Axumite and Merowe. There has been also a long-standing tie between the two peoples who have lived in one another's country over the years. It is evident that this relationship has had its own positive and negative features. In particular, since the end of World War II, when the Sudan became independent, the relationship has not developed in a positive manner as much as it should have been (MoF, 2002). The early relations between the people of modern day Ethiopia and that of Sudan have been shaped by the use of the river waters. The historic relations between the regions of Sudan and Ethiopia have always been founded on the continuous flow of the Blue Nile and Atbara rivers, which provided opportunities for trade that led to frequent wars, particularly along the borders. Ethiopian-Sudanese relations have historically been founded on domestic goals of security, economic development and access to water resources offered by the Nile. Apart from being an important neighboring country, and despite unrestrained history, Ethiopia developed strong connections with both elites in Khartoum and in Juba (Doop, 2013)

Sudan's relation with Ethiopia in terms of trade dates back to ancient times. One of Ethiopia's principal trade routes ran west to Sudan and then to Egypt and the Mediterranean. Muslim merchants from Sudan have been an important part of Ethiopia's trade for many centuries. Relations were not, however, always amicable. For instance, military conflict broke out between Ethio-Sudan in the 1850s. Sudanese Mahdists, or as they also were called "Dervishes" advanced into Ethiopia in 1885, resulting in a series of battles between Sudanese Muslims and Ethiopian Christians over the next four years. However, relations improved during the twentieth century when the Emperor Haile Selassie, who had been in exile during the 1936–41, Italian occupation of Ethiopia, returned with the help of Ethiopian patriots and British forces from Sudan. And also

Emperor Haile Selassie helped broker in the 1972 Addis Ababa Agreement that ended the first civil war between North and South Sudan (Berry, 2015).

The relations between Ethiopia and Sudan have been fluctuating between harmony and conflict over the years. Geographical, cultural, historical and economic proximities between the two neighbors have made them strategically significant and vulnerable to the interference of great powers, the Middle East nations and Egypt in their mutual relations (Embiale et al., 2018). One of the causes for the deterioration of relations with the Sudan concerns the use of the waters of the Nile. In this regard, the agreement the Sudan signed with Egypt in 1959 that excluded Ethiopia from the use of the river is an example worth mentioning (MoF, 2002).

Ethiopia and Sudan have entertained relations since the latter's independence in 1956. These relations have been problematic as they were usually spoiled by deeply embedded suspicion and rivalry. Relations were again strained during the Ethiopian military government's tenure (1974-1991) because of ideological differences, support for rebel groups and interference from other external states (Berouk, 2012). The hostile Ethio-Sudan relation during 1974-80 is explained primarily by the intensification of the internal conflicts in both countries and the involvement of the two countries in international Cold War rivalries in the sub-region. The Soviet Union supplied arms to Libya, Ethiopia and South Yemen, while the USA supported Egypt, Sudan and Somalia (Regassa, 2007:34-35).

4.1.3. Egypt- Sudan Relations

Egypt still shared a long border and continued to view Sudan as part of its enclosure. The Nile River flows through Sudan before reaching Egypt. An estimated 95 per cent of Egyptians depend on the Nile for fresh water. In 1959 the two countries agreed on a formula for sharing the water, whereby Sudan was authorized to use approximately one-quarter of the flow and Egypt about three-quarters (Berry,2015). However, mistrust and resentment between the two states prevailed when the new Sudanese government threatened the interests of Egypt by challenging its domination over the Nile waters. The Sudanese parliament demanded the abrogation of the 1929 Nile Water Agreement, which was signed between Egypt and Britain, on behalf of the Sudan, and refused to consent to Egypt’s High Dam at Aswan (Darwisheh & Abdin, 2019).

Egypt's main preoccupation has long been with the Nile River. For Egypt, which receives 100 per cent of the Nile waters on which it depends from upstream, securing the valley in one form or another is a matter of life and death. Hence, Egypt has had suspicious relationship with Sudan. Egypt's relationship with Sudan is also shaped by its own historical experience as a conquering power. Sudan as it is known today is in part a product of Egyptian imperial ambition. Turco-Egyptian conquest created 'the Sudan' as a political unit in the nineteenth century. Technically at least, Sudan was ruled by Egypt jointly with Britain from 1898 to 1956. During the period of Sudan's negotiations for independence, Egypt's understanding was that Sudan would form alliance with Egypt (Ryle, 2011).

4.1.4. The Prospects of Riparian States Relations in the Nile Basin

Some authorities identify the Nile basin as one of the hotspots in the areas where violent conflict could break out over the shared water resource because of the various hydro-political intricacies involved. Increasing demands for more water, an alarming population growth rate, the absence of comprehensive legal and institutional frameworks, and relations among the riparian states that are filled with suspicions and misunderstandings, are among the major factors creating the potential for an extreme conflict in the basin. To date, the Basin states have not been able to cooperate in order to devise a solution to the issue of the Nile for the common utilization and management of Nile water for the benefit of all riparian states (Mohammed, 2004).

It is vague whether regional disputes over the Nile water may activate future conflict, or whether the costs of confrontation will prevent this outcome. In 1988, Egypt's Foreign minister, Boutros Boutros-Ghali, hypothesized that the Nile River would undoubtedly spark Egypt's next war. Historically, Egypt has imposed its control over the Nile through the 1902, 1929 and 1959 colonial agreements, over the other Nile Basin nations. In 1970, Egypt endangered war over the building of the Fincha Dam in Ethiopia. More recently, Ethiopia's GERD, fifty kilometers from the Sudanese border, has drawn substantial criticism, largely due to Egypt's hostile response to its construction. Sudan, on the other hand, has been largely peripheral in the disputes over the GERD, downplaying the dam's potential negative effects and tossing its support behind Ethiopia. Egypt views the construction of Africa's largest dam as a threat to its national security, given the vulnerability of its declining water supplies (Nunzio, 2013).

The Nile Basin riparian states have different interests and priorities in regard to the Nile waters. Thus, all riparian countries have different expectations of a basin-wide cooperation. The interests of the Nile Basin states in water cooperation mainly rely on their geographical location and economic development (Atwan, 2018). The consideration of the characteristics of the Nile River is that it is easy to gauge the role it plays in the region for the riparian countries, which are economically depending on exploiting the basins water resources. Yet this economic dependence on the Nile water without concrete arrangements between riparian states will lead to failure or even conflict in the long run. Nile is one of the few international rivers which have the potential to ignite an armed conflict between the riparian states (Sandwidi & Stein, 2003).

4.2. The Indus River Riparian States Relations

The Indus River basin encompasses China, Afghanistan, India and Pakistan however the focus is the relations between India and Pakistan which are the main users of the river and also where recurring conflict prevails. The Indus River chiefly utilized by these two countries and usually conflict arise in the proportionate and fair use of the river. The climatic zones into which the Indus River descends are arid or semi-arid areas making the Indus a primary source of water for irrigation as well as other basic necessities.

4.2.1. India-Pakistan Relations

India and Pakistan were one country under British colony until 1947. But after decolonization, India and Pakistan made a partition. From the date of partition to the present, India and Pakistan have never achieved lasting peace and harmony (Rao, 2017). The Indo-Pakistan relationship has ever been characterized by chronic hostility (Raghavan, 2012). The beginning of Indo-Pakistan conflict in the subcontinent does not date from the creation of Pakistan only but it goes back to the history of Hindu-Muslim relations during the last many centuries. Muslim rulers and Hindu princes fought more than fifty wars during the Saltanate Period (1206-1526). Since the creation of Pakistan, there have been three wars (1948; 1965; and 1971) between Pakistan and India. The conflict, therefore, has deep psycho-cultural and historical roots. The negative stereotyping of each other demonstrated in various studies of the Indo-Pakistan relation (Haque, 1979).

Since the beginning of August 1947, Indo- Pakistan nature of relations has been tense except for a short-lived period of reconciliation. Pakistan and India have fought three wars (Ashraf, 2015).

Interestingly, India and Pakistan share same language, dress and culture and six watercourses, namely the Indus, Jhelum, Chenab, Ravi, Sutlej and Beas, along with their numerous tributaries (Sohail, 2015). The conflict between India and Pakistan erupted from a number of issues: Kashmir, water, transit, terrorism, involvement of external actor in the South Asian region, demarcation of boundary. However, the Kashmir has become the forefront issue that determines the relation between two neighbors and it has subdued the other issue. Kashmir is the source of water for Pakistan as all major rivers of Pakistan either originate in or flow through Kashmir (Sharma, 2012).

India intended to make Pakistan weaker so that Pakistan will rejoin India, but the Government and people of Pakistan have been committed to making Pakistan self-sufficient, so that they could cope with all difficulties like religious issues, economic issues, lack of resources, lack of accommodation for migrants, lack of building for office work, lack of money, weak army and issue in government structure. The territory of Pakistan was also divided into two parts East Pakistan and West Pakistan; there was no land link, between these two parts. So, Pakistan needed to use land and air of India to reach other part of the country. It was also a big problem of Pakistan that its areas were not integrated geographically (Sohail et al., 2015).

In the period 1947 to 1960 the two sides tried to address their differences through a number of short-term agreements but the dispute could not be settled through bilateral negotiations, and international mediation had to be sought. In 1960, after nine years of negotiations, both sides signed the Indus Water Treaty brokered by World Bank (Sohail et al., 2015). According to international law, there are two conflicting principles pertaining to the sharing of international waters. India demanded 24 per cent of the rivers' flow, based on the "principle of equitable water utilization," while Pakistan claimed that India should get 12 per cent of the flows, on the basis of principle of no significant harm. The water is evolving as a core issue between India and Pakistan for two causes. First, the water issue is closely related to the unresolved issue of Kashmir and thus is difficult to separate from concerns of security (Romshoo, 2012).

Water disputes between India and Pakistan reflected the political relationship between the two countries since the partition of the British India in 1947. That partition broke the interdependent hydraulic system. In following years, tensions between India and Pakistan have led to emergence of ‘water nationalism’ in both states. In the past, several parties, in both countries, have made

appeals to their respective government to reject the Indus Water Treaty of 1960, but no steps were taken in such direction by either of the two states. The Indus Water Treaty has survived two full wars (1965 and 1971), one limited war (1999) and a series of political-military tensions (1987, 1989–90, 2002 and 2008) between India and Pakistan (Ranjan, 2016).

The water conflict between India and Pakistan has made South Asia increasingly vulnerable to a breakout of war. Though the issues pertaining to water existed in pre-1947 India, the partition of the subcontinent into India and Pakistan made them hot bilateral problems between New Delhi and Islamabad. However, with the World Bank playing a vital role, the two countries signed a water-sharing agreement in 1960, what is known as the Indus Waters Treaty. This Treaty was welcomed as a successful mechanism for water distribution. However, the rise in population, industrialization, and urbanization has increased the demand for water immensely. Moreover, the treaty is confronted by the increasing changes in global climatic patterns. As a result, a number of water-related conflicts have arisen between the two riparian states which have posed a direct threat to the viability of the Treaty (Wani & Moorthy, 2014).

4.2.2. The Prospects of Riparian Relations in the Indus Basin

In the partition of the Indian subcontinent in 1947, the boundaries drawn were in disregard of hydrology since 80 per cent of the areas irrigated by the canals were in Pakistan. The waters of the Indus River Basin therefore were a main source of dispute between India and Pakistan soon after from independence. This is evident from the number of water disputes that broke out between the two states even led, at one point, to the unilateral termination of water supplies to East Punjab by India to the canals crossing into Pakistan. It thus looked that water would serve as the most likely facilitator for future wars between the two states, given their competitive use of a shared natural resource and enmities arising from a wider conflict (Soofi, 2016).

Water cooperation is an essential feature of managing international watercourses among riparian states and which requires riparian states to coordinate with one another through the sharing of information and the creation of joint cooperative mechanisms for the optimal utilization of water resources for mutual benefit (Robert, 2001). When it comes to the Indus River, Pakistan and India are lower and upper riparian states, respectively, sharing the Indus Basin. The Indus Waters Treaty is an important bilateral agreement, establishing a machine for them to cooperate over

water. However, as earlier discussed, certain factors resulted in hardship to the cooperation such as the continued construction of controversial Indian dams, Indian regional water hegemony policy, the existence of historic hostilities, and the Kashmir issue in the bilateral peace dialogues (Rockin, 2011).

Despite the fact that cooperation was established for the sharing of the Indus Basin between India and Pakistan with the signing of the Indus Waters Treaty fifty-seven years ago, over time this cooperation mechanism deteriorated due to the initiation of controversial dams by India (Anwar, 2016). India often disregards the legitimate concerns of Pakistan regarding the controversial dams and this has been so particularly over the last two decades (Undala, 2013). Moreover, India has also given a recent official statement suggesting that it might revoke or modify the Indus Water Treaty, a decision that would completely terminate cooperation over the water of the Indus Basin (Anwar, 2016). This action is likely to go against India's international legal obligations requiring cooperation among riparian states (Owen, 2013).

Based on the discussion above about the Indus water basin, despite efforts to achieve cooperation by ways of bilateral agreements, and treaties, the lack of fair distribution of water resources between the co-riparian states of the Indus basin have created an unfair competitive environment that has the potential to act as an inter-state tension-multiplier. Furthermore, the *status quo* in the Indus basin that has long existed proven to be unsustainable due to the growing water needs in the Indus basin. India, upper riparian state, is on the way to revoke the Indus water treaty despite this action against the critical interest of the lower riparian state, Pakistan. In the Indus basin in contrast to the Nile basin there has been historically a sort of agreements taking place even before the development of India and Pakistan as full-fledged modern states out of British colony in 1947. There were provincial agreements that attempt to fairly share the Indus waters. Looking forward a decade, unless immediate corrective actions are taken, in a way that India and Pakistan all indications on the ground are that India and Pakistan hydro-political situations will continue to significantly deteriorate in their efforts to water appropriation. The prospect for cooperation is therefore unlikely to meet its objective at least for the foreseeable future.

Chapter Five

5. Analysis of Challenges to Cooperation in the Nile and Indus Basins

This chapter presents the specific hydro-political characteristics, hindrance factors, challenges of cooperation, and the current hydro-political dynamics in the Nile and Indus River basins, and also makes a comparative analysis of the respective basins. The proposed objectives stated in chapter one are addressed employing document analysis techniques alone due the efforts to get primary sources via interview were restricted by the outbreak of the COVID-19. Those institutions which were supposed to serve as key informants namely: the embassy of Egypt, the Sudan, Pakistan, India, and the ministry of water, irrigation, energy of Ethiopia were reluctant to give information despite the researcher's futile attempts visiting their office where they are located. At last, the researcher has resorted to document analysis technique as a way out.

5.1. Specific Hydro-Political Characteristics of the Nile River Basin

When it comes to specific hydro-political characteristics, Egypt takes hydro-hegemonic power. Hydro hegemony refers to taking advantage of strong powers and geo-political leverage vis-à-vis other riparian countries. Egypt has long established a negative hydro-hegemonic system in the Nile Basin keeping away others from benefiting at any rate.[1] Egypt has been intensively engaged to strengthen this hydro-hegemonic situation employing all forms of power and historical advantage that it had from the past treaties and implemented the strategies and tactics to that effect. For instance, it has been forming strategic alliances, launching diplomatic efforts that favor its position, advocating the use of the principles of International Water Law to contest existing legal setting.[2] Moreover, it is also characterized by inter-state relations that are based on suspicion and misunderstanding, and unilateral appropriation of the Nile waters. Egypt using its hegemonic power acquired for centuries and also using the myth of Herodotus that "Egypt is the gift of the Nile," has established inequitable distribution of water resources to prevail in the Nile basin (Mohammed, 2015).

[1] See under chapter four Pages 47-48.
[2] See under chapter three Page 30

However, there are signs nowadays that Egypt's hydro-hegemony is challenged by the upstream riparian states for they become individually more powerful and work together cooperatively to challenge and stand against Egypt's age-old hydro-hegemony (Cascao, 2014; Tawfik, 2015). According to Cascao (2014) for instance, the decision by Ethiopia and the White Nile countries to move ahead with signing the Cooperative Framework Agreement (CFA), and Ethiopia's determination to initiate construction of the Grand Ethiopian Renaissance Dam (GERD), proves that the counter hydro-hegemonic arrangement has started by the upstream riparian states. In fact, the upstream states persistence to sign the CFA in 2010 reveals that the hydro-hegemonic order long established by Egypt is on the fall. The upstream states have formed coalition in the negotiations of the CFA to promote equitable and reasonable utilization of the Nile water (Dawit, 2011).

And, the recent power dynamics in the hydro-hegemony suggests a changing power balance that the upstream states are challenging Egypt's hydro-hegemony in the Nile Basin (Cascao, 2014). The upstream riparian states, these days, have become politically and economically stronger than a decade ago, and they are increasingly determined to utilize their water resources to realize national development needs. Even more, fortunately, the upper riparian states have got access to alternative financial assistance typically from China, which is a key external actor in the basin, becoming the major source of their finance. Such assistance was inaccessible some years ago. Because of these two contextual changes, the upstream states have determined to move ahead with several counter hegemony mechanisms (Cascao, 2014).

The upstream states have these days engaged in huge unilateral developmental projects than ever before in their respective lands. For example, Ethiopia has started programs to construct a number of hydroelectric power projects, one of which is the GERD, whose construction work already began on the Abbay/Blue Nile in 2011. Uganda has also initiated studies on a number of new dams to be constructed. Tanzania on its part is in the process of realizing a multi-million dollar water pump project to supply clean drinking water for its population in the Kahama and Shinyanga districts. Kenya also has similar projects that it wants to implement (Kenyi, 2011). Subversive act of the upstream riparian states installing a counter hydro-hegemony against the long established hydro-hegemonic power of Egypt is what explains the specific hydro-political characteristics in the Nile basin. Therefore, it is fair to conclude that though Egypt's influence in

various forms over the Nile basin is still a challenge, counter hydro-hegemony mechanisms of the upstream states is revealing potentials of bringing about an equitable and reasonable utilization of the Nile waters undermining Egypt's negative hydro-hegemony.

5.2. Factors Hindering Cooperation in the Nile River Basin

With regard to factors hindering cooperation among the upstream and downstream states on the Nile river basin, there are several factors which hindered honest cooperation not to take place. The main factors are discussed as follows: the first one is *colonial legacy.* From the outset, the treaty signed from 1891 up to 1929 was a colonial treaty signed by colonial powers to the interest of Egypt, by extension to their own, which has given a privilege to Egypt over the Nile water depriving of other co-riparian states of the basin the rights of utilizing the water at any rate. After independence was achieved, Egypt and Sudan, the downstream states of the Nile, made a bilateral treaty in 1959. Even though it was made by independent riparian countries still it had the legacy of colonial treaty in favoring Egypt. Moreover, as of the colonial treaty this one also denied other riparian sates from taking part in the treaty. Egypt insists on perpetuating the old treaties as references of international water law in her negotiation with upstream riparian states. On the other hand, upstream states insist on revoking of the old treaties and replace them with a fresh one involving all riparian states of the basin countries. However, Egypt has not shown willingness to engage in an open negotiation on the equitable distribution of the waters.[3]

Secondly, prevalence of *psychological difference* in points of views the Nile water among the riparian states. From past to present Egyptian leaders hold the myth that Egypt belongs to the Nile and vice versa. Egypt is devoted to control the Nile River without considering the interest of other riparian states. Egypt continually underlines its heavy dependence on the Nile waters. Therefore, the issue of reallocating the Nile water share is a matter of security it argues. The psychology of the Egyptians that Nile is the wealth of Egypt alone despite its trans-boundary nature, has been triggering continuous contradiction between the upstream and downstream countries. Other riparian states, on the other hand, claim that the Nile belongs to all stakeholders of the Nile Basin and have inherent rights to equitably and reasonably share the water resource.

[3] See chapter three page 27-31

Therefore, prevalence of psychological view divergence among the Nile riparian states is another critical hindrance for achieving cooperation among the Nile river basin (Kibaroglu, 2007).

The third hindering factor for cooperation is the *absence of strong institutional capacities* that help manage the Nile river basin countries to reach agreement. The importance of institutions in the management of shared watercourses is huge. On the contrary, lacking of strong institutional mechanisms adversely affect to reach agreement among the riparian states. Concerning the Nile riparian states, attempts of institutional establishment have been in place despite their shortfalls to realize what they intended for. Such institutional mechanisms include, for example, as the Hydro-Met which was established in 1967, the Undugu forum in 1983, the TECCONILE which was created in 1992, and recently the Nile Basin Initiative since 1999. The reason why these institutional mechanisms remain unsuccessful lies behind lack of inclusiveness to all riparian states from the outset. Moreover these institutions were faced with financial constraints as they were sponsored by outside donors such the United Nations Development Program, the Canadian International Development agency, the World Meteorological Organization, the World Bank. Especially, with regard to the recent institutional mechanism— the Nile Basin Initiative— is though it is better in its inclusiveness, there is still divergence of views between the upstream and downstream riparian states. The point of divergence is that while the downstream states claim to sustain the old colonial treaty in place, the upstream riparian states claim a fresh agreement to ensue abrogating the past colonial treaty to which they were not a party.[4]

The fourth hindering factor is the existence of *conflicting international water law doctrines.* For instance, the doctrine of absolute territorial sovereignty allows the source countries of a trans-boundary river to exercise unilateral control because the source of the water lies within its national territory. This doctrine disregards the interest of downstream states. On the other hand, absolute territorial integrity doctrine advocates that no riparian state can alter the natural flow course of a river disregarding the interest of the upstream states to benefit from. In this sense, while in the former doctrine favors upstream riparian states, the latter one supports downstream states to benefit from (Aaron, 2014). Therefore, in the context of the Nile river basin, while upstream nations such as Ethiopia claim to employ the absolute territorial sovereignty where

[4] See chapter three under Pages 31-34

they can benefit from, the downstream states such as Egypt insist on adhering to the application of the latter doctrine where they can best benefit from.[5]

5.3. Challenges of Cooperation in the Nile River Basin

With regard to challenges of cooperation the first one is the *prevalence of asymmetries of powers* between the upstream and downstream riparian states. These asymmetries are explained in views of material power, bargaining power, and hydro-hegemony situation. Those factors are the main reasons for the continual failure of reaching common consensus between the co-riparian states in finding water allocation schemes incorporating the principle of efficiency and equity in the Nile basin. For instance, with regard to the material power asymmetry, the downstream state, Egypt, take the lead in material capabilities, comprising economic power, military might, technological progress, and international political and financial support that are employed in order to win the compliance of other parties. Egypt is the most superior downstream country in the basin and has historically been using the river almost exclusively.[6] Egypt has had the upper hand over the upstream states with regard to bargaining power. This dimension of power speaks for the ability of actors to control the rules of the game and impose agendas, in the sense of their capability to delimit the political bounds of an agenda (Cascao, 2014). Some examples of bargaining power include: finding recognition via international treaty, claiming the moral high ground linking the question with international water law, influencing the negotiations via bilateral agreements, refusing to negotiate and cooperate with other stakeholders, or agreeing to negotiate only on its own terms with a unilateral decision making, which weakens cooperative institutions and using trade-offs. Egypt has been employing bargaining power without considering the rights of the other riparian states insisting on the past treaties to safeguard its historic water use.

Hydro-hegemonic situation is established in any river basin when one actor controls all forms of power. The hegemonic riparian country wants to maintain and consolidate its influence over the trans-boundary water resources so as to control different water resources (Zeitoun and Warner, 2006). Under this tactic, diplomatic isolation, threat of military action, espionage and propaganda are employed by the hegemonic state to contain the weaker riparian states from rising claim over the water resource to make them drop the claim. Egypt has been doing this against the upstream

[5] See chapter two under pages 15-16
[6] See chapter two under pages 20- 21

riparian states for centuries. Taking advantage of hydro-hegemonic situation in the Nile basin, Egypt has been, instead of coming to agreement with the upstream states upon the fair share and allocation water, claimed to sustain its historic legacy of exploiting the water institutionalizing the *status quo* tracing the colonial treaties in its own favor disregarding the rights of the upstream riparian states. Egypt has long been a legend hostile state to the upstream countries, specifically Ethiopia, viewing it as a potential threat to its survival. It was not uncommon to Egypt making several sabotages against Ethiopia so as to weaken to the extent of waging military aggression at some point in time.[7]

Second, environmental pressures: deterioration of the environment and demographic change with a subsequent demand pressures over the water resource alongside the basin countries has been causing the potential conflict rather than cooperation. Climate change presents serious challenges for the Nile, including reduced river flow, land degradation, the increased likelihood of droughts and floods. Rapid change in a demographic pattern in Egypt and upstream Nile basin countries, such as Ethiopia Uganda, Tanzania, Kenya, leads to issues of water scarcity as the demand over water resource mounts for the use of electricity, irrigation, industry waste, and domestic chore. Even more, the extreme disparity of unfairness in the sharing of Nile water among the basin countries creates challenges to cooperation affecting the possibilities to reach sound agreement in the fair share and utilization of the Nile water (Nunzio, 2013).The complex nature of the water balance of the Nile Basin has been exacerbated by the socio-economic problems of the Nile riparian countries, which are mainly characterized by a high rate of population growth, recurrent drought, desertification and abject poverty (Institute for Security Studies, 2012).

Third, unilateral project development; unilateralism has been identified as a common behavior in the Nile Basin countries that has prevailed throughout their history. Egypt and Ethiopia have both unilaterally developed projects on the Nile in order to promote their national interests. Unilateral behavior in the Nile Basin has been viewed as a direct threat to effective cooperation as it weakens the states' desire to cooperate. Throughout the history of the Nile, several projects have been unilaterally executed by the governments of Egypt and Ethiopia. In the 1970s, Egypt commenced technical studies of its project to transfer the Nile waters to irrigate Israel's Negev Desert. This unilateral action was highly condemned by Ethiopia and other Nile riparian states,

[7] See chapter four under page 47-48

as Egypt did not consult with any of them before announcing the project (Cascao, 2009). The conclusion of the Cooperative Framework Agreement (CFA) by the upstream states without Egypt's and Sudan's consent had marked another unilateral action in the history of the Nile Basin hydro-politics. Another recent unilateral move by Ethiopia is the construction of the GERD, which commenced in 2011 without any consultation with the downstream states. It is worth noting that Egypt and Ethiopia were moving forward with their unilateral projects while engaging in multilateral cooperation through different Nile Basin initiatives (Mahmoda, 2003). Thus, a unilateral move in the basin is equally a challenge to reach mutual agreement between the upstream and downstream states for effective cooperation.

Last but not list, the absence of durable and reliable third party mediation between upstream and downstream states. In fact, one factor which is thought to lead to conflicting riparian states into cooperation is the presence of a third party mediator. In this case international organizations or a powerful state can facilitate cooperation. Third party mediation plays a positive role by diffusing the conflict as it arises. A mediator can also assist states through the negotiation process leading to the signing of a treaty. However, on the one hand, due to the nature of the issue confronting riparian states in the Nile basin, and on the other hand, the absence of durable and reliable third party mediation, the long-term impact of these efforts couldn't achieve stable cooperation. A mediator can contribute to durable cooperation when it not only able to participate in the treaty's execution but also when it can assist states with a history of hostility to establish an effectively designed joint river commission. In fact, once the funding is complete and the mediator has left, the riparian states are still likely to need a joint commission to facilitate cooperation and manage disputes that may continue to arise as states proceed to use their shared river (Weinthal 2002). At some point also a potential drawback of mediation originates from the fact that the norms third parties bring to the negotiating table might contradict the needs of riparian states. The recent US mediation attempt that has taken place from mid-January to the end of February 2020 between the downstream, Egypt, and upstream, Ethiopia, is a case in point, failing to satisfy both parties as this mediation was from the outset in favor of one party, Egypt. Because of this Ethiopia has been disappointed with the US mediation efforts over the Nile Dam dispute, or else the GERD dispute. The government of Ethiopia has a great concern that US third party mediation is not genuine in taking in to consideration the concerns of both parties fairly and rather it has made

attempts to put Ethiopia under pressure to sign a deal which is highly in favor of Egypt. As a result, the state Ethiopia declined the proposal to comply with (Africanews.com/ Feb. 29, 2020).

5.4. The Current hydro-Political Dynamics on the Nile River Basin

The current hydro political dynamics on the Nile river basin is shaped by the growing population and economies and changing climatic patterns that have resulted in the increased pressures on the existing water resources all over the Nile basin. This has resulted in the increased concerns over sharing of trans-boundary waters. Since the history of water development, economically and geo-politically strong states have received the major portion of benefits from the trans-boundary waters. In the changing global context, the push for development in the remaining co-riparian states in the Nile basin states have initiated them to claim their equitable share of water and benefits from these trans-boundary waters. Since Ethiopia has reached to the point of storing the water in the GERD dam reservoir in the coming July 2020, the current political situation on the Nile river basin is even tenser than ever before. Egypt currently is utterly opposing the action of Ethiopia in different international media claiming that the action of Ethiopia is in contradiction with Egypt and which is against Egypt's historic rights of water use on the Nile River waters. Despite efforts of cooperation, Ethiopia and Egypt have never come to reconciliation over water use in the Nile River.

Currently, therefore, the hydro political dynamics in the Nile basin is explained by growing pressure and tensions of conflicts arising from escalating water demand across riparian states. Previously, the sharing of the Nile water was marked by political and economic processes rather than equity and justice. Egypt was/is the largest water consumer in the basin while other co-riparian states use of water share was/is negligible.[8]As the various cooperative attempts during this historical process of conflict management did not produce clear-cut results amidst growing tensions of conflicts, because of the downstream countries rejection for negotiation with the upstream states over the use of the Nile waters, the upstream countries unilaterally initiated water resource development planning for hydroelectric power and irrigation, which exacerbated tensions in the region (Institute for Security Studies, 2012).

[8] See chapter three under page 31

5.5. Specific Hydro-Political Characteristics of the Indus River Basin

As regards to the specific hydro-political characteristics of the Indus river basin the main one is Indian regional water hegemony policy, India has several national interests in the Indus basin. Firstly, the Indus Basin is a political asset for Indian power interests in the region. It is the territorial control of Jammu and Kashmir which makes India an upper riparian state in the Indus River System. The Indian control of the Indus Basin water resources is intrinsically linked to her historical claims over the disputed territory of Jammu and Kashmir. Dropping the territory to Pakistan or to an independent regime would mean surrendering the present upper hand in governing the water resources of the Indus Basin, which never ever Indian government would compromise it. Maintaining the control of the Indus Basin Rivers is also central to Indian exercise of power upon Pakistan as a political tool (Mirza, 2008). Here, it is worth noting that the conflict over Kashmir is primarily linked with water issues than mere territorial issues for Kashmir remains to be a strategic location in the Indus Basin water resources.[9]

On the other hand, Pakistani government is also equally determined not to lose its interest in the Kashmir and Indus basin at large. Pakistan responds to the security of its vital resource as a means of security maximization. Given the country's dependence on the Indus water for its vast irrigation network, the importance of Kashmir territory where huge amount of the Indus River passes through Pakistan is almost everything. The constructed and built geography of the Indus Basin has shaped the country's actions and continues to affect its safety. Thus, the capture and retaining of vital water resources located in the territory of Kashmir by India and Pakistan has very strong linkage to political thinking and strategic planning in the region. In addition, the hydropower potential of water resource in the Indus constitutes an important strategic pursuit for India to meet the needs of her rapidly growing economy. In the post-IWT period, India has paid considerable attention on the development of surface water resources in the Indus Basin System. A large part of this development is centered on exploiting hydropower potential of the Basin. The six rivers of the Indus Basin—the Ravi, Beas, Sutlej, Indus, Chenab, and Jhelum—provide unrestricted hydropower wealth to India, while for the last three rivers, limits are set in the IWT in taking care of Pakistanis interest. The recent focus of the Indian government is but in violation

[9] See chapter three under page 35-39

of the Pakistanis interest in that India is ultra-ambitious on utilizing the hydropower potential of western rivers of the Indus Basin for which the IWT has allocated only a 20% share and the rest 80% is allotted to Pakistan (Sile, 2016).

5.6. Factors Hindering Cooperation in the Indus River Basin

Concerning the factors hindering cooperation in the Indus River Basin, the first one is enduring *historic hostility* between Indo-Pakistan relations. The beginning of Indo-Pakistan conflict goes back to the history of Hindu-Muslim relations during the last many centuries even before the creation of India and Pakistan as separate modern states. Hindu princes and Muslim rulers fought more than fifty wars during the Saltanate Period (1206-1526) alone. Since the creation of Pakistan, also there were three wars taking place (1947; 1965; and 1971) between Pakistan and India. The conflict, therefore, has deep psycho-cultural and historical roots. This situation was even more exacerbated by the colonial legacy of the British policy of divide and rule which was believed to have been behind the Hindu-Muslim antagonistic spirit development that eventually led the two countries into a negative stereotyping of each other (Banerjee, 2016).[10]

Secondly, *the Kashmir issue* has remained to be a bone of contention in the Indus basin riparian states of India and Pakistan constraining their attempts of cooperation. Geographically, Kashmir is located at the northeast of Pakistan and the northwest of India. Several important river tributaries flow through this land, pass through India, and finally reach Pakistan. For this reason, Kashmir occupies a strategically crucial geographical location that is important for both India and Pakistan in order to own the rivers. Therefore, the two states have remained to be adversarial over the Kashmir territory not to lose its strategic importance for water and to save it from falling into the hands of the other state. The territorial conflict of Kashmir between India and Pakistan is essentially related to their respective strategic interests in the Indus Basin water resources, which are shared by the two countries under the framework of the Indus Waters Treaty (Qureshi, 2017).

The third hindering factor for cooperation in the Indus Basin is *unilateralism*. India frequently makes a move to build several water reservoir dams without mutual consent with Pakistan is reached. For instance, India recently approved several major dams along the Chenab, a 900km-long tributary of the Indus that was originally allotted to Pakistan under the IWT. This follows

[10]See under chapter three page 53-54

several other contentious dams already being built on shared rivers including Kishanganga on the Jhelum River, which was also allotted to Pakistan (Nabeel, 2017). India has been continuing the construction of the water storage projects to which the Pakistani government has expressed its concerns. As per the official stance of the government of Pakistan, these water storing projects have the potential to cause significant harm to Pakistan in terms of substantially reducing the flow of water to the Indus. Pakistan on the other hand heavily depends on agriculture, with the larger part of the population relying on irrigation on the Indus River for their livelihood. Despite the peace dialogues taking place, these dialogues have often ended up in failure and never facilitated perpetual cooperation and a sense of friendship between the two states. As the demand for water has exceeded supply, with rival demands by various economic sectors, provinces, and sovereign states, this has led to intense competition, tension, and disputes.[11] Consequently, deadlock occurs in the dialogue, which leads to the failure of the discussions taking place and spoils initiatives already taken for peace and cooperation (Qureshi, 2017).

The fourth hindering factor for cooperation has to do with *conflicting principles of international water law*. According to international law, there are two conflicting principles pertaining to the sharing of international waters. These are: principles of equitable utilization which is claimed by India; and principles of no significant harm advocated by Pakistan. These conflicting theories of international waters use causes difficulty for lasting peace and cooperation to reach agreement between the adversarial riparian states of India and Pakistan. Equitable utilization principle rests on the basis of shared sovereignty, equality of rights and which does not necessarily mean equal share of waters, however. India claims this principle of equitable and reasonable share based on its geography of the basin, existing utilization of waters, potential needs in future, climatic and ecological factors. This principle involves a balance of interests that accommodates the needs and uses of each riparian state. On the other hand, Pakistan claims the principle of doing no appreciable harm in water use, according to this principle, no state in an international drainage basin is allowed to make use of the watercourses in its territory in a way that would cause significant harm to the other basin states, including harm to human health or safety, to the use of the waters for beneficial purposes of the living organisms of the watercourse systems.[12] These conflicting principles of transnational water use makes the two contesting riparian states to claim

[11] See chapter four under pages 54-55
[12] See chapter two under pages 22-23

differing principles each of them demanding their suits of principles that ultimately impacts to arrive at agreement for mutual cooperation to take place.[13]

The last but not least hindering factor in the Indus basin cooperation has to do with *inadequacy of the Indus Water Treaty.* This treaty was signed by authorities of India and Pakistan brokered by World Bank in 1960. The aim of this agreement was to address the water related issues of both countries. After the Indus Water Treaty was signed, it was thought that all water-related disputes between India and Pakistan would be permanently resolved, but not yet.[14] Dispute has arisen between the two riparian states emanating from the interpretation of the provisions of the Indus Water Treaty. The Treaty does not deal directly with the issue of water scarcity. In fact, when the treaty was negotiated, the future possibility of water scarcity was not a priority taken as main concern for the negotiators. The critical provisions of the IWT simply say that India and Pakistan were obliged to ―let flow the river waters without interfering.[15] The inadequacy of the IWT as a mechanism to pacify Pakistan's security concerns is illustrated by India's push for using more waters of the Indus on grounds of facing water scarcity. The sense of insecurity and vulnerability on the side of Pakistan has become a permanent part of the Pakistani psyche, and continues to influence thinking over the treaty even today.[16]

5.7. Challenges of Cooperation on the Indus River Basin

When it comes to challenges of cooperation on the Indus river basin the following variables are involved. These are: development pressure, water scarcity, climate change, demographic change, institutional inadequacy, engagement in terror attack, and colonial legacy. The Indus basin as one of the poorest and fastest-growing regions in the world places massive strain on the water systems to sustain the population's basic needs and bringing about development in the region. The Indus River supports approximately 300 million people around the basin. Users around the basin are faced with increasing salinity, nutrient content, untreated sewage, and other forms of chemical pollution. Besides quality concerns, quantity is also a growing issue (Rao, 2017).

[13] See chapter two under page 41-45
[14] See chapter three under pages 39-40
[15] See chapter three under page 52-54
[16] See chapter three pages 41-42

When it comes to the first variable of challenges to cooperation, there is enormous *development pressure* in the basin that leads to scramble for scarce water resource between upstream and downstream riparian states. Due to the fact that waters of the Indus river is heavily demanded by the basin riparian states of India as well as Pakistan for development needs such as hydroelectric power generation and irrigation projects and the fact that the current climate change is triggering factors for water scarcity in the basin. It becomes dubious for these countries to readily to come to agreement for cooperation. Scrambling for scarce water resource is rather what these riparian states are taking as a viable option instead of coming into cooperation. Increasing water scarcity has long-term implications on food production and livelihoods within and outside the Indus Basin. The Indus River has also become the basis for numerous hydroelectric power generation projects. Water use in this region overwhelmingly supports agricultural and energy-related activities. Irrigation performance is of particular concern in the Pakistani portion of the lower Indus Basin, as the Indus system is primary source of water for irrigation and thereby the main source of income.

The second challenge of cooperation to the Indus basin pertains to *water scarcity*. The surface water flows in the Indus River is not regular as it depends on variables such as precipitation and glacial melt. The variability in flow and its composition raises significant challenges for, but ultimately proves to be the need and importance of integrated water management of, the Basin. Variation in the climate patterns impacts on crop productivity and corresponding livelihood from the farm to the market (Alam, 2017). This serious condition of water scarcity in the basin is likely to lead the riparian states into conflict instead of cooperation. Even though Pakistan needs more and more water from the Indus River, India also demands even more water for its domestic needs, so India will be hardly willing to give up its interest over the Indus water to feely flow into Pakistan. Therefore, climate change has no less effect to challenge cooperation over the Indus basin. Uncertainties inherent to climate change on water availability on the Indus River makes it difficult to predict a net impact. The insecurity associated with future water availability also significantly contributes to the potential conflict where tensions are often high, exacerbating the need for scarce resource undermining cooperative water management efforts.

Thirdly, the variable pertaining to challenges of cooperation in the Indus basin is *demographic change.* Rising population and resultant growing economies have resulted in increased pressures on the existing water resources in the Indus. This has given rise to the increased concerns over

sharing of trans-boundary waters. Thus, the international rivers are coming under growing pressure from increasing water demand and water quality deterioration. Increasing water scarcity due to huge demand over the fresh water owing to overpopulation has long-term implications on food production and livelihoods within the Indus Basin (Sadoff and Grey, 2002). The Indus basin which is one of the most populous regions in the world thus demands huge amount of water resource to sufficiently feed the population in the region from the Indus water. So as to fulfill the demands of the respective riparian states' population, water availability is indispensable factor. This situation complicates the possibility of cooperation attempts taking place between the Indus riparian states for the fact that the situation leads them to scrambling scarce resource moving unilaterally to satisfy the urgent needs of their populace for a living and development ends.

The fourth challenge of cooperation is *institutional inadequacy* to maintain long lasting peace and cohesion. There have been several attempts of institutional establishments for cooperation with the purpose of managing the Indus water in the basin riparian states. However, none of them has become effective to address the contesting issues between India and Pakistan.[17]The attempts of cooperation efforts which have been taking place starting from 1921 to the recent one in 1991 remained short lived cooperation attempts without resulting in lasting solution for the challenges that the riparian states are faced with. For instance, from among the recent efforts of cooperation established for promoting cooperation between India and Pakistan was the Permanent Indus Commission. This Commission would meet regularly once a year in India and Pakistan in a rotation basis and submit reports to respective governments. However, this commission failed to manage the dispute arising out of water/ dam allocation between India and Pakistan for lasting.

The last but not the least challenge of cooperation on the Indus River system is attempts of frequent *terror attack.* One of the prominent terror attacks was the one took place in November 2008, thereon 10 Pakistani terrorists trained by *Lashkar-e-Tayiba* killed 163 people and 300 wounded in the terror attack in Mumbai, India. This attack was initially triggered by the Indian illegal construction of damps in the Indus River allotted to Pakistan under the IWT. The attack was part of intimidation against the act of India to make her refrain from such activities. Saeed, an orchestrator of the terror, highlighted how important the Indus River is to Pakistan. Saeed has accused of India constructing dams and of diverting water from rivers allocated to Pakistan under

[17] See chapter three pages 40-45

the IWT. He has also demanded the Pakistani government to take action against what he calls Indian water terrorism. Protest marches, led by Saeed, used slogans and banners threatening India with a statement: "water flows or blood." Interestingly, the position of Saeed has been supported by many of the Pakistanis. For example, in 2011, Pakistani newspaper *Nawa-i-Waqt* encouraged the Pakistan government to take action against the alleged water robbery of India (Refseth, 2013). Thereafter, it has remained a long-lasting mutual suspicion of employing terror attack in the Indo-Pakistan relations. Due to the prevalence of this kind of mentality and practical actions, both riparian states wouldn't be willing to cooperate easily avoiding mutual suspicions.

5.8. The Current Hydro Political Dynamics in the Indus River Basin

The current hydro political dynamics on the Indus river basin is shaped by challenges in its water sector, due to rapid population growth, rapid urbanization and industrialization, environmental degradation, unregulated utilization of the resources, inefficient water use and poverty, all aggravated by climate change that have resulted in the increased pressures on the existing water resource all over the Indus basin. In the changing global context, the push for development in the riparian states in the Indus basin has caused both conflict and attempts of cooperation in use of trans-boundary waters. The hydro political dynamics on the Indus basin is briefly explained by growing hydro-political pressure and tensions of conflicts arising from escalating water demand in the Indus basin. These riparian states of the Indus River from outset tried to equitably share of the Indus water which was marked by political and economic processes. India which is the upstream riparian state claims to use the Indus River to the extent that would result in adverse effect on the downstream riparian state of Pakistan which heavily depends on the Indus water for most of its economic activities such as irrigation (Alam, 2017; Rao, 2017). Due to the long standing controversy between the two concerned riparian states over the use of the Indus water various cooperative attempts failed to yield lasting peace in the region. India ignoring IWT and all other cooperative efforts continues to unilaterally initiate water dam reservoir that could be to the detriment of Pakistan reducing waters runoff volume that reaches Pakistan. Currently, India's excessive ambition to exploit the Indus water for development endeavor such as planning for hydroelectric power and irrigation over the Indus River Basin has exacerbated the possible tensions in the region pushing Pakistan in return for reversing the situation of trans-boundary challenges of water insecurity on the Indus River Basin (Refseth, 2013).

5.9. Comparison of the Nile - Indus Basins Specific Hydro-Political Characteristics

In this section, a comparative analysis of the Nile and the Indus basins in views of hydro-political characteristics is treated. As previously discussed, the Nile River Basin has recently been characterized by antiestablishment of hydro-hegemonic order that long retained by Egypt- the downstream riparian state. The context in the Indus basin is, however, quite the reverse in that the hydro-hegemonic power is in the hands of India- the upstream riparian state. Unlike the Nile basin wherein the hydro-hegemonic order is subverted, in the Indus case the status quo is still unshaken despite unsuccessful efforts made by Pakistan to reverse the situation. In contrast to the Nile Basin, the hydro-hegemonic power in the Indus basin case is unshakably retained by the upstream riparian country. In the context of the Nile basin the upstream riparian states are shaking the hydro-hegemonic power as they are developing faster than ever before and formed alliance (by virtue of being many) against Egypt to restructuring the power balance. This is evident from the recently taken Comprehensive Framework Agreement that incorporated the upstream riparian states for fair share and use of the Nile waters. Such alliance in the Indus basin is however absent due to the fact that Pakistan is the only downstream riparian state and has no any other party with whom it can form alliance to challenge India's hydro-hegemony.

The Nile basin hydro-political status quo is challenged by the upstream states, as they become individually more powerful and determined to work together to utilize their water resources to realize national development needs. Even more, they have got access to alternative financial assistance typically from China, which is a key external actor in the basin becoming the major source of their finance. Such assistance was not there some years back. And hence, the upstream riparian states are determined to move ahead with several counter hegemony mechanisms. And, the current power dynamics in the hydro-hegemony suggests a changing balance of power that empowers the upstream states challenging the negative hydro political regime in the Nile Basin. Therefore, from the comparative discussion of the Nile and Indus basin so far it is safe to conclude that though Egypt's influence in the Nile is still a challenge, counter hydro-hegemony mechanisms of the upstream states is bringing about antiestablishment reform in the hydro-hegemony situation of the basin, which is however negligible in the Indus basin case as such.

5.10. Comparison of Challenges to Cooperation in Nile and Indus River Basins

As it has been discussed earlier on the separate section of hindering factors and challenges of cooperation, both the Nile and Indus basins have been hindered and challenged by various factors in the efforts to achieve cooperation. The natures of hindering factors and challenges are partly similar and partly not. For instance, both the Indus and the Nile basins are hindered and challenged by actions of unilateralism, lacking of institutional adequacy, power asymmetry, conflicting water use doctrines and principles, and recently environmental pressure. Despite the resemblance in some of the hindering factors and challenges of cooperation, there are quite many unique features in the respective basins.

One of the departures in the Nile and Indus basins is historical use of the Nile waters by Egypt shaped the *psychological makeup* of Egypt as a sole owner and user of the water without having to share with other co-riparian states. This situation also makes the possible reconciliation among the co-riparian states for fair share of Nile water difficult to its realization. In the context of Indus basin however there is no claim of historic use right as both India and Pakistan have been using the Indus River simultaneously even before the coming into being of separate states. The context in the Indus basin is so different. The issue of the Kashmir territory is rather a point of divergence debilitating the co-riparian states to reach cooperation. India and Pakistan as co-riparian states of the Indus Basin have irreconcilable interest over the Kashmir and failed to reach negotiation. The IWT which was brokered by the World Bank couldn't maintain lasting peace in the region though only brought about short term stability. India has been frequently violating the terms of this treaty which irritated Pakistan that demands the protection of the treaty to its own favor.

Another point of departure on the Nile and Indus basins in their hindering factors and challenges to cooperation is the issue of *water scarcity*. Water scarcity is nonissue in the case of the Nile basin as such at least for the time being despite its possibility in the future, whereas the Indus basin is heavily constrained by water scarcity which has made matters worse off for cooperation. India, for instance, due to waters scarcity, has been violating the treaty which she has entered with Pakistan in IWT. Demographic pressure of the rising population and the resultant growing economies raised concerns over sharing of trans-boundary waters. The Indus water is coming under growing pressure from increasing water demand and water quality deterioration. The Indus

basin which is one of the most populous regions in the world thus demands huge amount of water resource to sufficiently feed the population in the region. This situation complicates the possibility of realizing cooperation in the basin.

Another differentiation between the Indus and Nile basin is the *terror attack* frequently taking place in the Indus basin. Unlike the Nile basin wherein there is no an incident of terror attack taking place due to hydro-politics even though there have been episodes of direct or proxy wars waged against Ethiopia by Egypt in different times in history, the incident of terror attack is not yet recorded. In the context of the Indus basin, India and Pakistan are accustomed to the act terror attack in response to securitization of the Indus waters. One of the prominent terror attacks was the one taken place in November 2008, wherein ten Pakistani terrorists killed 163 people and wounded 300 in the terror attack in Mumbai, India. This attack was triggered due to the Indian illegal construction of reservoir for water storage in the western tributary rivers of the Indus which was allocated to Pakistan under the IWT. The attack was part of intimidation against the act of India to be refrained from such activities.

Last but not least variation between the Nile and Indus basin is *colonial legacy.* In the context of the Nile, colonial legacy plays crucial role as a challenge. This is because Egypt frequently traces the colonial treaties to be part of negotiation, while the upstream riparian states strongly oppose it as it was not a treaty that they were not a party. While Egypt claims historic right based on the colonial legacy, it has not been acceptable by the co-riparian states, and which made it hard to reach negotiation. In the Indus case however colonial legacy has subsidiary role in impacting the efforts to cooperation by heightening hostility in the priori existing Hindu-Muslim relation.

5.10. Comparison of the Nile and Indus Basins' Current Hydro-Political Dynamics

With regard to the current hydro political dynamics on the Nile and Indus river basins they both are shaped by challenges of water sector, mainly due to population growth, rapid urbanization and industrialization, environmental degradation, unregulated utilization of the resources, inefficient water use and poverty, all aggravated by climate change that have resulted in the increased pressures on the existing water resources. This has resulted in the increased concerns over sharing of trans-boundary waters. In the changing global context, the push for development in the riparian states in both the Nile and Indus basins has caused more of conflict than

cooperation in use of trans-boundary waters. The hydro political dynamics in the Nile and Indus basins currently is explained by hydro-political pressure and tensions of conflicts arising out of escalating water demand across riparian states. As regards unique features of the Nile basin's hydro political dynamics, since Ethiopia has reached the point of storing the water in the GERD dam reservoir in the next July 2020, the current hydro political situation on the Nile river basin is even tenser than ever before. Egypt currently is utterly opposing the action of Ethiopia through different international media claiming that the action of Ethiopia exactly against Egypt's historic rights of the Nile water use. Despite efforts of cooperation, Ethiopia and Egypt have never reached reconciliation over the use of the Nile River. In the Indus basin case, India which is upstream riparian state, claims to use the river to the extent that result in adverse effect on the downstream riparian state of Pakistan, which heavily depends on the Indus water for most of its economic activities. India ignoring the IWT and many other cooperative efforts continues to build water reservoir dam that could be to the detriment of the Pakistanis reducing waters runoff volume that reaches Pakistan. India's excessive ambition to exploit Indus water for development planning like hydroelectric power and irrigation over the Indus River Basin has exacerbated the possible tensions in the region pushing Pakistan in return to reverse the situation of trans-boundary challenges of water insecurity.

5.11. Conclusion

This thesis has made a comparative analysis of challenges to cooperation in the Nile and Indus river basins, from the comparative study, the Nile and Indus river basins have both similarities and differences in their endeavors to achieve cooperation. When it comes to the Nile river basin, its challenges are associated with historical colonial treaty concluded by colonial powers in favor of Egypt. Based on the historical colonial treaty Egypt has been claiming the historic use of the Nile water regardless of other co-riparian states of the basin. In the case of the Indus basin, colonial legacy had no significant role even though it might have subsidiary role in exacerbating the already existed Hindu-Muslim hostility. The hydro-hegemonic situation in the Nile basin was another challenge that hampered the possibility of attaining cooperation in the Nile basin. Similarly, hydro-hegemonic situation is apparent in the Indus basin that India has been dominant and usually violates the treaty it had signed. In the case of the Nile, it has been Egypt which has hydro-hegemonic power until recently.

Whereas, in the Nile basin subversion of the hydro-hegemonic power is on the way, this is not the case in the Indus basin due to inability of Pakistan to challenge the regional bully, India. While in the Nile basin the downstream state, Egypt, has been hegemonic, in the Indus case the upstream riparian, India is hegemonic power. The finding has shown that the location of a hegemonic power in a basin can be either upper or downstream and in either case such power(s) can negatively affect the roadmap to achieve cooperation unless power balance is maintained.

Another challenge to cooperation in the Nile basin relates to demographic and climate change that yielded environmental degradation with a subsequent pressure over the water resource along the basin countries inducing potential conflict instead of cooperation. This is equally true in the Indus basin case that demographic and climate change has caused severe challenges to water scarcity which in turn adversely impacted to reach cooperation. Climate change presents serious challenges to the Indus as well as the Nile, including reduced river flow, land degradation, higher likelihood of droughts and floods. Rapid change in a demographic pattern is present both in the Indus and the Nile basins riparian countries leading into water scarcity as the need over water resource goes up for the use of electricity, irrigation, industry waste, and domestic chore.

Unilateral project development has been identified as a common behavior both in the Nile and Indus river basins. In the Nile and Indus river basins, riparian states have unilaterally pursued projects in order to promote their national interests, for instance. Unilateral behavior in the Nile as well as the Indus basin has therefore remained a direct threat to the achievement of effective cooperation as it undermines the states' desire to come into cooperation. Thus, a unilateral move in the Nile and Indus basins has equally been a challenge to reach mutual agreement and genuine cooperation between the upstream and downstream states of the respective basins.

Absence of durable and reliable third party mediation between upstream and downstream states have also been another challenge to arrive at a successful cooperation. Third party mediation plays a positive role by diffusing the conflict as it arises. Thus, absence of durable and reliable third party mediation has negatively impacted the efforts to achieve stable cooperation in the Nile basin. Drawbacks of mediation may originate from the very fact that the norms third parties bring to the negotiating table contradicts with the needs of the riparian states. For instance, the recent US mediation attempt that was from mid-January to the end of February 2020 between Egypt and Ethiopia which failed due to its deficiency to satisfy both parties as the very mediation from the outset was in favor of one party that of Egypt.

When it comes to the Indus basin, similarly there is lack of strong third party mediation that persistently mediates between the two most prominent riparian states and users of the basin namely, India and Pakistan. The upstream riparian state, India, in contrast with the downstream riparian state, Pakistan, has an upper hand in maintaining hydro-hegemonic power over the Indus River. The two riparian states have long been in a hostile relationship even before their birth as modern states. The two states were under constant conflict over the use of the Indus water despite several attempts of coming into agreement via treaty.

In a nutshell, the comparative analysis in the Nile and Indus River basins in terms of specific hydro-political characteristics, hindering factors and challenges to cooperation, and the current hydro-political dynamics have shown similarities and differences. The findings have concluded that the possibility to attain cooperation both in the Nile and Indus basins is unlikely due to the fact that the factors of cooperation are significantly constrained by numerous challenges.

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Declaration

I, the under signed graduate student, declare that this thesis is my original work and has not been presented for a degree in any other university and that all sources of materials used for the thesis have been duly acknowledged.

Name: _____

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