

ADDIS ABABA UNIVERSITY
SCHOOL OF GRADUATE STUDIES

**A COMPARATIVE ANALYSIS OF HYDROPOLITICS IN THE RHINE
AND NILE RIVER BASINS**

BY
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ADDIS ABABA

JUNE 2014

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**A THESIS SUBMITTED TO THE SCHOOL OF GRADUATE STUDIES OF
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Acronyms

AU: - Africa Union

BCM: - Billion Cubic Meters

CCNR: - Central Commission for Navigation on the Rhine

CFA: - Cooperative Framework Agreement

CHR: - International Commission for the Hydrology of the Rhine Basin

ENTRO: - Eastern Nile Technical Regional Office

EU: - European Union

EUREA: - European Union of National Association of water suppliers and waste Water services

FAP: - Action Plan on Flood Defense

GERD: - Great Ethiopian Renaissance Dam

ICPR: - International Commission for the Protection of the Rhine

IGADD: - Inter-Governmental Authority against Drought and Desertification

ILA: - International Law Association

IWAC: - International Water Assessment Centre

NBD: - Nile Basin Discourse

NBI: - Nile Basin Initiative

NBS: - Nile Basin Society

NGOs: - Non Governmental Organizations

RAP: - Rhine Action Program

TECCONILE: - Technical Cooperation for the Promotion of Development and Environmental Protection

UN: - United Nations

UNDP: - United Nations Development Program

UNESCO: - United Nations Economic, Social and Cultural Organization

WMO: - World Meteorological Organization

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Abstract

Hydropolitics has gained prime importance in the world as transboundary water resources cover nearly half of the earth surface connecting many states. The Nile and Rhine river basins are among the largest river basins in the world connecting several states. This study proposes to make a comparative analysis of the hydro-politics of these river basins. The study extensively examines the existing hydro-political features and investigates the achievements in terms of legal and institutional cooperation in the two basins. The similarities and differences of river basin management in both basins and the factors rendering those similarities and differences are broadly analyzed.

The research is mainly based on secondary resources and related literature. It also has reviewed primary sources extracted from relevant institutions and authorities found in Addis Ababa. The available sources are analyzed through descriptive and explanatory approaches. The findings, among others, include the existence of both similarities and differences of hydropolitical features in the Nile and the Rhine River basins. Similarity is observed in terms of engagement of several states and existence of both tension and cooperation over the shared rivers. Disparity, on the other hand, is observed from the existing difference in range and status of cooperative initiatives along with variations with respect to geographical, economic and political features between the riparian states of the river basins. The findings show the existence of vast differences with limited similarities of hydropolitics in the two river basins.

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Chapter One: Introduction

1.1 Background

Nearly half of the Earth's land surface is occupied by transboundary lake and river basins (Towfique and Espey, 2002: 3). Many of these river basins are simultaneously perceived as important engines of regional economic development, crucial bases of livelihood resources, and as critical sites of biodiversity conservation. These rivers involve different hydropolitical features giving rise to major economic, environmental and political concerns (UNDP, 2006). The Nile and the Rhine are among the most important river basins showing such concerns.

Nile is the longest river in the world having a length of 6,825 km and the third largest with its catchment area of 3,352,710 km². It covers about one-tenth of the area of the African continent including "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, Burundi, Rwanda, Congo Democratic Republic and Eritrea" (Yacob, 2007, 25). Ethiopian highlands provide 86% of the Nile waters while the remaining 14% comes from the Equatorial Lakes region (*ibid*: 25- 26).

The River is economically significant where around 160 million people in the basin are directly dependent on the Nile for their livelihood. Most of all, the existing poverty in line with the current environmental degradation and high population growth, has increased this value of the river (Wondwosen, 2008: 34- 35). Witnessing this, the riparian states especially, Egypt and Sudan are heavily dependent on irrigated agriculture for food and cotton production from the Nile water (Abadir, 2011: 287). Though the upstream countries have not utilized it like the downstream countries, they have benefited to some extent. For instance, Ethiopia has built and is building different hydroelectric dams along the river's main tributaries. Uganda has also built a dam along the Bujagali Falls (Martens, 2011: 3- 12).

For long time, downstream countries of the Nile have pursued unilateral and conflicting approaches to the utilization of the river based on their stand on historical and natural rights. This has lead them to tense relationships with the upstream countries. Unlikely, the upstream countries particularly Ethiopia is not willing to accept such claims rather they argue from the doctrine of absolute territorial sovereignty point of view. In addition, it does not accept any

colonial or postcolonial agreements which the country is not part of it. These extreme stands of the two in line with the need to utilize the river lead long existing controversies in the basin.

However, this trend has started to change recently as the countries took different measures towards cooperation. The formation of NBI is one of the manifestations which after a decade of negotiations resulted in the signing of the CFA. Most of all, acceptance of the CFA by majority of the riparian states is a significant achievement in the area of cooperation (Abadir, 2011: 301-312). Though the riparian states have taken the way towards cooperation, one cannot conclude existence of an effective cooperation and fully integrated river basin management in the area. Instead it is still what the countries are trying to bring, making the above achievements a starting point but not an end.

On the other hand, the Rhine is one of the European rivers with different hydropolitical features. Originating from the Swiss Alps, it flows 1, 232 km through Switzerland, France, Germany and the Netherlands finally entering into the North Sea (Verwij, 1999: 455- 56). The 225, 000 km² catchment area of the Rhine extends over parts of Switzerland, Italy, Austria, Liechtenstein, Germany, France, Belgium, Luxembourg and the Netherlands. Switzerland, France, Germany, and the Netherlands dominate the watershed, together comprising 92% of the Rhine River Basin area while the remaining five basin countries comprise the remaining 8 percent (Frijters and Leentvaar, 2003: 2).

Navigation and trade along the Rhine led to extensive urban, agricultural, and industrial development including chemical, mining, pharmaceutical companies and steel manufacturing. 50 percent of the basin is used for agricultural production with 60 million people settled in the basin (ICPR, 2014a). Most of Germany's vineyards, the white wine production from the Alsace region of France and most of the Swiss red wine owe their existence to the River. In addition, the river is used to generate hydroelectric power. The Rhine's long history as a means of border defense has left its banks littered with ruins of spectacular castles making it one of the huge tourist sites with the existing recreational and bathing waters in the entire Rhine watershed (Frijters and Leentvaar, 2003: 2- 4).

So many different claims exist on the Rhine River leading to controversies including water quality problems, problems in river ecology, and flooding. But the riparian states are able to

improve the situation through cooperative relationships. The existing different legal instruments and institutions have proved their great importance in managing the tensions (*ibid*: 5-31).

The existing variation of the hydropolitics in these two river basins is the concern of the research where it compares the geographical, economic, and political features, and water related legal and institutional aspects in the two river basins requiring to draw a better and comparative understanding of effective river basin management in the two river basins.

1.2 Statement of the Problem

Since the time of earliest civilizations¹, the Nile River is assumed by many to be the sole property of its downstream countries, especially those of Egyptians. Starting from the era of ancient civilization, the Egyptians have made most use of the water of the Nile. Herodotus described this reality when he claimed “Egypt as a gift of Nile” (Yohannes, 2008: 33). Their very existence depends on the Nile as it provides them with more than 95% of the total amount of water that is being used each year. This fact, in line with the increasing number of population and climate change rose Nile to the heart of Egyptians politics. So, any kind of development in upstream countries that may hamper the free flow of the river is considered as a national security matter for them which in turn brought tense relationships in the basin. In different times, they have indicated their claim to employ war in order to protect the free flow of the river. They strengthened this stand under their new constitution of 2014 (Zerihun, 2014: 1- 8).

But recently these tensions have surfaced, as the upstream countries openly defied the status quo that favors downstream countries (Abadir, 2011: 285- 286). For long the upstream countries have not benefited from the river though they are the major contributors. However, as a result of current progress like their increasing number of population, ecosystem degradation and constantly failing rains in addition with the existing poverty, they have started to see the Nile as one of the best resource for development (Wondwosen, 2008: 35). So, the upstream countries, especially Ethiopia is trying to utilize it. These progresses have highly increased the long standing tension particularly between Egypt and Ethiopia. Most of all, the perceived scarcity of water in the basin has aggravated the situation as the downstream countries refused to accept such developments due to fear of reduction in water volume. This in turn led to unwillingness to

¹ Almost 5,000 years ago (Stebek, 2007: 45).

accept recent developments toward cooperation that expect them to compromise including the CFA (Abadir, 2011: 301- 312). As a result the two sides, the upstream and downstream states, have not come to agreement on the CFA. This results in lack of all inclusive basin-wide agreement in the basin.

Riparian countries in the Rhine basin on the other hand face different kinds of controversies and tensions related to the water of the river. The source of tension in the basin emanates from the existence of abundant water unlike the Nile basin. Abundance of water has led to flooding problems among the basin countries at different times. Though flooding is a natural phenomenon, various human interventions have altered the river regime and thus affected the flood patterns (Frijters and Leentvaar, 2003: 5- 10). Although have improved recently, pollution and salinization problems are still adding to the problems to some extent (Verwij, 1999: 453- 61).

Despite such challenges, the Rhine basin countries achieved different legal and institutional mechanisms for the basin management. At present different institutions exist in the Rhine with proved effectiveness like that of the CHR, ICPR and CCNR. These institutions have guided by different legal principles including International Convention on the Prevention of Chemical Pollution of the Rhine, the Rhine Action Programme, Action Plan on Flood Defence, EU Water Framework Directive, and Convention on the Protection of the Rhine (Frijters and Leentvaar, 2003: 5- 10).

Though a wide range of literature exists on the Nile and Rhine River basins, it lacks a comparative coverage. Most of the literature focuses on the hydropolitics of one or the other basin. Only few research works are engaged in comparing specific issues than comparatively treating the whole hydropolitics of the rivers (Bakker, 2009; Bernaver, 2010; Chase, 2012; Godana, 1995; Huisman, et al, 2000; IWAC, 2001). So, this study attempts to bridge the gap by comparatively studying the hydropolitical features of the Nile River basin with that of the Rhine River basin.

The Nile and Rhine River basins are chosen due to the riparian countries experience of active engagements marked by the histories of river basin management and institution development. Therefore, the study evaluates similarities and differences of river basin management and

institution development in the two basins. The study focuses, among others, on comparing the major hydropolitical features in order to gain a better and comparative understanding of the hydro-politics in the two river basins.

1.3 Hypothesis

The existences of different hydropolitical features in river basins highly affect the conflictive or cooperative patterns of riparian states. Though there is no river basin which can be taken as a blueprint for an effective river basin management, such effect of hydropolitical features can be understood from the comparison of the Nile River basin, which lacks effective river basin management, to the Rhine River basin with a relatively better river basin management.

1.4 Objectives of the Study

1.4.1 General Objective

The general objective of the study is to compare the hydropolitics of the Nile basin with that of the Rhine basin.

1.4.2 Specific Objectives

The specific objectives of the study are:

1. To show the existing geographical, economic and political features, and the relationships of upstream and downstream countries in the two river basins.
2. To explore the major achievements and failures in the areas of legal and institutional cooperation in the two river basins.
3. To understand the differences and similarities of river basin management between the two river basins.
4. To explain the factors behind the similarities and the differences between the two river basins.

1.5 Research Questions

The study compares the hydropolitics of the Nile and Rhine basins by pursuing the following key research questions.

1. What are the existing hydro-political features of the Nile and the Rhine River basins?
2. What have been achieved in the areas of legal and institutional cooperation in the two basins?
3. What are the similarities and differences of river basin management between the two river basins?
4. What are the factors behind similarities and difference of river basin management between the two river basins?

1.6 Methodology and Method of data Collection

1.6.1 Research Design

Research design is the overall plan that gives direction and systematic process to the research where it helps to ensure that the evidences obtained enabled us to answer the questions raised (De Vaus, 2001: 8- 9). In other words, it is a design that articulates “what data is required, what methods are going to be used to collect and analyze data, and how all of this is going to answer ones research question” (Wyk, 2005: 3). Within this context, the study adopts Most Different Systems Design/MDSD/ of comparative approach. The underlying goal of comparative research is to identify similarities and variances between cases demanding a better understanding and elaborative social, political and economic phenomena (Lim, 2005: 43- 46). The most commonly used types of comparative approaches are Most Similar Systems Design/MSSD/ and Most Different Systems Design/MDSD/. MDS design engages in two systems that are different in almost every respect except for variables under investigation. It focuses on identifying the factors for and existing similarities. On the other hand MSS design deals with two or more very similar social systems. According to this design, the characteristics that the systems share are considered to be constant where they can explain a particular social or political phenomena that is identified to be different among the two (*ibid*: 41- 43).

In line with this, the study compares the hydropolitics of the Nile and the Rhine river basins requiring to obtain a better understanding of the two river basins. The two river basins are comparatively examined where the area of similarities and differences between their hydropolitical features are elaborated.

1.6.2 Methodology of the Study

The general approach that guides the study is qualitative method. This method is selected for various reasons. First, this approach is suited for the collection and analysis of relevant data on the two river basins. Since the research has mainly based on different literature, it helps to improve the validity of the findings. Second, there are some aspects of the object under investigation whose data cannot be expressed and analyzed through quantitative methods. Since the research is not concerned with quantifying its results through statistical summary or analysis, it is best to use the qualitative approach. The other reason for adapting qualitative approach is that this research seeks to describe the hydropolitical features of the two river basins. Hence, it is basically a descriptive and explanatory research which tries to understand and describe the existing hydropolitical features of the two river basins. Finally, since the researcher analyzes the experiences of the two river basins, the method helps to interpret and analyze the results obtained from those experiences.

1.6.3 Methods of Data Collection

Both secondary and available primary sources are used to deal with the questions of this study. Primary data are collected through interview with experts in key Ethiopian government ministries: Ministry of Water, Irrigation, and Energy, and Ministry of Foreign Affairs. The secondary data has been collected from the existing published and unpublished materials including books, articles, journals, reports, documents of governmental and nongovernmental organizations, and internet sources.

1.7 Significance of the Study

The study is about comparing the hydropolitics of the Nile and the Rhine river basins. It gives a comparative understanding of river basin management in the two river basins by serving as a source of information about the hydro-political features of the two river basins. This in turn will

serve as an important input in expanding the existing knowledge on hydropolitics in general and that of the Nile and the Rhine river basins in particular. The understanding of different river basin management systems may also indicate new ways of policy formation, and legal and institutional cooperation among co-riparian states. The knowledge obtained from the study will help to initiate new ways of engaging in research for scholars as it strives to comparatively understand the main hydropolitical features of the two rivers.

1.8 Scope and Limitation of the Study

The research compares the hydropolitical features of the Rhine and Nile river basins. Since, the comparative analysis of the hydropolitical features of the Rhine and Nile basins is a vast topic, this study attempts to compare geographical, economical, and political features and tension and cooperation patterns in these basins.

The inability to collect primary data through interviews, questionnaires and/or observations of the Rhine River basin can be a problem to have a valid comparison. The researcher has tried to fill this gap by using different secondary resources. In addition, scarcity of recent books and journals in this river basin coupled with interruption of internet connection to download journals and related documents have been a limitation in conducting the study.

1.9 Organization of the Study

The study is organized into six chapters. The first chapter introduces what the study is about, the problem to be examined, the objectives, research questions, hypothesis, significance, method and source of data, scope and limitation of the subject under study. Chapter two presents a highlight of pertinent reviews of the literature and conceptual framework relevant to the major theme of the study.

In the third chapter, the thesis deals with the hydropolitical features of the Nile River basin. It in particular discusses the geographical, economic, and political features of the basin and the patterns of tension and cooperation among the riparian countries. Chapter four of the thesis presents the hydropolitical features of the Rhine River basin focusing on the geographical, economic, and political features of the basin, and the patterns of tension and legal institutional developments under this basin.

The fifth chapter provides a brief comparison of the findings of the thesis from the two study basins. It analyses the impact of the geographical, economic and political feature in the riparian relations and the similarity and difference of river basin management in the two basins. The last Chapter summarizes the main points of the study and focuses on the key findings and conclusions that the researcher tried to address.

Chapter Two: Conceptual Framework and Literature Review

This chapter is engaged in discussing conceptual perspectives in hydropolitics and reviewing literature of different scholars in the area. In line with this, it defines the concept of conflict, cooperation, water scarcity, transboundary resources, river basins, riparian countries, and hydro-hegemony in its first part. In the second part, it reviews literature by focusing on the conflictive and cooperative nature of water. Lastly, it discusses doctrines and principles in international water law practices and international legal instruments.

2.1 Conceptual Frame Work

Hydropolitics, which is also known as water politics, is a concept that deals with the existence of conflict or cooperation over water resources. Demonstrating this, Elhance (1999: 3) defined hydropolitics as “systematic study of conflict and cooperation between states over water resources that transcend international border.” However, the definition of hydropolitics can not only be limited as the interaction of sovereign states and involving only transboundary water resources. Manifesting this, Meissner defined it as “the systematic investigation of the interaction between states, non-state actors and a host of other participants, ... within and outside the state, regarding the authoritative allocation and/or use of international and national water resources” (Meissner, 1999: 4). So, the concept of hydropolitics involves various actors “ranging from the individual, to the household, village, city, social, provincial, national and international level” and covers a wide variety of issues such as “conflict and its mitigation, ... water service delivery, water for food, the social value of water, the political value of water, the psychological value of water, water demand management, water as a target of aggression, water as an instrument of peace, water and gender, water and ecosystems, and water as a critical element in sustainable development” (Turton, 2002: 16). The above two definitions are generalized by Turton description of hydropolitics as an “authoritative allocation of values in society with respect to water” (Turton, cited in Cascan and Zeitoun, 2010: 28).

The other most important concepts that have dominated the literature of transboundary water are conflict and cooperation. The two are heavily dependent on one another as the existence of one of them is the reason for the other. In other words the coming into reality of one of them is the

reason for the appearance of the other. As a result they can be considered as “two sides of the same coin rather than opposing ends of a spectrum” (Cascao and Zeitoun, 2010: 29).

Conflict is the existence of clash of interest among parties with the struggle to pursue it. In line with this, Swanstrom and Weissmam (2005: 9) defined it as a “situation in which two or more parties strive to acquire the same scarce resources at the same time.” The parties cannot get the resource at the same time because of different reasons including scarcity of the resource. This in turn creates divergence and frustration. So, the contradictory parties use conflict as a means which convey another definition of conflict as a “means by which each party propose to achieve its goal” through “physical violence...., and verbal acts (e.g. warnings, threats)” (Bercovitch, et al, 2008: 9). This indicates that conflict can be the perceptions of threats with hostile attitudes to one another or the actual occurrence of damage on one another. So, according to Mason (2003: 13), “at least one of the parties experience damage from the incompatible interaction as stemming from the other party, and at least one of the other parties ignores the negative impacts of their interaction, or willfully seeks to neutralize or harm the other party.”

Conflict over transboundary rivers emanates due to different reasons. For instance in water deficient areas like that of the Nile River basin, scarcity of demanded water and equitable utilization is the main source of conflict. Water scarcity is a “condition that exists when the demographically induced demand for water exceeds the prevailing level of local supply resulting in supply side augmentation becoming necessary” (Turton and Meissner, 2002: 39). So, as a result of less quantity of water, the need for utilization of water by upstream countries and the fear of reduction in supply amount by downstream states are the dominant reasons of conflict in the basin. However, the source of conflict in the Rhine River basin is highly different where the main source of conflict in this basin being flood and to some extent pollution which has high effect on water quality.

Cooperation on the other hand indicates the existence of positive interactions between parties. It is “the adjusting of behavior to the actual or anticipated preferences of others, through process of coordination in different ways” (Hampson, et al. 2007). In other words, Cooperation according to Rummel (1979: 7) indicates “working together for a common interest or cooperating act as a team” among two or a multiple states. However, this does not mean that it is equivalent to harmony since cooperation “can occur in circumstances where both contradictory and balancing

interests exist” (Axelrod and Keohane as cited in Yaekob, 2011: 7). Cooperation among transboundary rivers manifests through different activities including the existence of international legal instruments (like that of CFA in the case of Nile and the 1999 convention on the protection of the Rhine in the case of Rhine) and institutional arrangements (like that of NBI and ICPR in the two rivers respectively). Such cooperation in international river basins is very important for the existence of peace and security on one hand and economic development and integration on the other.

The other concept that needs clarification is transboundary Water Resources, that are defined as “fresh water resources that cross two or more states” (Ruth, et al., 2010: 3). They comprise international rivers, lakes and aquifers (*ibid*). The area that comprises transboundary river resources are called river basin which is also known as watershed or catchment area. In other words, river basin is “the area that contributes hydrologically being both surface and ground water, to a first order stream which outlet to the ocean or to a closed or inland sea” (*ibid*). States that comprise the catchment area are called riparian states. According to Sheam (2009: 4), they are defined as “of, pertaining to, or situated or dwelling on the bank of a river or other body of water.”

The last concept that needs clarification is hydro-hegemony. Its developers, Zeitoun and Warner defined it as “hegemony at the river-basin level, achieved through water resource control strategies such as resource capture, integration and containment” (Zeitoun and Warner as cited in Yaekob, 2011: 7). In other words, it occurs when the more powerful actor consolidates control over the transboundary flows (Cascao and Zeitoun, 2010: 27). Egypt in the Nile basin and, France and Germany in the Rhine basin can be taken as a good example. Though Egyptians are facing different challenges recently that are threatening to change the existing reality, they have been the hegemonic actor in the basin for long. France and Germany also used to share this status with Egypt in their basin. However this fact does not exist in the basin any more as the riparian countries have relatively the same power.

2.2 Water as a source of Conflict?

Though the trend has started to change recently, most literature on transboundary water resources indicates the conflictive potential of water resources (Haftendorn, 2000: 51- 68; Kovacs and

David, 1977: 87- 88; Molen and Hildering, 2005: 133- 34; Wolf, 2001: 241- 43; UN, 2008: 1- 2). In line with the prominent role of water for survival, its conflictive potential emanate when it transcends international boundaries (Haftendorn, 2000: 51). The intensity of the conflict can be exacerbated by a region's geographical, economic, and political features. Even if they have not caused any violent conflict until now, transboundary water resources have led to interstate tensions as can be seen in the Rhine basin, particularly before 1987 and in the Nile basin which significantly hampered development until recently.

Conflict over Transboundary River basins arises due to different reasons. The first, that has gained more coverage in transboundary water literature, is the scarce nature of accessible fresh water. From the total quantity of water in the world, only 0.007% is available for human use which is dropping since 1970 (Wolf, 2007: 242). The growing number of population in line with the existing economic development is putting a huge strain on this limited accessible water resource. This problem is further aggravated as almost half the globe's land surface lies within international watersheds (UN, 2008: 1- 3). Climate change is adding to the pressures on water resources in many areas as it is resulting fluctuations in water availability and water quality. As a result a growing number of states are experiencing rising or even permanent water stress, including higher frequencies or intensities of floods and droughts (Molen and Hildering, 2005: 133).

With scarcity always comes risk of conflicts over the limited resources since all states need to utilize them to respond to multiple internal requirements. So, competition over them can heighten tensions and even leading to open conflict. This problem is most extreme in the semi-arid regions of the world, and is intensified in cases where differing levels of development between states lead to varying utilization levels of the water resource (Wolf, 2007: 242- 243). According Toset, the situation will be firm as most of these rivers flows between countries with a history of conflict with in which water plays an important role in their economic life (Toset as cited in Molen and Hildering, 2005: 138).

The conflict between Egypt and Ethiopia over the utilization of the Nile River and conflict between Mexico and the USA over the utilization of the Colorado and Rio Grande can be taken as examples. More intense is the Jordan Basin conflict, which, in addition to the problem of the distribution of a scarce water resource in a semi-arid region that only covers 50% of the water

requirements of the population, is further complicated by the political and security issues of the region. These issues include the Palestinian struggle for an independent state and the political, economic and military security concerns of Israel (Wolf, 1996: 5- 7).

However for some, the problem is not the existing scarcity rather lack of effective management in river basins is the main problem. Water management is a highly complex political matter that requires strong institutions and reliable data base as to balance competing interests. However, most of the river basins lack this fact as a result of many reasons including “lack of adequate water institutions, inadequate administrative capacity, lack of transparency, ambiguous jurisdictions, overlapping functions, fragmented institutional structures, and lack of necessary infrastructure” (Carius, et al, 2004: 61). This in turn leads to inadequate governance and management of water resources creating tension among riparian countries. As a result most basins’ water management is characterized by mistrust and competing interests (*ibid*).

Utilization of water is also another source of conflict especially when a large or rapid change occurs in the existing water flow. Though the rivers are characterized by a plentiful flow in the upper basin, they may drastically reduce in the lower basin because of the extensive use of the resource among the upper riparians. As a result of this arrangement, the needs of the lower-lying states are not being satisfactorily met. Many difficulties can arise from utilization and runoff regulation activity of the upstream countries. This is especially prevalent in the cases of dam construction, reservoirs or extensive irrigation works which reduce water availability (Molen and Hildering, 2005: 139). Above all huge dependency on rivers by some downstream countries, like that of Syria, Sudan, Egypt, and Kuwait has increased the tension with upstream states (*ibid*).² The problem will be more pronounced when the lower lying states withhold their consent for such constructions because of fear of changes in the rivers’ quantity or quality. Existence of downstream hegemonic state with vital interests in protecting the water resources will worsen the situation (Haftendorn, 2000: 53- 54).

Haftendorn (2000: 54- 56) in addition to the above two reasons, adds pollution of international rivers as a ground for conflict. Utilization attempts of riparian states can conflict with

² Egypt and Sudan are highly dependent on the Nile River, and Syria and Kuwait are dependent on Euphrates and Mekong Rivers respectively.

environment leading to conflict among these states. Rivers serve as a means of disposing of waste water and industrial rubbish when different constructions take place along the river banks. This in turn will highly decrease the quality of water that cross borders resulting conflict among riparian states particularly creating tension between the upstream states that release the wastes and those of the downstream states that receive the polluted water. The situation will be aggravated if the river carry out essential needs like that of drinking water in downstream states as can be seen in the Rhine River basin. In addition to pollution, different constructions along the River Rhine have aggravated the existing flood problems leading to different controversies in the area.³ Wolf (2007; 243) also consider pollution as a source of conflict since he indicates the increasing contamination of surface water supplies may lead to “tensions, threats, and even to some localized violence.”

Conflicts arising from the use or pollution of a water resource would be easier to solve than those conflicts that arise from the distribution of a scarce resource. In the first two cases there are contested costs which can be manipulated in order to come to an agreement. In the case of a scarcity conflict, states are faced with a different scenario whereby a solution is only possible when the privileged state agrees to give up certain of its advantages. The situation will be aggravating when the lower riparian cannot prevent a detrimental action by the upper riparian. In this case, the survival of the lower-lying state comes into question and this can lead to its use of military action (Haftendorn, 2000: 52- 60). In the past, conflicts between Syria and Iraq over the Euphrates, between Israel and its Arab neighbors over the Litani and the Jordan water flow have led to violence on these grounds (*ibid*).

2.3 Water as a Source of Cooperation

While embedding a potential for conflict, Transboundary Rivers provide opportunities for cooperation and promotion of regional peace and security, as well as economic growth (Bernaver and Kalbhenn, 2010: 1). Although conflicts on water resources have been forecasted in different areas, no incident so far appeared except minor skirmishes which mostly remained at national level. Rather cooperation over trasnboundary water achieved a long and successful history

³ Since the Rhine has become a navigable waterway through different construction measures large stretches of floodplains have been lost further aggravating flooding problems (Frijters and Leentvaar, 2003: 3).

continuously out weighing conflicts (Carius, et al, 2004: 62). For instance, between the years 1948 to 1999 only one third of 1831 events were conflictive in nature. In addition, “109 out of the 263 international courses in the world have experienced the signatories of international water treaties while in 62 of them cooperation was institutionalized even farther through the establishment of River basin organizations” (Schmeier, 2010: 6).

Most of the time averting disputes is the strong political driver for initiating cooperation on transboundary waters, as riparian states always seeks to safeguard their common interests (Wolf, 2001: 242 - 47). Indeed, history witness this fact as freshwater resources have been a powerful incentive for cooperation compelling stakeholders to reconcile even the most divergent views. It gives a ground for solving conflictive interests and transboundary impacts through adequate legal and institutional frameworks, joint approaches to planning and sharing of benefits and related costs (UN, 2008: 7- 17).

Schmeier (2010: 7) has identified states calculation of cost benefit analysis of conflict as another source of cooperation. The chances for success of water related violence are very limited while their costs are extremely high. Even if vulnerable powerful downstream state exists with a demand for violence, getting into conflict is unrealistic since any harm on the upstream (including attack on industrial settings or dams) countries will in turn highly affect itself.

Effective cooperation over transboundary river basins have many benefits including in an increased food and energy production. Cooperation is also effective in easing tension among riparian states and to create an improved economic integration. In addition transboundary early-warning systems can minimize loss of life in the event of floods. So, cooperation directly or indirectly contributes to international trade, economic development, food and political security, poverty alleviation and regional integration. It also enables a better ecological management (UN, 2008: 2- 3).

However realization of Cooperation is not a simple issue as it takes a long and complex journey with many routes to be followed. At first any arrangement must be customized to a given basin's characteristics and reflect a range of environmental, hydrological, political, economic, social and cultural circumstances. Secondly, Political will and commitment from all governments, at all levels, are prerequisites for successful transboundary cooperation (*ibid*: 3). In addition, efforts of

cooperation are surrounded by different obstacles including “the critical nature of water for human existence; the multiple use of water; the sheer scale and the gap between policies and implementation of these policies” (Molen and Hildering, 2005: 139). Despite this fact, “international relations over freshwater resources are overwhelmingly co-operative and cover a wide range of issue areas, including water quantity, quality, joint management...hydropower” and, economic development (*ibid*: 140). Cooperation in river basins is manifested through the existence of legal and institutional frameworks.

Recent development in transboundary water resources literature indicates change from the previous trend as it starts to neglect the two extremes while considering the existence of both conflict and cooperation in river basins at the same time (Schmeier, 2010; Wolf, 2001; Cascao and Zeitoun, 2010). This brings the consideration of events in river basins as relations of riparian states whether being conflictive or cooperative. In other words “conflict and cooperation are not contradictory but can occur simultaneously in a basin” (Schmeier, 2010: 8). So, they cannot be seen separately rather can be considered as interaction of states regarding to water resources.

2.3.1 Doctrines, Principles and Practices of International Water Law

2.3.1.1 Doctrines in International Water Law Practice

Traditionally, international water law recognizes five main doctrines that attempt to define and delineate the rights of basin states to use water from a shared river system. These are;

i. Absolute territorial sovereignty

The absolute territorial sovereignty doctrine, which is also known as the Harmon Doctrine, empowers state with a total control of water resources lying under its territory. According to it, state can utilize its water resources as much as needed irrespective of its effect on other co-riparian (Petrella, 2001:46). Since these resources are found under the state’s jurisdiction, it has the right to do as it pleases and as it chooses. So, doctrine of absolute territorial sovereignty highly favors the upstream states, always facing opposition from the downstream ones (Menon, 1975: 445). Most of all, it doesn’t get along with the current legal views and moral thoughts which uphold mutual benefit as a guiding principle. As a result it failed to be implemented in any water treaty (Aaron, 2008: 73). However, most upstream countries like that of Ethiopia and Switzerland use this doctrine as a ground for utilization of their water resources.

ii. Absolute territorial integrity

This doctrine is the exact opposite of absolute territorial sovereignty as it gives the veto power to the downstream states. It is also known as the theory of a natural flow of river since it argues for the continued, unaltered and uninterrupted natural flow of water from the territory of the upstream states to downstream states (Godana, 1985: 11). It demands that a state has the right to expect the same volume of water that is not impaired in quality to flow into its territory. Upstream states are prohibited to use water located in their jurisdiction as long as it interrupt, increase or decrease the flow of the water (Petrella, 2001:46). In other words, it allows upstream states to utilize the river as long as such utilization does not affect downstream states. However, such right can be taken away by downstream states as they have right to object any upstream water utilization that is likely to disrupt the natural flow or adversely affect the water position of the former (Godana, 1985: 11). So, like the above one this doctrine does scarcely fit the existing international realities. For Aaron (2008: 73) the two doctrines “are extreme claims not supported by international jurists or international practice”. The doctrine of absolute territorial integrity is exercised by Egypt and Sudan in the Nile basin and by the Netherlands in the Rhine basin.

iii. Limited territorial Sovereignty and of Limited Territorial Integrity

These doctrines can be considered together as they are complementary in practice. They lay a reasonable concept for water utilization as they permit states to utilize the water flowing on their territory as long as it does not affect other riparian states (Rahaman, 2009: 160- 162). The co-riparians 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. They simultaneously recognizes the rights of both upstream and downstream countries as they guarantee the right of reasonable use by the upstream country in the framework of equitable use by all interested parties. Principles of equitable and reasonable utilization and an obligation not to cause significant harm are part of these doctrines (*ibid*). Downstream states in both the Nile and the Rhine River basins base their arguments on the no harm rule. For Nile River basin countries, particularly for the upstream ones, the principle of equitable and reasonable utilization is a firm ground of argument for utilization of the water.

So, these theories represent a more balanced approach that seeks to contribute to the joint development of riparian states within a shared basin through equitable division and sharing of benefits (Godana, 1985: 21). They, particularly the theory of limited territorial sovereignty, have been adopted in the majority of the treaties signed in different years. However, this does not mean that they are free from inaccuracy. Still, they failed to identify what equitable and reasonable uses and no applicable harm constitute (*ibid*).

iv. Community of Interest

This doctrine emphasizes on collaborative management of the river basin. According to Petrella (2001: 46) the doctrine claims that “no state may use the water on its territory without consulting other states to achieve integrated management based upon cooperation.” It demands the maximum utilization and optimum economic development of an entire river basin where responsibilities and benefits are shared (Godana, 1985: 12). According to this doctrine a state’s sovereignty is limited by similar rights of other states sharing the same basin. It reinstates the community of interest approach and attributes a positive duty to render active cooperation in the rational development and utilization of the shared water resources (Rahaman, 2009: 163- 165). Downstream states in the Rhine basin demand the application of this doctrine as they need to share the responsibilities regarding flood and pollution problems with upstream states in line with the benefit of the river.

v. Prior Appropriation (Prior Use)

This doctrine is also considered as a “natural” or “historic” right (Garretson et al, 1967:50). According to this doctrine, in time of new water negotiations prior utilization by states gets into consideration. So, as long as these states are able to establish facts on the ground they have the right to secure and claim such interest in new water negotiations (*ibid*). According to Aaron (2008: 74) this doctrine “accords rights to those states who first used this water”. It neither favors the upstream countries nor do the downstream countries since it allows for the one who first utilize the river. Some states, like that of Egypt, use this doctrine in their argument for their share of water over international rivers. However, it does not gain any applicability under international water law practice (Garretson et al, 1967:57).

2.3.1.2 Transboundary Water Resources Utilization Principles

There are different principles of transboundary water resources utilization that are considered by international convention, judicial decisions and international treaties. These are;

i. Principle of Equitable and Reasonable Utilization

This use-oriented principle is a sub-set of the theory of limited territorial sovereignty (Rahaman, 2009: 164). It entitles each basin state to a reasonable and equitable share of water resources for beneficial uses within its own territory. Equitable and reasonable utilization rests on a foundation of shared sovereignty and equality of rights, but it does not necessarily mean an equal share of waters (*ibid*). In determining an equitable and reasonable share, different factors such as “the geography of the basin, the hydrology of the basin, the population dependent on the waters, economic and social needs, the existing utilization of waters, potential needs in the future, climatic and ecological factors of a natural character and availability of other resources” should all be taken into account (Article 6 of the UN Watercourses Convention, 1997: 5). It entails a balance of interests that accommodates the needs and uses of each riparian state. This is an established principle of international water law and has substantial support in state practice, judicial decisions and international codifications (Birnie and Boyle, 2002: 302). This principle has vast acceptance in the Nile basin as it even manage to incorporate in the CFA. Riparian states particularly that of upstream states in this basin uses it to firm their argument for right to utilize the river. Downstream countries on the Rhine also use it in order to support their argument for reasonable utilization of the river in order to prevent water quality and quantity problems.

ii. Obligation not to Cause Significant Harm

This principle is also a part of the theory of limited territorial sovereignty (Rahaman, 2009: 164). According to this principle, no states in an international drainage basin are allowed to use the watercourses in their territory in such 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 (*ibid*: 164- 165). In other words, states are expected to take all necessary measures to prevent significant harm while they use international rivers under their territories (Article 7 of the UN Watercourses Convention, 1997: 5).

This principle is widely recognized by international water and environmental law. However, the question remains about the definition or extent of the word ‘significant’ and how to define ‘harm’ as a ‘significant harm’ (Rahaman, 2009: 165). This principle is incorporated in all modern international environmental and water treaties, conventions, agreements and declarations. It is now considered as part of the customary international law (Eckstein, 2002: 82–83).

Downstream states both in Nile and Rhine River basins trace their demand for no harm on the river that may affect their interest. Egypt and Sudan in the Nile River basin fear any development in upstream states may decrease the water volume that in turn may harm their interest. While in Rhine River Netherlands criticize upstream countries for polluting the river and for resulting in an increased flood pattern. In addition, it argues for increased flood problems as a result of different constructions that took place in upstream states. So, these countries base their argument on this principle to prevent any further harm on their water interest.

iii. Principles of Notification, Consultation and Negotiation

Every riparian state in an international watercourse is entitled to prior notice, consultation and negotiation in cases where the proposed use by another riparian of a shared watercourse may cause serious harm to its rights or interest (Rahaman, 2009: 164). Article 3 of the ILA’s Complementary rules applicable to international resources states that: “when a basin State proposes to undertake, or to permit the undertaking of, a project that may substantially affect the interests of any co-basin State, it shall give such State or States notice of the project” (Manner and Metsalampi, 1988). The notice shall include information, data and specifications adequate for assessment of the effects of the project.

Most upstream countries often oppose this principle. Starting from the negotiation process of the 1997 UN Watercourses Convention these principles, which are included in Articles 11 to 18, faced opposition from three upstream riparian countries: Ethiopia (Nile Basin), Rwanda (Nile Basin) and Turkey (Tigris-Euphrates Basin). However, despite this opposition the principles are generally accepted by international legal documents (Birnie and Boyle, 2002: 319). Egypt highly support this principle as it demand to gain prior notification by upstream states before they take any development on the river.

In line with Principles of Notification, Consultation and Negotiation, the principles of cooperation and information exchange demands exchange of information and data regarding the state of the river as well as current and future planned uses along the river. However this principle is not about responsibility of notification of states to other riparian states when they want to take any development on the river rather it is voluntarily cooperation in order to analyze the state of the river (Rahaman, 2009: 165).

iv. Peaceful Settlement of Disputes

This principle advocates that all states in an international watercourse should seek a settlement of disputes by peaceful means in case states concerned cannot reach agreement by negotiation (*ibid*: 166). This principle has been endorsed by most modern international conventions, agreements and treaties, e.g. the 1966 Helsinki Rules (Article XXVII) and 1997 UN Watercourses Convention (Article 33).

2.3.1.3 International Legal Instruments

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. Since then, more than 3,600 treaties have been drawn. Majority of these treaties and agreements used to deal with navigation and boundary demarcation. But since the last century, the focus of negotiation and treaty has shifted towards the use, development, protection and conservation of water resources (UNDP, 2006).

The recognition of the importance of bilateral, regional and multilateral legal frameworks by the international community has made possible the conclusion of a number of treaties, protocols and conventions on the use, development and protection of transboundary watercourses and related ecosystems (Heyns, 2002: 6- 16). For instance, the 1976 Convention on the prevention of Chemical pollution of the Rhine and the Convention on the protection of the Rhine against Chloride pollution, the 2010 CFA in Nile basin, the 1960 Indus Water Treaty, the 1991 Pakistan Water Apportionment Accord, the 1995 Agreement on the Cooperation for the Sustainable Development of the Mekong River Basin, the 1995 Protocol on Shared Watercourse Systems in the Southern African Development Community Region are few examples.

At global level, there is no formally ratified rule of international water law. But the frequently cited ones are the 1966 Helsinki Rules of International Water Courses, the 1997 United Nations Convention on Non-navigational Uses of International Watercourses and the 2004 Berlin rules. The 1966 Helsinki Rules of International Water Courses was the first attempt towards a complete codification of international rivers by an international organization (ILA) (Kibaroglu 2002:129). It is established based on customary international law and best known for its cooperation of equitable and reasonable utilization of international river basins (Aaron, 2008: 80). However, they are criticized for neglecting allocation of surface and ground water. It further fails to consider states role in determining equitable utilization on one hand and reasonable utilization without harming others on the other (*ibid*). Nevertheless, until the adaptation of the 1997 UN Convention on the Utilization of the Non-navigational Use of International Watercourses, they served as “single authoritative and widely quoted set of rules for regulating the use and protection of international watercourse” (Salman, 2007:630).

The coming of the 1997 Convention on the Non-Navigational Uses of International Watercourses represents an important step forward in international water law. Though it is not yet formally ratified and thus not operational, it provides a legal framework for inter-state cooperation on international watercourses. It also encourages cooperation in order to address equitable, reasonable and non-harmful utilization of the international freshwaters (UN, 2008: 5). The principles of equitable and reasonable utilization, and the principle of obligation not to cause significant harm are the backbone of this convention. It has given each states right and responsibilities whether they are found at upper or down part of a river. The upstream riparian has the rights to equitable and reasonable use of the shared waters, while the downstream riparian have the responsibility to allow the common waters to be equitably shared. On the other hand, upstream riparian States are responsible for and obliged not to cause significant harm, while the downstream riparian States have the rights not to be significantly harmed (Akech, 2008: 3- 6). The No-Harm principle is forming a fundamental rule, while the principle of equitable and reasonable utilization is regarded as the cornerstone of international water law (UN, 2008: 5- 7). This can be seen in different regional agreements including the CFA.

The Berlin Rules comes with an important development when it presents the principles of the no significant harm and equitable utilization as equal. It connects the right to an equitable share with

the responsibility and obligation not to cause harm and with a reasonable use of waters (Aaron, 2008: 87). This fact gives the principle of no significant harm a strong base like that of equitable utilization. The Berlin rules has gained huge acceptance in the Rhine basin as the basin use to face vast pollution problems and is victim of flood problems.

In addition, other multilateral environmental agreements such as the United Nations Convention to Combat Desertification and its Subregional Action Programmes, the Ramsar Convention on Wetlands and the United Nations Convention on Biological Diversity may not solely address water issues, but help provide an important support framework for cooperation. A number of initiatives are also already under way to develop legal frameworks for individual shared aquifers including the Nubian Sandstone Aquifer System and North-Western Sahara Aquifer System). Similarly the body of law pertaining to flood management and drought-proofing is steadily growing (UN, 2008: 7- 10).

Despite the proliferation of agreements on transboundary water management, there are still numerous watercourses without adequate legal frameworks for cooperation. Notably, from 263 lake and river basins, 158 of them lack any type of cooperative management framework (Heyns, 2002: 6- 16). Moreover, existing agreements are sometimes not sufficiently effective to promote integrated water resources management due to problems at the national and local levels such as inadequate water management structures and weak capacity in countries to implement the agreements (Akech, 2008: 3- 6).

Transboundary lake and river basins cover nearly half of the land surface. 145 states share their territory under these basins while 30 countries totally lie within them. Nearly 90% of the world's population lives in countries that share these basins while 40% of the world's population lives in basins that comprise two or more countries. These population gains 60% of their fresh water flow from these resources (UN, 2008: 1). The Nile and Rhine River basins are two of these basins being found in two different continents. The Nile, whose names come from the Greek name *Nelios*, for the River god of ancient Egypt, is a river found in Africa (NBI, 2012: 12). The river has two main tributaries: the White Nile originating in Tanzania, and Abbay rising in Ethiopia. After joining in Khartoum, Sudan, the Nile flows north into the Mediterranean Sea with its basin covering 10% of the continent (El-Fadel, 2003:107). The Rhine River basin on the other hand is found in Europe. The name Rhine comes from the Celtic word *Renos*, meaning

raging flow. It emerges from the glacier in Swiss Alps and flows to the North Sea with its basin comprising nine states (IWAC, 2001: 35). The different features of the two rivers including geography, economic, political and conflictive and cooperative patterns of riparian states are discussed in the next two chapters.

Chapter Three: Hydropolitical Features of the Nile River Basin

In the preceding chapter, the study examines four pertinent issues of hydropolitics in the Nile River basin, namely, geographical, economic and political features, and issues of conflict and cooperation. The first three sections of the chapter discuss the geographical, economic and political features of the River basin in line with their impact on the riparian states relations. In the last two sections, trends of conflict and cooperation in the basin are scrutinized.

3.1 Geographical Features

The Nile River Basin stretches over distinct geographical, climatological and topographical regions. Traveling 6695km Nile is the longest river in the world located between 4⁰S and 31⁰N and 24⁰E and 40⁰E (NBI, 2012: 12). The basin area spans over 3.18 million square kilometer stretching from Lake Victoria in South Central Africa to the Mediterranean Sea. It covers 10 percent of African continent comprising Egypt, Sudan, Ethiopia, South Sudan, Uganda, Rwanda, Kenya, Tanzania, Burundi, Democratic Republic of Congo and Eritrea (Timmerman, 2005: 2). The important geographic features of the basin include the Nile and headwaters, mountains, wetlands, lakes, plains, the Delta, and the desert. The Nile has two major tributaries named as the White Nile and the Blue Nile (Abbey) (Karyabwite, 2000: 9- 19).

The White Nile flows through large parts of equatorial Africa, which enjoys substantial amount of rainfall distributed the whole year. Its catchment area comprises portions of all basin states' territories except that of Egypt (Oestigaard, 2010: 8). The White Nile originates in Burundi from the Luvironza River that drains into Lake Victoria through Ruvubu and Kagera Rivers. After leaving its primary source, Lake Victoria, the White Nile flows through Lake Albert and northern Uganda to South Sudan border becoming Bahr al Jabal. Bahr al Jabal forms Bahr al Abyad or the White Nile with another major tributary from Ethiopia known as Baro-Akobo/Sobat (NIB, 2012: 28). The White Nile provides a small but steady flow of water where from its origin to the sea, the river drops in elevation by nearly half a mile, creating a huge potential for hydroelectricity generation in Tanzania and Uganda (Swain, 2002: 294).

The Equatorial Lakes Region accounts for only 15 percent of the Nile's yearly flow as the White Nile loses a considerable amount of water to evaporation and to swamp areas near its source (*ibid*).

Abbay or Blue Nile, on the other hand, rises at a spring site upstream of Lake Tana of Ethiopia. The Abbay/Blue Nile basin extends from the Ethiopian highlands to the plains of Sudan including numerous tributaries. Starting from here it flows through various gorges and shallows of its homeland to west then north until it eventually meets the White Nile at Khartoum carrying tons of mud and silt along its course (Timmerman, 2005: 2). Before reaching Khartoum, it is joined by two seasonal tributaries, the Rahad and Dinder Rivers, and Tekeze River, all of which also originate in the Ethiopian highlands (NBI, 2012: 28). Abbay has a steep slope as its elevation drops to less than one third of a mile above sea level giving Ethiopia a high potential for hydropower generation. It provides 85% of the yearly flow of the Nile (Elhance, 1999: 56).

At Khartoum the Blue Nile or Bahr al Azraq joins the White Nile. From there the Nile flows northeast through the desert, to Egypt and later to the Mediterranean Sea (Timmerman, 2005: 2). The black sediment brought down by the Tekeze/Atbarah and Abbay/Blue Nile Rivers settle in the Nile delta making it very fertile which in turn leads to dense population in the area (Elhance, 1999: 57- 58). Approximately 84 billion cubic meters (BCM) of water flow each year to Lake Aswan in Egypt. However, due to the extreme reliance on the river, only about 0.4 (BCM) actually reach the Mediterranean Sea (Shema, 2009: 4).

The important geographical feature that has a significant impact on the hydropolitics of the Nile basin is the high evaporation rate. Much of the landscapes and terrain the river covers are arid or semi arid areas making evaporation rate very high (NBI, 2012: 12). Aside from evaporation from White Nile as it proceed to northward into the arid regions of South Sudan and evaporation from Lakes along it, the river loses approximately 14BCM of water through evaporation from the Sudd swamps which is nearly equal to the water contributed to the Nile by the Barro-Akkobo/Sobat River. In addition, evaporation rate is significant after Khartoum, as the Nile flows through the desert without any perennial source of water. The rate of evaporation is highly challenging in Egypt also where almost 10 BCM of water is evaporated particularly from its reservoir in Lake Nasser of the country (Elhance, 1999: 57). This has contributed for water scarcity problem in the basin.

The seasonal fluctuation of rainfall has added to the scarcity problem in the Nile basin. Rainfall pattern highly fluctuates particularly in the Ethiopian highlands. For instance, Abbay is characterized by significant seasonal fluctuations where during the flood season its yearly flow extends to 95% (NBI, 2012: 29). This has brought available water resources (especially Abbay) as a crucial alternative for their development. Above all, Egypt and Sudan lack the necessary rainfall amount for survival while most part of Ethiopia is also arid or semi arid leading increased dependency on the Nile. There are estimations for the existence of large aquifers underneath of Egypt's, Sudanese and Ethiopian's territory which has a capacity to avoid any problems related to water paucity. Nevertheless, economical weakness and fear of environmental damages stand in the way of utilization of these resources (Elhance, 1999: 57).

In addition, the average annual flow of the Nile has been declining over the years due to climate change. For instance in 1960s, the average annual flow of the river in Aswan dam was estimated at 110 billion cubic meters. However, it has declined to around 80 billion cubic meters (Swain, 2002: 296). So, as a result of the above factors water has become a scarce resource in the basin where riparian states get into controversies in time of utilization.

The impossibility of navigation along the Nile River except for a limited length has also affected the hydropolitics of the Nile basin.⁴ In one hand, its absence has avoided potential controversies over freedom of navigation (Elhance, 1999: 56). On the other hand, however, if the river had such quality, it would have improved riparian states' relations as it would have integrated them by serving as a route. The capacity of the river for generating hydropower also has a huge impact on the hydropolitics of the basin. On one hand, the utilization of the river for hydropower by upstream states is creating stress with downstream states while on other hand, expansion of such projects are expected to integrate riparian states in the near future through hydropower trade.

3.2 Economic Features of the Nile Basin

Historically the Nile basin countries particularly the eastern Nile basin countries were the land of great ancient civilizations witnessing the great Pharaonic civilization of Egypt, the ancient state of Merowe and the Aksumite Empire of ancient Ethiopia (Elhance, 1999: 59- 60). However,

⁴ Nile totally has a navigable length of 4, 149 km in addition to the 800 km potential navigational length on the Blue Nile during the high water times and length of a 1, 545 km, to the second cataract, from Khartoum to Aswan (Elhance, 1999: 56- 58).

these countries today are categorized among underdeveloped states with weak economies and food deficiency. They frequently face drought conditions and famine leading them to be the major recipients of aid and incurring them into huge debts (Mason, 2004: 2).

Their huge dependency on ineffective agriculture has further weakened their economy. Agriculture, particularly subsistence agriculture and cattle raising, is the primary economic activity without a single state having strong industrial sector in the basin. Despite such long coverage, however, agriculture is not effective as it fails to give significant contribution to the economy of the countries leaving them to be a net importer of agricultural commodities (Cheshire, 2010: 21- 25). In addition, the rapidly increasing number of population is putting a strain on this weak economy. Currently there are more than 400 million people living in the basin countries which are expected to reach 600 million in 2025 and 850 million in 2050. To the existing poverty in the region, this amount of change in population number has been a huge strain to the economy (ENTRO, 2006: 36- 40). Population growth, in line with poverty, is also leading to environmental threats such as overgrazing, and deforestation in upstream states (Onema, et al, 2006: 6).

So, the Nile basin and its water resources are central to the survival of the riparian states, where they use it to protect themselves against the vagaries of nature, to enhance their food security, to develop cash-generating crops, and to develop energy for economic development (Timmerman, 2005: 3). In line with this, the Nile River is used for irrigation, hydropower generation, navigation, and municipality uses. As the countries are highly dependent in agriculture, it is common to found vast irrigated land along the river especially in the downstream countries which occupy 98.7% of the irrigated land in the Nile basin. Nile serves as a transportation route and for industries in these countries (Cheshire, 2010: 21- 22). Hydropower generation is also highly vast particularly in upstream countries with many hydropower projects including that of Tana Beles, Bujagali, and Ruzizi I power plants lying under these countries (Bartle, 2013: 82; Reynolds, 2013).

In addition, upstream countries have a larger demand and are taking different developmental activities for expansion of hydropower projects which are creating intensification of tensions in the basin. These countries failed to utilize the water of the Nile in significant manner for long due to different reasons including their weak economies and colonial legacies. Except Egypt

most of the countries used to lack the basic infrastructure and human resources that are needed to implement and maintain large development projects on the Nile River (Elhance, 1999: 60- 62). However, recently they are showing a rapid economic growth rate which has given them monetary capacity to pursue new development projects along the river that threatens to tip the scale of total control and consumption of the Nile's fresh waters away from Egypt. Though Egypt is still farther ahead of these countries, average annual growth rates over the last decade indicate further utilization of the river by these countries (Oestigaard, 2012: 32). This is what one can understand from current developments in the basin particularly from the construction of big projects like that of GERD, and Ruzizi III and IV hydropower projects on the Nile (Reynolds, 2013). Aside from creating tension with downstream states, these projects particularly GERD, may also integrate the upstream countries through hydropower trade.

In line with the huge dependency by downstream countries, these projects have heightened the tension in the Nile basin. Downstream states are highly dependent on the Nile River. As they lack rain water, these countries rely almost entirely on irrigated agriculture extracting 75% of the Nile water every year. Nearly the entire Egyptian population is settled along the Nile Valley and the Delta with 40% of their work force engaging in agriculture. Sudanese also are heavily dependent on irrigational agriculture where Gezira Scheme alone constitutes 60% of the country's foreign earnings. Nile is also the only source of water for other uses of these countries (Chesire, 2010: 21-24). Their reliance over the river is highly increasing with the growing population and economic advancement further worsening the problem of the basin since, in response to these developments, downstream states are planning different projects including building new cities in the desert to transfer population away from condensed areas, for extending irrigation so in turn to achieve self sufficiency, for promoting industrialization, tourism and for improving its environment (*ibid*). Therefore, the proliferation of hydropower projects in the upstream countries is perceived by downstream countries, especially Egypt, as impact to their national interests because of the fear that the water volume reaching them might be reduced.

3.3 Political Features of the Nile Basin

The Nile basin countries are affected by colonialism and cold war rivalries resulting in long existing instabilities that had potentially explosive conflicts in the 1970s and 1980s. Except Ethiopia which had never been colonized, all of these states are "young sovereign states"

(Elhance, 1999: 62). Since independence, though these states made several attempts to establish stable governments, they have failed to do so as a result of many reasons including colonial legacies, different military coups, imposition of one party rule and ethnic and power driven conflicts. Colonial powers contributed to the existing conflicts as they randomly drew and imposed international borders that have a huge potential for ethnic clashes as can be seen today. What worsened the situation was the existing heterogeneous nature of the basin countries in terms of their ideological orientations, political and economic systems, and ethnic and religious compositions (*ibid*: 62- 63). These conflicts had been further aggravated by Cold War superpower competition for client regimes including selective use of aid by donors and massive dumping of military hardware. For such a volatile region, these actions are pressing causes for distorting domestic politics and interstate relations in the basin (William, 2011: 13- 17).

In the immediate post Cold War era, nearly all of the riparian states engaged in domestic conflicts leading some on the verge of collapse or fragmentation. In Sudan an active and very costly civil war raged between the central government in Khartoum and the South Sudan rebellions for long leading the division of the country into two in 2011. Such, fragmentation, if continued, will highly complicate the existing water problem in the basin (*ibid*: 26- 28). However, according to Fekhamed Negash, such developments will be problems if only the new comers bring new agendas. If not, they will not affect the current relations of the basin states unless the issue of water allocation rose in the future.⁵

In addition, the instability in the collapsed state of Somalia has extended its problem to its neighboring states, particularly to Ethiopia, as a result of its unification attempts. The two countries had interred to war in 1977 with the former demanding the separation of the regional state of Ogaden (William, 2011: 37). This is not the only military conflict Ethiopia engaged to protect its territorial integrity. Ethiopia had fought the secessionist movements of Eritrea since the time of Emperror Haile Sellassie, finally leading to the secession of the latter. In addition, it had engaged in long domestic conflicts as the previous government engaged to suppress internal rebellion movements. Such instabilities had also been the main manifestation of other basin states as they were engaged in either internal or cross border conflicts. These instabilities has

⁵ Ato Fekahemed Negash, director of transboundary waters in Ethiopian Ministry of Water, Energy and Irrigation: interviewed at the Ethiopian Ministry of Water, Energy and Irrigation on April 19, 2014.

highly affected the countries development and hindered them from utilizing the river as it took their attention to bringing inner stabilities and keeping their territorial integrity. The lack of trust among the countries also evaded the ground for cooperation at the time (*ibid*: 37- 38).

The instabilities had been further aggravated by political interventions among the basin countries. Especially Egypt, for Fikahemed Negash and Abebe Aynete has been ensuring that the upstream riparian states remain weak, unstable, and underdeveloped and thus incapable of constructing large water projects that may pose a serious challenge to its share of water.⁶ They further argued that, even today Egypt has been accused of instigating dissent and helping rebellions in other basin countries especially in Sudan and Ethiopia.

However, the political environment has changed particularly after 2000 where the basin countries start to gain more political stability and focus on the existing poverty. So, according to Zerubabel, previous military conflicts including proxy wars have become less significant.⁷ These developments, in addition with favorable international political dynamics, have highly improved the riparian relations particularly among the upstream states. Such cooperative integration is manifested through the existing regional institutions including IGADD, East African Community and joint infrastructures constructed among the countries including roads and hydropower dams. It can also be seen from their stand as a block in AU Economic commission. So, the upstream countries, especially Ethiopia is highly challenging the long existing hegemony of Egyptians expecting to bring a balance soon.

But still the issue of current instability in Egypt and South Sudan must be solved to strengthen existing cooperation achievements. According to Fikahmed Negash and Abebe Aynete, political instability has always negative impact as their will be lack of understanding among the series leaders and difficulty in reaching long term decisions. Though put in insignificant percentage, they fear that, the need for legitimacy also may bring immature decisions by the new leaders in Egypt which may create conflict in the basin. In addition, despite change of government in Egypt, the leaders who seize power always consider Nile as a national security matter. This stand

⁶ Ato Abebe Aynete is a Researcher in Ethiopian International Institute for Peace and Development, interviewed at On April 20, 2014.

⁷ Ato Zerubabel Getachew is an International Relations Expert in Ministry of Foreign Affairs of Ethiopia, interviewed at Ministry of Foreign Affairs of Ethiopia on April 21, 2014.

of Egyptians toward the River has highly strengthened as it got recognition under their new constitution of 2014 (Zerihune, 2014). This fact has further complicated the dilemma and indicated that change on the Egyptian side is unthinkable despite change of government. In addition to its impact on other riparian countries, instability in Egypt has been a problem to its interest in the basin. The Egyptians has been unable to withstand their internal instability for quite some time which is in turn is affecting the countries long existing dominance on the river as it forced them to turn their face towards the inner problems.

3.4 Tension in the Nile River Basin

The Nile has been identified as a hot spot where war over water in this basin is predicted by many. For instance Boutros Boutros-Ghali, the former State Minister for Egyptian Foreign Ministry, in 1988 stated his fear of war over the Nile, while Ismail Serageldin, the former vice-president of the World Bank and the previous UN Secretary General Kofi Annan supported this argument as they stated their fear of water wars of the next century (Sandwidi and Stein, 2003:1; Mohammed, 2004: 47). The involvement of the basin countries in the long existing controversies varies with great variance in their degree of dependency on the river which mainly emanated from difference in availability of alternative resource and varying amount of the respective areas lying within the basin (Oestigaard, 2012: 26).

For instance for Egyptians, the River Nile implies their very existence. It is literally the life giving artery of the country (*ibid*: 28). 98% of the population lives in the Nile valley were except for the small Mediterranean strip and narrow Nile valley the rest of Egypt is just a vast desert. Nearly 98% of their fresh water resource comes from the Nile satisfying 95% of the countries water requirement (Cheshire, 2010: 21-22). The country hardly receives any rainfall increasing its dependency on the River and its vulnerability to changes in water supply. In other words, any development regarding Nile is perceived as security matter for Egyptians (Mason, 2004: 1). As a result, often in their history Egyptian leaders have sought to unify the Nile valley under their rule in order to conquer the areas of the sources of the Nile. This intention of Egyptians has brought them into conflict with other riparian countries when Egypt made several military expeditions with the objective of controlling the Nile Basin (Yacob, 2012: 2). This particularly created a long standing diplomatic tension with Ethiopia which provides 86% of the annual flow of the river.

The battle of Gundet in 1875 and Gura in 1876 which was fought between the two countries are the main manifestations of this demand of Egyptians (El-Fadel, et al, 2003).

Sudan is also heavily dependent on the River after Egypt. Most of the land in Sudan is either arid or semi arid as the northern area of Sudan containing about 30% of the country is desert bordering a semi-arid Sahelian region of low mountains in the central area of the country. This fact has denied the country a capability to maintain rain fed agriculture (Cheshire, 2010: 23- 24). So, they highly depend on the Nile for irrigational schemes that currently brought most of the country's foreign earnings. As a result, like Egyptians, Sudanese also do not want any change in the supply of the water. Nile traverses the entire land of the Sudan where the White Nile and the Blue Nile meets under its territory giving Sudanese like Egyptians a base for argument of absolute territorial integrity rights to the river (Deng, 2007: 49).

Though for long Sudan and Egypt cooperate on the Nile, it doesn't mean conflict on the water doesn't exist among the two as Egypt doesn't seem to rely on and trust Sudan. This is manifested through several military threats from Egyptians. For instance, former president Mubarek made clear that "those who play with fire in Khartoum ... will push us to confrontation and to defend our rights and our live" (*ibid*: 47). So, the duality cannot be totally considered as cooperation rather can be seen as imposition or manipulation from Egyptians (*ibid*: 48). But above all, the main rivalry exists between these two downstream riparian countries on one hand and Ethiopia on the other as the latter provides a huge amount of water.

Ethiopia, as well, highly needs to utilize the water as more than half of the country is either arid or semi arid. The remaining parts are also highly affected by seasonality of rainfall or lack of another permanent source of water except the Nile and its tributaries (Cheshire, 2010: 17). So, Ethiopia greatly needs to utilize these resources to its development as it is one of the poorest countries in the world. It frequently faces food insecurity and drought. What worsen this situation is that 79% of Ethiopian population is engaged in rain fed agriculture where constantly failing rains and irregularity in seasonal rainfall has put a huge strain on agricultural productions. For the country's food production that depends on rain fed agriculture, this has brought huge

risk.⁸ So, in order to improve its people's life, the country forced to depend on the Nile as a way out (knife, 2006: 8). This is what Emperor Haile Selassie tries to point out in his speech in the 1950s as he state that "It is of paramount importance to Ethiopia, a problem of the first order that the waters of the Nile be made to serve the life and the needs of our beloved people now living and those who will follow us in centuries to come" (Yacob, 2007:100). This indicate that the future of Ethiopia depends on utilization of available water resources including Abbay, Tekeze and Baro-Akobo that consists 85% of the Nile water supply resulting an increased water tension with the lower riparian states (El-Fadel, etal, 2003: 114)

On the other hand, except Ethiopia other upstream countries depend less on the Nile leading to different needs and political priorities from the above three. Rwanda, Burundi and DRC have relatively less interest in utilizing the river rather are more concerned on their other water resources.⁹ Kenya, Tanzania and Uganda are more concerned with the development of the Equatorial lakes than the Nile. These countries also have other water resources that help them to satisfy their water need.¹⁰ Eretria also has additional rivers including Gash, Baraka, Ansebe, Falkat, Labaa, and Alighede. In addition, in most of these countries agriculture without irrigation is possible since they have sufficient precipitations (Johnston, 2009: 2). This does not mean that they never use the Nile water. They want and have utilized the water for different reasons but their reliance is very low compared to the two downstream countries and the importance of the river for Ethiopia as these countries receive less or for some nearly no rainfall and as they lack other sustainable and meaningful water sources.

⁸ Ethiopia has suffered from famine in 1973, 1974, 1984, 1985, 2003, and as recently as 2006 showing the volatility that Ethiopia faces because of its heavy reliance on rain feed agriculture and limited access to the Nile waters (Chesire, 2010: 17).

⁹ For instance, DRC mainly focus on Congo River basin where it is trying to build the world biggest hydropower plant on the River (Reynolds, 2013).

¹⁰ These countries rainfall status and available alterative water sources respectively are

Burundi- 100mm – 1500mm; Rueizi, Malagarasi and Ruvuvu Rivers

DRC- 1524 mm in the North and 1270mm in south; 60% of its land is found under Congo Basin with many tributaries as well as lake Albert

Uganda- 1000mm- 1500mm; Lake George and Lake Kyoga, and includes parts of Lakes Victoria, Albert and Edward

Rwanda- 1000mm- 1500mm; Lakes along Kagara River and watershed between Nile and Congo Rivers

Tanzania- 1930mm- 508mm varying over regions; Lake Victoria, Lake Malawi, Lake Tanganyika

Kenya- 250mm- 1,250mm; T'ana and Galana Rivers, half part of Turkana and a small part of Lake Victoria (Shema, 2009: 23- 25).

So, the availability of alternative water resources has lessened these upstream states involvement in the existing controversies while drawing Egypt, Sudan, and Ethiopia as crucial players in the conflict (Williams, 2011: 31- 32). Due to being a new state and as a result of current internal instabilities, South Sudan has not been a significant participant in hydropolitical issues of the basin. The coming of South Sudan into existence may bring two important changes in the future. The first is change in the number of the crucial players with the summation of South Sudan, if it able or gain the capacity to be one (*ibid*). It is also a change in regime in one of the main players (Sudan), affecting its role/capacity in the basin (Kinfu, 2006: 5- 12). But since nothing has been seen regarding effective role of South Sudan and the low involvement of other countries, the study focus on the existing rivalry among Ethiopia, Sudan and Egypt.

The main issue of conflict in the Nile basin is lack of equitable share of water among the riparian countries. Upstream countries, particularly Ethiopia which provide 85% of the water of the Nile, utilize almost nothing of it. Yet the lower riparian countries contribute nothing but consume most of it (William, 2011: 31- 33). Downstream countries, especially, Egypt has high capacity of exploitation of the river that emanates from geographical, economical and historical circumstances that have obtained in the country. Its economic advancement has able the country to built different projects on the river (Sandwidi and Stein, 2003: 5- 8). In addition, Egypt has got advantage from the British colonialism as the latter helped Egypt to utilize the Nile water resources while prohibiting other riparian states from utilizing it. Especially, the 1959 agreement gave Egypt and Sudan effective control of the water of the Nile. Though Ethiopia was not part of this agreement, it was not engaged in any effective activity regarding the river as it was unable to do so because it was occupied in struggling to maintain its territorial integrity and political independence during the colonial era. As a result it had neither the time nor the resources to utilize the water of the Nile (Kinfu, 2006: 2- 10)

Since 1959, Egypt has made repeated statements about its readiness to use military force to protect its share of the river's water that is stated under the agreement. In other words it aimed still to prevent any construction on the river by other riparian countries. In line with this, Ethiopia has faced threats many times as Egypt stated the declaration of war in fear of supply change in the water volume. They frequently declared that the only reason that will take Egyptian to war is water. For instance, in 1978 former Egyptian President Sadat stated that “we

depend upon the Nile 100 percent in our life, so if anyone, at any moment thinks to deprive us of our life we shall never hesitate [to go to war] because it is a matter of life or death” (Oestigaard, 2012, 73).

Even today Egypt wants to block upstream countries from utilizing the water resources through blocking financial deal from international partners. For instance “the African Development Bank denied a loan to Ethiopia that was aimed at harnessing Abbay (Aleltu Hydro-electric Project) as Egypt managed to have the loan blocked using its diplomatic leverage” (Elias, 2009: 96). On the other hand, though they prevent others from utilizing it, Egypt has constructed different dams and barrages which secure the existence of water throughout the whole year without any consultation or reference to upstream countries. Such developments include the Aswan dam, Sinai and Kharga/ Dkhala water diversion projects. Sudanese also have done the same making water utilization in the basin a unilateral action without notifying the upstream states or considering its effect as if Nile is their resource only (*ibid*).

This status quo cannot be maintained for long as can be seen from current developments. The upper riparian countries are forced to utilize the water resource as a result of different factors including rapidly increasing population, economic advancements, and the decrease in availability of the amount of water particularly that of rainfall. So these countries “claim their right to equitable water distribution” (El-Fadel, et al, 2003: 108). But these factors are not only the problems of upstream countries’. They are also escalating downstream countries demand for increased water resources.

In addition, climatic change has put another strain on the existing problem as the need for water that is resulted from aridity, expansion of drought, and desiccation has aggravated the existing scarcity. Most of all, “the flow of the Nile River is expected to decline beginning in the period 2040 to 2069” from “declines in precipitation and increased evapotranspiration due to heightened temperatures” (Shema, 2009: 13). Particularly for agricultural dominated economy of the basin countries, this is an elevated threat as the effect of water shortages will threaten food security which could potentially lead to the outbreak of violence in the absence of comprehensive international management.

Along with population growth, another important trend is the expanding economic growth in the basin. Developed economic capability will give the states power to pursue significant projects over the river that they were not able to achieve before. Current changes in the basin including large scale irrigation, huge hydroelctrical dams, and formation of new towns manifest this fact.¹¹ However, such developments will not satisfy all as it may take place at the expense of others as can be seen from Egyptian projects in Sinai and Aswan. Most of all, in line with growing number of population, the existing economic advancements that compiled with rapid urbanization have heightened the demand for water (Selamu, 2013: 1). These demands are incompatible particularly giving the existing scarcity of water which fails to fulfill the existing demands by the two sides. Yacob Aranso also states this potential as;

With the sharp increase of population in the coming decades ...every riparian country may not only feel more need but also the obligation to utilize its water resources to maximum levels. Such demands are already soaring beyond the level of available water resources in the entire basin. Egypt and the Sudan have projected their water needs for agriculture alone at 65.5 BCM. This amount is 12.26 BCM higher than the total available water in the Nile Basin. This is a clear indication that when all riparians come up with their respective national water master plans the available water resources and national demands will be at irreconcilable variance (Yacob, as cited in Kinfe, 2006: 10).

Thus, the increasing number of population and economic developments are furthering the tension in the Nile basin as they are creating competition among riparian countries for utilization of water in attempt to sustain the current economic development and growing population.

3.4.1 Great Ethiopian Renaissance Dam

GERD, which is the largest project ever attempted by Ethiopia, is a hydropower project built on the River Abbay in Beneshangul Gumuz National Regional State of Ethiopia. The dam will has an installed capacity of 6,000 MW and a reservoir half large as Lake Tana becoming one of the

¹¹ All the three countries are planning to develop different projects. Egypt has embarked the Toskha and Sinai Development projects that demand to bring more irrigation. They also want to create employment opportunities to its citizens particularly to its farmers through creating new towns that are linked to Nile by Canals like that of Nubia. Such development needs a large volume of water. Sudan is also taking difrent developments to expand irrigation. Ethiopia has expressed its interest in developing its water resources by building a series of micro-dams on the Blue Nile that will be used for irrigation and hydroelectric generation (Chesire, 2010: 20- 26).

ten largest dams in the world. In collaboration with other projects, the GERD will enable the country to meet local demand and export electricity (Ethiopian Embassy in London, 2012: 6). In addition to current population growth and economic problems the construction of the dam is perceived by Ethiopia as a must to sustain the growing population and the current economic advancement (Bartle, 2013: 82- 83).

Ethiopia started the construction of the dam by notifying other riparian states and considering of mutual benefit and its effect. For long the country's foreign policy demand mutual benefit in international relations. The same goes to the River Nile as the country is willing to cooperatively share the water resource of the river as can be seen from the Emperor Haile Siallase's speech in 1958 claiming "Ethiopia may be prepared to share this tremendous God given wealth of hers with friendly neighbor nations" (Yacob, 2012: 2). So, the country has taken different activities including an assessment of its environmental impact, formation of technical team, and assurance of its lack of harm for Sudan and Egypt in line with explaining the country's desires through diplomatic relations. Most of all, the country has established an international panel of experts, composed of Ethiopia, Sudan, Egypt and international experts, to assess the impact of the dam on Sudan and Egypt (Ethiopian Embassy in London, 2012: 12).

As reiterated through different times, the dam is also expected to benefit Sudan and Egypt in addition to Ethiopia. It will help to solve the existing power shortage in the region as it may provide cheap and huge amount of hydroelectric power. It also has the capacity to avoid problems of siltation of the dams in Sudan and Egypt that costs those countries millions of dollars. In addition it will contribute to minimize evaporation losses from dams located in downstream countries and flooding problems to Sudan contributing for the existence of constant water in the area.¹² This factors contribute to enhance better performance of projects in downstream countries including hydropower schemes to perform more effectively as there will be more reliable sediment free and regular water flow (Entehabu, 2013: 4). Most of all as a hydropower dam, it does not consume water. This is what Ethiopia assure downstream states as

¹² Around 19 BCM of water evaporates from Aswan and other dams in Sudan. Aswan alone faces 14.3 BCM amounts of evaporation losses. But evaporation losses from the fully developed GERD will not be more than 0.4 BCM since it is situated in a deep gorge in cool wet highlands. Siltation is also another problem for downstream countries as most of the dams are filled with siltation. For instance in Sudan is suffering from siltation which has decreased their storage capacity over 50% where 70% of its water budget goes to avoid this problem (Molla, 2012: 19).

the country repeatedly stated that the project is not consumptive rather the water returns to its course after producing power (William, 2011: 33).

But despite such developments the construction of the GERD, has added fuel to the existing tension in the region. As a fear of reduction in available water resource diplomatic conflict started between Ethiopia and Egypt as a direct result of the construction of the Grand Ethiopian Renaissance Dam since the announcement of the building.

It is clear that as the major dependent on the river, the construction of the dam has a major implication for Egypt. So, it is highly resisting the coming into existence of this dam where it is taking what it can to prevent the construction. According to Fekhamed Negash and Zerubabel Getachew, starting from announcement of the project, Egypt has made different diplomatic visits to other upstream countries and South Sudan seeking support and to Ethiopia demanding the freeze of the project until the country is assured the lack of harm to its water supply. Such diplomatic efforts have not yield much success. But Egypt, despite being discouraged, has widened its diplomatic effort to international status as it engaged in influencing westerners. Most of all, in this year Egypt has launched a diplomatic offensive to convince European powers to pressure Ethiopia against building the Renaissance Dam. Particularly their visit to Italy on February six is the most significant as the Italian Salini Construction company is building the dam after it signed a contract with the Ethiopian government in December 2010. However, according to Fikahmed Negash, they failed to change anything. The only effort of Egyptians that yield fruit is their success in closing the doors of international donors and monetary funds. As a result, Egyptians thought, Ethiopia will stop the construction as it lacks the capacity to do so by itself. But the government of Ethiopia has managed to collect funds from its people.

Egyptians have also been engaged in military threat since the announcement of the construction of the dam. Egypt scholars and politicians has been heard when they publicly mulled about military strikes and sabotage both in conferences held in Cairo and on the media. But most of all the live TV transmission of 2011 in Egypt clearly showed this interest of Egyptians as they were suggesting different forceful measures including launching direct military attack, sabotaging the dam, destabilizing Ethiopia, aiding insurgents. The tension between the two has escalated when Egypt declared the only option for their agreement is for Ethiopia to halt the construction of the GERD in 2013 (Entehabu, 2013: 3). They officially asked Ethiopia to halt the dam with former

President Morsi indicating the other option will be war unless Ethiopia is willing to accept their proposal when he state that “If our share of Nile water decreases, our blood will be the alternative” (Simon, 2013: 8).

Ethiopia does not seem to believe that this interest of Egyptian will turn into action and most of all it considers war as useless like the other efforts of Egyptians rather it can bring more problems to the area. Prime Minister Haile Mariam affirmed this stand of Ethiopia when he stated that;

We don't think that Egypt will go to war for securing its benefit. War can destabilize all, not just Ethiopia, and there has never been any history of successful war with Ethiopia. ... Some people are raising the idea of water wars, but that would benefit no one. What would benefit all of us would be a cooperative agreement. William, 2011: 33

In addition, since Egyptians fail to show actual problems or significant harm of the dam to their country despite of a groundless fear, Ethiopia considers their resistance to the dam as unwillingness to not let go the long existing monopoly of the water and to see the development of the country (William, 2011: 33). This is mainly due to fear that such construction will bring development to the country which in turn will give it a power for further utilization. Ethiopia also considers the action of the Egyptian government as a distraction to escape the domestic opposition they face for some time now (Yilma, 2014).

As the dam is a central element in the Ethiopia's ambitious growth which is perceived to pull the country out of the existing poverty, Ethiopia does not seem to turn back from this project at any cost. This is what the late Prime Minister of Ethiopia indicated when he state that “the construction of the dam won't be delayed even for a single minute” (Simon, 2013: 4). Most of all, Ethiopia argued that it has a right to utilize its own natural resource relating it to territorial claims. So, in other words Ethiopia is ready to response to all of the actions of Egypt including war aggression when it stands to construct the dam. This opposite stand of the two in which none of them are willing to accept the proposal of the other seems to heightening the problem while the construction of the dam is progressing.

Sudan seems to be more cooperative than Egypt regarding to GERD. Like Ethiopia, Sudanese has accepted the report of IOPE. According to Fekhamed Negash, with the secession of South

Sudan, Sudanese have lost their access to oil leading their total dependency on water. Most of all, the Tekeze dam has proved benefits of dams built in Ethiopia to their agricultural production. So, Sudan has gradually changing its stand towards cooperation with Ethiopia.

3.5 Legal and Institutional Initiatives in the Nile River Basin

3.5.1 Downstream States Legal and Institutional Initiatives

Downstream states had taken different legal and institutional initiatives at different times. The first initiative among these countries is the 1959 Agreement for the Full Utilization of the Nile Water between Egypt and Sudan. Under this treaty, the two countries negotiated for the allocations 55.5BCM of water for Egypt and 18.5BCM for Sudan based on a calculated yearly runoff of 84BCM. This left an extra 10BCM unallocated to make up for losses due to evaporation (Nebiyu, 2013: 3- 4). In addition the two countries agreed to jointly handle claims to Nile waters by other riparian countries in the future. It also allowed for the construction of the Aswan High Dam which is now the basis of Egyptian claims to historical water rights.¹³ The dam is controversial because it acts as an obstacle to more equitable utilization of the waters, and as it has negatively impacted the basin's ecosystem. The agreement further provided for the construction of other works in the Nile by the parties for their joint benefit (*ibid*). From the above, it is evident that the 1959 agreement aimed at securing the use of Nile waters for Egypt and to some extent for the Sudan while the rights of the upper riparian countries to equal use of the River were not considered.

Egyptians still strongly opposes any modification on the 1959 agreement which would reduce their entitlement to the Nile water. They consider any change in the agreement as a strategic threat and have repeatedly threatened to use all means to prevent the violations of the agreement. However, major demographic and economic expansion and development throughout the region suggest that changes are quickly approaching. Most of all, the other Nile Basin countries now consider the previous agreements as a remnant of a colonial era which should be annulled as it

¹³ Aswan High Dam is the first largest man-made lake with a reservoir which is 591 Km long. In addition to irrigation, the dam was designed to provide considerable hydro-electric power as well as improve navigation below it. This dam can store 1.5 times the average annual flow of the Nile storing the flood in Lake Nasser (Timmerman, 2005: 5). Though it provide a high degree of protection of the lower Nile from flood, it has affected the beneficial aspect of natural flooding as it would have protect the fertility of the floodplain. Egyptians has also built Sinai, El Salam and Kharga/Dkhala water diversion projects (Cheshire, 2010: 37).

does not reflect their needs and aspirations (Kimenyi and Mbaku, 2010:2- 6). This movement has resulted in the formation of the Cooperative Framework Agreement by upstream countries which is discussed in the following section.

Downstream states' effort for creating cooperative initiatives was not limited to legal agreements but also extended to institutional initiatives since 1967. They founded Hydromet in this year to enhance cooperation through studying and providing hydrological data on the equatorial region's water resources. Egypt, Kenya, Sudan, Tanzania, and Uganda were signatories to it while Ethiopia kept observer status since 1971. After 25 years of operation it ceases to exist without any significant contribution except the gathered hydrological data (Kinfu, 2004: 17). Later in 1983, the Udungu forum was established as a result of the Egyptians' initiation. Egypt, Sudan, Uganda, and Republic of Congo were its member states while Ethiopia, Kenya, and Tanzania remained as an observer. It was aimed to establish cooperation in "culture, environment, telecommunication, electric power, trade, and water resource development" (Yacob, 2007: 214). Like its predecessor, Udungu ceases in 1993 without considerable role (*ibid*).

Although it has a short life span, Technical Cooperation for the Promotion of Development and Environmental Protection (TECCONILE) can be seen as another important attempt to institutional cooperation in the basin. It was formed in 1992 following the dissolution of Hydromet, with Egypt, Sudan, Rwanda, Tanzania, Uganda, and Democratic Republic of Congo as founding members. Ethiopia and Kenya kept an observer status. TECCONILE demanded for the establishment of regional organization as to promote integrated development of water resources and for the consideration of water allocation in the basin. Like the above two, however, it failed to be effective ceasing in 1998 (Kinfu, 2004: 18).

In addition to the above three, other efforts including Nile Basin Integrated Development (NBID) was made but none of them have achieved their founding aim. As can be seen in the above discussion all of them are the results of downstream countries' initiation which in turn are taken as a driving factor for their failure. Downstream states are criticized for establishing such developments for delaying their hegemony over the river which has highly affected the long term effectiveness of these institutional attempts (Yacob, 2007: 213).

3.5.2 Basin-wide Cooperation Initiatives

3.5.2.1 Nile Basin Initiative

NBI is a new chapter for cooperation efforts in the Nile basin as it is the first basin-wide institutional mechanism that brings together all riparian countries to address a common agenda. It was launched in 1999 by ministers of water affairs of riparian states except Eritrea with assistance from the World Bank and UNDP.¹⁴ NBI was formulated to serve as a transitional institution until CFA negotiations are finalized and a permanent institution of Nile Basin Commission incorporating all states is created (Batisha, 2011). It was an important step in creating a forum to maintain cooperation and peaceful negotiation among the riparian countries. In order to do so, it provides an institutional mechanism, a shared vision, and a set of agreed policy guidelines (Shema, 2009: 10- 11).¹⁵ NBI is guided by its shared vision seeking to achieve “sustainable socioeconomic development through the equitable utilization of, and benefit from, the common Nile basin water resources” (Tvedt, 2010: 106).

NBI strives for cooperatively developing the Nile and bringing peace and security to the basin. It aimed to address problems related to shared resources, history and political economy of the region. In order to do so, it provides an institutional mechanism, a shared vision, and a set of agreed policy guidelines. It also has established various projects targeting different sectors both at basin level (projects under Shared Vision Program) and at sub-basin level (projects under Subsidiary Action Programme). Through these projects, NBI serves as a forum for cooperation and information exchange among experts from the basin countries. These projects, however, have not been able to show significant progress since their existence (Shema, 2009: 10- 12). In addition to these projects NBI has been engaged in studying basin-wide Power development options and trade opportunities in the Nile basin (NBI, 2014).

The NBI, hindered by different challenges, has an apparent ineffectiveness. From the very beginning, NBI has been gaining funds from international financial institutions, particularly, from the World Bank. This fact has highly limited its effectiveness as this institution demand

¹⁴ Eritrea serves as an observer

¹⁵ The organizational structure of the NBI is composed of the Council of Ministers of Water Affairs of the Nile Basin Countries (Nile- COM), the Technical Advisory Committee (Nile TAC), and Nile Secretary (Nile- Sec) (NBI, 2014).

unanimity in decision of riparian states before granting funds. This in turn has given states power to veto any development efforts of their neighbors where reaching decisions become unachievable under the initiative (Shema, 2009: 27).

The existence of various interests of riparian states under the initiative has further weakened the performance of the NBI. For instance, Egypt is “extremely reluctant to address the issue of reallocation in fear that doing so would decrease their entitlement” rather “attempted to redirect regional focus on the potential benefits to be gained from integrated development, but only in those areas which will not directly lessen their water supply” (*ibid*: 27). Ethiopia on the other hand believes that effective cooperation will surface “if, and only if, the 1959 bilateral agreement between the Sudan and Egypt is nullified and a fresh Nile water redistribution arrangement that would accommodate the interests of all the riparian countries is negotiated” (Mohamoda, 2003: 23). The diversion of interest between Egypt and Ethiopia also trace to NBI’s goals and projects bringing these states as the leading advocates of two divergent issues. Egypt focuses on regional cooperation where it has been a major supporter of TECCONILE and its Action Plan while Ethiopia on the other hand seek for the formation of basin-wide legal agreement being more interested in Panel of Experts and its Cooperative Framework (Foulds, 2002). The inability of NBI to address these diversions has highly limited its effectiveness in the basin as it fails to lay all inclusive agenda.

The failure of NBI to involve civil society in its decision making processes limited its effectiveness as it hindered NBI from cooperating all stakeholders. The current NBI’s structure hinders access to information where under some countries water resources information is even considered a national secret. Projects particularly in areas of resource management and irrigation are considered as the concern of high levels of government (Shema, 2009: 31). In order to strengthen the voice of civil societies and to ensure NBI’s response to development needs of local community, NBD was founded in 2003 as a partner of NBI.¹⁶ However, NBD has failed to raise the voice of the riparian society or integrate them rather it remained as a public platform for dialogue among civil society organizations in the Nile Basin (NBD, 2007: 1-2). In line with

¹⁶ NBD is a civil society network with over 1200 member and partner organizations within the Nile Basin region. NBD offers a public platform for dialogue, partnership and cooperation among civil society organizations in the Nile Basin. The NBD network is open to all civil society organizations involved in basin resources management and development within the Nile Basin Region to join as either full, associate or honorary members.

NBD, another civil society organization/NBS is also struggling to raise the voice of the society.¹⁷ NBS seeks “real involvement in NBI that include participation from project planning to project evaluation/monitoring and not just as ‘implementers’” (NBS, 2012). NBS demand to change the reality by bringing new insights through “creating a public dialogue on goals, policies and tradeoffs over Nile waters issues” (*ibid*). Nevertheless, like NBD, NBS has not been more than a forum and source of information for the public. As a result the NBI lacks multilateral governance failing to gain a broad basis and to strengthen its performance.

Since its establishment most of NBI’s focus has been mediating claims and uniting multi-lateral relations. In other words it has been serving as a platform for the riparian states where they can discuss as to know the realities on the utilization of the water of the Nile and for joint planning and management of water and related resources in the river basin providing the most promising framework for organization, development, and cooperation across the basin states (Shema, 2009: 10- 11). Such effort has lead to hopeful developments particularly since 2010. So, though its projects have not been doing well and it has not able to address the various conflictive interests in the basin, NBI can be considered as a successful as the CFA and existing cooperation among the states could have not been achieved without its effort and role as a forum.

3.5.2.2 Cooperative Framework Agreement

CFA is a framework agreement aimed to govern the relations of Nile basin countries. It is established to strengthen and promote cooperation, integrated management, sustainable development, harmonious utilization, conservation and protection of the river. It also provides for the establishment of a permanent Nile River Basin Commission through which member countries will act together to manage and develop the resources of the Nile (Draft CFA, 2010: 3). It is composed of fifteen general principles and thirty-nine articles providing the rights and obligations of riparian states.¹⁸ It is introduced by the upper riparian states as an international legal instrument (Nebiyu, 2013:4).

¹⁷ The NBS is a Canadian based non-profit organization that is independent of the NBI. Their goal is to empower people and facilitate real involvement by NGOs and not just by NBI donors and countries (NBS, 2012).

¹⁸ They are based on the international principles including principles of equitable and reasonable utilization, obligation not to cause significant harm, prior notification of planned measures and water security of each riparian state (Nebiyu, 2013:4; Selamu, 2011: 4- 5).

The signing of the CFA is a significant development in the process of negotiations in basin. It has given right to all the basin states to use the water of the Nile. Such step will render any earlier agreements and claims to the Nile as null. These will allow the upstream countries to utilize their water resources that have been blocked for long. So, for the upper riparian countries, the signing of the CFA is the realization of their dream as they have been negotiating for such development for a decade. Though this development may affect the long existing interest of downstream countries, the highly emphasized principle of prevention of harm to any Nile basin state in the agreement will secure them (*ibid*: 4- 6).

The CFA was officially opened for signature on the 14th of May 2010 at Entebbe Uganda. Four riparian states: Ethiopia, Rwanda, Tanzania and Uganda signed the agreement on this very first day. Kenya and Burundi have joined later. South Sudan and The Democratic Republic of Congo are expected to follow suit. Egypt and Sudan have continued to negotiate over the agreement, although neither has rejected the principles of the agreement. They propose that Article 14(b) should be amended as: “Not to adversely affect the water security and current uses and rights of any other Nile Basin State” in other words demanding the consideration of previous agreements (Adonia, 2010: 4). As a result Egypt and Sudan vigorously opposed moving forward until the disputed water security issue was resolved.

Egypt has taken different measures including visiting different upstream states offering support in return for changing their claims toward the agreement. They have also exercised huge diplomatic influence over potential donors and lenders including the World Bank and Western governments to counter the effects of the CFA. When failed they disseminate many threats and warnings including military actions particularly after upstream states signed the agreement (Granit, etal, 2010: 20). This indicates their reluctance to give up their claims over the waters of the Nile which is not supported by either the fact on the ground or theoretical, legal and practical experiences of the World.

However, upstream countries are pushing back with clear indication of their larger number and growing diplomatic pressure resulting in more success. They sought this framework as a legal base for their struggle against poverty without seriously threatening the well-being of the lower riparian states. Particularly the Ethiopian government is highly challenging Egypt’s hegemony and its efforts certainly seen to be effective (*ibid*). According to Zerubabel Getachew, the

ratification of CFA by Ethiopia and Rwanda and the process to do so by the remaining four assures its future existence. This in turn put cooperation as the only choice for downstream states as six states are enough to proceed. So, it seems that the time has come for Egypt and Sudan to negotiate with the upper riparian countries.

Altogether, hydropolitics in the Nile basin is highly affected by water scarcity, climate change, weak economy, and by rivalries among the two sides: downstream states, particularly Egypt who insistence in keeping status quo on one hand; and upstream states, particularly Ethiopia who struggles for securing its water utilization rights on the other. In response to the tension that emanates as a result of these factors, the riparian countries have formulated legal and institutional initiatives. Nevertheless, they failed to gain basin-wide acceptance where although these initiatives gain recognition by majority of the riparian states, their acceptance can be considered as one sided in the existing controversies since the riparian states that have accepted the CFA are all upstream countries. Adding to this, despite the existence of cooperative initiatives, unilateral actions by riparian states have continued affecting cooperation efforts in the basin. However, in line with such large number of upstream states along with their expansion of different hydropower projects and with the coming of change in the long existing stand of Sudanese towards the utilization of the Nile, cooperation and cooperative initiatives may gain a strong stand in the basin in the near future.

Chapter Four: Hydropolitical Features of the Rhine River Basin

This chapter examines pertinent issues of hydropolitics of the Rhine River basin. Conflict and cooperation trends are different among international river basins as a result of the existing variation in the hydropolitical features. One can see such variations of conflict and cooperation trends from the existing difference in hydropolitical features of the Nile and Rhine River basins which has resulted in variant river basin management.

4.1 Geographical Features

The Rhine River emerges from Swiss Alps in Switzerland from the two headstreams of Vorderrhein and Hinterrhein. It travels for 1, 232 km to North Sea flowing through mountain ranges of the Alps, uplands and plateaus of the northeast Jura range, Rhensish Mountains, the Vosges Mountains, Black Forest of Germany, and South German Scarp lands and low lands with coastal plain. Rhine has a catchment area of 170, 000km² covering Switzerland, France, Germany, Netherlands, Italy, Austria, Liechtenstein, Luxemburg, and Belgium (Frijters and Leentvarr, 2003: 2). Switzerland, France, Germany, and Netherlands comprise 92% of the basin area while the remaining riparian states comprise the remaining 8% of the basin area. Rhine has an average annual discharge of 2, 200 cubic meters per second (Kate, 2008:1).

The Rhine River, from its source to its mouth, has over 35 tributaries with the main ones being Aare, Neckar, Main, Moselle, Ruhr, and Meuse Rivers. Moselle is the longest one originating from French Mountains. It meets Rhine in Koblenz, Germany. The other tributary that originate from French is Meuse which emanated from Langres Plateau. It flows across Belgium to Netherlands where it meets the Rhine River. Main and Neckar emanate from Germany (Uehlinger, etal, 2009: 39- 42).

The Rhine basin is categorized under four areas according to the river's distinct ecosystems. The first is the high Rhine that is found between its origins in the Swiss Alps and the city of Basel, locating mainly in Switzerland. It consists the famous falls at Schaffhausen, frequent inundations, and large sediment depositions. It is also an important ecological reaches for migratory birds and fish. One of the largest tributary of the Rhine, Are, joins the main stream in the High Rhine (Frijters and Leentvarr, 2003: 2- 3). The second is the Upper Rhine located

between Basel and Bingen. This area is an important reach of alluvial areas along the Rhine that contains alluvial forests, wooded fringes, reed plains, and water filled swamps. The other is Middle Rhine which is located between Bingen and Cologne. Its steep slope differentiated it from the rest of the areas. The last is the Lower Rhine between Cologne and German- Dutch border and the branches of the delta in Netherlands. It contains lower reach of the river containing major cities and industries. Like the above three, it also contains alluvial areas (*ibid*).

The nature of the River which is characterized by massive and steady flow has made navigation easier where a large portion of the river approaching to 800 km is navigable. This has highly affected the hydropolitics of the basin as major shipping activities take place on the river where it connects the two major ports of Rotterdam and Duisburg in Netherlands and Germany respectively (Uehlinger, et al, 2009: 1- 9). This, according to Frijters and Leentvaar (2003: 2- 5), has highly facilitated the economic and social integration of the riparian states.

Water is abundant in the Rhine basin where “Rhine with its tributaries, uncounted brooks, lakes, wetlands and groundwater ... forms a widely ramified network of water bodies... always following the slope towards the North Sea” (ICPR, 2014b). This fact has been a problem to the basin as it made the basin a major flood prone area which, in turn, has been creating a huge impact on the hydropolitics of the basin. In addition, the frequent weather change in the basin, where precipitation occur at any time of the year, as it is found in a temperate zone, has furthered flood problems (Uehlinger, et al, 2009: 9). The change in watercourses has endangered human life through different times in the basin. As a result, large scale construction has been done to regulate and provide the river with stable and regular bed as to combat the problems. Especially, in upper Rhine, the river was regulated in order to stop flooding leading to change in the river’s original size. After the reconstruction of the upper Rhine, navigation with large ships became possible up as far as Basle (Chase, 2012: 612).¹⁹

Construction activities were also taken in the lower Rhine, which is the main flood prone area than any part of the basin, since the beginning of 1990s. However, despite such efforts, flood has continued to be a major problem and source of tension in the basin where currently “potential

¹⁹ Different flood control measures, such as the construction of dikes along the Upper and Lower Rhine have been taken (Frijters and Leentvaar, 2003: 3).

flood damage along the Rhine is estimated at 165 billion Euro” (ICPR, 2014b). At the same time this problem has laid a ground for cooperation where the riparian states have been integrated in order to combat the problem.

4.2 Economic Features of the Rhine River Basin

The Rhine River basin is European most important economic region containing economically developed riparian states. The basin has the highest density of chemical and pharmaceutical industry in the world and is one of the biggest centers of steel production where it consist huge industrial centers like Ruhr and Neckar. It also consist other important industries like that of paper and pulp companies, and potassium and coal mines (Ralf, 2009).

This development of the states has allowed them to effectively utilize the river putting the Rhine as the highly important river in Europe. From 150 million people in the basin countries 60 million of them are directly dependent on the river (ICPR: 2014a). Most of all, twenty million of them are dependent on it for drinking water.²⁰ Much of the area in Netherlands and many cities in Germany gain their water resources form this River (Chase, 2012: 612- 613). Adding to this fact, the existing industrial development has highly increased this value of the river as a transportation route. Navigation is a common usage of the river to all riparian states with the basin containing the world’s biggest sea port of Rotterdam at the downstream part of the River and with the important inland ports of Duisbur, Strassbourg and Basel along its upstream banks. It is used for transportation of goods that are needed for manufacturing like that of coal and iron ore found in the localities near to the river and for transporting industrial out puts to different parts of the basin (Villeneuve, 1996: 442- 443). Altogether, about 50% of all European inland navigation takes place on the Rhine. So, its value is high as transporting such bulky commodities is cheaper and easier when taken by water transportation (Uehlinger, etal, 2009: 36).²¹ Rhine, not only gives transportation services to these heavy industries but also provide the necessary water for them. Furthermore, these industries use Rhine to discharge their waste (IWAC, 2001: 34).

²⁰ The Ruhr, which is one of the main tributaries of the Rhine, provides the region with drinking water.

²¹ In addition to the increased industrialization of the riparian states, the removal of political restrictions on navigation, physical improvements to the navigation channel, and canalization of the Rhine’s hinterland has increased the magnitude of navigation in the river (Uehlinger, etal, 2009: 36).

Rhine River has been also highly important for agricultural productions through fishing and irrigation. The fertile soils along its banks and particularly at its mouths have made agriculture effective in the basin. The River is well known for production of wines in Germany, France and Switzerland; for its flower productions in Netherlands and for its fish products, particularly that of Salmon (Chase, 2012: 612- 613). In addition, the river has been utilized for energy production and recreational activity. Large scale hydropower production takes place on the river with more than 2000 hydroelectrical power plants occupying the entire basin. In addition the river provides cooling water for 10 nuclear plants along the basin. The historical cities along the river and the varied geographical nature of the river have made it a huge tourist attraction site. The Rhine's long history as a means of border defense has left its banks littered with ruins and spectacular castles.²² In addition, the Rheinfall, 18m waterfall west of Lake Constance is also another most important tourist attraction (IWAC, 2001: 35).

However, apart from their contribution to the economy, the industrial development of the basin states have highly put a strain on the environment as it has been polluting the river for long. They have highly resulted in environmental degradation through “canalization of the river (which destroys natural habitat), discharge of wastewater from large industrial firms and municipalities, run-off from agricultural lands” (Verweiji, 1999: 356). Particularly in the late 1960s and early 1970s the problems has reached its climax resulting in the naming of the river as the “sewer of Europe” (Wessel, 1995: 1). Such developments in turn have contributed for the low water quality including salinization of water and for increased flood danger. Pollution has highly endangered the quality of the river for both human beings and the existing plant and animal species that depend on the river. This has created tension among the basin states as it has a huge effect both on the economical and for some on the survival question of the riparian states especially that of the downstream countries. Though, the action of one state has create tension with the other as the water flows down, according to Raadgever (2005: 1), all states has contribution to the pollution of the river and its tributaries.

In addition, the developed economies of the Rhine riparian states have given them the capacity to regulate the river regime for favorable navigational route and other needs as discussed above.

²² The 90-mile gorge of the middle Rhine, in particular, is famous for its fortresses, castles and vineyards making it a famous tourist center. The cities of Cologne and Dusseldorf in Germany and Strasbourg in France are also another major tourist sites in the basin (IWAC, 2001: 35).

This fact in turn brought increased frequencies in flood patterns. In line with pollution, the change in the Rhine River's regime has also endangered different fish species. For instance, the riparian states have regulated part of the River in Middle Rhine, which used to be rocky, in order to facilitate shipping activity. This activity has vanished or decreased different fish species as the states have affected their reproduction through building weirs and power stations with locks (Frijters and Leentvarr, 2003: 2- 3). This problem, like that of flood, has shaped the riparian relations where it has been both source of tension and collaboration.

But this long existing tension and, the long existing pollution and flood problems in the Rhine River basin have started to change over the last 25 years as of different measures have been taken by the riparian countries cooperatively. Currently Rhine is one of the cleanest rivers in Europe with the achievement of high reduction of discharges to the river. It does not mean that Rhine is totally immune from effects of pollution. Still efforts to avoid discharges like nutrients from agricultural areas and the need for restoring ecology in the rivers and floodplains is in progress. In addition, the countries are working together to restore the natural habitat of the River (Chase, 2012: 611- 614). Especially, the Rhine 2020 Program is established for this purpose which is showing significant achievement (BBC, 2013). So, the industrialization problems and problems related to changes in the natural structure of the River have been sources of cooperation than tension since the beginning of 1990s.

4.3 Political Features of the Rhine River Basin

The development of the riparian states in the Rhine basin has been unique; however they have a common historical background. The riparian states are affected by the long existing conflicts in the basin. Under monarchical regimes, they were integrated through different conflicts among themselves as aggressor or being conquered resulting in change of states boundaries. At the time, Rhine has been used as a safe border and a shipping route (Frijters and Leentvarr, 2003: 4- 5). Rhine itself, however, was the most disputed border between the Roman and Germanic peoples starting from the first Century AD, which led to numerous wars between the two. The conflicts between the two come to an end in 1806 with the collapse of the Holy Roman Empire which resulted in changes of the riparian states' boundaries as it has diversified the states that have demands on the river. Although the Vienna Congress of 1815 redrew the boundaries of the

states, it did not bring any significant changes except on Prussia which gained major territories along lower and middle Rhine (Huisman, etal, 2000: 85- 87).

The series of Napoleonic wars had furthered the instabilities of the basin. This war in line with the French revolution had brought France as the hegemonic power in the basin at the time. Other conflicts like that of the hundred year war between Britain and France, and unification wars in different parts of the basin like that of Germany had effectively avoided stability in the basin (*ibid*). Especially, the Franco-Germany war from 1870- 1871, taken away the influence of France as it brought Germany as the most powerful states since it gained territories along the river. The stress between Germany and France continued until the end of the Second World War resulting in many controversies until then. In addition, due to their long existing military, political, and economic power they entertain, the two were unwilling to cooperate in water related issues of the basin including abatement payments for the pollution of the river (*ibid*: 86).

The last conflict in the Rhine basin trace back to the First and Second World Wars which had international impact. During these wars, the basin states tried to grasp different trans-boundary interests leaving aside water related problems. The Cold War rivalries further complicated the riparian states relations as it managed to avoid mutual trust among them. Problems related to the water were denied priority leading to their intensification in the basin. Above all, water related problems were perceived as the concern of the downstream countries only but not a basin-wide matter. So, traditionally downstream states always have to take the initiative to convince the upstream ones in order to solve the problems (Raadgever, 2005: 13). In addition, change in hegemonic power in the area used to influence interaction of the basin countries as anything is done under the willingness of the most powerful state. This can be clearly seen from the previously pre eminent political, military and economic power of France and Germany.

Currently all states have managed to develop a democratic system with stable political environment. Most of all, except for Switzerland and Luxembourg all the basin states are member of the EU (Frijters and Leentvarr, 2003: 4- 5). So, European laws and regulation will guide them in any matter related to the river. This has helped them to focus on utilizing the river than internal or external threats to the governing system or to the territorial integrity of the countries. Most of all it has enabled the countries to work cooperatively to mange problems that emanate as a result of the utilization of the river.

The existing stable and democratic system in the basin has allowed the people and other organizations like that of the media and environmental groups to bring change regarding to the river as they have sufficient power of influence on the governments. For instance the Sandoz incident in 1986 is a major manifestation.²³ During this year environmental groups showed high demonstrations in line with the people in the basin. The media followed this foot step as they start to blame the government particularly by pointing out and criticizing the responsible ministers. This pressure has brought a huge change towards the management of the River (Verweij, 1999: 459). So, river basin management in the Rhine basin is not only basin-wide but also has multilateral authorities giving it a firm ground.

4.4 Tension in the Rhine River Basin

Before 1987 states relations in the Rhine River basin were very limited, uncooperative and with sometimes being an absolute hostile. The river was the most disputable border between the Romans and Germanic people in the northwest Europe raising tension at different times.²⁴ Most of all the frequent controversies with regional rulers trying to promote trasboundary interests had been firm before the 1990s (Mandel, 1992: 43- 44). In addition, stress between the riparian states of Switzerland, France, Germany and the Netherlands and to some extent Luxembourger was high during the period of 1945- 1987 (Verweij, 1999: 454). These controversies emanated as a result of different reasons that are associated with the river.

The first of such controversies was related to navigation on the Rhine River. Until 19th century navigation on the Rhine faced different physical obstacles. As it carries large volume of goods this obstacles became a primary concern at the time. Many rulers along the river, including kings, bishops and, cities and robber knights tried to profit from the Rhine navigation (Huisman, etal 2000: 87). As a result there were numerous tolls along the Rhine where passing ships had to pay duties to the rulers of different Rhine sections. Several attempts including force was taken though failed to change the reality until 1815 (Uehlinger, 2009: 6).

²³ On November 1, 1986 fire broke out in the warehouse of the Sandoz Company in Basel, Switzerland. The warehouse contained 1, 351 tons of various chemical substances, some of which are extremely toxics. These chemicals flushed into the river forming a red trail that trace to 70 km long. It slowly moved downstream from Switzerland to France, Germany, and the Netherlands. For over a distance of 400 km, it killed all fish and other organism and prompted drinking water alert from the Switzerland border to the Netherlands. As a result all drinking water companies in the riparian countries that were using Rhine were shut down (BBC, 2013).

²⁴

In the 1815 peace treaty of Vienna, all the basin states voluntarily voted for free navigation leading to the end of the controversies over navigation in the area (*ibid*). As a result, the principle of freedom of navigation in international waterways was established. Despite this, France had put some strain on navigation as it forced the “right to construct a lateral canal on its bank” under the 1919 Treaty of Versailles” (Frijters and Leentvarr, 2003: 23). But Germany demanded canalization by constructing weirs in the River. The action of French had a high effect on the distribution of the water not only on navigation but also agriculture and fishing in Germany. This brought the two countries into conflict which has become one of Hitler’s arguments to prepare for war in 1919 as 50% of the canal was finished on the eve of the Second World War (Huisman, etal 2000: 87). The stress continued until the end of the Second World War where the two voluntarily modified the Versailles regulation by using “canalization of the river and construction of Lateral cannels” as a solution which is still serving both (Frijters and Leentvarr, 2003: 24).

The success in navigation, in addition to other developments in basin, in turn has brought a huge impact on fishing activity in the basin. Fishing was an important economic activity until 1900 on the Rhine and its tributaries. As hydropower and navigation gained priority, weirs and dams made it impossible for fish migration in spawning grounds. This brought another stress in the basin resulting different negotiations that brought different agreements including the treaty on Salmon Preservation. However, unilateral promotion of interest in navigation and hydropower has continued harming the ecosystem and fishery interest of the riparian states as a whole. For instance despite the existing treaties, the Netherlands take different investments including construction of delta works, canalization of the Lower Rhine hindering fish migration as its work closed the ways to spawning areas (Frijters and Leentvarr, 2003: 23- 24).

The developments in the Rhine basin have also further aggravated the flooding problem in the basin. Human intervention at different times has highly altered the river regime and thus affected the flood patterns. Due to the constructions in the 18th and early 19th century, the Rhine has lost more than 85% of its natural alluvial areas, as human kind used them for settlements or agriculture. In addition the corrections carried out in these centuries have shortened the upper Rhine by 82 km and the lower Rhine by 23 km. These actives resulted in high water levels increasing the existing natural flood damages in the basin (Philp, etal, 2008: 4).

The capacity of flood damage is also highly increased as the Rhine basin is densely populated with vast investments on the basin²⁵. In other words, these developments have “aggravated the maximum flood level and the spread of flooding by land development in the catchment area, by river development and by reducing natural flood storage areas” (Frijters and Leentvarr, 2003: 31).

The other and the main controversial issue was pollution. Chemical and thermal pollution by industries, agricultural firms have highly polluted the river. This in turn has highly degraded the quality of the water resulting controversies in growing inequality in distribution of usable water mainly for drinking and agriculture production, which are the most critical ones especially for downstream states (Mandel, 1992: 43- 44). Though the Rhine dispute has emphasized on usable water apportionment, it also focused on a gradually growing level of pollution. The dispute was not quite mild, however, according to Verweij (1999: 454- 458), it created little enmity and contentious friction among riparian over most water related issues and failed to bring effective solution for some time.

The other water related controversies regarding to pollution was its different effects to the riparian states leading to variety of response to the problems. Most of all, downstream states are dealing and highly affected with problems originated in upstream states including pollution and deforestation. Water crossing borders with highly declining water quality become international problems with responsibility to clean it. However, the less victimized states in the basin were not willing to share the responsibility with the highly affected ones, though they are the ones contributing more (Haftendorn, 2000: 54- 55). Switzerland due to its uppermost position is the least victim while Netherlands suffered the most as it is the most downstream state. As a result there is different willingness towards solutions including willingness to pay for costs of the pollution. For instance, Raadgever (2005: 2) stated that Netherlands usually paid a significant higher proportion of pollution abatement costs than either of the two major polluter; France and

²⁵ Several floods have stricken the Rhine basin in 1900s particularly major floods occurring in 1993 and 1995. The 1993 flood brought considerable damage along the Moselle, the middle Rhine and lower Rhine including Meuse valley in the Netherlands (Wessel, 1995: 9). The other most spectacular flood was the one of January 1995 that resulted due to high water levels from the enormous amount of rain in the middle and upper Rhine. It leads huge disaster in the Netherlands and flooding of the old town of Koln. The two rivers totally brought an estimated economic damage of 1500 billion Euros (Uehlinger, et al, 2009: 37).

Germany. Above all, the variation in economic activities among riparian countries where downstream countries are relatively highly engaged in agriculture while the upstream ones mainly engaged in industry, has created variation of interests to pollution problems leading to controversies among the two (*ibid*).

Pollution has also increased as a result of the salinization of the Rhine River. The Rhine delta is very vulnerable to salt intrusion from the North Sea. For Netherlands this development was a high threat as most part of the country gains its water resource including drinking water from the river. The threat was aggravated as the country not only faces salt intrusion from the North Sea but also increasing salt intrusion from the hinterland (Mandel, 1992: 44). This has brought the Netherlands into controversy with other basin countries particularly with France. For instance in 1979, the Dutch ambassador was recalled by his government as a protest to the dumping of large amounts of salt into the River Rhine by an Alsatian mining Company of France. This action of the Company though has not brought a wide effect, has slightly affected some Dutch water companies, the port of Rotterdam and a few agricultural areas (Verweij, 1999: 454). The increased salt content also had affected the basin countries as it leads to an increased chloride concentration on Germany- Dutch border and other basin states. As a result, Raadgever (2005: 1) stated that, the governments of German, France and the Netherlands protested in vain against the increasing pollution of the Rhine.

It is not lack of want or effort for cooperation that grasped the countries of the Rhine River basin under continuous stress. Different efforts at different times were taken for establishing institutional and legal initiatives. Especially, from the end of the Second World War, extensive efforts for international cooperation were taken though were unsuccessful until 1987. For instance, with the initiation of the Netherlands, the basin states formed ICPR in 1946. However, rather than coming into common ground the riparian states continued their controversies as each delegate tried to protect their national interest failing to reach an agreement and rather sometimes becoming distrustful. According to Verweij (1999: 456), this fact had restrained riparian relations as they “fought constant battles over jurisdiction and competency.”

Before 1987, not only did the governments of the riparian states fight persistently over minor details of the international plans to clean up the Rhine, they were also busy implementing extensive domestic protection policies for the Rhine and other water bodies within their border

neglecting international cooperation in the basin. Until the end of 1980s these domestic water protection programs in all Rhine basin countries, especially that of Switzerland, France, Germany and the Netherlands were “command and Control systems” where under such systems “water protection goals are centrally set usually in the form of effluent limits and water quality standards which are determined with the help of some technological notion such as best available technical means for waste water treatment” (*ibid*: 457). So, government monitor environment through monitoring polluters as it force them to use such technologies through government agencies. This fact brought controversies among the governments in international forum as each of the states tried to defend and uphold their own programs and policy styles over the others (*ibid*). In other words, differences in each country systems have huge effect in international deliberation aiming to create a common system as it will create controversies since each team will strive for acceptance of its own practice. For instance, when the ICPR states sought to establish a priority list of highly toxic chemicals complete with specific effluent limits and technical standards aiming to impose this list on the domestic control programs in place in the riparian countries, the difference in domestic programs has made it impracticable. According to Verweiji (1999: 458);

...the Dutch water protection programs were almost exclusively based on water quality standards. In contrast the German water pollution policies were almost fully based on effluent limits. Another difference between the national policies concerned the classification of industries. Effluent limits are usually formulated on an industry by industry basis. The industry classifications that were used in the Rhine countries varied. Alternative industry classifications and different emphases on effluent limits and water quality standards are only two instances of how the command and control policies for water protection diverged from each other.

This fact highly hindered the international negotiations on the protection of the Rhine, as each national delegation to the ICPR tried to impose its own way of water pollution control on the other delegation.

Another problem at the time was the highly formal legalistic way of intergovernmental decision making that prevailed among the riparian states particularly in the ICPR. Conventions at the time need support not only from basin states and approval of their parliaments but also from the

European community. This took up a lot of time and gave opponents many opportunities to block the adoption of international agreement. But most of all, they did not seem comfortable with taking up such formal obligation since it will bind them legally though this was exactly the way in which the delegations tried to proceed (Huisman, et al, 2000: 91). So, this indicate their reluctance to engage into effective cooperation as they tries to hide behind such long legal process that they believe may not come into existence after passing such long stage.

In addition the governments were not interested in getting into such agreements as they feared of its effect on domestic economic interest. As a result they viewed tranboundary cooperative processes in terms of one state against the other before the coming of different accidents including that of the Sandoz (*ibid*). These accidents highly changed the long existing relations of states in the area laying a ground for effective international cooperation.

However this does not mean that all the problems in the area are vanished. Still problems related to salt and water cooling is creating troubles to some extent. Different negotiations on heat treaty have been taken starting from early 1970s. Particularly starting form 2010, climate change renewed the water temperature problem. But, according to Hofstra (2010), the riparian countries have failed to achieve any success as the opinions of the delegations could not be brought together.

4.5 Legal and Institutional Initiatives in the Rhine River Basin

The first cooperative initiative in the Rhine basin trace back to the 1449 Strasbourg regulation. This regulation was aimed to protect the River against pollution and overfishing. Latter in the 19th century the basin states voluntarily voted for free navigation in Vienna convention which interned into effect under the 1831 Mainz Convention (IWAC, 2001: 35). This treaty was revised in 1868 as the Mannheim Convention which also revised as Rhine Navigation Act latter in 1963 (Villeneuve, 1996: 443).

The Mainz Convention established the Central Commission for Navigation on the Rhine (CCNR). CCNR is the oldest organization in the world that is still active. It is established to ensure “the freedom of navigation on the Rhine and its tributaries, and to maintain a uniform legal regime governing navigation along the full length of the river” (Frijters and Leentvaar, 2003: 5). CCNR also takes technical and administrative regulations regarding the safety of the

navigation and treatment of complaints regarding the Act of Mannheim and promotes economic use of shipping and canal system development (Raadgever, 2005: 10). According to Chase (2012), member states have the responsibility to ensure freedom of navigation on the Rhine and its tributaries, and for establishing a uniform legal regime.²⁶

Later in 1855, the riparian countries formed the Salmon Commission to regulate and protect salmon fishing. The commission failed to prevent the highly decreasing fish content as a result of overfishing. However, it laid a ground for the formation of the Salmon treaty in 1869. The Netherlands was not willing to accept the treaty as the country feared its negative impact on its fishery interest. The riparian states managed to convince the Netherlands to sign with concluding a new treaty in 1885. This treaty, which is serving them still now, has been ratified by all states (Huisman, et al 2000: 87- 88). The treaty demanded all basin states to take efforts for preservation of the salmon stock and for the protection of spawning areas in the Rhine and its tributaries. In spite of this legal international instrument, the threat for fish species has increased as navigation and hydraulic power generation got a far higher priority than fisheries and other interests (Sicherman, 2012).

The Netherlands began raising environmental concerns about the Rhine River to the CCNR after World War II. As a result, the ICPR was found in 1950 by the Netherlands, Germany, France, and Luxembourg (Kate, 2008: 5).²⁷ The ICPR has the responsibility to “formulate investigations into the type, source, and extent of Rhine pollution, recommend appropriate measures, to reduce it, and prepare agreements between the participating countries” (Frijters and Leentvaar, 2003: 8). It is expected to be competent for all matters that the states jointly charge it. It also supervises an Early-warning System (EWS) that comprises of warning protocols and the Rhine alarm model that allows the prediction of an estimated reach of an accidental spill. It is in charge of drafting general policy statements affecting various river basin management issues, which then need to be integrated into national programs and legislation. Most of all, the highly developed trust between the riparian countries as a result of the long standing cooperation, has highly contributed for the acceptance of its decision (Raadgever, 2005: 8-9). ICPR has brought significant results in

²⁶ The Netherlands, Belgium, Germany, France and Switzerland are member states of CCNR. The member states have four representatives and two substitutes with a veto power (Kate, 2008).

²⁷ Austria, Liechtenstein and Belgium have observer status.

reduction of chemical pollution and to some extent contributed to reduction of other sources of pollution changing the history of the river from the most polluted to one of the cleanest (IWAC, 2001: 39).

The 1963 Berne convention gave ICPR its legal foundation. This convention allowed the organization to take official actions, including issuing reports and holding international conferences. It set out the official tasks of the ICPR, requiring it to “report on the state of the environment of the Rhine, to propose international policy solutions to the Rhine’s ecological problems, to hold regular international consultations; and to monitor and partly implement any intergovernmental agreements that have been reached” (Chase, 2012: 617). After this reorganization of the ICPR, the organization began to take more formal actions and establish major treaties.

The major treaties the ICPR finalized are the Convention on the prevention of Chemical pollution of the Rhine and the Convention on the protection of the Rhine against Chloride pollution. These conventions were concluded in 1976 in order to control the discharge of Chemical and Chloride substances into the Rhine. After prolonged negotiations, additional protocol on these Conventions was formally ratified in 1994, though its implementation started in 1991 (Villeneuve, 1996: 445- 448).

In line with this, the riparian states also have established the CHR demanding a better water quality in the Basin. CHR was founded in 1970 with the help of UNESCO and World Meteorological Organization (WMO).²⁸ It is developed with the joint scientific institutes of the member states working together for sustainable development of the Rhine basin. It is aimed to expand knowledge on the hydrology of the river basing through joint research, data exchange and through identifying solution for transboundary problems using different systems including that of the Rhine Alarm Model. It provides the result of the hydrological studies to the responsible authorities of member states.

²⁸ It contains Switzerland, Austria, France, Germany, and the Netherlands as its member states.

This in turn will Support decision making in sustainable water resources management by solving of cross border problems (Kate, 2008).²⁹

Despite these efforts, pollution in the basin had further aggravated until the end of 1980s. The existing various approaches to regulating pollution discharge levels in the river and poor relations of the countries has made international cooperation impractical in the basin. However, the 1986 Sandoz accident has facilitated the establishment of effective cooperation in the basin. Especially, the Rhine Action Program (RAP) in 1987 was a direct result of this incident. RAP was established with a limited time frame from 1987 to 2000. It aimed to keep the Rhine ecosystem alive and in good health, and to restore species that had disappeared. Although it was not binding, the return of Salmon in the Rhine by the year 2000 testifies the success of this program (BBC, 2013). In 1988, after the major flooding, an Action Plan on Flood Defense was agreed in addition of the Ales Declaration in 1995. It aimed to improve precautionary flood protection and risk awareness (Philip et al 2008:5).

The aims of the RAP and FAP have been formalized by inclusion of them in a new Convention on the Protection of the Rhine signed in 1999. The Convention was signed in Bern by governments of Switzerland, France, Germany, Luxemburg and the Netherlands and the representatives of European community. The parties formally confirmed their determination to reinforce their cooperation and to continue protection of the valuable character of the Rhine, its banks and its flood plains. Unlike the RAP, the 1999 Convention is legally binding among the contracting states (Pichyakoro, 2002: 23- 26). It entered into force on 1st January 2003 with the aim to bring;

sustainable development of the Rhine ecosystem, the production of drinking water from the waters of the Rhine, improvement of sediment quality in order that dredged material may be deposited or spread without adversely affecting the environment general flood prevention and protection, taking into account ecological requirements, To help restore the North Sea in conjunction with other actions taken to protect it. (IWAC, 2001: 37).

²⁹ The Rhine Alarm Model is developed in order to warn the availability of harmful substance, so that, necessary measures can be taken by the concerned actors. The system covers the Rhine from Lake Constance to the sea, including the tributaries of Aare, Neckar, Main and Moselle. Seven international alarm stations are on the Rhine mainstream between Basel and Arnhem (Uehlinger: 2009:36).

The 1999 Convention has expanded the goal of ICPR from protection against pollution to a broader scope that includes flood prevention (*ibid*).

The latest cooperative initiative in the basin is the Rhine 2020 program on sustainable Development of the Rhine which is adopted by the ICPR. It is the expansion of the 1999 convention and established as a successor of RAP in 2001 (Philip et al 2008: 13). It was developed in order to improve the Rhine ecosystem, Water quality and to advance ground water protection as well as flood protection and prevention (Sicherman, 2012).

As member of EU, all states except for Switzerland and Luxembourg are regulated by EU Water management regulations. The most influential of such regulations is the EU Water Framework Directive (WFD). It aimed to achieve “good water” status by 2015 “using the natural geographical and hydrological unit for the management organizations instead of the former administrative or political borders” (Raadgever, 2005: 4). For surface waters, the definition of 'good' is based on achieving ecological quality which take biology, chemistry and physical features of rivers into account. In order to coordinate its implementation, the Rhine committee was set up under the framework of the ICPR. This committee includes Austria, Belgium and Liechtenstein in addition to the existing ICPR members. The International Meuse Commission (IMC) is formed to enforce the EU WFD in 2002 (*ibid*).

4.5.1 Nongovernmental Actors in the Rhine River Basin

Nongovernmental actors have huge influence and participation in the Rhine River Basin. The inclusion of regional and local authorities, stakeholders, NGO's and the public in the decision making process is common in this basin. The environmental problems particularly after the 1970s have highly increased public awareness raising different movements in the riparian countries. This in turn led to the formation of different river basin organization and the rising of public participation first in the Netherlands and latter expanding to other basin states (Raadgever, 2005: 17).

The first of such nongovernmental actors mainly focus on water quality and controlling of pollution. One of these organizations is the International Association of Water Works in the Rhine catchment area (IAWR). IAWR is currently the most important association concerning drinking water in the Rhine basin. It stands and represents the interest of 20 million people who

depend on the Rhine for drinking water (RIWA, 2001). It aimed to “bring healthy rivers, healthy drinking water by means of natural process, low concentrations of toxic substance and sufficient water” (Raadgever, 2005: 18). To achieve this, IAWR maintain international monitoring networks that check for an extensive variety of substances that could form a threat to the river; and by taking supplementary research that check surface water and the substances that could harm it (*ibid*).

Another important organization for protection of drinking water is the European Union of National Association of water suppliers and waste Water services (EUREA). It represents the European water and waste water industry which serves about 400 million people. In line with this, different non state actors are established in order to protect the quality of the water. The European Environmental Bureau is one of these organizations. It compromises 143 citizens’ organizations for promoting environmental and sustainable policies on European Union level (EUREAU, 2005).

NGOs in the Rhine basin also have extended their area of concern to the industry. One of such actors is the German Chemical Industry Association that represents the political and economic interests of 1, 600 German chemical companies which constitute 90% of the entire German chemical industry. In the sector of agriculture also different nongovernmental actors are organized. These organizations work together where for instance many of them cooperate through the committee of professional agricultural organization (COPA) that represents the general and specific interests of farmers in member states. Nongovernmental actors have also highly involves on issues related to fishing. The most important NGOs in this area are European Anglers Alliance (EAA) and Dutch organization of Anglers (Raadgever, 2005: 118- 123).

Several national and international nongovernmental organizations that represent the interest of navigation also resided in the basin. At regional level European Barge Union (EBU) is founded in 2001 to protect navigational interests. The EBU deals with “the development of the European transport policy, the improvement of the economic position of inland navigation, the structured cooperation with national and international institutions, the exchange of information and experience between the parties involved” (*ibid*: 120). In addition to nongovernmental actors national organizations like that of Swiss navigational association, works on navigational related issues (*ibid*).

The above mentioned NGOs are not the only institutions in the Rhine basin. Rather the basin is dominated by various non-state actors while these are some of them which have effective results. Like that of the many inter governmental organizations in the basin, the NGOs mostly focus in particular water related issues. The participation of these environmental NGOs has been officially included in the 1999 Convention on the Protection of the Rhine. Most of all, the ICPR exchange information with relevant NGOs giving account for their position during decision making. The concerned NGOs also get an observer status in the ICPR. For instance, most of the official observers of the ICPR are environmental organizations including Greenpeace International and French Alsace Nature (*ibid*).

The role of citizens and residents is also high in the Rhine basin. For instance the society has played a significant role during the cooperation between Austria and Switzerland against flooding of the Alpine Rhine. The Hoog water platform Association in the Netherlands is also another important manifestation. The activities of the association are demonstrating, informing, researching, composing specific working groups and cooperating with similar associations, to convince politicians to not plan flood retention in the area (Kampa,etal, 2003: 34- 36). Leaders of municipalities and cities along with the residents, also play a significant role in decision makings related to water resources. For instance through *Hoch Wassernot gemeinschaft* Rhine (HWNG), they cooperate to increase protection against floods. HWNG represents over one million residents in the middle and upper Rhine basin. In addition, an organization called Environmental Council at the Ministry for the Environment has been created with a total of 30 representatives from various stakeholder associations including none state actors on the environment, fisheries, agriculture and local and regional authorities. Although the council does not have any decision-making power, it serves in an advisory function ensuring the approval of new legislation by a wide range of societal groups (Raadgever, 2005: 20- 21).

As can be observed, participation in the basin stretches over different anarchical structures. However, influence and types of stakeholder involvement varies over different hierarchies. For instance;

...at the higher level (i.e. river basin), involvement is usually directed more towards the participation of organized stakeholders and may, in particular cases, even lead to alterations in overall management strategies. At lower levels, the general public seems to

get increasingly involved, with solutions being more practice-oriented and suited for implementation on the ground. However, at this level, the activities are often limited to information dissemination. (Kampa,etal, 2003: 34)

Generally, the favorable geographical environment of the Rhine which has allowed navigation, the developed economy of the states and the current political stability and integration through EU have contributed for riparian states effective cooperation and integration in the Rhine basin. However, the effects of flood in line with pollution and salinization problems, has continued to be source of tension in the basin. In order to alienate these problems the riparian states has established many legal and institutional initiatives.

International cooperation on the Rhine River Basin has been ongoing since 15th century and continues today to resolve trans-boundary conflicts and manage water problems, including shipping, navigation, salt intrusion, water pollution, and flooding issues. Especially, the riparian states have established a strong institutional river basin management after the mid 19th century. These initiatives for long mostly focus on specific aspects of the river like that of navigation and fishing. But over the years, the issue starts to expand to focus on various areas at a time, including that of water quality and quantity management which comprises different aspects including flood prevention, pollution and navigation. Although have not able to remove them all, the initiatives are fruitful as they have managed to highly decrease the problems and to create effective cooperation and integration in the basin easing preventing and solving water related problems.

Chapter Five: Comparative Analysis of the Hydropolitics of the Rhine and Nile River Basins

This chapter presents a comparison of the hydrpolitical features of the Rhine and Nile River basins. At first glance, both the Nile and Rhine River basins seem to have more differences than similarities. Both rivers cross international boundaries bringing concern of water related issues to several riparian states. Both river basins induce inter-riparian cooperation or tension over different issues related to water resources. Pattern of relations among riparian states is affected, with varying degree, by geographical, economic, and political features, which have led to another area of similarity between the two. Such features also indicate the existence of several differences between the two basins. Thus, this chapter presents an analysis of their similarities and differences. It also looks into the critical factors that lead to such resemblance and disparity.

5.1 The Impact of Geography on the patterns of Riparian States Relations

Geographically, the Nile basin covers a wider catchment area. This has brought more riparian states (eleven countries) under the Nile than the Rhine basin (which comprises nine countries) increasing the number of riparian countries which are concerned on water related issues. This may complicate cooperation efforts in the basin creating a need to manage more interests than it is in Rhine basin. As can be seen from recent developments, competing and sometimes contradictory interests between the upstream and downstream riparian states have hindered the effectiveness of institutional initiatives and the realization of legal instruments. On the other hand, the existence of relatively large number of riparian states in divergent geographical locations has contributed for cooperation among the upstream countries of the basin. In other words, the existence of more riparian countries (nine countries) in upstream part of the river has laid a ground for cooperative initiatives as these countries have, more or less, the same stand toward the utilization of the water. That is why Ato Fekhamed Negash argued that, being few in number, the downstream states (Egypt and Sudan) are facing marginalization and lack of voice under the current developments. This fact has left them with no other reasonable choice except entering into cooperative initiatives established by upstream countries. This is what the current movement of Sudan towards cooperation, for instance, is witnessing.

On the other hand, in case of the Rhine River basin, although do not have the same effect, water related problems, like that of flood, have impact on all riparian states. Thus, the various locations of the states indicate the various degree of effect but not absence of problems related to the river. This has brought collaborative efforts easing cooperation in the basin.

Along with its wider catchment area the Nile basin comprises larger number of population (nearly six times) than the Rhine basin. High population has a tendency to worsen water scarcity problems which in turn may further water scarcity related tension among riparian countries. For instance, according to Oestigaard (2012: 25), “with the existing and expected population... each country will depend more on the Nile for its development and each drop of water will become more precious.” Thus, tension in the basin is exacerbating as states engaged in competition for the scarce water resource of the river in order to satisfy the need of their population.

On the other hand, population settlements along the Rhine and Nile Rivers have been source of tension in both basins. In the Nile basin many people, especially in Egypt, have settled along the River. Such dense settlement along the river has affected the basin in two ways. First, change in water volume that emanates as a result of human made or natural changes means huge problems for riparian states especially for downstream states. For instance, according to Elhance (1999: 60), any changes that have impact on the water volume of the Nile have significant impact on Egypt, as 96% of its population lives in the narrow Nile Valley and Nile Delta, bringing the country into different controversies with other riparian countries in time of utilization. The need for utilization of the river by upstream countries in order to improve their societies’ economic status on the other hand is intensifying tension in the basin. According to Zerubabel Getachew, a huge number of populations along the Abbay River particularly those of the highlanders are highly affected by seasonality of rainfall putting them under critical poverty. So, the need to utilize the River is huge where Ethiopia is planning to take different developments on the River including hydropower and irrigational projects. These opposing interests of the two are further complicating their relations.

In the Rhine basin also many people have settled on the river banks. This has increased the potential damages of water quantity or quality related problems. That is why Linde, et al (2011: 461) argues that the impacts of flood and pollution problems have heightened as a result of dense

population settlement along the River. Increased damage in turn may intensify the existing tension in the basin.

The most significant difference between the Nile and Rhine basins that brought variation in riparian issue of concern is variation in water volume related to the different geographical location of the two. The Nile basin is mostly located in arid and/or semi arid region where precipitation rate is highly limited while evaporation rate is very high. In addition, large parts of the Nile watershed do not generate runoff. As a result, in the Nile basin water is scarce powering utilization of it as a main source of tension among the riparian countries. Similarly, Elhance (1999: 57), argues that low precipitation rate in line with high evaporation losses have great significance for the hydropolitics of the basin as it further aggravates the scarcity problem in the basin which has been source of tension among upstream and downstream countries.

In contrast, water is abundant in the Rhine River basin. Rhine is located in temperate zone that leads to huge amount of precipitation in the basin. In addition, almost all parts of the Rhine watershed generate runoff. However, though this fact avoided rivalries related to water scarcity, it has been a major source of tension in the basin as it has prone the riparian countries to flood problems. According to Bakker (2009, 286), the existence of plenty of water sources, in addition to other factors, has put the basin as one of the major flood venerable international river basin with having the second highest number of floods until 2009. Thus, Bakker argues that in the Rhine River basin the need to manage flood problem is the primary concern of riparian states.

In addition to its contribution to the variation in water volume, the disparity in amount of watershed that generates runoff and their distribution have huge impact on riparian states relations of the Nile and the Rhine River basins. In the Nile basin, all the water volume originates from the upstream part of the basin while the downstream countries contribute nothing. As a result stress among the two is high where as a primary contributors the upstream countries perceive they have right for utilization while as a major recipient and total dependent on the River the downstream countries struggle to avoid any change in the water volume of the River. Similarly, Turton, et al (2005: 50) argued that:

The fact that 85% of the Nile waters flow from Ethiopia, while the remainder comes from Lake Victoria in East Africa, has potential for conflict as Egypt though contributes nothing

is totally dependent on this flow of water from the upstream countries. As a result, Egypt views the use of water from the Nile River as a matter of utmost strategic importance.

On the other hand, almost the entire watershed in the Rhine basin generates runoff avoiding potential conflict over distribution or utilization of the River.

Availability of alternative water sources is another geographical feature that has impact on the hydropolitics of the Rhine and the Nile basins. Lack of alternative water sources for downstream riparian states and Ethiopia has aggravated the problem in the Nile River basin. Both Egypt and Sudan depend on the river as they lack the necessary rainfall amount and other water sources to sustain their agriculture and other needs. Ethiopia also highly needs to utilize the River as its most part lacks the necessary rainfall amount and alternative water resources. As a result, stress and competition among these countries is high. That is why Mason (2003: 14) argued that scarcity arising from reduced total availability of certain resources (supply-induced scarcity) has been a major source of tension between the three countries in the basin.

Availability of alternative water sources also has affected the degree of concern of riparian states in the Nile basin. As the two downstream countries and Ethiopia lack the necessary alternative water resources to satisfy their water needs, they highly engage in water related issues in the basin. On the other hand, the remaining upstream countries have been less active in such issues as they have the necessary alternative water resources to satisfy their needs. Similarly, Shema (2009: 21) stated that “the Eastern Nile countries have a demonstrably higher level of reliance on Nile water than the countries in the Equatorial Lakes region” putting them as the main rivalries in the area where the two downstream states (Egypt and Sudan) struggles to sustain the status quo while Ethiopia is struggling to change it as it start and/ or need to utilize it. As a result, there is variation of concern between the riparian states which has hindered the proliferation of cooperation in the basin. If other upstream countries have the same concern like Ethiopia, cooperation initiatives would has been accelerated where there may have been strong legal and institutional initiatives long ago as these states would have a greater influence together over the downstream states as can be seen in recent initiatives.

In contrast, tension related to lack of alternative resources is not a problem in the Rhine basin. First the riparian states have the necessary alternative sources. Secondly, since their concern is

not related to scarce water resource, they are not engaged in any water scarcity related issues. Rather they are concerned with almost all inclusive issues like that of salinization, pollution and flood management resulting in participation of almost all states. This in turn has affected the hydropolitics of the basin in two ways. First, since almost all riparian states are affected by the problems, they, before the beginning of the 1990s, came with various solutions in which managing them were huge difficulty. From the beginning of 1950s and until the end of 1990s, all riparian states were engaged in water related issues that had posed problems on their interest. According to Verweiji (1999: 456- 457), this had complicated river basin management as it created difficulty in managing varied interests of the riparian states since they all were engaged in securing their national interest. The nature of the problems which encompasses all states also has laid a ground for cooperation in addition to furthering the tension. This is what the post 1987 developments in the Rhine basin witness. All states engaged together in search for solutions to the problems as the effect of the problems, including the impact of flood, have negative outcomes to the human life and economies of most of the riparian states.³⁰

Climate change in both the Nile and Rhine basins has added to the problems as it has been bringing changes to the environment furthering the effects of sources of tension in both basins. In the case of the Nile, seasonality in rainfall, increased rate of evaporation as a result of global warming, and reduction of water volume through times has added to the problem of scarcity. Riparian countries in the Rhine basin have also been affected by climate change as it has increased flood pattern in the basin.

The rivers natural flow also contributes to increased cooperation among the riparian countries on one hand and to economic development of the basins on the other. Although varies in degree, both serve for the generation of hydropower which has the capacity to integrate riparian countries through hydropower trade. However, variation in the flow also has brought additional advantage, navigation, for the Rhine River riparian countries. Rhine has been the main source of cooperation as it integrates the riparian countries through its service as a major transportation route. That is why Frijters and Leentvarr (2003: 2) argued that the navigational capacity of the Rhine has socially and economically integrated the riparian states leading to the rising of effective cooperation in the basin. They further argue that navigation is a common interest of

³⁰ See patterns of riparian relations in the Rhine basin under section 4.4 and 4.5 in the previous chapter.

riparian states as it is exercised by all of them laying a ground for collaborating in combating any problem towards it. Although the Nile also serves as a navigation route, it is very short and limited to states territories. It is also affected by seasonal variation of the water volume. So, the role of navigation as bases of cooperation is not viable. Rather the role of hydropower generation may become more effective in this basin. Altogether, geography has been both source of tension and condition for cooperation among riparian countries in both Nile and Rhine basins.

5.2 The Impact of Economy on the Riparian States Relations

Both Nile and Rhine rivers are economically significant. Although serve different interests they are the main source of economic benefit in their areas. The Nile is used as the primary source of water for irrigation, municipality needs, and hydropower generation while Rhine serve as source of drinking water, navigation, for dumping of industrial and household wastes, and for cooling water in industries. Like that of the Nile it also serves as source of employment, hydropower, and irrigation.

The service of the rivers highly varies in line with variation of economical status between the Rhine and the Nile River basins. The Rhine River basin is one of the highly developed regions in the world while the Nile basin is known for its weak economy comprising underdeveloped riparian countries. Economic activity in the latter is dominated by agriculture where the River is mainly utilized for irrigation. This in turn has brought strain on the existing scarce water resources in the basin as it is a huge water consumptive sector. What worsens the situation is the huge dependency of downstream countries on the Nile as they have no alternative water resources. Egypt and Sudan are almost totally dependent the Nile for their agricultural production where they comprises 97% of irrigational land along the River. Thus, any change in the water volume as a result of upstream countries utilization is considered as a threat to their national interest. That is why, Thomas Homer-Dixon (as cited in Shema, 2009: 20) argued that the risk of “conflict is more probable when a downstream riparian...is highly dependent on river water and is strong in comparison to upstream riparian countries.” The problem is further aggravated with recent utilization developments by upstream countries in response to heightened need as a result of the growing number of population, economic development and climate change. Thus, according to Turton, et al (2005: 51) the underlying reason for tension in the Nile

basin is rooted in Egypt's almost total reliance on the Nile and recent increased demands of upstream countries.

On the other hand the riparian states in the Rhine basin are highly industrialized where the need for availability of plenty of water is not required besides its abundance. So, competition for water use is not observed under this basin. Rather the tension in the Rhine basin emanates from the effects of industrialization on the quantity and quality of water. The developed economy of the riparian states has able them to restructure the regime of the basin as per their interest leading increased flood problems in the basin. In addition, different industries across the riparian countries use the Rhine for dumping of wastes and industrial uses resulting in degraded water quality. Especially, increased pollution of the river before 1987 had been a major source of controversy in the basin. However, with the coming of the government of the riparian states into negotiations after end of 1980s the problems have been a main source of cooperation. But, still such problems in addition with salinization and increased patterns of flood, as a result of changes emanated from different constructions along the river have sustained the tension though have highly decreased.³¹ Salinization problem also exists in the downstream countries of the Nile basin. So, in both it creates strain on the availability of fresh water as the rivers serve for drinking water and agriculture especially in downstream countries. However, water quality is not a problem in the Nile (with very limited existence in the downstream part of the river) as the countries mainly engaged in agriculture and hydropower generation which have low impact on the environment.

The variation in economic activities between the Nile and Rhine River basins also lead to different level of integration of riparian countries. Agricultural economy in the Nile basin has furthered the tension as it creates competition rather than integration. As they all produce the same products (food products) rather than trading among themselves they struggle to secure the necessary water for their agricultural interest. Thus, according to Chesire (2010: 42- 43), the need for engaging in different sectors including improved hydropower generation, industrialization is significant in order to evade competition for water and for an improved economical integration of riparian countries.

³¹ See under section 4.4 in the previous chapter.

Current hydropower developments by the riparian countries, especially by Ethiopia are expected to diversify the economy integrating the riparian countries in the Nile basin through hydropower trade. This progress in turn may contribute for industrial development as it will solve the regions electric power problem further diversifying the economic activates in the basin. Such projects are also avoiding problems of agriculture in Sudan (and is expected to do the same in Egypt decreasing related costs) which has huge plain fertile lands appropriate for agriculture. So, this in turn creates a huge agricultural land that can provide necessary food products for the whole basin in turn increasing integration of the riparian states. According to Ato Zerubabel Getachew, Botswana's new road towards knowledge based economy is also expected to add to the diversifications with its attempts of innovations and improved ICT technology. Cooperative engagements in construction of infrastructures among upstream countries are also expected to strengthen the social and economic integration of the riparian countries. These developments are expected to build up cooperation as they bring interdependency among the riparian countries.

On the other hand, the economy of the Rhine riparian states is varied. Although the countries mainly deepened on industrial sector, they produce relatively diversified products including wines, flowers, mineral for industrial uses and varied industrial products. This in turn brought interdependency between the riparian countries as they exchange these products. The navigational capacity of the river facilitated this cooperative pattern as it provides cheap transportation service.

The variation in economic status among the riparian states also has resulted in different capacity of managing water related problems in the Nile and Rhine River basins. The developed economy of the riparian countries in the Rhine basin has empowered them with effective power to prevent and/or manage water related problems. They have established different warning system and cooperate to rehabilitate damage in the whole basin. Such activities include resettling the population to other area before the coming of the warned problems (mainly flood), working together for rehabilitating damage areas through contributing the necessary financial needs, and compensating for damages (whether being at individual level or state level). That is why Bakker (2009: 273), stated that the developed economic capacity of the riparian states has decreased the damage of water related problems where "it may be reasonable to measure a Dutch householder's relatively minor flood damage in thousands of dollars."

On the other hand, the weak economy of the Nile riparian countries have denied them the capacity to resist water scarcity related problems. Scarcity is a natural problem that they cannot change unless they engage in less water consumptive sector like that of industry. However, despite many efforts they are taking, agriculture still is the major economic activity of the riparian countries. In addition, even if they need to utilize the existing water in a better manner and to utilize alternative resources like that of the existing large aquifers underneath of their territories, they lack the necessary technology and human power to do so. Thus, their weak economy has left them with no choice except competition over the scarce water.

The developed economy of the Rhine basin also enables the riparian countries to utilize the River for various uses unlike the single aspect of utilization by Nile riparian states. It also helped them to yield an effective outcome from their utilization. For instance despite low engagement in agriculture (compared to their industry) they have able to have a more effective result than the Nile riparian states who have almost entirely engaged on it. In opposite industry in the Nile which have a very limited existence is more productive than their agricultural output indicating for the need of better engagement in this aspect. Lack of effectiveness in utilization has been a huge strain for Nile riparian states, as it has put a strain on their economy in turn increasing demand for water, while the existing success in different areas of utilization has eased cooperation on the Rhine.

The other economic feature that has been affecting riparian relations in the Nile and Rhine basins is the variation of the economic status of the riparian states. In the Nile basin such variation can be seen from two angles. The first is the economic variation between the upstream and downstream countries. When relatively seen Egypt is more economically powerful than the other upstream countries. Such disparity in economic stance has highly affected the interest over the water utilization among the two streams as there have been varied plans of development. That is why Ato Fekhamed Negash argued that the same economic stance may have lead better cooperation in mutual utilization since their need may have resembled. For instance if all the riparian states have a weak economic stance they may engage in mutual utilization in need of financial cooperation as can be seen from cooperation between Rwanda, DRC and Burundi in Ruzizi II hydropower dam project. However since the Egypt has the necessary capacity to do so, it is not willing to engage in such projects. On the other hand, the existing relatively same

economic status among the upstream countries has created cooperation pattern as they have relatively common interest towards the river. This has further aggravated tension among riparian states as all the upstream countries have the same stand toward utilization and cooperation due to their weak economy while Egypt struggles for keeping its political legitimacy over the river.

In contrast, need or capacity for utilization of the river is not a problem in the Rhine basin. First of all, the riparian countries have relatively the same economic status giving them the capacity to utilize the water as per their need. This has in turn resulted in the engagement of all riparian states in utilization of the River leaving none of them less benefited. Secondly, since water is abundant the need for utilization is not a problem for them rather effects of utilization strain riparian states relations in the basin. Altogether, the effect of economic status and utilization of the rivers have huge impact on the hydropolitics of the riparian states in the Nile and Rhine basins, as it lays a ground for both tension and cooperation.

5.3 Impacts of Political Features on Riparian States Relations

Political features have a huge impact on the hydro-politics of the Rhine and Nile River basins. From the begging, hydro-politics in both basins had been highly affected by the pre 1990s political conflicts. Water related issues were neglected as the riparian states in both basins were engaged in either intra or interstate rivalries. Thus, the concerns of the riparian states were securing stabilities but not water related issues.³²In the Nile basin riparian states particularly those of upstream ones were engaged in intra states conflicts (like that of insurgent movements in Uganda and Sudan) and interstate conflicts (including Ethio-Somali War in 1977, War between Uganda and Tanzania between 1978- 1979, and Ethio-Eriteria wars). Poverty was denied a primary concern where economic development and/or utilization of the River were elapsed. Thus, according to Abebe Aynete, this fact had reduced the potential rivalries between upstream and downstream states.

In the Rhine basin also, the concern of the riparian states were unification as can be seen from Franco-prussiona war (1870- 1871), and securing territorial integrity and furthering their political interests as the First and Second World War wars (1914- 1918/ 1939- 1945) witness. As a result water related problems were ignored. That is why Huisman, etal, (2000: 86- 87), argued that the

³² See under section 3.3 in Chapter 3 and 4.3 in Chapter 4.

increased pollution (particularly between 1950 and 1987) and flood problems at the time had emanated from lack of attention by the riparian countries.

In addition, political instabilities during this time were taken to further water related interests by riparian states, especially Egypt, in the Nile basin further devastating their relations. According to Stebek (2007: 45), “Egypt’s desire to leave no stone unturned that would shake Ethiopia’s political stability and territorial integrity had always been apparent despite seemingly tranquil diplomatic relations and formal statements.” This role of Egyptians has further aggravated the tension and created mistrust among the riparian countries. In the Rhine basin, although not significant, states involvements in other states politics were also seen. But unlike the Nile, in the Rhine basin riparian states used water related problems to further other political interests and involvements were direct interventions. The France and Germany conflict in the Second World War can be taken as the main example where the later used canalization of the river by the former as one of the main reason for attacking the country during the Second World War.

These conflicts had been major obstacles for cooperation since the riparian states consider one another as enemies and as there were unfavorable political system that denies negotiation. For instance, during the Cold War era riparian states were taking sides affecting their integration. In addition, they used to ally with one power as to further their interest affecting the other. This in turn has created competition and mistrust that has traced to present day. For instance, according Fekhamed Negash, though Ethiopia brought different cooperative initiatives among upstream countries during the *Derg* regime, it failed to gain acceptance due to the different ideological stand of the riparian states. The instabilities, according to Verweiji (1999: 357) had also hindered cooperation in the Rhine basin where the categorization and controversies of riparian states along with their various interests had made cooperation unachievable before the 1990s.

The coming of political stability in the Rhine and Nile River basin has laid a better ground for cooperative initiatives. In the Rhine basin, with the coming of stabilities the riparian states start to focus on water quality and quantity problems. Different regional institutions have emerged leading to a better integration and trust among the riparian states. The integration of the riparian states under the EU also has furthered cooperation of riparian states in the basin.

Political stabilities in the Nile basin also have improved upstream countries relations as it has brought alienating poverty as their primary concern. In order to do so, the upstream riparian states in the Nile basin are struggling for securing their right for utilization of the River which has been a main source of cooperation among these states countries recently. That is why Haftendorn (2000: 59) argued that, “with end of inter and intra state conflicts the relationships of the states in the Nile basin is normalizing opening a possibility for future joint cooperation.” This does not mean that political instabilities in the basin have long gone. According to Wondwosen (2008: 38), still different conflicts including conflicts between Ethiopia and Eritrea, Sudan and Eritrea, Uganda and the DRC, Uganda and Sudan have impact on the cooperation initiatives in the Nile basin. However as their occurrence has highly decreased, lowering their impact on cooperation attempts.

In addition, in contrast to the Rhine, cooperation in the Nile basin lacks a basin-wide ground where still political relations between upstream countries and downstream countries is filled with mistrust as the latter fear any initiatives or developments in the former as a threat to their national interest while the upstream countries consider the downstream ones as an obstacle for their development. Thus, basin-wide legal and institutional cooperation have been unachievable. Similarly, Wondwosen (2008: 38) argued that “mutual suspicions and distrusting among the upstream and the downstream countries on water resource development has been a major problem for cooperative initiatives in the basin.”

The current political instabilities in Egypt have added to the tense relations in the Nile basin. Politicians in Egypt are believed to exploit current developments in the basin for gaining legitimacy by their people. All my informants argued that though water utilization has no impact on Egyptians water interest, its leaders are drawing these developments as a danger to the existence of the country so that they can manage to divert their citizens’ attention away from current political problems and to strengthen their power. In addition, promises for avoiding such developments also are being used as a base for gaining power in the current election by some. These trends are highly affecting the current cooperative initiatives and riparian relations in the basin.

But most of all, these instabilities in Egypt may affect its long existing hegemony in the basin. The series regime changes in the country has unable it to take a strong decision regarding the

developments in the basin. In addition, internal stability has taken away the primary concern from water related issues. In line with the current stability, economic development and better riparian states integration in upstream part of the River, this fact may weaken the role of Egypt in the basin. This in turn may bring power balance in the basin which has a capacity to strengthen cooperative initiatives as all riparian countries have the power to secure their interest creating all inclusive and reasonable utilization of the River. According to Sinnona, (2012: 17) “a power balance among riparian states is important in order to have an equilibrium in the defense of interests, so that political frictions evolve in new stabilities based on diplomatic relations, rather than conflicts.” So, the coming of power balance in the basin may solve the long existing tension among the riparian states.

On the other hand, there is no hegemonic power in the Rhine basin with a capacity to influence the developments of other riparian states. Through different times Rhine basin has faced different hegemonic powers. But most of all France and Germany used these statues as instruments for securing their interest. For instance, they were not willing to pay the required financial contribution when cooperative rehabilitations took place and were unwilling to stop bringing harmful developments.³³ So, they used to demand utilization of the river as they want despite its negative effects on other. However, with the coming of resemblance of power such unilateral action ceases to exist, leading better cooperation among the riparian states. Currently, according to Frijters and Leentvarr, 2003: 2- 3, riparian states in the Rhine basin have relatively the same political and military power where one cannot have a significant impact on others. So, Frijters and Leentvarr argue that this has laid aground for cooperation among the riparian states as it bring a fair ground to participate where all states can benefit without any of them being significantly harmed as they have capacity to secure their interest.

The existing variations of institutional development of riparian states in the Rhine and Nile basins also have brought significant variation between the hydropolitics of the two basins. Riparian states in the Rhine basin have strong democratic system while the latter are struggling to bring the same. Though the writer do not argue for the need of replication of this system in the Nile basin, it is clear that from the comparison of the cases this system has highly contributed for the existing cooperation in former while absence of favorable political system has affected

³³ See under section 4.4 in Chapter 4.

cooperation initiatives in the later. According to Frijters and Leentvarr, the existing democratic system in all riparian states has able the riparian states to lay a strong ground for negotiation and has reduced the potential conflict among them. Most of all, it has avoided potential intrastate instabilities, rather laid fertile ground for the current stable political environment in the basin.

On the other hand, according to Wondwosen (2008: 37) lack of favorable political environment, where the riparian states lacks strong political institution and are engaged in different instabilities has highly affected their relations. For instance recent developments in Egypt and South Sudan have denied the establishment of effective political institutions that have ability to influence water related issues of the basin. In addition, the other riparian states are not free from internal instabilities or controversies. So, water related problems in Rhine basin have a chance to solve easily compared to the Nile basin.

In addition, water related issues are traced to all levels of government in the Rhine basin. This in turn has facilitated the implementation of decisions and legal instruments, and information exchange. The political system also laid a favorable ground for civil society participation. In the Rhine not only organized bodies/ NGOs have the chance to participate on water related issues, but the societies residing in the basin also have a huge role. Their role is not limited to participation but extend to influencing decision and raising issues that can be taken into consideration. This is what developments after the Sandoz incident and the 1993 and 1995 flood incidents witness. In addition to such influence these organizations also have further power as they influence government decisions through engaging in parties like that of the Green party. In other words, water related issues have become a basin-wide matter in Rhine basin gaining the concern of all, and at all level. The assumption that the River belongs to all riparian states and societies has highly developed. Thus, they all engaged in protecting, and implementing water related decisions effectively easing cooperation in the basin as it creates strong riparian states relations at all level.

The Nile basin on the other hand lacks any effective none governmental actors participations. Water related issues under this basin are considered as governmental matters only. This in turn has affected the effectiveness of cooperative initiatives especially that of institutional initiatives in the basin. According to Sinnona (2012: 17), “an institutional initiative always requires public support and civil society control to be able to work in the long term”. He further argued that

“Cooperation among stakeholders and civil society organizations has positive spillovers both on water management and on regional security, it opens the idea of a win-win relation, through sharing of common benefits, and it averts the seeds of discord.” So, the need to establish effective public participation is important as to create effective river basin management in the Nile.

When deeply seen in both cases, it is understandable that the role of politics is huge compared to other factors discussed before. For instance with the achievement of stability, effective democratic system and strong civil society participation, almost every patterns of tension have changed in the Rhine basin towards cooperation. Political stabilities after 2000 have also improved riparian states relations among upstream states in the Nile basin.

In addition, though scarcity is presented as the main problem in the Nile basin, huge effect of political features than scarcity on hydropolitics of the basin is observed. First one must ask that is water not enough for the basin countries. All of my informants argued that water in the area is enough not only for now but even for the next generations if used properly. The deputy ambassador of Egypt also shared this stand in his speech on May 14, 2014.³⁴ So, the major source of tension in the basin is politics where the downstream states struggles to secure their long existing hegemony over the River while the upstream countries strives to secure their right for equitable utilization. The researcher believes that the upstream states question is clearly economy; the need to utilize the River for changing their current economical reality. However, interest of downstream states trace to politics, in line with economical questions of course, as they struggling to secure their hegemony in the basin and using it for gaining legitimacy in their country. Developments on the River mean neglecting their long existing hegemony over the River. In addition, such developments may bring a new power in the area which will challenge their hegemony. Thus, according to Yacob (2014), the unwillingness of Egyptians, and Sudanese for change in the region and the current movements of upstream countries for utilization of the River and for securing their rights through legal and institutional initiatives lies at the heart of the tension making politics the primary/major factor that is guiding the riparian relations in the Nile

³⁴ Taken from the deputy ambassador’s speech in the Panel discussion on the prospects and challenges of the CFA, on May 14, 2014 in Addis Ababa Ethiopia.

basin. Generally, politics is the main factor behind tension and cooperation initiatives in both basins.

5.4 Tension and Cooperative Initiatives

Water resources have been both sources of tension and cooperation in the Nile and Rhine River basins. Tension is not a recent phenomenon in both basins rather it has long existed. However, sources and degrees of tension vary in the two basins. In the Rhine basin the strain mainly emanates from flood problems and degraded water quality while in the Nile basin tension is related to equitable utilization of the Nile.

The degree of the involvement of riparian states in water related issues in the Nile and Rhine basins varies according to riparian states' interest over these resources. In the case of the Nile, upstream states, except Ethiopia, have no strong interests on the River as they have the necessary alternative resources leaving Egypt, Ethiopia, and Sudan as the main contenders in the basin. In case of the Rhine, the Netherlands, as being the main victim of water quality or quantity related problems, has always engaged in controversies with other riparian states, especially with France and Germany whose dense industries and the structural change they took over the River have furthered pollution and flood problems in the basin.

Unilateral developments in both basins have further aggravated the tensions. In the Nile basin such developments are common where one can see different projects including Aswan High dam, Bujagali Hydro Power dam, and GERD. This development indicates competition and lack of consideration for mutual and equitable utilization among the riparian states. In addition, since they are done without cooperatively analyzing their impacts on other countries' interest, these developments are taken as a threat among the riparian states. Thus, according to Batish (2011: 4) unilateral developments are very risky that are intensifying riparian relations in the basin. Lemma (as cited in Shema, 2009: 27) further argues that "unilateral developments on the Nile will be a recipe for conflict over the utilization of the Nile water."

On the other hand, in case of the Rhine basin, unilateral developments have highly affected the ecology of the basin resulting severe natural problems including the extinction of different species and increased flood patterns. For instance according to Frijters and Leentvarr, (2003: 23- 24), despite the existing treaties riparian states, especially Netherlands, engaged in promoting

their interest in navigation and hydropower highly affecting the ecology of the basin. This has further complicated riparian relations in the basin. Environmental effects of unilateral developments also can be seen in the Nile but their impact in the controversies is very low.

Variation in area of tension brought variation in ability of solving the problems in the Nile and Rhine River basins. Water related problems in the Rhine basin, though related to natural flood problems, are mainly aggravated by manmade changes in the regime of the River and effects on water quality. This means that the problems can be solved through restoring the natural balance of the basin as the countries are striving to do so currently. For instance, according to ICPR (2014: 2), current tension in the Rhine basin mainly emanates from previous developments on the River by riparian countries including restructuring the River and extensive pollution forcing the riparian countries to focus on water quality and ecosystem improvement, and flood prevention.

On the other hand, water problems in the Nile basin are related to scarcity of water limiting available solutions. According to Haftendorn (2000: 57) “problems emanated from scarce nature of water resources highly limiting the available solutions as the use of financial resources as a bargaining chip is limited unlike pollution related water problems and as one cannot sell a resource that one does not have an abundance of.” Thus, managing water related problems is difficult in the Nile basin than the Rhine basin.

As a result, tension is stronger in the Nile than the Rhine basin. The current developments in the basin including population growth, environmental degradation and constructions over the River in upstream part of the basin have heightened the tension among the riparian countries. In opposite, a relatively stable environment is observed in the Rhine basin with better river basin management.

In response to the different controversies the riparian states in Nile and Rhine basins have established different legal and institutional frameworks. However, the road they walk through and the degree of effectiveness varies. In the case of the Rhine, cooperation initiatives have a long standing where one can find the longest institutional initiatives (like the CCNR) and one of the longest legal frameworks (ex. the 1449 Strasbourg regulation) in the basin. Although, initiated by few (downstream states mainly), these developments were aimed for the whole basin

(cooperating almost all states), and attempted to solve the problems of all. As a result they have been able to bring up a strong cooperation in the basin.

In opposite, though initiatives for cooperation also trace back for long in the Nile, such attempts were taken by downstream countries as an instrument for securing their interest on the River. According to Yacob (2007: 13) this interest of the downstream countries affected the role of these institutions becoming the driving factor for the failure of basin-wide cooperative institutions before 1999. Most of all, they were not basin-wide efforts rather were the integration of few states. Basin-wide cooperative initiatives are young in the Nile basin as they have risen recently.

The long existence of basin-wide cooperation initiatives in the Rhine basin has laid a fertile ground for effective river basin management. First, it has contributed for the proliferation of various well structured institutions and legal instruments that focus over different water related issues. This has created a vast forum for negotiation where states have many opportunities to deal with their problems. Most of all, these initiatives have been effective especially after 1990s improving integration and trust among the riparian states. Thus, these initiatives have highly improved riparian states willingness to compromise during negotiations and decisions.

In contrast, riparian states in the Nile basin lack the necessary effective institutional and legal frameworks. Although manage to establish different instruments including the NBI and the CFA, they lack to have a basin-wide acceptance. Especially, according to Wondwosen (2008: 37) lack of basin-wide agreement has been a major factor that has been hindering cooperation in the basin. In addition, the young existence of cooperation initiatives in the Nile basin has highly affects their roles as effective outcomes and trust among the riparian states that comes with effectiveness of the institutions takes time.

In addition, in contrast to the Rhine basin the existing mistrust among the riparian states, especially between Ethiopia and Egypt have strained the effectiveness of current cooperative initiatives as the riparian countries fear to compromise during negotiation for basin-wide agreements. There is fear of getting hurt from any development in the area making basin-wide institutional and legal cooperation unattainable. For instance, Oestigaard (2010: 11), Egypt is not willing to compromise or let go the previous legal agreements or to engage in new commitment

regarding to equitable water utilization as it fear such change may affect its national interest in the future. This environment resembles the controversies between the riparian states in the Rhine basin during 1960 – the beginning of 1990s where the riparian states were not willing to accept or compromise any water related interest of them in fear of their impacts on their economical interest.³⁵ So, the need to compromise, particularly by downstream states to the extent that does not bring them any significant harm is very necessary to bring cooperation in the area.

Current developments, however, seem to change the controversies in the basin as can be seen from the growing alliance of Sudan with upstream countries. This fact in turn may avoid the long existing categorization, which has been a huge problem, and may bring a basin-wide agreement in the area. This may left Egypt alone without significant power of influence against the upstream countries. In addition the acceptance of the cooperative initiatives by majority of the riparian states is also strengthening river basin management in the basin.

Unlike the Rhine, the existing cooperative initiatives in the Nile basin consider varied issues at the same time. On one hand, it has been a huge barrier for basin-wide cooperation in the Nile as rejection in one part of the CFA (Article 14) resulted in the rejection of it by Egypt and Sudan.³⁶ If it has been a specific issue, however, other issues like that of agreement on the environment may have gained acceptances.

On the other hand, this fact has benefited the riparian states, since signing of the agreement (the CFA) by majority of the riparian states indicates having accord in different areas avoiding further negotiations.

Generally, the existence of cooperation overrides tension in both basins, particularly gaining a strong stand in the Rhine, though tension is a huge challenge in the Nile basin.

Altogether, there is difference with limited similarity between the hydropolitics of the Nile and Rhine River basins. Variations in geographical, economical and political features between the two basins have brought the variation in their hydropolitics. Geographically, location of large numbers of states in upstream countries in the former and favorable flow of the river for navigation in the latter has initiated cooperation initiatives in both basins. On the other hand,

³⁵ See under section 4.4 in Chapter Four.

³⁶ See under section 3.5.2.2 in Chapter Three.

scarcity problems in the Nile and natural flood problems in the Rhine have been source of tension among the riparian states. The developed economies of the riparian states in the Rhine basin have contributed for better cooperation among the riparian states of the basin as it avoids the need for plenty of water and improved the capacity of the states to deal with water related problems. Most of all, the existing favorable political environment and strong cooperative initiatives in the Rhine contributed for better management of the river basin. As a result in the Rhine basin there is a better river basin management than the Nile.

Chapter Six: Conclusion

Hydropolitics of the Nile and the Rhine is varied, with limited similarities. This variation emerges from the existence of difference with respect to geographical, socio economic, political and legal/institutional features in the two basins. In the case of the Rhine River basin, the riparian countries have a developed economic integration, and a relatively better political stability. The geography provided the basis for the improved riparian integration among the Rhine riparian states, as the river has a favorable flow for navigation. Rhine is a main source of transportation in the basin becoming a huge opportunity for collaboration of the riparian states. On the other hand, the weak and agricultural economy, scarcity of water and relatively less favorable political arena has hindered riparian states' cooperation in the Nile basin. Rather, these features have contributed for the existing controversies among the riparian states in the Nile basin.

The better river basin management of the Rhine River can be best understood through the existing effective institutional and legal initiatives, while the weak river basin management in the Nile can be seen from continued rivalries among upstream and downstream countries (especially between Egypt and Ethiopia) over utilization of Nile water. For instance, the recent tension between Egypt and Ethiopia emanated from the recent developments on the Nile, and the lack of basin-wide legal institution.

The variation in basin-wide cooperative initiatives in turn has created a different capacity of handling tensions related to water resources in the Rhine and Nile basins. Tensions exist in both basins but the area and the degree of tension are different. In the Nile basin tension is mainly related to political and economic interests of riparian countries who struggle to secure utilization of the water. On the other hand, the downstream states have been unwilling to let go their long existing hegemony over the water of the Nile. The main source of tension in the Rhine basin is related especially to flood problems that are aggravated by climate and manmade changes on the river regime. From the comparison it is understood that the tensions are better handled by Rhine riparian states than the Nile ones due to the existence of institutional cooperative frameworks and developed economic capacity of the riparian states. The riparian states of the Rhine basin are in a better situation for effective negotiations and collaboration in face of problems which may arise at present or in the future.

This does not, however, mean that problems are long gone in the Rhine basin. Tensions over pollution and flood management have sustained despite many efforts. Especially, lack of environmentally friendly utilization has continued in creating a problem towards water quality and quantity. The Nile has an advantage in this regard as the upstream countries have mostly been and are planning to utilize the river in a better manner that does not affect the environment significantly as they focus mainly on hydropower. This positively contributes for the environment significantly as it protects the environment, water quality, and quantity. This, in turn, can be seen as an opportunity for future cooperation in the Nile basin.

Despite their differences, what has been observed from the Nile and Rhine basins is the existence of prospects for more cooperation. In the Rhine basin, cooperation has existed for quite a long time though it's not without limitations. They have been trying to strengthen institutional mechanisms for avoiding current problems and for achieving sustainable developments through creating common projects and frameworks. Riparian states of the Nile also have been struggling to bring cooperative initiatives and they have been successful to some extent in negotiating their interest. The signing of the CFA in 2010/2011 by majority of the riparian states is the main witness for this success. In spite of Egypt's unwillingness to cooperate with upstream countries, the momentum of basin-wide initiative is irreversible. So, while the tension still lingers, cooperation is coming out in an immense way in this basin.

From studying the hydropolitical circumstance of the Nile and Rhine basins, it can be observed that cooperation is the only way out for achieving development, stability and better river basin management in international trans-boundary river basins. So, the need for establishing basin-wide legal and institutional initiatives is enormous and highly recommended. In addition utilization of rivers in an environmentally friendly way is significant as to avoid current and/or future controversies over international river basins and for better and effective cooperation among riparian states.

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Appendix 1: List of Key Informants

Ato Abebe Aynete, researcher in Ethiopian International Institute for Peace and Development, interviewed at Ethiopian International Institute for Peace and Development on April 20, 2014.

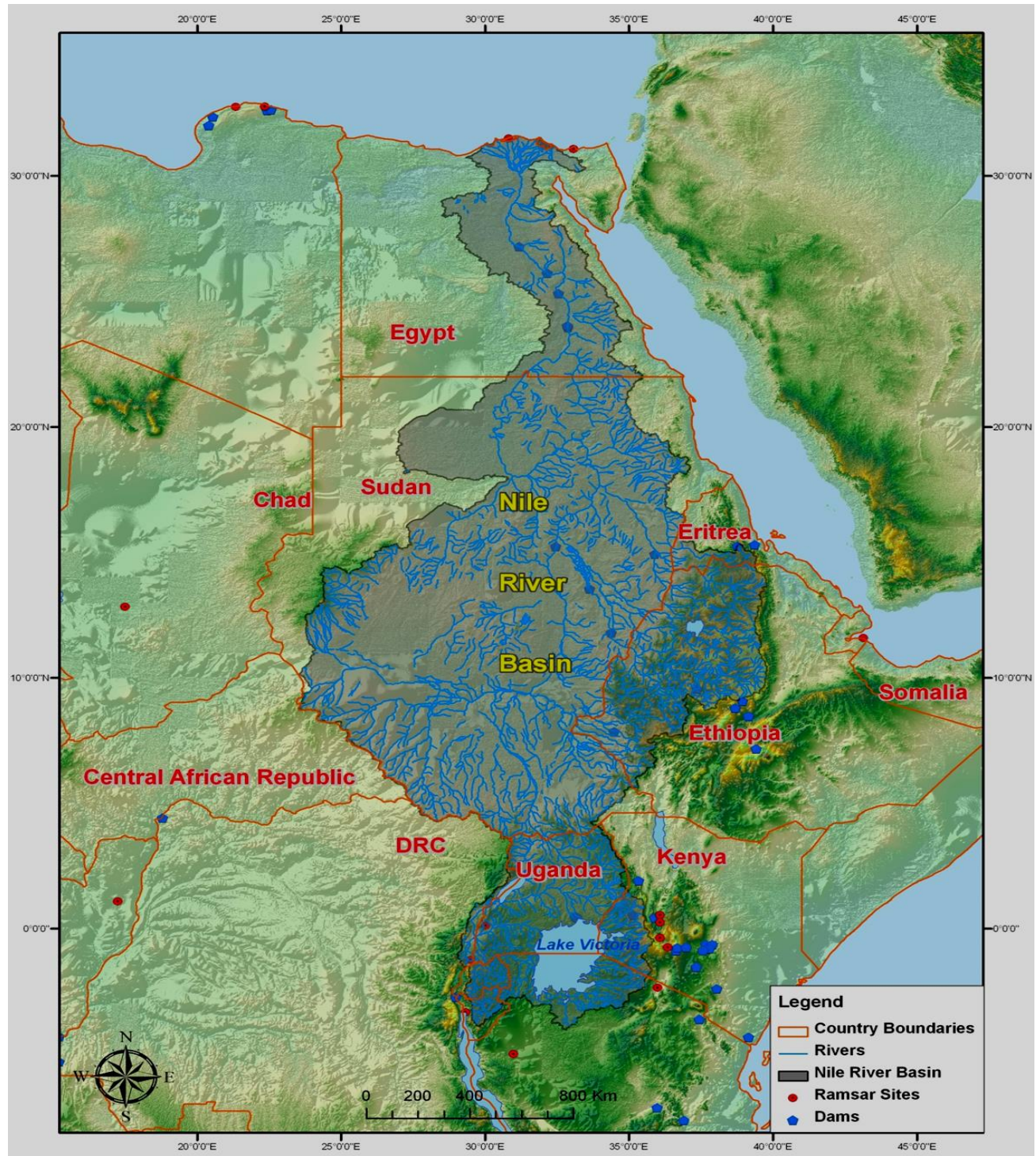
Ato Fekahemed Negash, director of transboundary waters in Ethiopian Ministry of Water, Energy and Irrigation, interviewed at the Ethiopian Ministry of Water, Energy and Irrigation on April 19, 2014.

Ato Zerubabel Getachew, an International Relations Expert in Ministry of Foreign Affairs of Ethiopia, interviewed at Ministry of Foreign Affairs of Ethiopia on April 21, 2014.

Appendix 2: List of questions passed to authorities for interviews

1. Is there a critical scarcity of water in the basin? Is water enough for the countries' need?
2. How the long existing weak economy does affect the riparian states relations?
3. What kind of strain and opportunities are brought by the existing relative variation in economic development, between upstream and downstream countries for cooperation attempts in the basin?
4. What is the effect of current economic development of upstream countries on the riparian relations?
5. What is the effect of the long existing instability in the basin on the riparian relations?
6. How fragmentations of countries influence riparian relation in the basin?
7. What will be the effect of the coming in to existence of South Sudan?
8. What is the effect of current instability in Egypt for the negotiations taking place in the basin in one hand and Ethiopia's current development on the river on the other?
9. What changes does the relatively stable political environment in upstream countries brought?
10. What are the benefits and effects of GERD for the riparian countries?
11. What is the reason behind Egyptians unwillingness to accept new development in the basin? Is it fear of reduction in water volume or unwillingness to let go the long existing hegemony?
12. What do you think of Sudan's movement towards cooperation in the basin and its effect on Egypt?
13. Do you value the NBI as a successful initiative?
14. Can the CFA change the existing reality?

Appendix 3: The Nile River Basin



Source: <http://entroportal.nilebasin.org/OSIKit/Lists/Basin%20Definition/AllItems.aspx>,
Accessed 2, 5, 2014

Source: Adonia, 2010: 2.



Appendix 4: The Rhine River Basin

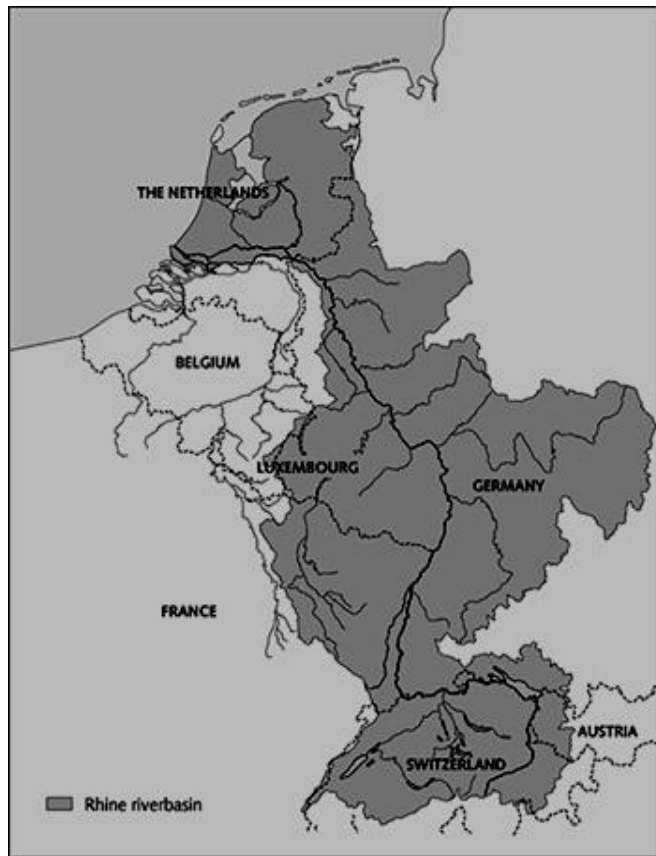


Figure 1. The river basin of the Rhine.



A.

B.

Source: A. D. Frijters and Jan Leentvaar, 2003: 2.

B. <http://geography.howstuffworks.com/europe/the-rhine.htm>, Accessed 5, 2, 2014.

The Rhine River



Source: Mandy Barrow, 2014, River Rhine, <http://www.mandybarrow.com>, Accessed 2, 5, 2014.

DECLARATION

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

Yeshihareg Abebe

June 2014

This thesis is submitted for examination with my approval as an advisor of the candidate.

Dr. Yacob Arsano

June 2014