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Egyptian-Ethiopian water relations: A benefit sharing perspective

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EGYPTIAN-ETHIOPIAN WATER RELATIONS: A BENEFIT SHARING PERSEPCTIVE

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“ But the water problems of our world need not be only a cause of tension; they can also be a catalyst for cooperation...If we work together, a secure and sustainable future can be ours“ Kofi Annan, February 2002

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ABSTRACT

The aim of this research is to examine the Egyptian-Ethiopian water relations especially over the question of the Grand Renaissance Dam (GERD). The research theoretically and empirically investigates the possibilities of conflict and cooperation in the future of the Egyptian-Ethiopian water relations. The research then highlights the main incentives and deterrents to water cooperation between Egypt and Ethiopia. Given the magnitude of untapped benefits that could be achieved from cooperation, the research explores the viability of the *benefit-sharing* model as a tool for reinforcing sustainable cooperation in the Blue Nile Sub-basin. As benefit-sharing is not a novel concept to the Nile Basin countries, the research highlights the key milestones achieved in this direction and the main challenges encountered. The GERD has been promoted as a benefit-sharing project that carries benefits to Ethiopia and other Nile Basin states and thus this study looks at potential costs and benefits of this project and draws conclusions accordingly. The research finally puts forward the idea of cooperation beyond the Nile File as a much-needed step to transcend long-standing water sharing issues that have hampered previous cooperation attempts for long years. The research argues that the current issue of the GERD needs to be allocated within a broader framework in order to create a wider room for negotiation and trade-offs. The methodology of this study depends on qualitative tools of analysis and uses secondary sources for data collection. This study is significant because the GERD project is creating controversy in the Blue Nile Sub-basin due to the uncertainties and anxieties around its implications on the downstream Nile states, especially Egypt. Since the GERD project is a fait accompli, there needs to be a visualization of future water relations between Egypt and Ethiopia. In order to find a way out of this stalemate, the two countries need to think of win-win solutions that cause no harm to any party involved by looking into different cooperation opportunities.

List of Acronyms and Abbreviations

AHD: Aswan High Dam

BAR: Basins at Risk

CFA: Cooperative Framework Agreement

COMESA: The Common Market for East and Southern Africa

DoP: Declaration of Principles

ENSAP: The Eastern Nile River Basin Subsidiary Action Program

ENTRO: The Eastern Nile Technical Regional Office

FHH: Framework of Hydro-hegemony

GERD: Grand Ethiopian Renaissance Dam

Hydromet: Hydro-Meteorological Survey of the Equatorial Lakes

IPoE: International Panel of Experts

JMP: Joint Multipurpose Program

NBI: Nile Basin Initiative

NELSAP: The Nile Equatorial Lakes Subsidiary Action Program

NELSAP-CU: The Nile Equatorial Lakes Coordination Unit

Nile-COM: Nile Council of Ministers of water affairs

Nile-SEC: Nile Secretariat Office

Nile-TAC: Nile Technical Advisory Committee

SAP: Subsidiary Action Programs

SDBS: Socio-economic Development and Benefit Sharing

SVP: Shared Vision Program

TWINS: Transboundary Waters Interaction Nexus

TWO: Transboundary Water Opportunity

UNDP: United Nations Development Program

WEIS: Water Event Intensity Scale

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Chapter 1

1.1: Introduction

There are over 286 transboundary basins shared by 151 countries around the world (Cuppari, 2017, p. 1). Management and distribution of shared transboundary waters has always remained a highly contentious issue on the regional and international level. Thus, sustainable and equitable management of the transboundary water resources present a top-priority issue for co-riparian states to avoid conflicts and boost cooperation.

In Africa, with the exception of island states, every country has territory in at least one transboundary river basin (Awulachew et al, 2008, p. 1). There are around 80 major transboundary rivers and lakes in Africa which cover nearly 62% of the continent's total territory (Ibid, p. 2). Some of the African river basins are shared by as many as eleven states such as the case of the Nile River Basin (Ibid). The Nile River Basin includes eleven states, namely Burundi, Democratic Republic of Congo, Egypt, Eritrea, Ethiopia, Kenya, Rwanda, Sudan, South Sudan, Tanzania, and Uganda. While the upstream states geographically control the Nile water sources, downstream countries (Egypt and Sudan) have enjoyed an uninterrupted flow of the Nile waters.

Egypt, Ethiopia, Sudan, South Sudan and a small part of Eritrea form the Eastern Nile Sub-basin (ENTRO, 2016). As per the 1929 and the 1959 Nile historical treaties, Egypt and Sudan get an annual water share of 55.5 and 18.5 billion m3 respectively. Based on Egypt's quota of the Nile waters, the country has been described as a *hydro-hegemon* (Zeitoun and Warner, 2006; Ana Cascão, 2008). Upstream states (especially Ethiopia) have never considered themselves bound by the provisions of the 1929 and the 1959 water treaties. Despite that

objection, upstream states had not taken any serious steps to challenge the status quo due to different political and economic constraints that had occupied their agendas for years.

Despite Egypt's large share of the Nile waters (55.5 billion m3), the country is in fact the most vulnerable when it comes to water security due to its limited water resources, high population growth and mounting economic needs. Egypt receives the least rainfall of any Nile Basin country and is almost solely dependent on the Nile waters (Hassan & Al Rasheedy, 2011, p. 133). Around 97 percent of Egypt's water needs comes from the Nile (Nunzio, 2013, p. 4), and almost 10% of Egypt's electricity generation is produced from the Aswan Dam alone (Ibid, p.2).

Ethiopia, on the other hand, provides around 86 per cent of the Nile water sources that descends from its 'water tower' highlands. The country has 12 river basins with an annual runoff volume of 122 billion m3 of water (Awulachew et al, 2007, p. 4). In addition, it has around 2.6-6.5 billion m3 of ground water potential (Ibid). Due to the lack of proper water management strategies, Ethiopia has suffered for long years from severe drought that resulted in a huge humanitarian crisis (Kimenyi & Mbaku, 2015, p. 98).

Lately, arising issues such as climate change, new economic and development pressures, high population growth and declining water resources have impelled upstream Nile countries to demand renegotiating their shares of the Nile waters. The unilateral signing of the Cooperative Framework Agreement (CFA) has been the spark that ignited old tensions between upstream and downstream Nile riparians, more particularly between Egypt and Ethiopia. Both Egypt and Sudan had reservations about certain provisions that address the redistribution of the

water shares, particularly with Article 14 of the agreement (Al-Ahram, 2015). Article 14 addresses the rights and the obligations of the Nile riparians towards each other's water security (Ibid). Hence, the two countries refused to sign the CFA agreement, whereas Ethiopia, Kenya, Rwanda, Tanzania and Uganda unilaterally signed it in 2010 and Burundi in 2011 (Leb & Wouters, 2013, p. 37).

Following the disagreement over the CFA, a series of pivotal events unfolded in the region including the Arab Spring period and the new political landscape that has followed it. Additionally, the formation of the newest basin state, South Sudan, has caused a number of profound changes in the region on many different levels. Amidst that political turmoil, the Ethiopian government announced the construction of the Grand Ethiopian Renaissance Dam (GERD) and its large reservoir in 2011. Since the announcement of the GERD project, the Egyptian-Ethiopian relations have been deteriorating over the question of the dam. The Egyptian government has been extremely concerned that this project might affect Egypt's share of the waters that come from the Blue Nile and could eventually escalate to a serious water security issue.

Egypt's major concern is the GERD filling strategy, especially the first filling plan which will considerably decrease Egypt's share from the Nile waters depending on its duration (ElNashar & Elyamany, 2017, p. 1). Until now, Egypt and Ethiopia have not agreed upon a final filling strategy that guarantees sufficient water flows to Egypt especially during the periods of prolonged drought (International Non-Partisan Group, 2014, p. 4). At this advanced phase of the GERD project, the two countries need to reach a quick agreement on the technical operations of the dam and the reservoir (Arab News, 2017).

Despite the ups and downs in the GERD discourse, in March 2015 Egypt has signed the Declaration of Principles (DoP) with Ethiopia and Sudan in which Egypt publicly declared its preliminary acceptance of the Grand Ethiopian Renaissance Dam in accordance to the principles stipulated in that agreement (Salman, 2017, p. 204). The DoP is viewed as a significant milestone in building cooperation between Egypt and Ethiopia after four years of continuous tensions (Al-Ahram, 2015). However, it has been criticized it for lacking any binding force (Arab News, 2017).

Many reasons drove Egypt in the DoP direction. Firstly, the construction of the dam was already in a very advanced stage, and had clearly become a *fait accompli* (Salman, 2017, p. 204). Secondly, most regional and international allies to Egypt either endorsed the GERD project, or have remained silent about the issue (Ibid). Even Sudan, one of Egypt's closest regional allies, recently declared its support to the GERD project (Ibid). Moreover, Egypt currently faces many internal threats such as the rising trend of water overuse, the rapid population growth, and the current economic plight that necessitate smooth coordination and cooperation with its riparian neighbors. The United Nations warn that Egypt could run out of water by 2025 (Nunzio, 2013, p. 4).

It's noteworthy that Egypt and Ethiopia share a long history of both conflict and cooperation. Despite their divergent water interests, the two countries have managed to achieve bilateral and multilateral cooperation on and beyond the Nile River. Although the two countries have not reached an effective cooperative framework, they have managed to contain their conflicts, so that they maintain their good neighborly relations for long years.

Given the aforementioned background, the Nile River is thus perceived to be a driver for either *contest* or *consent* between Egypt and Ethiopia. The ups and downs in the history of hydro-relations between Egypt and Ethiopia raise many questions marks over the future of the hydro politics of the Blue Nile especially upon the GERD completion.

Hence, this research shall thoroughly analyze potential opportunities for reinforcing water cooperation between Egypt and Ethiopia. It shall highlight some background information that explain the history of hydro-relations between Egypt and Ethiopia including significant water treaties and initiatives. It will also shed the light on some existing theories and paradigms that have been commonly repeated in different research work that concern the management of transboundary river basins. A conceptual framework of benefit-sharing will be applied in to order to examine its relevance and viability to achieve cooperation *on* and *beyond* the Nile River.

1.2: Research Questions

Throughout this study, the researcher aims to find answers to the research questions in the literature review section and the subsequent chapters. The main research question is:

- **To what extent does the benefit-sharing model reinforce effective cooperation between Egypt and Ethiopia?**

Supportive questions are:

- What are the main water issues between Egypt and Ethiopia?
- What are the previous applications of the benefit-sharing model in the Nile Basin?
- What are the shared benefits that the GERD project can bring to Egypt and Ethiopia?
- What are the areas of cooperation between Egypt and Ethiopia beyond the Nile File?

1.3: Background

The Nile River, considered to be the longest watercourse in the world, crosses the borders of eleven states: Burundi, Democratic Republic of Congo, Egypt, Ethiopia, Eritrea, Kenya, Rwanda, South Sudan, Sudan, Tanzania and Uganda (Swain, 2014, p. 675). The Nile represents a major source of livelihood to its eleven basin states which depend on it for different purposes including irrigation, hydropower generation, navigation and transportation (Ibid).

The overall volume of the Nile's annual water flow is about 84 billion cubic meters (Nunzio, 2013, p. 2). It has two main tributaries: The White Nile which originates from Burundi and the Blue Nile which descends from the Ethiopian 'water tower' highlands (Swain, 2014, p. 675). The Nile Basin itself is divided into several sub-basins. Egypt, Ethiopia, Sudan, South Sudan and a small part of Eritrea lie in the Eastern Nile Sub Basin (ENTRO, 2016). The Eastern Nile Sub Basin covers an area of 2,695,300 km2 and is sub divided into other sub basins: main Nile (44 %), the Baro-Akobo-Sobat and White Nile (26 %), the Abbay/Blue Nile (17 %) and the Tekeze-Atbara (13%) (Ibid)

1.3.1: Egypt's Water Profile

Egypt is the furthest downstream Nile riparian state. The country depends on the Nile River to supply around 97% of its freshwater needs (Azarva, 2012, p. 461). As stipulated in the 1929 and the 1959 water treaties, Egypt's total share of the Nile waters is 55.5 billion m3/year which mainly comes from the Blue Nile and the rest of it comes from the White Nile (Kimenyi

& Mbaku, 2015). Other noteworthy sources of water include groundwater, treated water[1] and desalinated sea water (Salim, 2012, p. 12). Egypt has two groundwater aquifers: one in the Nile Basin and the other one is in the Western Desert (Azarva, 2012, p. 462). The groundwater in the Western Desert reservoir is a nonrenewable source and requires a massive budget for its extraction (Ibid). Egypt is considered to be the driest country in Africa as it only receives a total of 51mm of rainfall per year and the southern parts of the country almost receives no share of rainfall as only 10 mm may fall once every ten years (Ibid, p. 461).

The current population of Egypt is 97 million with 2.5% growth rate per year (CIA, 2017) and is expected to rise to 140 million by 2050 (Nunzio, 2013, p. 4). As the population increases, the demand for fresh water sources increases to supply its needs for agriculture, industry, electricity production and domestic use. With Egypt's rapid population growth, the per capita water availability is expected to reach 500 m3/year, which means 'absolute scarcity', by the year 2025 (Hefny & Amer, 2004, p. 43). Therefore, securing an interrupted flow of the Nile Waters is a top-priority issue for Egypt.

1.3.2: Ethiopia's Water Profile

Ethiopia is the most upstream Nile Riparian state. The country has 12 major river basins, with an annual flow of approximately 122 billion m3 of water (Noel et al, 2007, p. 15). Ethiopia's water resources are mostly concentrated in the western part of the country which is inhabited by only 33% of the population, while the rest of the population (67%) reside in the

[1] Treated water should not be counted as a percentage of Egypt's total share of water because it is a reused source (Salim, 2012, p. 12).

eastern part and live off 11% of the surface water resources (Ibid). A large portion of the surface water flow of Ethiopia feeds into downstream countries (Ibid). The Ethiopian 'water tower' highlands alone provide 86 per cent of the total water of the Nile, distributed as: the Abay Blue Nile (59%), Sobat (14%), and Atbara Black Nile (13%) (Swain, 2014, p. 675).

Another important water resource in Ethiopia is the annual rainfall. It is estimated that Ethiopia annually receives an average of 850 mm rainfall (Noel et al, 2007, p. 14). The western side of Ethiopia receives a unimodal rainfall that starts in February/March and ends in October/November (Ibid). Whereas the eastern parts have bimodal rainfall seasons, with one major and one minor season (Ibid). Major portion of the rainfall waters (around 60%) is consumed in savannah and grassland types of land and around 13% is diverted into river and lakes flows (Ibid).

Due to the uneven distribution of Ethiopia's surface and rainfall water resources, groundwater resources become a critical water resource due to its abundance throughout the country (Noel et al, 2007, p.15). It is estimated that Ethiopia has groundwater potential of 2.6 billion m3/year that are mismanaged and poorly developed (Ibid). Different studies, including one developed by *G. Hailemichael* in May 2004, have shown that the development of groundwater is the ultimate solution to save Ethiopia from any water scarcity threats that are projected to arise in the near future (Ibid).

Ethiopia is a country with high population that grows with annual rate of 2.9% (CIA, 2017). Despite Ethiopia's multiple water resources, the country has suffered for long years from severe drought that resulted in a huge humanitarian crisis (Kimenyi & Mbaku, 2015, p.

98). In order to alleviate poverty and boost economic development, Ethiopia has started planning several new water projects on the Nile including the Grand Ethiopian Renaissance Dam (Kimenyi & Mbaku, 2015, p. 98).

1.3.3: The Grand Ethiopian Renaissance Dam (GERD)

The idea of establishing the GERD dates back to the 1950s and its construction site was initially planned by the US Bureau of Reclamation (Madani & Islam, 2017, p. 257). It is located on the Blue Nile River, around 20 km from the Ethiopian-Sudanese border (IPoE report, 2013, p. 7). Only in years 2009 and 2010, the Ethiopian government started to review the studies of the GERD project for implementation (Madani & Islam, 2017, p. 257).

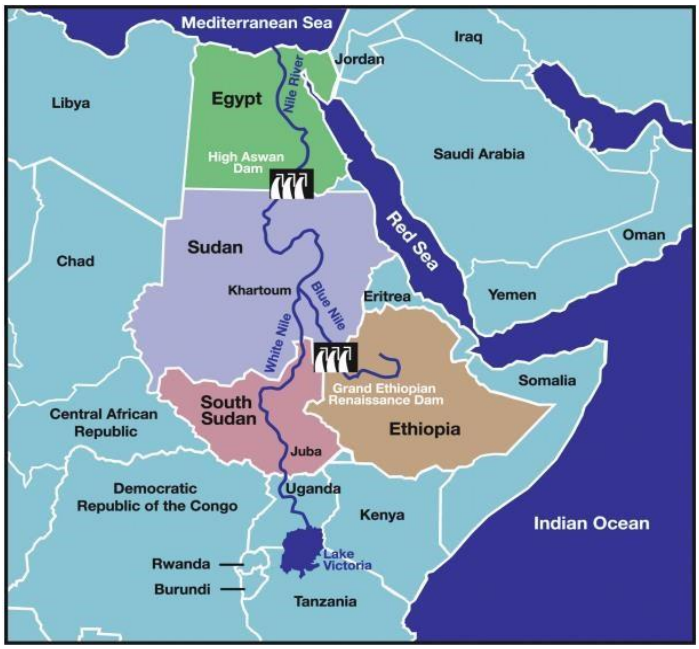
The GERD is part of the 'larger Millennium' Project led by the Ethiopian Revolutionary Democratic Front that came into power in 1991 with a vision to build a democratic system and unite the whole society around a shared goal (Abdelhady et al, 2015, p. 74). As such, the GERD symbolizes national unity by bringing together more than 80 ethno-linguistic groups (Ibid).

In 2011, the public announcement of the GERD project had resulted in a lot of controversy over the water security of the downstream countries especially Egypt.
The construction budget of the GERD is 4.2 billion USD (Upadhyay & Gaudel, 2017, p. 19). China funds around 30 percent of the project and the rest of the budget is managed by the Ethiopian government through selling treasury bonds, deducting salaries of the state employees and collecting donations, both inside and outside Ethiopia (Abdelhady et al, 2015, p. 74).

The dam itself is of 145 meters height and its reservoir covers an area of 1,874 square kilometers with a storage capacity of 74 billion cubic meters (IPoE report, 2013, p. 7). As per the pronouncements of the Ethiopian Government, the main objective of the dam is hydropower generation with a capacity to produce 15,692 GWh of electricity annually (Upadhyay & Gaudel, 2017, p. 19).

Currently, there is an ongoing debate between Egypt and Ethiopia over the dam's filling strategy. Ethiopia has specified two filling phases: the first filling and the complete filling (Arab News, 2017). The first filling phase is the period during which the reservoir reaches a certain capacity, so that the dam should start generating power (Ibid). Whereas the complete filling is the phase where the dam reservoir reaches its full capacity (74 billion cubic meters) (Ibid).

Figure 1: Grand Ethiopian Renaissance Dam (GERD)



Source: Adopted from Habteyes et al, 2015, p. 1238

1.3.4: Historic Nile Treaties and Agreements which include Egypt and Ethiopia (in chronological order)

The Pre-Egyptian independence Nile treaties (1891, 1902, and 1906 treaties)

Under the British colonial rule, the Egyptian hydropolitics and all other external matters were primarily managed by Britain (Hassan & Al Rasheedy, 2007, p. 33). Same case applied to other African countries in the Nile River basin that were also colonized by other foreign powers such as Italy, France, Belgium and Germany (Ibid).

In **1891**, Britain (on behalf of Egypt) and Italy (on behalf of Eritrea) concluded the protocol of Rome which stipulated that Italy would refrain from building any projects on the Nile Atbara (Tekezze) that could affect the downstream flow of water to Egypt (Hassan & Al Rasheedy, 2007, p. 33).

In **1902**, Britain (on behalf of Egypt) and Menelik II of Ethiopia signed the Addis Ababa agreement that bound the two parties to preclude any projects on the Blue Nile, Lake Tana and the Sobat River which would affect the normal flow of their waters to the downstream states, unless there is a joint consent signed the two by parties as well as Sudan (Hassan & Al Rasheedy, 2007, p. 33).

In **1906**, Britain (on behalf of Egypt) and Belgium (on behalf of Belgian Congo, now the Democratic Republic of Congo) signed the London treaty that included a commitment by an independent Congo not to construct or develop any constructions on or near the river Semliki, a tributary of the Nile River, that would reduce the volume of waters entering Lake Albert (Hassan & Al Rasheedy, 2007, p. 33).

In the same year (**1906**), a tripartite agreement was concluded between Britain, France and Italy that stipulated a commitment to maintain the unity of Ethiopia and to protect the interests of Great Britain and Egypt in the Nile basin in regard to the regulation of the waters of River Nile and its tributaries (Hassan & Al Rasheedy, 2007, p. 33).

The post-Egyptian independence Nile treaties (1929 and 1959)

The 1929 Nile Waters Agreement

In 1929, Egyptian-British Nile River treaty was signed which allocated the shares of the Nile waters between Egypt and Sudan (Ferede & Abebe, 2014, p. 62). In this treaty, Egypt recognized Sudan's share in the Nile waters while reserving its own historic and natural rights with respect to the Nile. The treaty allocated a share of 48 billion cubic meters to Egypt and 4 billion cubic meters to Sudan. The agreement stipulated the following (Ibid, p. 61):
"*No irrigation or power works are to be constructed or taken on the Nile or its tributaries, or on the lakes from which it flows in so far as all these are in Sudan or in countries under British administration, and entail prejudice to the interests of Egypt*".

Since Ethiopia was not included in the 1929 treaty, it does not consider itself bound to it. This treaty was criticized for emphasizing Egypt's monopoly of the Nile waters at the expense of the upstream riparian states (Ferede & Abebe, 2014, p. 62).

The 1959 Nile Waters Agreement

Following its independence in 1956, Sudan expressed its dissatisfaction with the 1929 agreement and requested renegotiating it (Ferede & Abebe, 2014, p.64). After a period of tensions between Egypt and Sudan over the shares of the Nile waters, the two countries agreed

in year 1959 to redistribute the quantities of the average annual Nile flow to be 18.5 billion cubic meters to Sudan and 55.5 billion cubic meters to Egypt (Ibid).

This agreement stipulates that if any other riparian country objects over the Nile water resources, Sudan and Egypt shall handle it together (Ferede & Abebe, 2014, p. 64). If this objection concerns redistributing the Nile waters with another riparian state, Sudan and Egypt agreed to distribute the allocated amount equally from each country's share (Ibid). On the one hand, the agreement gave Egypt the right to build the Aswan High Dam and on the other hand, it granted Sudan the right to construct the Roseires Dam on the Blue Nile in addition to some other irrigation and hydroelectric power generation projects (Ibid).

Both colonial and post-colonial Nile agreements are characterized by unilateralism and misappropriation of the shares of the other riparian states. On the one hand, upstream Nile riparians do not consider themselves bound by these historic agreements as they were not part of them in the first place. On the other hand, Egypt contends that these treaties are nonnegotiable historical rights that should be respected by the upstream riparian states.

Generally, the Nile Basin cooperation at this phase was too low or non-existent due to the hydro-political tensions caused by the colonial and post-colonial Nile agreements. It was an era of rampant unilateralism, minimum or no Nile dialogue and entrenched mistrust between Nile riparian states. Starting 1967 onwards, the Nile riparians started shifting towards a multilateral strategy by forming different basin-wide initiatives that gather Nile riparians to discuss water issues and develop cooperative initiatives.

1.3.5: Regional and Bilateral Cooperative Initiatives in the Nile Basin which include Egypt and Ethiopia (in chronological order)

The 1967 Hydro-Meteorological Survey of the Equatorial Lakes (Hydromet)

In 1967, Egypt led an initiative to promote cooperation between the Nile basin countries and created the Hydro-Meteorological Survey of the Equatorial Lakes or (Hydromet) (Yohannes, 2009, p. 53). The Hydromet is considered to be the first intergovernmental project to promote cooperation in the Nile Basin area. It was supported by the United Nations Development Program (UNDP) and the World Meteorological Organization (Ibid).

The main purpose of the initiative was to collect and analyze meteorological data in the west Nile watershed (Yohannes, 2009, p. 53). Sudan, Kenya, Tanzania, Uganda, Rwanda, and Burundi joined the Hydromet, while Ethiopia and Democratic Republic of Congo (DRC) refused to join objecting on the absence of the water redistribution issue from the organization's mandate (Ibid, p. 54).

In 1971, Ethiopia joined Hydromet only as an observer (Flintan & Tamrat, 2002, p. 302). The Hydromet project ended in 1992, as member states wanted to replace it with another initiative that satisfies all riparian countries in order to achieve sustainable cooperation and coordination of the Nile waters affairs (Ibid).

The 1983 UNUGU initiative

The UNUGU is an initiative led by Egypt that aimed to reinforce brotherly relations between the Nile basin States as *NUGU* in Swahili means brotherhood (Mekonnen, 2010, p. 426). The main purpose of establishing the UNUGU was to discuss all issues that concern the

Nile waters including agriculture, resources management, promoting economic, technical, and scientific cooperation between the riparian states (Ibid).

Sudan, Uganda, DRC, and the non-riparian Central African Republic, Burundi, Rwanda, and Tanzania joined the initiative, whereas Ethiopia and Kenya participated as observers (Mekonnen, 2010, p. 426). Despite the effective role that the UNUGU played in uniting the riparian states under one institutional framework, it did not accomplish its main goal of creating sustainable cooperation (Ibid).

This failure has been attributed to the fact that some riparian states perceived it as another hegemonic tool that Egypt created to support its interests in the Nile affairs (Mekonnen, 2010, p. 426). Other reasons for failure is the absence of Ethiopia and Kenya, two important upstream riparian states, from the UNUGU membership (Howell & Allan, 1994, p. 361).

The 1992 TECCONILE

The Technical Cooperation Committee for the Promotion of the Development and Environmental Protection of the Nile (TECCONILE) was established in 1992 by Egypt, Rwanda, Sudan, Tanzania, Uganda, and Zaire (DRC) (Howell & Allan, 1994, p.361). Other Nile riparians, namely, Ethiopia, Kenya, Burundi and Eritrea, joined as observers (Ibid). TECCONILE was initially planned to be an interim project for a period of three years with an end goal to establish a permanent basin-wide institution (Ibid).

The 1993 Framework for General Cooperation between Egypt and Ethiopia

This accord is considered to be the first bilateral framework between Egypt and Ethiopia in their post-colonial era (Tedla, 2013, p. 4). It was signed in July 1993 in Cairo between former

president Hosni Mubarak and late Ethiopian Prime Minister, Meles Zenawi (Ibid). This framework agreement mostly covered "*the issue of the use of the Nile waters* "(Talwar, 2013, p. 80). In the agreement, Egypt and Ethiopia agreed to "*to promote their economic and political interests as well as the stability in the region*" (Ibid). Although this agreement does not specify methods of cooperation, it clearly emphasizes that the two countries need to work together to reach mutually agreeable solutions (Ibid, p. 81). The two countries also agreed to "*refrain from engaging in any activity related to the Nile waters that may cause appreciable harm to the interests of the other Party*", however, the framework itself does not include any provisions for enforcement (Ibid).

The 1999 Nile Basin Initiative (NBI)

The NBI marks a significant progress in the history of the Nile basin as it was the first time when all Nile riparian states (with the exception of Eritrea which participated as an observer) cooperated under a unified institutional framework (Mekonnen, 2010, p. 422). The NBI was intended to serve as a transitional arrangement to be later replaced by a permanent legal framework (Ibid). It consisted of the Nile-COM (Council of Ministers of water affairs), the Nile-TAC (Technical Advisory Committee and the Nile-SEC (Secretariat Office) located in Kampala, Uganda (Hamed & Ahmed, 2014, p. 24).

The Nile Basin Initiative primarily aimed at increasing the level of trust and transparency between riparian states by supporting joint hydro-development programs (Mekonnen, 2010, p. 422). The shared vision of the NBI is "*to achieve sustainable socioeconomic development through the equitable utilization of, and benefit from, the common Nile Basin water resources*" (NBI, 2017). The NBI manages two tracks: the technical and the

legal/political (Seide, 2014, p. 2). The technical track mainly focuses on the execution of regional projects such as socio-economic development, transborder trade, confidence building and environmental protection (Ibid). Whereas the legal/political track focuses on equitable and fair utilization of the Nile waters without causing any significant harm to any of the Nile riparians (Ibid). This initiative was perceived to be a very promising step towards more cooperative and productive era (NBI, 2017).

The 2010 Nile Basin Cooperative Framework Agreement (CFA)

The CFA acts as the legal track of the NBI. The framework was a product of long negotiations that started in 1999 and was ready for signature in 2010 in the NBI to formulate a cooperative framework agreement between all Nile riparians (Salman, 2012, p. 20). Both Egypt and Sudan opposed the CFA insisting on preserving their rights to the current shares of the Nile waters in accordance with the 1959 Nile Treaty (Ibid).

The CFA does not include any specific figures with respect to water distribution (Paisley & Henshaw, 2013, p. 10), however, it generally aims at guaranteeing equal and fair use of the Nile waters by all Nile Basin states (Salman, 2012, p. 21). It also states that each country has the right to utilize the waters of the Nile River Basin within its territories without doing any significant harm to other riparians (Ibid). The CFA does not include a formal mechanism for dispute settlement or exchange of information between Nile riparians (Paisley et al, 2013, p. 10). Both Egypt and Sudan were not satisfied with the provisions of the CFA and demanded amendments of some of its articles (Ibid). The main debate was on Article 14 which requires all basin states to cooperate on ensuring and sustaining water security for all (Ibid). Article 14 in the CFA states that:

Nile Basin states recognize the vital importance of water security to each of them. The States also recognize that cooperative management and development of the waters of the Nile River System will facilitate achievement of water security and other benefits. Nile Basin states therefore agree, in the spirit of cooperation:

(a) to work together to ensure that all States achieve and sustain water security.

(b) Nile Basin States therefore agree, in a spirit of cooperation not to significantly affect the water security of any other Nile Basin State.

Egypt and Sudan requested to amend the wording of Article 14(b) to be "*not to adversely affect the water security and current uses and right of any other Basin State*" (Paisley et al, 2013, p. 10). Egypt and Sudan backed their argument by consistently referring to the no-harm rule that is stipulated in the UN Convention on the Law of Non-Navigational Uses of International Watercourses[2] (Ibid).

The 2015 Declaration of Principles on the Grand Ethiopian Renaissance Dam (GERD)

In March 2015, the Declaration of Principles on the GERD was signed by Egypt, Ethiopia and Sudan (Tawfik, 2015, p. 2). The agreement consisted of ten principles, four of which focused on the GERD (Salman, 2016, p. 520). The ten principles are:

(1) Principle of cooperation,

(2) Principle of development, regional integration and sustainability,

(3) Principle of no causing significant damage,

(4) Principle of fair and appropriate use,

(5) Principle of the dam's storage reservoir first filling, and dam operation policies,

[2] The UN Convention on the Law of the Non-Navigational Uses of International Watercourses was concluded in 1997 and it is the only universal treaty that governs shared freshwater resources. Article 7 of the convention states that all states sharing an international watercourse need to "*take all appropriate measures to prevent that cause of significant harm*". Source: UNECE, last retrieved on December 1st, 2017.

(6) Principle of building trust,

(7) Principle of exchange of information and data,

(8) Principle of dam security,

(9) Principle of the sovereignty, unity and territorial integrity of the State,

(10) Principle of the peaceful settlement of disputes.

Article 10 specifically deals with the mechanism of dispute settlement between the three countries (Salman, 2016, p. 522). It calls upon the three parties to resort to a peaceful settlement of disputes through negotiation or consultation (Ibid). If matters further escalated, the three parties may ask for mediation or conciliation, or they may refer the issue to the heads of state (Ibid). However, Article 10 does not mention anything on a resort to arbitration or to the International Court of Justice (Ibid).

On the one hand, some Egyptian officials view it as a positive step towards reaching an agreement over the GERD as it succeeded to bring Egypt and Ethiopia to the negotiation table to discuss the main guidelines of operating the dam after a long period of tensions (Tawfik, 2015, p. 2). On the other hand, other Egyptian opinion leaders view that it is not fair to Egypt as it does not preserve its rights in the Nile waters and does not include any reference to the historical water treaties (1929 & 1959) (Ibid). Moreover, it did not include any clauses that commit Ethiopia to reconsider the size and the storage capacity of the dam (Ibid).

Chapter 2: Research Methodology

This chapter explains the methodology used in the research. It provides an overview on the data collection and data analysis with an aim to further examine potential cooperative opportunities between Egypt and Ethiopia through the lens of the benefit-sharing framework.

2.1: Methodology and Data Collection

This research is a qualitative exploratory study that uses published sources of secondary data in order to draw comparisons and linkages between different opinions around transboundary water relations in general and the Egyptian-Ethiopian water relations in specific. Consequently, the research focuses on assessing the applicability of benefit-sharing model to achieve cooperation between Egypt and Ethiopia *from* and *beyond* the Nile River and prevent future conflicts.

Secondary data is collected from verifiable journal articles, research papers and publications as well as reports published by credible regional and international organizations such as World Bank, the Nile Basin Initiative (NBI) and the United Nations Agencies. This research also uses official reports and documents published online by the governments of Egypt and Ethiopia. The use of secondary data is justifiable as the topic extends beyond the boundaries of Egypt and concerns other Nile Basin states. Due to the factor of time and logistics, it was challenging for the researcher to reach out to a wide-range of experts and scholars who represent different opinions about the topic. Thus, in order to avoid skewed findings, the researcher preferred to rely on published secondary data to present a broad and non-biased view of the Egyptian-Ethiopian water relations.

2.2: Data Analysis

The starting point of the research is analyzing different conflict-cooperation arguments in the literature of transboundary water issues. The research then analyzes the same argument at the Egyptian-Ethiopian level. The aim of exploring these arguments is to reach a conclusion on whether transboundary water issues lead to conflict or cooperation. Following the conclusion part, the research explores the main deterrents and incentives to cooperation between Egypt and Ethiopia.

After determining the main standpoints of the research, the research adopts the benefit-sharing framework and the theory of issue linkage as its conceptual framework in order to explore more cooperative opportunities between Egypt and Ethiopia that can be achieved from and beyond the Nile River. The research focuses on two types of the benefit-sharing model: benefits from the river and benefits beyond the river. In one chapter, the research explores earlier applications of the benefit-sharing model in the Nile Basin countries and the main challenges encountered in its implementation process. The aim of this analysis is to examine the familiarity of the concept of benefit-sharing to the Nile Basin states including Egypt and Ethiopia. Following this chapter, the research explores possible benefit-sharing opportunities from the Grand Ethiopian Renaissance Dam through applying a cost-benefit analysis. The GERD project has been promoted as a benefit-sharing tool that carries a variety of benefits to Ethiopia, Egypt and other neighboring African countries and therefore, it is important to assess this project from a benefit-sharing perspective.

Finally, the research looks at possible cooperation opportunities between Egypt and Ethiopia beyond the Nile file. This part of the analysis tries to link the current issue of the

GERD to a broad network of water and non-water related opportunities between Egypt and Ethiopia in order to explore more potential benefits beyond the river. Based on the research findings drawn from each chapter, a conclusion is formulated along with a number of recommendations for more sustainable and effective cooperation between Egypt and Ethiopia.

Chapter 3: Literature Review

This chapter starts by looking at different conflict/cooperation conceptualizations in transboundary water literature. This is followed by examining the same debate at the level of the Egyptian-Ethiopian hydro-relations. After seeking to understand the conflict-cooperation argument, a conclusion is drawn from the literature in order to set up the conceptual framework. The chapter ends with a discussion on influencing factors (incentives & deterrents) to water cooperation between Egypt and Ethiopia: unilateralism, divergent interests, asymmetric relations and interdependence.

3.1: Conflict or Cooperation?

Managing shared water resources has been viewed as a complex issue as the uses (or misuses) in one country can easily impact the quality and quantity of water in other neighboring countries. Accordingly, there is a growing debate in both the policy and scientific literature that water can be a driver of conflict and possibly war between riparian countries (Elliot, 1991; Gleick, 1993; Homer-Dixon, 1994; Elhance, 1999). On the contrary, there are other studies that negate the water conflict scenario and strongly argue that water is a tool for cooperation (Wolf, 1998; Salman and de Chazournes, 1998; Turton, 2000; Sadoff and Grey, 2002).

There are different types of international water issues in which water can be an instrument of cooperation or a catalyst of conflict (Marty, 2001 cited in Mostert, 2003, p. 2). These issues have been grouped into three categories: (a) collective issues, (b) negative externality issues and (c) positive externality issues (Ibid). Collective issues are those problems that trigger similar concerns in all countries involved such as climate change issues (Ibid).

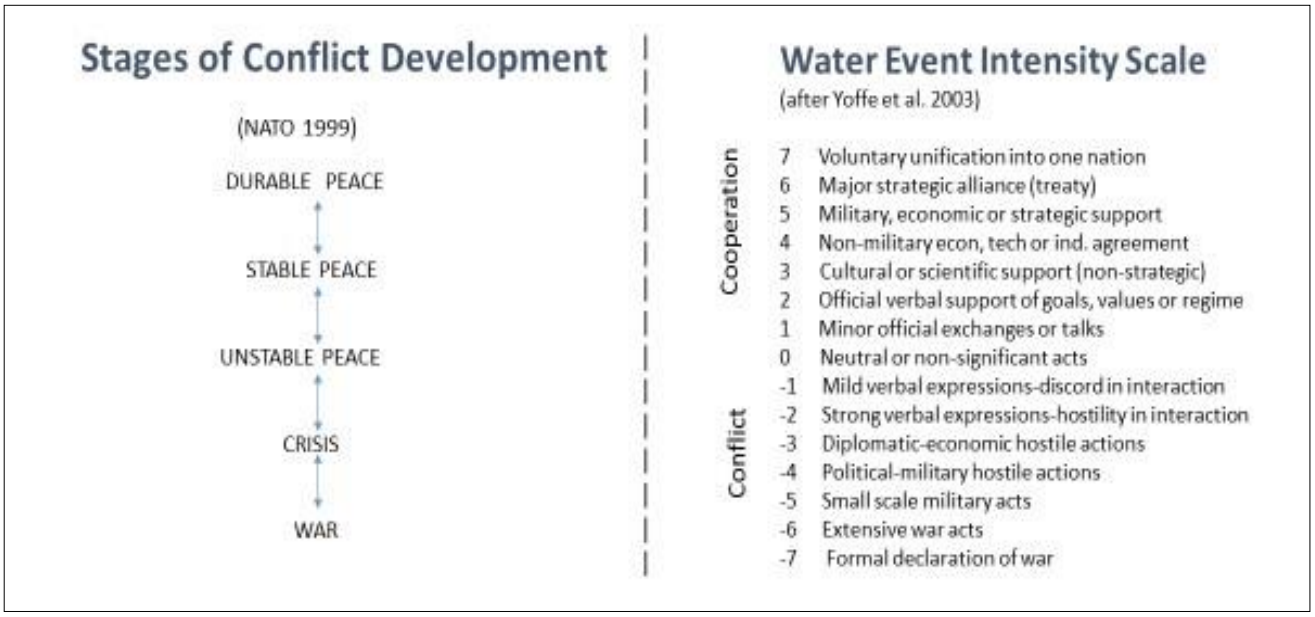
Negative externality issues happen when projects or activities in one country cause negative effects in another country such as water diversions (Ibid). Positive externality issues are those that result from activities that aim to achieve overall benefits to all countries concerned (Ibid).

In regard to the above-mentioned scenarios, water conflicts are most likely to happen when there are negative externality issues and cooperation is most expected in the presence of collective issues (Mostert, 2003, p. 2) and/or positive externality issues. Yet, cooperation could happen in extreme negative externality issues as a result of countries' willingness to maintain good neighborliness with one another (Ibid). Also, with respect to collective issues, conflicts could arise if there is mistrust or poor international relations between concerned countries (Ibid).

Conflict is a broad term as it embraces a wide range of events where demands of different states may collide (Vinogradov et al, 2003, p. 25). This may range from minor disagreements and competition to the level of violent tensions that threaten international peace and security (Ibid). Cooperation can also come in different forms and scenarios. It can range from nominal informing to joint projects (Tesfaye, 2014, p. 128). Water cooperation can come in the form of treaties/agreements between upstream and downstream states which cover issues that concern distribution of water shares, water quality and water projects (Ibid). Another form of water cooperation is basin-wide joint management and/or governance initiatives (Ibid). The Nile Basin Initiative (NBI) is one example of joint management forums that opened dialogue between upstream and downstream Nile riparians (Ibid). In joint management initiatives, member states agree on a shared vision and thus shift from unilateralism to a more inclusive strategy to foster regional development and achieve greater benefits (Ibid).

Yoffee et al (2003) have ranked conflict and cooperation events on a scale of 15 points. This tool was named Yoffe's Water Event Intensity Scale (WEIS).

Figure 2: Yoffe's Water Event Intensity Scale (WEIS).



Source: Yoffee et al, 2003 cited in Zeitoun & Mirumachi, 2008, p. 302

In the water conflict argument, there are three issues that have been identified as the main reasons behind shared water disputes (Wolf et al, 2005, p. 81). These three issues concern: water quality, water quantity and timing of water flow (Ibid). Issues related to the quantity of water and its allocation can drive conflicts among riparian states especially when the resource is limited or scarce (Ibid). According to Homer-Dixon, water scarcity can result from environmental changes, population growth and the unequal distribution of the resource (Homer-Dixon, 1994, p. 3).

Water quality degradation and interrupted water flows are another alarming issues that can easily induce water conflicts (Wolf et al, 2005, p. 81). Problems in the quality of shared water can pose significant harm to both the environment and human health (Ibid). Repercussions of water pollution can be a sufficient reason for states to go into conflict, such as those in the Rhine River Basin[3] (Ibid). Timing and coordination of water flow is another factor of contestation between upstream and downstream riparians in the presence of upstream dams and reservoirs (Ibid).

Wolf et al (2004) brought forward another reason for water conflicts which is the poor management of water systems (Wolf, Carius, & Dabelko, 2004, p. 61). In this argument, the lack of water resources is not the major contributor to the water conflicts, but rather the lack of transparency, the weak institutional capacities and the lack of necessary infrastructure (Ibid). Lack of political will of co-riparians, absence of strong legitimate institutions, lack of technical water expertise and absence of a water-dispute settlement system are all sufficient factors that can result in a weak water management mechanism (USAID, 2014, p. 8). The management of transboundary water systems is a highly complex process due to divergent interests of the co-riparian states (Wolf, Carius, & Dabelko, 2004, p. 61). Therefore, this complex process requires regular data sharing and continuous dialogue in order to build trust and confidence to foster cooperative action (Ibid).

[3] As explained by MacQuarrie & Wolf (2013), contamination in the Rhine River caused severe siltation in the Rotterdam's harbor. The costs of dredging the harbor were very high and thus Rhine's users went into conflict over responsibility and compensation (Ibid). However, negotiations resulted in a peaceful settlement among the conflicting parties (Ibid).

Securitization[4] of water issues has recently evolved as another factor that can trigger conflicts over shared river basins. Securitization is basically when an actor highlights a certain issue as an existential threat to a specific referent object, then calls for adopting exceptional measures in order to contain this threat (Buzan et al, 1998, pp. 22-23). The securitization of water is perceived to carry both benefits and risks (Gupta et al, 2016, p. 6). On the one hand, the positioning of the water as high politics could help raise global awareness and solidarity for all water-related issues and thus secure enough resources for its management (Ibid). On the other hand, extreme politicization of water makes it a matter of life and death and thus justifies the use of the extraordinary measures, which may sometimes mean the use of force, in order to control the situation (Ibid).

At the other end of the conflict-cooperation spectrum, there is a group of analysts who view that the tendency towards cooperation is more abundant in transboundary water relations than the conflict scenarios. Empirically speaking, the University of Oregon carried out a study called "Basins at Risk" that analyzed the nature of relations among states that share rivers basins on a scale from conflict to cooperation (Wolf, 2007, p. 20). Based on the outcome of this study, the number of cooperative events outweighed the conflictual ones throughout the history of interstate relations that involved shared water resources (Ibid). The study revealed that between years 1948 and 2000, there were 1,228 cooperative events, while the number of conflicts was only 507 (Ibid). The overall findings of this research study can be summarized as follows:

[4] The securitization theory was firstly introduced by the Copenhagen School of Barry Buzan, Ole Woever and others

(a) Most transboundary relations are cooperative. Out of 1,831 events, 1,228 cooperative relations were indicated (67.1%). The number of conflictual cases was 507 (27.7%) and the remainder 96 events were found to be non-significant (Wolf et al, 2003, p. 39).

(b) Around two-thirds of the total 1,831 events were only verbal (between *verbal hostility* and *verbal support*) (Wolf et al, 2003, p. 39).

(c) The main water issues are those related to infrastructure and quantity. 64% of the total studied events (conflicts and cooperation) were mainly about water quantity and infrastructure issues. Water quality-related events accounted for 6% (Wolf et al, 2003, p. 40).

(d) Water can act as both unifier and irritant. Throughout history, water had been a source of contestation between neighboring countries such as India and Pakistan. However, water conflicts can eventually get resolved, even between bitter enemies. One example of water conflicts resolutions is the 'picnic table'[5] negotiations between Jordan and Israel (Wolf et al, 2003, p. 40)

(e) Co-riparian states cooperate over a wide variety of issues that concern water quality, water quantity, hydroelectric power and overall economic development (Wolf et al, 2003, p. 40)

Sadoff and Grey (2005) argue that there are many positive incentives linked to water cooperation on the social, environmental and economic levels. This wide range of benefits that come with water cooperation encourage hostile states to commit to cooperation and overcome conflicts (Bencala & Dabelko, 2008, p. 24). Benefits from water cooperation are categorized into four different types (Sadoff & Grey, 2005, p. 421). Firstly, benefits from the river in the form of hydropower, food, navigation and tourism (Bencala & Dabelko, 2008, p. 24). Secondly, benefits to the river from a better managed ecosystem (Ibid). Thirdly, benefits beyond the river in the form of economic integration and increased development (Ibid). Fourthly, decreasing river-related costs as a result of preventing conflicts (Ibid).

[5] The 'picnic table' talks were secret rounds of negotiations between Jordan and Israel to resolve their conflicts on the Jordan River

Table 1: Types of Benefit-Sharing

Type	The Challenge	The Opportunities
Type One: **Increasing Benefits to the River**	Degraded water quality, watersheds, wetlands and biodiversity	Improved water quality, river flow characteristics, soil conservation, biodiversity and overall sustainability
Type Two: **Increasing Benefits from the River**	Increasing demands for water, sub-optimal water resources management and development	Improved water resources management for hydropower and agricultural production, flood-drought management, navigation, environmental conservation, water quality and recreation
Type Three: **Reducing Costs because of the River**	Tense regional relations and political economy impacts	Policy shift to cooperation and development, away from dispute/conflict; from food & energy self-sufficiency to food & energy security; reduced dispute/conflict risk and military expenditure
Type Four: **Increasing Benefits Beyond the River**	Regional fragmentation	Integration of regional infrastructure, markets and trade

Source: This table has been copied from Sadoff, C. W., & Grey, D. (2005).

3.2: Conflict and Cooperation at the Egyptian-Ethiopian Level

The Nile water conflicts are generally characterized by some distinctive features: (a) downstream countries' high dependence on the Nile waters that originate from upstream states, (b) upstream countries' limited utilization of the Nile water despite their geographical position and (c) Egypt's control of a large share of the Blue Nile's waters due to its powers (Mason, 2004, p. 167) (Whittington & Wu, 2006, p. 3). Due to its position as the farthest downstream state, Egypt is always concerned that water development projects in Ethiopia would obstruct the normal flow of the waters downstream (Mason, 2004, p. 171).

According to Homer-Dixon (1994), "*Conflict is most probable when a downstream riparian is highly dependent on river water and is strong in comparison to upstream riparians. Downstream riparians often fear that their upstream neighbors will use water as a means of coercion. This situation is particularly dangerous if the downstream country believes it has the military power to rectify the situation*" (Homer-Dixon, 1994, p. 19). On the basis of such

criteria, armed conflict is likely to happen in the Nile Basin now or in the future (Whittingon & Wu, 2006, p. 3). Other prophecies of the water war scenario over the Nile rely on the fact that population volume is projected to more than double by year 2050, coupled with climate change issues, could easily end up increasing water and food insecurity in the region (Gebreluel, 2014, p. 30).

According to history, water conflicts between Egypt and Ethiopia have not exceeded the level of mutual suspicion, diplomatic tensions and verbal threats (Erlich, 2002 cited in Mahmoda, 2003, p. 24). In 1979, President Sadat declared, "*the only matter that could take Egypt to war again is water*" (Gebreluel, 2014, p. 30). Despite the fiery rhetoric and tensions, history has also witnessed many cooperation events between Egypt and Ethiopia including *the Hydromet (1967), the UNUGU (1983), the TECCONILE (1992) and finally the Nile Basin Initiative (NBI) (1999).*

As per Yoffe's water event intensity scale (WEIS) (Figure 2), it can be concluded that Egyptian-Ethiopian hydro-political relations have been swinging between point 4 (non-military economic, technical or industrial agreements) and point -1 (mild verbal expressions and discord in interaction) (Cascão, 2008 cited in Zeitoun & Mirumachi, 2008, p. 302) or some would argue that in some occasions conflicts might have reached point -2 (strong verbal expressions-hostility in interaction).

In addition to the long history of cooperation between Egypt and Ethiopia, some analysts view that Egyptian-Ethiopian water war is irrational due to a number of factors. Firstly, if the reason for war is an upstream dam project, the downstream state cannot militarily

attack the dam, or else it would flood the downstream lands, as well as, negatively affect the quality of the water flowing downstream (Gebreluel, 2014, p. 32). In water conflicts involving upstream and downstream states, upsteam states get a power advantage as they can control the flow and the pollution of the river than the downstream states (Sjostedt, 2008, p. 232). Secondly, Egypt's current economic plight will not allow it to finance a water war against Ethiopia (Milas, 2013 cited in Gebreluel, 2014, p. 31).

3.3: Conclusion: Cooperation and Conflict Co-exist

Water issues do not necessarily lead to absolute conflict or absolute cooperation (Mirumachi & Allan, 2007). Due to the complexity of water interactions, conflict and cooperation co-exist at variable intensities and levels (Ibid). "*Conflict is a concept that is independent of co-operation; not always opposite to it. In certain circumstances, conflict may be an integral part of inducing and sustaining co-operative behavior, and the two may coexist in various social settings*" (Craig, 1993 cited in Mirumachi & Allan, 2007, p. 4).

Craig (1993) argues that conflict and cooperation are not at two opposing ends of a continuum, they co-exist at different intensities (cited in Mirumachi & Allan, 2007, p. 4). For example, in situations where levels of cooperation are high and conflict are low, relations between states become "stable and comfortable" (Ibid). Based on this argument, Craig (1993) has developed a tool to interpret different facets of water interactions by plotting high and low levels of cooperation and conflict on a 2 x 2 cell matrix.

Table 2: Craig's Matrix

		Cooperation	
		Low	High
Conflict	Low	Little interaction	Stable and comfortable
	High	Unstable relations	Unstable, intense, sometimes interactive

Source: Craig, 1993 cited in Mirumachi & Allan, 2007, p. 5

Transboundary Waters Interaction Nexus (TWINS) Model

Based on Craig's (1993) matrix, the TWINS Model also assumes that conflict and cooperation co-exist at different intensities and levels (Mirumachi & Zeitoun, 2008, p. 11). In other words, it argues that not all cooperation is 'pretty' and not all conflicts are 'violent' (Ibid, p. 9). It considers that transboundary water relations are not static and that they are influenced by a number of factors such as power relations, states' interests and level of trust or distrust (Ibid, p. 13). Thus, it divides water interactions into: negative, neutral and positive and plots them on a 5 X 4 cell matrix (Ibid, p. 11).

Table 3: TWINS Matrix

Categories of Interaction Nexus **(TWINS)**	Types of Interaction	Examples of Interaction	Influencing Factors
Low Conflict-High Cooperation	**Positive Interaction** -Equal Cooperation -Cooperation on a wide range of issues -Conflicts are reduced through deliberative processes	-Establishing transboundary regimes -Negotiating water treaties based on international water law e.g. no harm, equitable use -Conclusion of effective treaties	-Benefit Sharing/Expanding the basket of benefits -Reduction of environmental uncertainty -Economic/Developmental Interests -Issue-Linkage -Mutual Distrust -Sharing of resources -Improvement of international reputation -Changes in power asymmetries -Control of resources
Low Conflict-Medium Cooperation	**Neutral Interaction** -Limited/Token Cooperation (on selected issues) -Mild verbal expressions of Conflict	-Joint water management; Joint Infrastructure -Benefit-sharing agreements -Creation of Basin-wide organizations	
Low Conflict-Low Cooperation	**Neutral Interaction** -Minimal or no interaction -Ad hoc Cooperation; Self-interested Cooperation; Unstable Cooperation	-Technical meetings/commissions -Minor exchange of information	
Med/High Conflict Low Cooperation	**Negative Interaction** -Coercive/Dominative Cooperation -Securitized/Violent Conflict	-Contained or violent conflicts -Resource Capture -Unilateral environmentalism	

TWINS matrix is adapted from Mirumachi & Zeitoun, 2008, p. 11.

Positive interaction occurs when cooperation tends to satisfy the interests of all involved actors and leads to sustained inter-state relations (Mirumachi & Zeitoun, 2008, p. 14). It includes both

'broad' and 'equitable' cooperation (Ibid). Broad cooperation means cooperation on a wide range of issues that may include non-water related aspects (Ibid). Whereas, equal cooperation means that it includes all states on equal terms (Ibid).

Neutral interaction includes inter-state cooperation that is neither pure nor manipulative, but rather medium or minimal cooperation that can range from ad-hoc, self-interested, tactical to limited and unstable forms of cooperation (Mirumachi & Zeitoun, 2008, p. 14). Neutral faces of conflict can come in form of mild verbal expressions (Ibid).

Negative interaction includes higher and more escalated levels of conflict that can reach violent wars. At this level, inter-state cooperation is either dominative or coercive (Mirumachi & Zeitoun, 2008, p. 13).

3.4: Incentives and Deterrents for Water Cooperation in the Nile Basin

Throughout the history of water relations between the Nile riparian states, there has been a number of incentives and deterrents for the process of cooperation. In the literature of transboundary water management, a number of factors has been recurrent in different studies that aim to study transboundary water interactions. These factors are: unilateralism, divergent interests, asymmetric relations and interdependence.

Unilateralism

Unilateralism has been identified as a common behavior in the Nile Basin countries that has prevailed throughout their history of cooperation (Waterbury, 1997; Waterbury & Whittington, 1998; Erlich, 2002; Swain, 2002; Waterbury, 2002). Each of Egypt and Ethiopia has unilaterally developed projects on the Nile in order to promote national interests

(Mahmoda, 2003, p. 29). Unilateral behavior in the Nile Basin has been viewed as a direct threat to effective cooperation as it weakens the states' desire to cooperate (Ibid).

Unilateral behavior can come from either ignorance, habit or convenience and therefore there are two types of unilateralism: passive and active (Waterbury, 1997, p. 279). Passive unilateralism occurs when a riparian state does nothing or just performs a very minimal action towards the shared river (Ibid). Active unilateralism, on the other hand, is when a riparian state intentionally executes development projects on the river that impact the quality or the flow of the water (Ibid).

Throughout the history of the Nile, several projects have been unilaterally executed by the governments of Egypt and Ethiopia (Mahmoda, 2003, p. 29). In the 1970s, Egypt commenced technical studies for its project to transfer the Nile waters to irrigate Israel's Negev desert (Mbaku & Kimenyi, 2015, p. 99). This unilateral action was highly condemned by Ethiopia and other Nile riparians as Egypt did not consult with any of them before announcing the project (Kendie, 1999, p. 157). In the 1990s, Egypt had started several ambitious agricultural projects in the desert including the 1997 Toshka project (Ibid, p. 159). The project was estimated to use more than 5 Bm3 of water every year through transferring the waters from Lake Nasser to the Toshka depression (Cascão, 2009, p. 249). This action faced opposition from many neighboring Nile riparians, especially Ethiopia (Ibid). Ethiopia's objection to the Toshka project was mainly due to the contradiction in Egypt's Nile policy as the country constantly opposed development projects in the upstream part of the Nile, while it was actively using the waters for major irrigation projects (Thomson, 2005).

In the 1990s, Ethiopia has also commenced feasibility studies for several hydropower and irrigation projects on the Nile River (Cascão, 2009, p. 254). Ethiopia wanted to send a strong message to the downstream riparians that it would unilaterally embark on its own hydraulic missions with or without multilateral negotiations and agreements (Ibid, p.256). The conclusion of the Cooperative Framework Agreement (CFA) by the upstream states without Egypt's and Sudan's consent had marked another unilateral action in the history of the Nile Basin hydropolitics (Ibid). Another recent unilateral move by Ethiopia is the construction of the Grand Ethiopian Renaissance Dam which commenced in 2011 without any consultations with the downstream states.

This unilateral trend had hindered the main objectives of the NBI to promote a new culture of multilateral cooperation across the Nile Basin (Cascão, 2009, p. 263). It is worth noting that Egypt and Ethiopia were moving forward with their unilateral projects while simultaneously engaging in multilateral cooperation through the Nile Basin Initiative (Ibid). Ethiopia, for example, was very keen to engage in the NBI projects and benefit from the financial support offered by the World Bank (Ibid). However, the country knows very well that mega hydropower and irrigation projects cannot be implemented multilaterally and may not be included in the agenda of NBI projects and therefore they have to be executed unilaterally (Ibid).

On the one hand, these unilateral projects clearly showed that the Nile riparian states had not been ready to overcome their "hydro-sovereignty" strategy (Wouters, 2002 cited in Cascão, 2009, p. 263) and that national priorities and interests remained to be the "determinants for collective action" (Waterbury, 2002 cited in Cascão, 2009, p. 263). On the other hand, the

NBI authorities and external donors had turned a blind eye to the unilateral moves in the basin and had not taken any steps towards regulating cooperation between Nile riparians (Cascão, 2009, p. 263).

Divergent Interests

The Nile Basin riparians have different interests and priorities in regard to the Nile waters and thus each country has different expectations of a basin-wide cooperation (Mason, 2004, p. 198). The interests of the Nile Basin states in water cooperation mainly relies on their geographical location and economic development (Ibid, p. 168).

Ethiopia's interests in the Nile waters stems from its need to utilize the water resources for its development and poverty alleviation (Mason, 2004, p. 173). Hydroelectric power generation and irrigation are considered to be the main interests of Ethiopia concerning the Nile waters (Ibid, p. 169). These interests have been made clear in the 1957 statement by the late Emperor Haile Sellassie I (Arsano & Tamrat, 2005, p. 17):

> "*We have already explained the plans that are under [way] to utilize our rivers as an essential step in the development of agriculture and industry. It is of paramount importance to Ethiopia, a problem of 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 the centuries to come. However, in general, Ethiopia may be prepared to share this tremendous God-given wealth of hers with friendly neighboring nations, for the life and welfare of their people, it is Ethiopia's sacred duty to develop the great watershed which she possesses in the interests of her own rapidly expanding population and economy. To fulfill this task, we have arranged for the problem to be studied in all its aspects by experts in the field. Ethiopia has time and again set this forth as her position regarding the utilization of the Nile waters*".

Ethiopia puts the issue of reallocating the shares of the Nile waters as a precondition to a basin-wide cooperation (Mahmoda, 2003, p. 26). From Ethiopia's point of view, a basin-wide cooperation will only become effective if the 1959 agreement is renegotiated and a new water

distribution agreement is formed in order to satisfy the interests of all the Nile basin states (Ibid).

Given that Egypt is the most downstream Nile riparian country, it constantly underlines its heavy dependence on the Nile waters and thereby the issue of reallocating the Nile shares is a matter of security (Mahmoda, 2003, p. 26). Despite Egypt's strategy of water security, the country has been interested in maintaining goodwill with its neighbors through encouraging general cooperation and regional development (Ibid). Accordingly, Egypt's interest in water cooperation is to mainly consolidate its present shares of the waters and to secure more waters through information sharing and development projects such as reforestation of the Ethiopian highlands and ecological conversation (Ibid).

The divergent interests of Egypt and Ethiopia from the Nile cooperation were clearly declared in the "Country Papers" that were presented in the 5th Nile 2002 Conference in year 1997 (Erlich, 2002 cited in Mahmoda, 2003, p. 26). Egypt's official "Country Paper" focused on information sharing on local water issues in order to develop basin-wide projects. In the same conference, Ethiopia strongly advocated for the need to foster dialogue and communication between Nile riparians in order to discuss the issue of the water shares (Ibid).

Divergent interests of Egypt and Ethiopia do not necessarily lead to conflicts around the Nile, but instead this could eventually result in 'win-win' trade-offs between the two countries (Mason, 2004, p. 198). For example, Egypt could support development projects in Ethiopia, and in return Ethiopia commits to securing water flow to Egypt (Ibid).

Asymmetric Relationship

Relationships between co-riparian states are naturally asymmetric (Gleditsch & Marit, 2012, p. 520). Beginning with geographical asymmetries in upstream/downstream natural configuration, in which upstream states get the upper-hand in managing the river affairs since they control the origins of the waters (Ibid). Moreover, upstream states get environment-specific powers (Sjostedt, 2008, p. 232) as activities taken by upstream countries usually affect the quality and quantity of the water for the states downstream (Gleditsch & Marit, 2012, p. 520). When it comes to collaboration on environment-related issues, upstream states get decision autonomy (Sjostedt, 2008, p. 232).

However, there are other scenarios where downstream states have the upper-hand such as the case with navigation issues (Sjostedt, 2008, p. 232). In navigation issues, downstream states could control the access of upstream states to important harbors and therefore limit their trade activities (Ibid). Besides geographical asymmetries, co-riparian states usually have asymmetric characteristics. Countries differ in their population growth, GDP per capita, and access to natural endowments (Just & Netanyahu, 2012, p. 11)

Power asymmetry is another integral element of hydro-relations between co-riparian states. Powerful states do not necessarily have to be upstream, they could be located upstream, middle or even downstream (Daoudy, 2008, p. 363). The basic definition of power is "*A's ability to get B to do something that B would not do otherwise*" (Dahl (1957) quoted in Daoudy, 2008, p. 364). The concept of power has been further developed to incorporate different elements. Mark Zeitoun and Jeroen Warner (2006) conceptualized 'power' as being

based on three dimensions and then the concept had been further modified to incorporate four important pillars (Zeitoun & Cascão, 2010, p. 31). Firstly, state's *military, political, economic and technological capabilities* or what is called *structural power* (Ibid). Secondly, states' *bargaining power or relational power* and its ability to control of 'the rules of the game' and 'set the agenda' (Zeitoun & Warner, 2006, p. 442). Thirdly, the ideological power through which strong states have the *knowledge power* to trick weaker states into following their self-serving ideology (Ibid, p. 443). Fourthly, state's *geographical location* (Zeitoun & Cascão, 2010, p. 31)

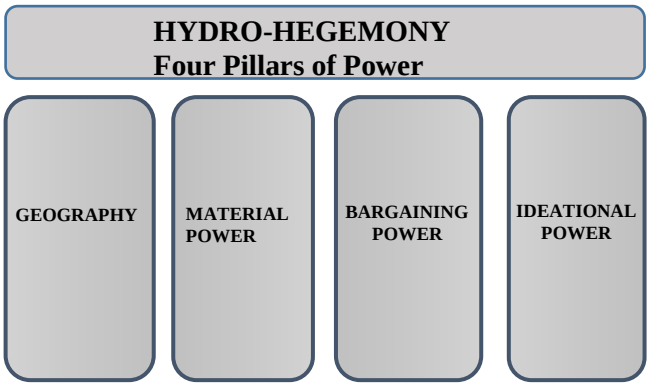
Power asymmetry and hegemony are two sides of the same coin. "*Power determines who the hegemon is*" and hegemony allows a better understanding of asymmetric power interactions (Zeitoun & Allan, 2008, p. 9). Hegemony can be understood as a mix of force 'sticks' and consent 'carrots' (Gramsci, 1935 cited in Zeitoun & Allan, 2008, p. 9). Based on the notion of hegemony, the Framework of Hydro-hegemony (FHH) has been conceived (Zeitoun & Warner (2006). The concept of Hydro-hegemony is defined by Zeitoun and Warner (2006) as:

> "*Hegemony at the river basin level, achieved through water resource control strategies such as resource capture, integration and containment. The strategies are executed through an array of tactics (e.g. Coercion- pressure, treaties, knowledge construction, etc.) that are enabled by the exploitation of existing power asymmetries within a weak international institutional context"*.

Zeitoun and Warner explained two facets of 'hydro hegemony': leadership and dominance (Zeitoun & Warner, 2006, p. 439). Leadership or the 'positive' form of 'hydro-hegemony' means managing the stability and order of water affairs to provide an overall benefit to both strong and weak states (Ibid). Whereas, the dominant or the 'negative' form of

'hydro- hegemony' occurs when weaker states are denied their rightful shares to water resources due to the actions of the more powerful states (Ibid).

Figure 3: Four Pillars of Hydro-Hegemonic Power



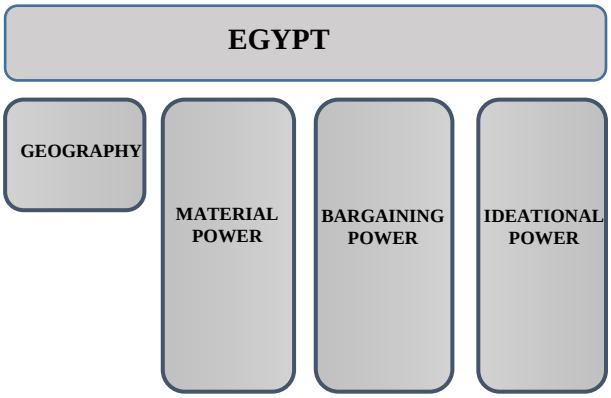
Source: Zeitoun, M., & Cascão, A. E. (2010). Power, Hegemony and Critical Hydropolitics.

Zeitoun and Warner applied the framework of hydro-hegemony to the cases of Nile, Jordan and Tigris and Euphrates river basins where they concluded that the hydro-hegemons in those river basins represent the dominant type of their theory (Zeitoun & Warner, 2006, p. 437). In the case of the Nile Basin, Egypt has been identified as a dominant hydro-hegemon that possessed enough material, bargaining and ideational powers to maintain its position as a Nile hegemon for long years (Zeitoun & Cascão, 2010).

The Nile River Basin has been characterized by a high degree of power asymmetry between upstream and downstream states (Cascão, 2009, p. 247). Besides Egypt's possession of strong military power, the country has maintained good relations with world's greatest powers such as the US and the European Union and thus has achieved predominance in terms of both economic and bargaining powers in the Nile Basin (Grandi & Hussein, 2017, p. 10). Moreover, Egypt has had strong commercial relations with its Nile co-riparians that helped in

expanding its political and economic capacities (Ibid). Those commercial relations included investments, development projects and aid channeling (Ibid, p.11). The combination of all these powers have afforded Egypt a hydro-hegemonic position in the basin. Ethiopia, on the other hand, had not been able to exercise its geographic power as an upstream state due to many internal issues and divisions that distracted its involvement in any water-related activities (Tegegne, 2015, p. 104).

Figure 4: Egypt's Four Pillars of Power



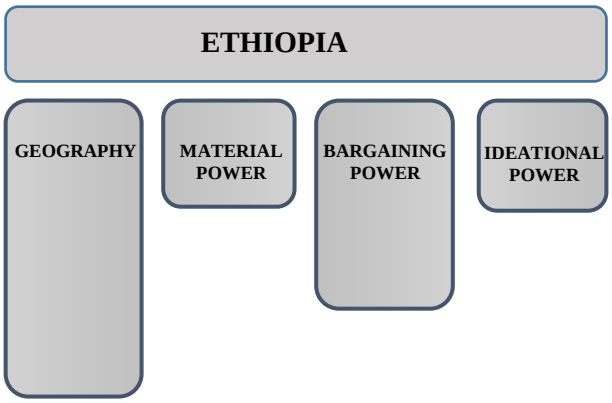
Source: Zeitoun, M., & Cascão, A. E. (2010). Power, Hegemony and Critical Hydropolitics.

The hydro-politics of the Nile Basin have significantly changed since the 1990s which contributed to balancing power asymmetries between Egypt and Ethiopia (Cascão & Nicol, 2016, p. 561). The Nile cooperative projects initiated in the 1990s onwards have notably increased the ideational and bargaining powers of Ethiopia (Ibid). Ethiopia and upstream states have started to possess both human and institutional capacities to manage information, data and communication of the Nile affairs. Thus, they have started to play an active role in knowledge management, agenda-setting and policy planning (Ibid).

In terms of bargaining power, upstream states have succeeded to build strong sub-alliances among each other to strengthen their bargaining positions vis-à-vis the downstream riparians (Cascão & Nicol, 2016, p. 562). Ethiopia has started to take the lead and bring issues to the table for discussion including the issue of hydraulic development in the upstream countries and the long-standing issue of equitable utilization of the Nile waters (Ibid, p. 561). The increase of Ethiopia's bargaining power was most visible in its alliance with the equatorial riparian neighbors to unilaterally sign the Cooperative Framework Agreement (CFA) despite the reservations of both Egypt and Sudan (Ibid). Ethiopia has also succeeded to build strong alliance with Sudan based on a plan of benefits exchange including hydro-power trade and sediment control (Ibid).

As for economic power, China's involvement in financing the Grand Renaissance Dam has had a significant impact on balancing power asymmetries between Egypt and Ethiopia (Tegegne, 2015, p. 105). China has provided different equatorial and Eastern Nile Basin countries with favorable investment deals which enabled them to move forward with their hydraulic development projects (Ibid). More importantly, Ethiopia's energy development plans play a critical role in expanding the country's economic powers (Grandi & Hussein, 2017, p. 11). Ethiopia has already signed energy trade agreements with Dijbouti, Kenya and Sudan (Ibid). If successful, Ethiopia could easily expand its influence in the Nile Basin by trading relatively cheap hydroelectric power in exchange of political alignment (Ibid).

Figure 5: Ethiopia's Four Pillars of Power



Source: Zeitoun, M., & Cascão, A. E. (2010). Power, Hegemony and Critical Hydropolitics.

The notable development in Ethiopia's regional influence has been explained as a counterhegemonic strategy (Cascão, 2008; Zeitoun & Allan, 2008; Zeitoun & Cascão, 2010; Mirumachi et al, 2017). Cascão developed her theory of counter-hegemony on the bases of the Framework of Hydro-hegemony of Zeitoun and Warner in order to explain the resistance of the non-hegemonic states to dominant hegemons (Hanke, 2013, p. 30). Cascão divides the 'counter-hegemony' strategy into two phases: a) the reactive phase during which non-hegemons resist and contest the status quo and b) the active phase and that is when non-hegemons start building an alternative regime (Cascão, 2008 cited in Hanke, 2013, p. 30). As far as the Nile Basin is concerned, Ethiopia has contested Egypt's hegemony through applying a number of reactive and active strategies (Cascão, 2008 cited in Tawfik, 2015, p. 5). These strategies included: advocating for the principle of 'equitable utilization', forming coalitions, fund raising for development projects and participating in cooperative initiatives in order to challenge the status quo (Ibid).

According to Lowi (1993), asymmetric relations in transboundary water settings can trigger conflicts only if this is in the interest of the most powerful state (cited in Daoudy, 2008, p. 366). Nevertheless, asymmetries could reinforce effective cooperation if *influenced* or *challenged* (Jagerskog & Zeitoun, 2009, p. 9). Asymmetries can be rendered in a way that produces 'win-win' or 'positive-sum' outcomes to satisfy all pertinent parties (Ibid, p. 12). The benefit-sharing model offered by Grey & Sadoff (2002) is one example of influencing asymmetries (Ibid). Asymmetries can also be challenged by either leveling the players or the playing field (Ibid). Leveling the players can happen by empowering the weaker states 'non-hegemons' and enhancing their technical and bargaining powers (Ibid). As for leveling the playing field, this can be done through effective legislative and regulatory water system at the sub-national and international levels (Ibid).

Interdependence

Interdependence can simply be defined as "*situations characterized by reciprocal effects among countries or among actors in different countries*" (Keohane & Nye, 1977 cited in Nye, Jr. & Keohane, 1987, p. 730). In the field of international relations, the notion of interdependence between states was firstly introduced from an economic/commercial perspective by Richard Cobden in 1850 (Copeland, 1996 cited in Eynon, 2016, p. 4). Based on the classical trade theory, trade interdependence allows states to sell the goods they are best at in exchange for other goods that they cannot produce (Barbieri, 2002 cited in Nijenhuis, 2012, p. 31). Therefore, states become part of an interdependent unit in which violent conflicts are unlikely to take place as it would obstruct trade activities and negatively affect states' income (Ibid).

In his theory of neo-functionalism, Ernst Haas was the first to introduce the link between economic interdependence and political integration in his analysis of the European Community (Haas, 1958). According to Haas's theory, economic interdependence between states promotes further political integration among them (Ibid). Following in Haas's work, Keohane and Nye broadened the concept of interdependence to include other linkages between states and developed the concept of Complex Interdependence (Eynon, 2016, p. 5). Keohane and Nye defined the concept of complex interdependence as "*a situation among a number of countries in which multiple channels of contact connect societies; there is no hierarchy of issues; and military force is not used by governments towards one another*" (Nye, Jr. & Keohane, 1987, p. 731).

Keohane and Nye positioned their theory of Complex Interdependence as an "*ideal type of international system*" that involve "*joint gains or joint losses between the parties involved*" (Keohane & Nye, 1977 cited in Eynon, 2016, p. 5). The theory is not only limited to situations of *balanced independence*, but also extends to asymmetries of *dependences* between states as well (Eynon, 2016, p. 10). The theory assumes that asymmetric dependences can be used a source of power by the weaker states (Ibid). Keohane and Nye introduced two dimensions of interdependence: sensitivity and vulnerability (Keohane & Nye, 1977 cited in Rana, 2015, p. 294). *Sensitivity* means the extent to which states are sensitive to external changes (Ibid). More sensitive states would incur more costs to control changes than the other states (Ibid). As for *vulnerability*, it means the degree to which states can control their responsiveness to the sensitivity (Ibid). The less vulnerable state does not necessarily have to be less sensitive, however, it means that it would suffer less from altering policies or changing events (Ibid).

International river basins naturally create an inevitable network of complex interdependencies among riparian states (Elhance, 1999, p. 13). This complex network includes political, economic, environmental and security interdependencies (Ibid). Multiple water uses and benefits, threats of resource scarcity and population growth are all factors that create economic interdependence among co-riparian states (Nijenhuis, 2012, pp. 33-35). Co-riparian states are also bound by basin-wide institutions, water treaties and international law which establish political interdependencies among them (Ibid). As for environmental interdependence, it comes from rising global warming issues and its threat to water availability (Ibid).

Interdependence between co-riparian states is viewed as a source of either conflict or cooperation. Wolf et al (2006, p. 1) argue that interdependence prevent conflicts between states, "*water fuels greater interdependence. By coming together to jointly manage their shared water resources, countries can build trust and prevent conflict*". Wolf et al based this interdependence-cooperation argument on the findings of the BAR (Basins at Risk) study that presented historical evidence of cooperative events among interdependent co-riparian states that outweighed conflictual ones (Wolf et al, 2006, p. 3). Wu et al (2013, p. 90), on the other hand, argue that overestimation of the interdependencies, among co-riparian states can adversely affect cooperation for many reasons. One problem is that overestimated interdependence can create anxiety among co-riparians regarding their expectations of cooperation and thus hamper any further process of integration (Ibid). Another problem is that overestimation of interdependencies may distract states from proceeding with important and simple water development projects due to perceived advantages from other interdependent projects (Ibid).

With regards to the Egyptian-Ethiopian hydro-relations, a water war scenario is highly unlikely in the complex interdependent world that Keohane and Nye put forward. As assumed by the *complex interdependence* theory, security is not achieved by military force, but rather with possible means of cooperation (Eynon, 2016, p. 23). In this regard, the issue of the GERD is not likely to create a military conflict between Egypt and Ethiopia as it would produce unbearable consequences for the two parties (Ibid, p. 24). Therefore, "*the influence deriving from favorable asymmetries in sensitivity is very limited when the underlying asymmetries in vulnerability are unfavorable*" (Ibid). With the rise of new security threats such as climate change, consideration of the interdependent characteristic of the issue would be the rational solution as the survival of one state becomes dependent of the survival of the other states (Ibid, p. 22). As Whittington argues, "*cooperation is viable because adaptation to climate change is likely to be expensive, and more importantly, the risks are highly tangibly detrimental*" (Whittington et al, 2014, p. 605).

Besides the natural interdependence between Egypt and Ethiopia as two riparian states sharing the Nile, it is argued that Nile Basin Initiative (NBI) with all its programs and projects has increased the overall level of interdependence among the Nile riparians (Kaasa, 2015, p. 40). One of the key characteristics of Complex Interdependence is multiple channels of contact which refers to the effect of transnational relations on increasing sensitivity of states to one another (Keohane & Nye, 1972 cited in Eynon, 2016, p. 18). Therefore, the NBI has opened opportunities for dialogue, communication and investments, and thus increased the degree of interdependence among the Nile riparians (Ibid, p. 49).

As for economic interdependence, it is argued that trade relations decrease during the times of tension (Copeland, 2002 cited in Eynon, 2016, p. 18) and the announcement of the GERD project in 2011 had indeed disrupted trade relations between Egypt and Ethiopia (Eynon, 2016, p. 18). However, this tension has not lasted for so long and old trade ties have been incrementally restored between the two countries since 2013 (Ibid). Several trade and investment agreements have been signed between Egypt and Ethiopia including twenty bilateral deals on education, health and trade (BBC, 2014). Also, three Egyptian projects worth $50 million were announced to be established in Ethiopia's first industrial zone (Daily News Egypt, 2013 cited in Eynon, 2016, p. 19).

Chapter 4: Conceptual Framework

Based on the review of the literature, this research study nullifies the likelihood of a water war scenario to break out between Egypt and Ethiopia. Conversely, it adopts the conflict-cooperation co-existence notion and argues for further cooperative relations between the two countries on and beyond the Nile River based on a number of factors. First and foremost, history proves that the number of international water treaties and cooperative events outweighed the conflictual ones even between the bitterest enemies. In the context of the Nile Basin, Egypt and Ethiopia have never fought a violent war over water issues. Using Mirumachi's TWINS model, the Egyptian-Ethiopian water relations fall into the neutral-interaction category. In other words, the water relations between two countries has been swinging between low conflict and low/medium cooperation. The two countries have been engaged in common cooperative initiatives, yet they have not reached a robust cooperation model. This does therefore not mean the complete absence of conflict, but simply how water conflicts between Egypt and Ethiopia have never escalated beyond the level of threats and counter-threats.

Secondly, the idea of an upstream-downstream water war is strategically irrational (Gebreluel, 2014, p. 32). If the reason for war is a dam project in the upstream state and the downstream is militarily capable of attacking the project site, any violent action towards the dam would result in mutual destruction (Ibid). Attacking an upstream dam would flood parts of downstream countries and could easily provoke the upstream state to strike retaliatory actions by polluting the waters, and ending up with a severe lose-lose situation (Ibid).

Thirdly, the balance of powers between Egypt and Ethiopia makes a water war a less likely scenario. One the one hand, Ethiopia is geographically more powerful than Egypt due to its position upstream. On the other hand, Egypt is militarily stronger than Ethiopia. This balance of powers makes Egypt and Ethiopia very vulnerable to each other's actions. Thus, violent conflicts become unfavorable as the two countries' asymmetries in vulnerability are similar (Eynon, 2016, p. 24). Fourthly, the multifunctional nature of the water and the complex interdependent characteristics of transboundary river basins open the door to cooperation opportunities through forming the right linkages between various water and non-water issues.

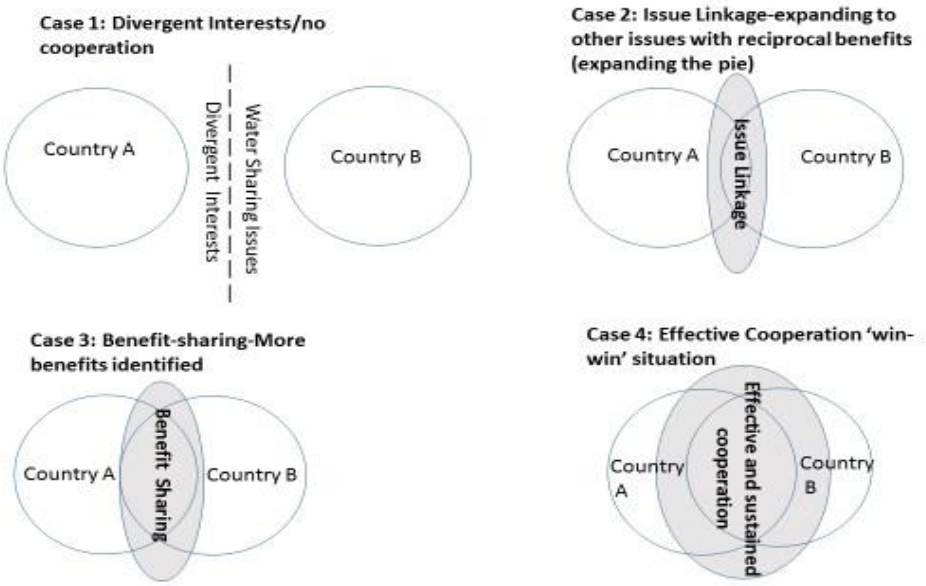
Hence, this research analyzes possible cooperation opportunities between Egypt and Ethiopia using the benefit-sharing framework. The concept of benefit sharing is defined as "*any action designed to change the allocation of costs and benefits associated with cooperation"* (Sadoff & Grey, 2005, p. 422). In other words, it suggests an integrative 'positive-sum' approach (Wolf, 2004, p. 18) through exploiting different hydrological interdependencies in order to derive potential benefits whether social, economic, political or environmental. It also offers a positive and pragmatic approach of negotiating between riparian states by tying issues of water to other non-water aspects such as energy exports, raw materials and manufactured goods. As discussed by Woodhouse and Phillips (2009, p. 101), "*negotiating on a project by project can easily result in a stalemate-whereas the basket of benefits approach means opportunities can be modified and changed until an acceptable outcome is agreed by all*".

Thus, an integral feature of the benefit-sharing model is *issue linkage* or *broadening the basket of mutual benefits*. In the international cooperation literature, issue linkage theory is simply a bargaining tool which is defined as "*linkage between unrelated or only loosely-*

related issues in order to gain increased leverage in negotiation" (Wallace, 1976 cited in Poast, 2013, p. 287). In other words, it simply means linking water and non-water issues in order to create 'bigger baskets' of benefits that can be achieved by all involved parties (Tollison and Willett, 1979 cited in Daoudy, 2008, p. 367). Such linkages broaden the countries' ranges of options and open the door to multiple constructive solutions or what's called '*the package deal'* (Mostert, 1998, p. 209).

Issue linkage has two main objectives (Poast, 2013, p. 287). First objective is to encourage states to reach an agreement by generating benefits from cooperation (Ibid). Second objective is to incentivize states to stay committed to the negotiated agreements (Ibid). Therefore, issue linkages expand the pie by introducing bigger baskets of benefits and trade-offs and in turn, this facilitates a viable benefit-sharing deal to be conceived. Wolf et al (1999) studied 145 successful water treaties in which issue-linkages were very common (Gupta, 2016, P. 107). Wolf et al found that 30 percent of those treaties included monetary linkages, one percent included political linkages, 4 percent had land linkages and 7 percent had other types of linkages (Ibid).

Figure 6: Conceptual Framework



Source: The author, modified from (Sadoff & Grey, 2005, p. 421).

As discussed in the earlier chapters, there are four types of benefit sharing: (1) benefits to the river, (2) benefits from the river, (3) reduction of costs because of the river and (4) benefits beyond the river (Sadoff & Grey, 2005, p. 421). Given the current controversy over the GERD, chapter five analyzes the potential *benefits from the river* that can be generated from this project. In an attempt to broaden the basket of benefits, chapter six looks into potential *benefits beyond the river* which refers to possible issue linkages between the Nile water issues and other non-water cooperation opportunities such as trade deals and joint investments.

Benefit-sharing is an incremental process that has three phases: short, medium, and long-term (Tafesse, 2009, p. 239). Short-term phase is strengthening ties between co-riparian states through establishing different cooperative initiatives and maintaining continuous dialogue (Ibid). Medium-term phase is about setting benefit-cost sharing plan (Ibid). Finally, the long-term phase is establishing joint development projects to potentially create positive

outcomes to all co-riparians (Ibid). In the case of the Nile Basin, there have been important steps taken in the short-term phase that will be thoroughly discussed in chapter four.

Chapter 5: The Benefit Sharing Framework in the Nile Basin Initiative

The Benefit-Sharing model is not new in the context of the Nile Basin. There have been earlier attempts to incorporate this model into the operations administered by the NBI at the basin and sub-basin level. Hence, this chapter aims to further analyze the Nile Basin experience with the Benefit-Sharing Framework. It tries to specifically answer the following questions: *What was achieved?* And *What went wrong?* Both Egypt and Ethiopia were active members in the NBI during the benefit-sharing workshops which took place between years 2008 and 2009 in which they have listed their envisioned benefits from the Nile River. In addition, Egypt, Ethiopia and Sudan have been part of the Joint Multipurpose Program (JMP) of the Eastern Nile Sub-basin that aimed to promote benefit-sharing projects between the three countries. Thus, this analysis facilitates the understanding of the applicability of the benefit-sharing model as a cooperative tool to foster sustainable and effective cooperation between Egypt and Ethiopia and avoid future conflicts.

5.1: The NBI Benefit-Sharing Framework

The main vision of establishing the Nile Basin Initiative is "*to achieve sustainable socio-economic development through equitable utilization of and benefit from, the common Nile Basin water resources*" (NBI, 2017). This vision aims at achieving an overall development at various scales and levels such as poverty alleviation, optimal use of the water and economic cooperation to seek win-win gains for all member states (Bhargava, 2012).

The benefit-sharing model has been thoroughly studied and reviewed under the auspices of the Nile Basin Initiative (NBI) to serve as a cooperative tool to unlock more value from the basin and resolve disagreements between upstream and downstream states with an overall

positive outcome (NBI, 2014, p. 10). Therefore, the NBI defines benefit-sharing as "*cooperation between states to increase the benefits in a transboundary basin and to fairly distribute the benefits in support of local, national and regional development objectives*" (Ibid). Another definition of the NBI benefit sharing framework is "*a mechanism to identify new benefit sharing scenarios in the context of increasing cooperation. In turn those forms of cooperation would reduce the possibility of conflict and provide an alternative perspective for cooperative and beneficial water sharing*" (NBI, 2009, p. 8). According to the latter definition, the NBI Benefit Sharing Framework aims at optimizing water use across different sectors and countries (Ibid, p. 6) and avoiding conflicts.

In one of the NBI reports, the benefit-sharing model has been conceptually explained showing how upstream and downstream countries could collaborate to optimize water use in one sector in order to produce higher return value in other sectors and thus increase the overall benefits to all countries involved (NBI, 2009). Therefore, the NBI hypothetically explains the benefit-sharing model as following:

Scenario One:

Country A (upstream) and Country B (downstream) share 100 $km^3$of water flow (Q) per year (NBI, 2009, p. 7). Based on an agreement, Country A gets a share of 80 km^3 and Country B gets 20 km^3 (Ibid). On the one hand, Country A has more efficient industry, but an average agriculture (Ibid). On the other hand, Country B has more efficient growth in the agricultural sector, yet it does not possess enough capacities for developing its industrial sector (Ibid). Based

on the aforementioned, the two countries generate a combined economic return (P) of a total US $115 million (Ibid).

Consumption/Sector	**Country A (Upstream)**		**Country B (Downstream)**	
	Volume (km^3)	Economic Return ($M)	Volume (km^3)	Economic Return ($M)
Agriculture	60	60	12	30
Industry	5	25	0	0
Domestic Consumption	15	0	8	0
Total	80	85	20	30
Combined Total	Total Volume= 100 Km^3, Total Economic Returns= 115 $M			

Scenario Two:

Country B is not satisfied with the present water allocation plan and thus requests to redistribute the shares of the water, so that it could build its infrastructure (NBI, 2009, p. 7). After negotiations, Country B now gets a share of 25 km^3 and Country A gets 75 Km^3 (Ibid). However, the total economic returns of the two countries falls to US $105 million (Ibid).

Consumption/Sector	**Country A (Upstream)**		**Country B (Downstream)**	
	Volume (km3)	Economic Return ($M)	Volume (km3)	Economic Return ($M)
Agriculture	60	60	12	30
Industry	3	15	0	0
Domestic Consumption	12	0	13	0
Total	75	75	25	30
Combined Total	Total Volume= 100 Km3, Total Economic Returns= 105 $M			

Scenario Three:

To make up for that economic loss, Country A decided to spend $5 million to enhance its water use efficiency which results in increasing the water flow to Country B with an additional 5

km^3 per year (NBI, 2009, p. 7). The extra $5km^3$ helps Country B to improve its agricultural sector and therefore it agrees to return the $5 million to Country A (Ibid).

Consumption/Sector	**Country A (Upstream)**		**Country B (Downstream)**	
	Volume (km^3)	Economic Return ($M)	Volume (km^3)	Economic Return ($M)
Agriculture	60	60	12	30
Industry	3	15	0	0
Domestic Consumption	12	0	13	0
Total	75	75	25+5 from A	30-5 to A
Combined Total	Total Volume= 100 Km^3, Total Economic Returns= 105 $M			

Scenario Four:

Despite the improved cooperative relations between Countries A & B, the net economic return is still the same value without any further increase (NBI, 2009, P. 7). Country A notices that its economic return from agriculture is still low in comparison with Country B which is much more advanced in this sector (Ibid). The two countries agree that instead of B returning $5M (investment debt) per year to A, B will provide A with the know-how to improve its agriculture (Ibid). As a result, Country A increases its economic return from agriculture with $5 million each year and agrees to increase the water flow to Country B by an additional 5 Km^3 (Ibid).

Consumption/Sector	**Country A (Upstream)**		**Country B (Downstream)**	
	Volume (km^3)	Economic Return ($M)	Volume (km^3)	Economic Return ($M)
Agriculture	60	65	17	30
Industry	3	15	0	0
Domestic Consumption	12	0	13	0
Total	75	75	25+10 from A	30-5 invested in training A
Combined Total	Total Volume= 100 Km^3, Total Economic Returns= 110 $M			

Scenario Five:

Despite the economic progress achieved in both countries, it is not as beneficial as scenario A (NBI, 2009, p. 8). Due to the interest in both countries in achieving win-win outcomes, A & B agree to evenly divide their water shares, so that each country gets a share of 50 km^3 per year (Ibid). This agreement is contingent on a continuous improvement in the agriculture sector (Ibid). Country A also decided to allocate an extra 2 km^3 from its share to its industrial sector (Ibid).

Consumption/Sector	**Country A (Upstream)**		**Country B (Downstream)**	
	Volume (km^3)	Economic Return ($M)	Volume (km^3)	Economic Return ($M)
Agriculture	33	55	37	60
Industry	5	25	0	0
Domestic Consumption	12	0	13	0
Total	50	50	25+10 from A	30-5 invested in training A
Combined Total	Total Volume= 100 Km^3, Total Economic Returns= 140 $M			

Scenario Six:

Countries A & B notice the overall economic progress and thus decide to continue in this positive-sum direction (NBI, 2009, p. 8). This time, they decide to invest more in their industrial sector (Ibid). Since Country A is more developed industrially than Country B, the latter decided to get some assistance from A in this sector (Ibid). The two countries also decide to reallocate the shares of the water, so that A gets 60 km^3 per year and B gets 40 Km^3 per year (Ibid).

Consumption/Sector	**Country A (Upstream)**		**Country B (Downstream)**	
	Volume (km^3)	**Economic Return ($M)**	**Volume (km^3)**	**Economic Return ($M)**
Agriculture	40	60	20	50
Industry	8	40	7	35
Domestic Consumption	12	0	13	0
Total	60	100	40	85
Combined Total	Total Volume= 100 Km^3, Total Economic Returns= 185 $M			

Scenario 6 is seen as a perfect model for a win-win outcome ((NBI, 2009, p. 8). In Scenario 1, Country A got a share of 80 Km^3/year and made an economic outcome of $85M/year (Ibid). After cooperation with Country B, it now gets a share of 60 km^3/year and makes an annual economic return of $10M (Ibid). Also, Country B used to get a share of 20 km^3/year and made an annual economic return of 30km^3$ and now it gets a share of 40 km^3 and makes an annual economic return of $85M/year (Ibid).

In these hypothetical scenarios, the NBI aimed to simply explain how cooperation could generate a wide array of shared benefits if countries agree to change their water sharing perceptions (NBI, 2009, P. 8). The model also shows that the benefit-sharing model is achievable if countries agree to cooperate and if there are new opportunities that they can jointly optimize

(Ibid). Therefore, the benefit-sharing model is a mechanism to unlock new opportunities of benefit-sharing in the context of stable and sustainable cooperation (Ibid). As a result, the possibility of conflict will be reduced and the rate of interstate cooperation will be increased (Ibid).

5.2: Main Achievements

The Shared Vision Program (SVP) and the Subsidiary Action Programs (SAP)

The Nile Basin Initiative includes two complementary programs: the all-basin Shared Vision Program (SVP) and the sub-basin Subsidiary Action Programs (SAP) (Hamed & Ahmed, 2014, p. 3). The Shared Vision Program (SVP) mainly focuses on reinforcing trust and confidence among the Nile Basin countries (Ibid). Whereas, the Subsidiary Action Programs (SAP) aims to promote investments and economic development at sub-basin levels (Ibid).

The SAP has two main programs which are managed by two sub-basin offices (Hamed & Ahmed, 2014, p. 3). In the Eastern Nile region, the Eastern Nile Technical Regional Office (ENTRO) is responsible for the Eastern Nile River Basin Subsidiary Action Program (ENSAP) (Ibid). In the Nile Equatorial Lakes region, the Nile Equatorial Lakes Coordination Unit (NELSAP-CU) manages the Nile Equatorial Lakes Subsidiary Action Program (NELSAP) (Ibid, p. 4).

The Eastern Nile Technical Regional Office (ENTRO) and the Joint Multipurpose Program (JMP)

ENTRO is located in Addis Ababa, Ethiopia and is responsible for managing projects for water resource development in the Eastern Nile region by assisting Egypt, Ethiopia, South Sudan, and Sudan to initiate development projects and investments at a regional/transboundary level (Hamed & Ahmed, 2014, p. 31).

The ENTRO has developed a number of investment projects including the Joint Multipurpose Program (JMP) (Hamed & Ahmed, 2014, p. 42). The objective of the JMP is to develop multiple economic integration projects between Egypt, Ethiopia and Sudan that go beyond the river (Tafesse, 2009, p. 241). The JMP plan includes four main elements: (a) watershed and environmental management, (b) increasing agricultural productivity, (c) building power systems and (d) sustaining growth and cooperation (Ibid).

In 2006, the ENTRO office developed the One System Inventory (OSI) in order to support the Joint Multipurpose Program (JMP) of the NBI (Hamed & Ahmed, 2014, p. 4). The main objective of the OSI was to serve as a regional knowledge hub across Egypt, Ethiopia and Sudan that aimed to assess the Nile Basin resources and development opportunities (Ibid). It primarily focused on water resources, socio-economy and environmental issues of the region (Ibid).

The JMP launched the first phase of its projects (JMP1) that included ‘Anchor Projects’ and ‘Ancillary Projects’ (World Bank, 2013, p. 10). The Anchor Projects included plans for constructing a large dam for hydroelectric power generation and other joint multipurpose water

development projects such as watershed and agricultural management (Ibid). Whereas, the Ancillary Projects focused on areas of transport and navigation (Ibid). In 2009, The JMP1 Identification (ID) studies were designed to support the Eastern Nile (EN) countries (Egypt, Ethiopia and Sudan) to identify the first package of the JMP1 major investments through a series of research and consultations (Ibid). Despite the promising steps taken by the JMP1, the progress of the project was interrupted and eventually closed in December 2012 for a number of reasons (Seide, 2014, p. 2):

(1) One key reason was the disagreements over the Cooperative Framework Agreement (CFA) in mid-2010 between the three EN countries which led to a 'freeze' in the participation of Egypt and Sudan in the whole Nile Basin Initiative including the JMP1 (World Bank, 2013, p. 11). Researchers and consultants were not able to travel to some EN countries and therefore all data gathering and information collection activities were halted (Ibid, p. 23).

(2) In addition, the announcement of the unilateral construction of the Grand Renaissance Dam on the Blue Nile outside the JMP1 process complicated the hydro political situation between the three EN countries (World Bank, 2013, p. 11).

(3) Another reason was related to the quality issues of the technical studies (World Bank, 2013, p. 23). The JMP1 ID studies were originally designed with a high level of complexity that created long-term issues with its implementation (Ibid). Moreover, the supervision process was not of a high standard to allow satisfactory results (Ibid).

(4) Institutional and Managerial issues were also factors to the JMP1 stagnation (World Bank, 2013, p. 25). Due to the hydro-political turmoil between the three EN countries and the freeze in participation of Egypt and Sudan, the progress of the project was negatively affected by the reduction of the high-level technical and managerial capacities (Ibid). Due to the tensions that arose between the three EN countries, two managers who were directly involved in the JMP1 ID studies resigned from ENTRO and were not replaced (Ibid). Additionally, some core staff positions such as the Economist and the Finance Specialist remained unfilled as high calibers were discouraged to apply due to the political uncertainty that surrounded ENTRO from 2010 onwards (Ibid).

The Socio-economic Development and Benefit Sharing (SDBS) and the NBI Benefit-Sharing Framework (BSF)

Among several projects concluded under the Shared Vision Programs (SVP) of the NBI, the Socio-economic Development and Benefit Sharing (SDBS) Project has emerged as the NBI's second strategy in year 2005 at the level of the basin (Mekonnen, 2011, p. 358). The SDBS project was designed as a part of the NBI benefit-sharing strategy. It mainly aimed at (1) developing a network of private and public sectors, technical experts, academicians, and NGOs representatives from across the Nile basin, (2) identifying possible opportunities for socio-economic development and benefit-sharing, (3) building national and regional capacities for policy making and macro-economic analysis and (4) developing criteria and methods for sharing the benefits and costs of basin-wide cooperation along with risk management plan (Seide, 2014, p. 5).

The SDBS consists of three stages: (1) establishing a common understanding, (2) building scope and significance of benefit sharing scenarios and (3) determining magnitude of baskets of benefits (NBI, 2009, p. 11). *Stage one* was mainly a planning phase during which the Nile riparians could discuss what they expect from the benefit sharing framework and how they plan to apply it (Ibid). Some of the main points that needed to be discussed in stage one is whether the framework will be applied to the whole river basin or to separate sub basins, what types of benefits are to be included in the agreement (e.g. trade) and if the agreement only includes Blue water[6] or it extends to other types such as Green water[7], groundwater or virtual water[8] (Ibid). *Stage two* is setting a broad range of benefit sharing scenarios and identifying

[6] Blue Water refers to both surface water and groundwater
[7] Green Water is the water that comes from the rain and is stored in the soil
[8] Virtual Water is the water embodied in products such as agricultural products

potential “baskets of benefits”. Stage two is just qualitative and does not involve accurate calculation of the benefits. *Stage three* of the framework is to create a quantitative analysis for the determined shared benefits.

Transboundary Water Opportunity (TWO) Analysis

As part of the World Bank’s plan to employ the benefit-sharing model in the Nile system, the TWO Analysis tool was developed to explore all existing and potential development opportunities ‘the basket of benefits’ that can be generated from transboundary water resources to produce positive-sum outcomes (Phillips et al, 2009, p. 2). This tool is not only confined to Blue Water as it also applies to Green Water, Virtual Water and all forms of reusable water (Ibid, p. 4). In early 2009, thirty-five representatives from all the Nile Basin countries attended a three-day workshop to work on the TWO matrix (Ibid, p. 19). In the TWO analysis workshop, the Nile Basin countries discussed potential development opportunities within the following categories:

- **Hydropower and power trading:** Electrical power is one the most important indicators for a healthy economic growth, however, there are many hydropower resources that have not been explored yet especially in developing countries (Phillips et al, 2009, p. 9). Despite the great economic value of hydropower, the development of hydropower projects might produce critical effects on the river balance within a transboundary basin (Ibid). Thus, the positive economic benefits of hydropower development should be weighed against the potential negative effects of dams on co-riparian states (Ibid). The

location of the dams on transboundary rivers is one important factor that should be agreed upon by all co-riparians (Ibid).

- **Primary production:** This refers to the potential benefits that can be attained in the agricultural sector by improving water techniques (Phillips et al, 2009, p. 9). The agricultural sector is considered to be one of the most important contributors to economic development in many states especially in Africa (Ibid). In Africa, huge volumes of water are wasted due to the mismanagement of the irrigation techniques (Ibid).

- **Urban growth and industrial development:** Fresh water allocated to the industrial and services sectors can generate higher economic returns than that of the agricultural sector (Phillips et al, 2009, p. 10). However, it is important for countries to carefully select the right industries that can accelerate their economic growth (Ibid).

- **Environment and ecosystem services:** the TWO model gave a special emphasis on the fisheries and tourism in this sector, however, there is a wide range of other services that can produce high positive returns as well such as food, biochemical products and climate regulation (Phillips et al, 2009, p. 10).

TWO Analysis Matrix

The final shape of TWO Analysis Matrix is an optional decided by the riparian states themselves (Phillips et al, 2009, p. 19). Riparian states may add or remove to the original development categories (the right vertical column in the matrix) (Ibid). This contends the fact that each transboundary basin has unique characteristics and accordingly each has a different mix of development categories (Ibid)

In the TWO matrix, riparian states answer certain questions related to the selected possibilities for benefit-sharing and rate the importance of each selection using the color coding shown below (Phillips et al, 2009, p. 25).

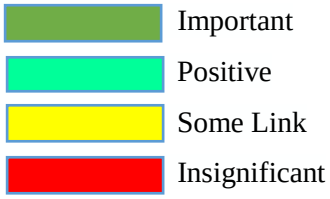


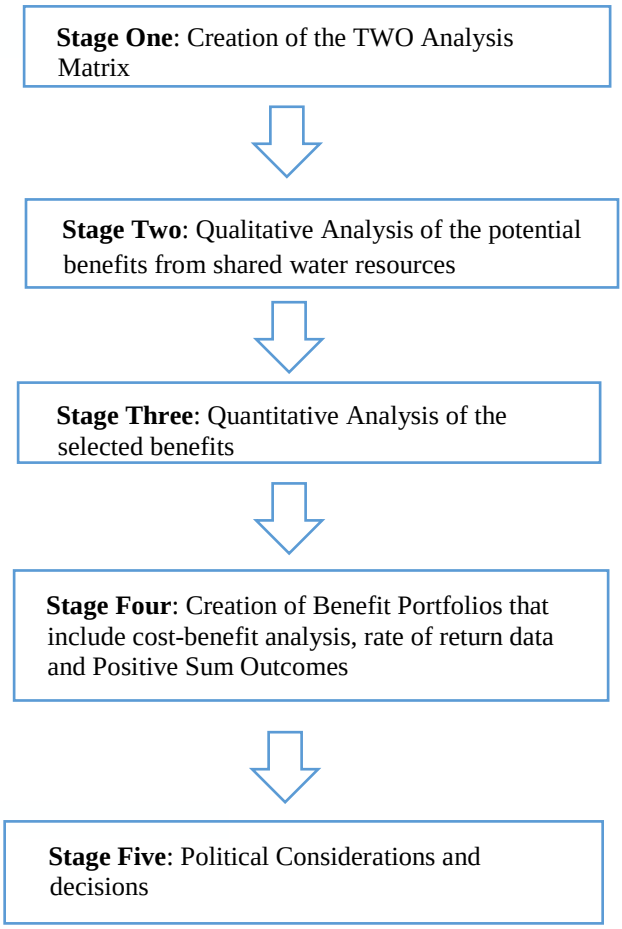
Table 4: The TWO Model

Questions:

Development Opportunity	**Sub-category**	**New Water (NW)**	**Efficient Use of Water (EUW)**	**Virtual Water (VW)**
Hydropower	Construction of Dam X →	Can Dam X create NW?	Can Dam X allow more EUW?	Can Dam X affect VW flows?
	Construction of Dam X ←	Can NW affect Dam X Construction?	Can the EUW affect Dam X construction?	Can VW flows affect Dam X construction?
Primary Production (Agricultural benefits)	Crop yields →	Can changes in crop yield create NW?	Can changes in crop field affect the EUW?	Can changes in crop yield affect VW flows?
	Crop yields ←	Can NW enhance crop yields?	Can the EUW enhance crop yields?	Can VW flows affect crop yields?
Urban Growth/Industrial Development	Growth of the mining sector →	Can mining growth create NW?	Can mining growth affect the EUW?	Can mining growth affect VW flows?
	Growth of the mining sector ←	Can NW enhance mining growth	Can the EUW enhance mining growth?	Can VW flows affect mining growth?
Environment and Ecosystem Services	Tourism →	Can increased tourism create NW?	Can increased tourism affect the EUW?	Can increased tourism affect VW flows?
	Tourism ←	Can NW increase tourism?	Can the EUW increase tourism?	Can VW flows increase tourism?

Source: TWO Analysis Matrix copied from (Phillips et al, 2009, p. 11)

Stages of the TWO Analysis Exercise (Phillips et al, 2009, p. 16)



During the same period of the TWO analysis workshop, the Nile riparians were very much occupied with their discussions on the draft of the Cooperative Framework Agreement (CFA) (Ibid, p. 20). Despite their disagreements over the CFA, the Nile riparians smoothly collaborated on finalizing the TWO Analysis matrix (Ibid). In the exercise, the Nile riparians agreed upon several issues that can be summarized as following:

- Enhancing the flows of the Blue Water within the Nile Basin through a better management of the Green Water-Blue Water interface in the upper parts of the White Nile and the Blue Nile where there is frequent rainfall (Woodhouse et al, 2017, p. 236).

- Improving the use of fresh water in agriculture in all the Nile riparian states. Inefficient irrigation has resulted in low agricultural yields in the whole Nile Basin (Woodhouse et al, 2017, p. 236).

- Giving attention to the Virtual Water flows, through a well-managed pattern of import and export of traded products between Nile riparians. This largely depends on the overall improvement of the agricultural sectors in the Nile Basin (Woodhouse et al, 2017, p. 236).

- Developing the industrial sector across the Nile Basin countries, especially those industries that rely on the primary ores that are abundant in the riparians involved. Allocating water to the industry sector brings higher economic returns, compared to the use of allocating the same volumes of water to the agricultural sector (Woodhouse et al, 2017, p. 236).

- Promoting high-end tourism (including ecotourism) which can generate high economic returns in many Nile riparian states (Woodhouse et al, 2017, p. 236).

5.3: Main Challenges

Mekonnen (2010, p. 249) argued, "*in as much as sharing transboundary waters is difficult, designing the appropriate modality in which benefit-sharing would be carried out is as difficult and perplexing*". Although the NBI benefit-sharing model has achieved significant strides theoretically, the operationalization of this model still remains a big challenge (Haileslassie et al, 2008, p. 66).

Several studies have been conducted to identify the key reasons behind the stagnation of the benefit-sharing and socio-economic development in the Nile Basin. Among these studies, Okbazghi and Keren Yohannes (2012) argue that one of the main reasons is the Nile riparians' preoccupation with supply augmentation strategies rather than strategies for demand

management diversifications. Therefore, the Nile riparians states have unilaterally planned for mega water projects on the Nile which have signaled weak faith among 'benefit sharing' negotiators (Ibid).

Another important factor identified was the mismanagement of foreign funding which was mostly spent on symbolic and pilot projects (Yohannes & Yohannes, 2012, p. 204). The operationalization of the NBI benefit-sharing model mainly depended on foreign assistance from the international organizations and donor governments (Ibid). Although an externally-driven transboundary cooperation has proven to support internal resource capacity, but it still could not completely substitute it (Ibid, p. 205). Confidence-building and trust needs to reinforced by the Nile basin countries themselves in order to achieve a sustainable benefit-sharing model (Ibid).

The inadequate capacity for policy analysis has been another key issue to the benefit-sharing implementation in the Nile Basin (NILE-SEC, 2001, p. 5). Many Nile Basin states lacked the requisite skills to conduct research studies and assessments to the different scenarios of investments and their projected outcomes (Ibid). Therefore, the uneven capacities of policy analysis across the Nile Basin made it difficult to reach well-informed discussions and conclude mutual agreements (Ibid). This will not happen except if representatives of each country are well-trained to communicate with each other in the technical language that all groups understand (Ibid).

In 2009, Cascão conducted interviews with a number of national and regional stakeholders including experts and consultants who were directly involved in the Nile Basin benefit-sharing project (Cascão et al, 2009, p. 65). The interviews were an attempt to identify the

main challenges faced in implementing the benefit-sharing model (Ibid). The outcome of the interviews revealed that several NBI stakeholders considered the benefit-sharing model as a complex and opaque (Ibid). They looked at it as a 'purely' theoretical concept that is difficult to be realized in real life (Ibid). Cascão summarized the findings of her interviews in the following points:

1) Key decision-makers found it difficult to identify the range of benefits that could be generated from the model to be traded among the NBI countries (Cascão et al, 2009, p. 65).
2) Due to the absence of joint investment projects between the Nile riparian states, it was challenging to identify the possible costs and benefits from the application of the model (Cascão et al, 2009, p. 65).
3) It was also difficult to visualize the benefit- and cost-sharing at a basin-wide (multilateral level) (Cascão et al, 2009, p. 65).
4) Some upstream riparians were concerned that the benefit-sharing approach would overshadow or replace the long-standing issue of water allocation, which is something considered by upstream states as a top-priority (Cascão et al, 2009, p. 65).
5) It was difficult for some stakeholders to comprehend the idea of handling the benefit-and water-sharing paradigms simultaneously (Cascão et al, 2009, p. 65).
6) Some decisions makers criticized the lack of coordination between the Socio-economic Development and Benefit Sharing (SDBS) program and existing investment projects (Cascão et al, 2009, p. 65).

Chapter 6: The Grand Ethiopian Renaissance Dam as a benefit-sharing tool

From the outset, the GERD has been promoted as a benefit-sharing project that will bring benefits to Ethiopia and its neighboring countries including Egypt and Sudan. According to the late Ethiopian Prime Minister, Meles Zenawi, the GERD project was initially planned to be a jointly-owned project in which Egypt and Sudan would have contributed to its costs with percentages of 20% and 30% respectively, however, the conditions for such an arrangement did not exist (Tawfik, 2015, p. 11). Given that the GERD project has been unilaterally executed by the government of Ethiopia without prior consent from Egypt and Sudan, this chapter shall further examine if the GERD could still serve as a viable benefit-sharing project between the three countries. A cost-benefit analysis will be conducted in order to list the main potential advantages and disadvantages of the GERD on the three Blue Nile countries (Egypt, Ethiopia and Sudan).

6.1: GERD: Cost-Benefit Analysis

Generally, the construction of a dam project in an upstream country is a highly contentious issue as it may produce negative externalities to the downstream countries especially when the repercussions are not accurately reflected in the cost-benefit analysis of the country causing them (Dombrowsky et al, 2012, p. 5). Negative externalities may include reducing normal water flow to downstream countries that is used for agriculture, navigation or domestic consumption (Ibid). On the other hand, an upstream dam may also generate benefits to downstream countries when it improves flood management in the downstream part and produce favorable economic benefits to all pertinent riparians (Ibid).

Table 5: Dombrowsky's upstream dams' costs-benefit analysis

Externalities of upstream dams in a downstream country	
Benefits to upstream state	**Externalities in downstream state**
Hydroelectricty	(-) changed flood and sedimentation regime (-) peak flows (-) seasonal imbalance
Flood Control	(-) changed flow and sedimentation regime (-) peak flows (+) regularized flow
Irrigation/Drinking Water	(-) changed flow and sedimentation regime (-) peak flows (-) seasonal imbalance (-) high to low water extractions (+) regularized flow
Improved Navigability	(+) increased trade

Source: Dombrowsky et al, 2012, p. 5

GERD anticipated benefits

- **Hydropower Generation**

As per the pronouncements of the Ethiopian government, power generation is the GERD's primary objective which is expected to produce an electric power of 6000MW, with an annual energy production of 15130GWH (Tesfa, 2013, p. 4). The project is planned to be a source of clean and renewable energy for Ethiopia and other African countries including Egypt at much lower prices (Ibid, p. 6). Ethiopia has already negotiated power purchase agreements have with neighboring countries, including Djibouti, Kenya, Rwanda, Sudan and Tanzania (Donnenfeld, 2017). Consequently, this project could represent a promising step towards a more sustainable regional cooperation that may boost economic growth and welfare in Ethiopia and other Eastern Nile countries.

Despite, Ethiopia's endeavor to strengthen power trade relations with neighboring and even distant states, this goal is still far from reality as currently, the transmissions lines only

reach Sudan (International Non-Partisan Group, 2014, p.8). Egypt, Ethiopia and Sudan need to start negotiating a power trade agreement followed by building transmission lines to deliver the GERD's hydropower (Ibid). It is noteworthy that building the transmission lines would require strong financing and investment capabilities (Ibid). Moreover, timing is another crucial factor to be considered in this hydropower transmission plan (Ibid, p.9). As stated in the report, the establishment of transmission lines from the GERD to Sudan and Egypt is estimated to take a minimum of five years to be completed (Ibid).

- **Water Conservation and Flood Control**

The GERD is projected to sustain a regular flow of the Nile waters to downstream countries which will benefit navigation and irrigation activities (Yihdego et al, 2017, p. 13). It is also expected to regulate floods during the wet season and improve water supply during the dry season from November to June (Ibid).

Besides, the location of the GERD in the high lands is expected to reduce the amount of evaporated water in comparison with the Aswan High Dam which loses around 12% (14.3 billion cubic meters) due to evaporation (Yihdego et al, 2017, p. 9). According to some studies, the evaporated water in the Ethiopian highlands forms a cloud and feed the Nile back in the form of rains, whereas the evaporated water in the Aswan Dam is lost in the Sahara Desert (Tesfa, 2013, p. 10).

In order to guarantee a regulated water flow with the presence the GERD, there needs to be a prompt plan to regulate the operations of the GERD with the downstream dams: Egypt's Aswan High Dam (AHD) and Sudan's Sennar and Rosiers dams (International Non-Partisan

Group, 2014, p. 3). Given that both the GERD and the AHD have two large, over-year storage reservoirs, it has become very critical to coordinate the filling plans between the two reservoirs especially during the dry seasons (Ibid, p.4). As Sudan lacks an over-year storage facility, it could face a major problem to secure its monthly water requirements during the filling phase of the GERD reservoir (Ibid).

- **Sedimentation Management**

Due to accumulation of sediments in the Sennar Dam of Sudan, the reservoir has lost around 71% of its water storage and electric-power generation capacity (Tesfa, 2013, p. 8). Same problem applies to the Roseires Dam which has lost around 36% of its operational capacity (Ibid). As for the Aswan High Dam (AHD) in Egypt, more than 6.285 billion tons of sediments were accumulated in its reservoir between years 1964 and 2008 which have impacted its capacity for electricity generation in addition to the high maintenance and dredging costs (Ibid). The government of Ethiopia contends that the GERD would reduce the sedimentation level in the Blue Nile by up to 86% which should be saving both Egypt and Sudan the large annual spending on dredging and maintenance operations (Ibid, p. 9).

GERD anticipated costs

In the case of the Grand Renaissance Dam, it is important to assess the potential costs on the downstream countries in general, and on Egypt in specific. According to the assessment report released by the IPoE, the GERD construction plan had not included an effective assessment of its impacts on downstream countries, "*no downstream flow records and hydro-meteorological information are given as would be needed to assess the downstream impacts of*

the GERD project" (IPoE, 2013, p. 35). As mentioned in the IPoE report, the design of the GERD is shortsighted and gives much focus on power production and reservoir filling, but "*does not consider environmental and socio- economic impacts downstream*" (Ibid, p. 40). Long-term environmental and socio-economic impacts could include threats to fisheries and biodiversity, riverbed and banks erosion and other problems to the agriculture activities around the river (Ibid, p. 41).

- **Sustainability of Water Flow to Downstream States**

Although Ethiopia assures that the project is mainly constructed for power production, it is still uncertain whether Ethiopia will use the dam for irrigation purposes. The current Ethiopian Prime Minister, Helamariam Desalegn, contended that the GERD will be mainly used for hydropower production and not for irrigation purposes (Tawfik, 2015, p. 28). However, in one of former Prime Minister Zenawi's speeches, he mentioned that the dam's reservoir would "*provide for extensive opportunities for fisheries and cultivation which were previously non-existent*" (Ibid). Exploiting the dam for irrigation purposes will significantly impact water flow to downstream countries (Ibid).

From Egypt's perspective, the GERD is expected to tremendously reduce the flow of the water to the country especially during the filling period and due to the evaporation from the GERD itself (Yihdego et al, 2017, p. 9). The projected reduction of the water flow to Egypt is between 11 and 19 billion m3/year (Ibid). If the flood waters are stored in the GERD, it will reduce the water level in Lake Nasser and thus reduce the hydropower generated from the Aswan Dam (100 MW) (Ibid). Accordingly, Egypt will lose an overall of 25-40% of its electricity supply (Ibid).

The filling period of the dam is inversely proportional with the amount of water flow to the downstream countries (Schoeters, 2013, p. 40). In other words, a short filling period will strongly reduce the amount of water flow to the downstream (Ibid). This reduction in the water flow could create problems during the dry season. Thus, the three countries (Egypt, Ethiopia and Sudan) need to agree upon a reasonable filling period that guarantees no harm to any of the downstream states (Ibid). So far, Ethiopia did not disclose its filling plans and thus this is causing tensions between Egypt and Ethiopia especially that the project is almost complete.

- **Quality of the Nile Water**

One of the GERD potential benefits is preventing the accumulation of sediments in the downstream countries' dams and reservoirs. However, the sediment accumulation in the GERD's reservoir itself over the years is a serious issue that had not been carefully considered (Wolancho, 2012, p. 5). The accumulation of sediments in the GERD will not only affect the project's lifespan, but also it will affect the quality of the water flowing downstream (Ibid). Sediment is a critical pollutant which carries toxic elements that deteriorate the quality of the water and damages the aquatic ecosystem (Ibid).

Ethiopia previously suffered from sediment accumulation in its reservoirs. One example is the Aba-Samuel dam which was one of the first power stations in Ethiopia (Wolancho, 2012 , p. 3). The dam lost half of its operational capacity due to sediment accumulation (Ibid). Another example is Koka dam and its reservoir in Addis Ababa which was specially constructed for hydropower generation. In 2000, the country experienced power cutouts as the dam was clogged with sediments (Ibid). Around 481 Mm3 of sediments were accumulated in the Koka dam displacing an equivalent amount of water with an estimated energy loss of 128 M KWh (Ibid).

- **Quality of Cultivated Lands**

One of the claimed benefits of the GERD project is reducing the sedimentation level in the Blue Nile and thus enabling the Sennar Dam, Roseires Dam and the Aswan High Dam to restore their full operating capacities. This would definitely save Egypt and Sudan the time and money spent on annual maintenance, however, those sediments are rich in decomposed basalt and silts that have a great value in increasing soil fertility (Schoeters, 2013, p. 40). Consequently, the riverbank fields will be eroded and thus impacting the agriculture activities of this area (Ibid). This erosion could further lead to food insecurity problems (Ibid).

- **Resettlement**

Involuntary resettlement of people ihabiting the project area is one of the most challenging impacts of large dams construction (Schoeters, 2013, p. 32). Not only do the inhabitants lose their homes, but also they become subject to severe social challenges (Ibid, p. 33). They can be deprived of their food, land, water resources, jobs and become vulnerable to various health risks (Ibid). Moreover, restteled communities add new pressures on their host communities as they consume more land, food and other living resources (Ibid). Additionally, new conflicts can emerge due to resource division between resettled residents (Ibid). On the one hand, the Ethiopian government contends that the GERD project will not cause any significant human settlements and therefore it will impose very minimal social and environmental risks (Ibid). On the other hand, a field survey conducted by International Rivers (2012) shows that the GERD will result in the resettelement of 5110 inhabitants who live in the dam area (cited in Schoeters, 2013, p. 33). In most cases, resettelement programs depend mainly on compensation

and mitigation rather than development which leave the resetteled communities worse off than before (Ibid).

6.2: Concluding Remarks

There is no doubt that unilateral construction of dam projects may act as a 'game changer' that challenges the status quo and affect the power balance between riparian states, however, this does not necessarily lead to an equitable system of sharing the river benefits. Given the aforementioned analysis of possible costs and benefits, the GERD holds uneven costs and benefits to Egypt, Ethiopia and Sudan. As far as the downstream states are concerned, the GERD construction plan has not been based on any comprehensive cost-benefit-calculus and thus it hardly considered potential effects on downstream countries. It also lacks clear studies on its impacts on Ethiopia, on downstream countries, and on the river itself. Even after the IPoE's studies and recommendations, Ethiopia refused to halt construction until the assessment of the project is completed. This has definitely increased the level of mistrust between Egypt and Ethiopia and complicated negotiations around the rules of filling and operating the dam.

Although the concept of benefit-sharing suggests a change from the volumetric allocation of water to the allocation of shared benefits, it should not compromise the water security of the states that are fully dependent on the river. As discussed by Dombrowsky et al (2012, p. 10), a necessary precondition for a successful benefit-sharing project is creating more benefits of cooperation than those of unilateral actions. In other words, it needs to make all pertinent parties better off with a benefit-sharing deal than without (Ibid, p. 3). As previously discussed, the GERD does not fulfill this equation due to its uneven net benefits as well as other environmental and societal impacts.

Therefore, there should be a broad framework of cooperation, as proposed by the benefit-sharing model, to include more equitable and fair benefits in order to build trust between Egypt, Ethiopia and Sudan. A rapprochement over the GERD is an important step to harness brotherly relations between the three Blue Nile countries, but more importantly it is a wake-up call for the three countries to embark on further economic and political cooperation. Increasing trade relations and investments have been proposed by politicians and technical experts as a solution to water conflicts. In the next chapter, possible *beyond the river* opportunities will be discussed in order to reach possible reciprocal benefits between the three countries.

Chapter 7: Cooperation Beyond the Nile River

This chapter aims to highlight opportunities of cooperation between Egypt and Ethiopia *beyond* the Nile file. Referring to the theory of *issue linkage,* the current issue of the Grand Renaissance Dam needs be linked to broader water and non-water issues where the two countries could generate reciprocal benefits. Issue linkage shall offer new venues of cooperation and tradeoffs, so that the two countries could expand their basket of benefits. Hence, this chapter will focus on the fourth type of the benefit sharing model which is *benefits beyond the river.*

It is worth noting that the bilateral relations between Egypt and Ethiopia have always been comprehensive and have never been limited to the Nile River. As the late Ethiopian Prime Minister, Meles Zenawi, described it, it is a "catholic marriage in which divorce is unthinkable[9]" (cited in Yigzaw, 2011, p. 51). Relations between the two countries goes back to the time when the Ethiopian Orthodox Tewahedo was under the administration of the Egyptian Coptic Orthodox Church until 1959 when it became independent and had its own patriarch (Dibaba, 2016). Ethiopian Muslims are also very close to Al-Azhar in Cairo who go there to study Islamic Sciences (Ibid).

Besides religious and cultural ties, economic relations have played an important role in the history of the two nations. In 1905, the National Bank of Egypt supported the establishment of Ethiopia's first bank "the Bank of Abyssinia" (Dibaba, 2016). The bank firstly operated as an affiliate of the National Bank of Egypt until it was handed over to the government of Ethiopia under the rule of Emperor Haile Selassie in 1930 (Ibid).

[99] Ethiopian Prime Minister Meles Zenawi in an interview with the Egyptian TV in July 2010

In terms of trade and investments in modern times, there is a considerable number of Egyptian investments in Ethiopia that are run by Egyptian companies in different industries. One notable example is ElSewedy Cables Holding Co. which has ongoing large investments in the energy sector in Ethiopia. Meeting the growing demand of energy and cables market in Ethiopia, the company invested $50M in ElSewedy Cables Ethiopia PLC[10]. The Arab Contractors Company also opened an office in Ethiopia with plans to build two major roads in Ethiopia with a budget of $110M being primarily funded by the African Development Bank[11].

Despite the existence of various opportunities for cooperation between the two countries, these opportunities have not been exploited in an effective way that could generate mutual benefits. Theoretically speaking, it should be possible to reinforce regional development in the Blue Nile Sub-basin based on the comparative advantages in each country that should induce more trade and investment deals (Wichelns et al, 2003, p. 545). Egypt has very skilled human resources and advanced technical experience in diverse fields such as medicine and agricultural technology (Ibid). Ethiopia is rich with agricultural products and livestock and the country is endowed with a surplus of labor force (Ibid). Setting aside long-standing water-sharing problems in the region, this chapter discusses several cooperation opportunities that might offer pragmatic solutions to promote sustainable cooperation between Egypt and Ethiopia and overcome future conflicts.

[10] This information is posted on ElSewedy Electric Official Website, retrieved on December 1st, 2017
[11] This information is retrieved from the official website of the Ethiopian Ministry of Foreign Affairs, last checked on December 2nd, 2017

7.1: Technical and Scientific Cooperation

One very important aspect of cooperation between Egypt and Ethiopia is technical cooperation and the exchange of the know-how (Al-Saidi et al, 2017, p. 112). The African Region is subject to critical future challenges such as those related to climate change and the Blue Nile Sub-basin is no exception (Ibid. p. 113). Thus, the two countries need to cooperate to create a hydro-climatic infrastructure to be able to study, monitor and mitigate climate-related risks such as floods and droughts (Ibid). Currently, full access to information, frequent reporting and exchange of data among Nile riparian states is either very limited or underdeveloped (Ibid). Accordingly, transboundary collaboration is necessary to improve the role of pertinent ministries and research institutions through capacity-building workshops and training (Ibid).

Technology and scientific cooperation should not be confined only to the field of hydro-meteorological services, it should extend to other important domains such as health and education (Ayenew, 2015, p. 33). In the Blue Nile Sub-basin, Egypt is considered to be a leading country when it comes to advanced research and technology (Ibid). Egyptian universities and research institutions are very well equipped to host Ethiopian and Sudanese researchers to get trained in Egypt (Ibid).

7.2: Health Cooperation

As mentioned in the previous section, Egypt has a strong comparative advantage in the field of technology and science which gives it great opportunity to lead cooperative initiatives with its African neighbors in various domains including health and medicine. Some of these initiatives are already taking place and among them is a series of medical convoys led by the Egyptian heart surgeon Sir Magdi Yacoub with a 27-member team to perform cardiac surgeries

for those in need in Ethiopia (State Information Service, 2017). This initiative has started since 2014 and is still continuing (Ibid). The project is led by the Magdi Yacoub Foundation in collaboration with the Egyptian Agency of Partnership for Development (EAPD)[12] and the Cardiac Center of Ethiopia (Ibid).

Another ongoing initiative in the health domain is led by the Egyptian 57357 Health Sciences Academy in collaboration with the EAPD to train and assess pediatric oncology hospitals in Ethiopia and Kenya (All Africa, 2016). The training includes different courses on clinical pharmacy, nursing, child care and health care equipment (Ibid).

All these initiatives are very positive and promising; however, they are mostly done on a project-by-project basis without clear long-term plans. These initiatives should be incorporated in a bigger plan to further strengthen Egypt's relations with Ethiopia and other African states. Therefore, health projects need to cover wider specializations and be scheduled on more regular basis. They should also follow an organized agenda, so that the outcomes of such projects become more effective and structured.

7.3: Investments and Trade Cooperation

In the Blue Nile Sub-basin, there are promising investment scenarios in different sectors depending on each country's resources and expertise (Al-Saidi et al, 2017, p. 112). For instance, Ethiopia is rich in arable land resources that open the door to many opportunities of land investments which are mainly used for food production (Ibid). Land investments in Ethiopia

[12] The Egyptian Agency of Partnership for Development (EAPD) was established in July 1st, 2014 as part of the Egyptian foreign policy towards Africa. The EAPD is mandated to organize workshops and training to the Islamic and African states, provide technical and humanitarian assistance, assist in financing African developmental projects and cooperate with the UN agencies on related projects.

account for almost 1 million hectares (Ibid). In recent years, Ethiopia have been very active in promoting land investments as part of its development plan, so this can be a good investment opportunity for Egypt (Ibid). Investing in arable land have become very strategic especially with the mounting food demands in Africa (Ibid, p. 13). Here, the need for regional cooperation become very critical in order to increase agricultural efficiencies (Ibid).

A second possibility involves the investment in the irrigation facilities. Egypt has around 4.4 million hectares of cultivable areas which are almost entirely dependent on irrigation (Al-Saidi et al, 2017, p. 112). Thus, the country has well-established experience with modern irrigation systems such as sprinkler and drip irrigation that can be used to optimize irrigation infrastructure in Ethiopia (Ibid, p. 113). Ethiopia as well needs investements in its irrigation system as 20.5 percent of its total cultivable area (13.2 million hectares) is suitable for irrigation. Hence, agricultural production in Ethiopia is to a large extent dependent on rainfall which vary substantially from one year to another (Wichelns et al, 2003, p. 544). Investments in irrigation facilities in Ethiopia would considerably enhance the volume of its agricultural products and livestock, and in turn this should provide Egypt with more affordable exports of agricultural and meat products (Ibid, p. 547). This can be a good opportunity for Egypt to consolidate its relations with Ethiopia by enhancing their agricultural activities and exporting the know-how with regards to irrigation technologies.

A third opportunity involves negotiating free trade agreements that enable the three countries to import and export products with minimal restrictions (Wichelns et al, 2003, p. 549). Despite the variety in products and resources in each of Egypt and Ethiopia, the level of imports and exports between them is still very limited. For instance, Egypt imports around 40 percent of

meat products from many countries around the world to meet its national demands for production and consumption (Ayenew, 2015, p. 33). Whereas Ethiopia alone has the capacity to cover Egypt's demand of meat as it is a large livestock producer (Ibid). Besides, Egypt is a major importer of food crops including sugar, wheat and coffee which Ethiopia produces in large amounts and thus has enough capacity to export them to Egypt (Ibid). Food-related trade or what is known as 'Virtual Water Trade' in the Blue Nile Sub-basin is very critical to ease pressures on the Nile River waters (Al-Saidi et al, 2017, p. 112).

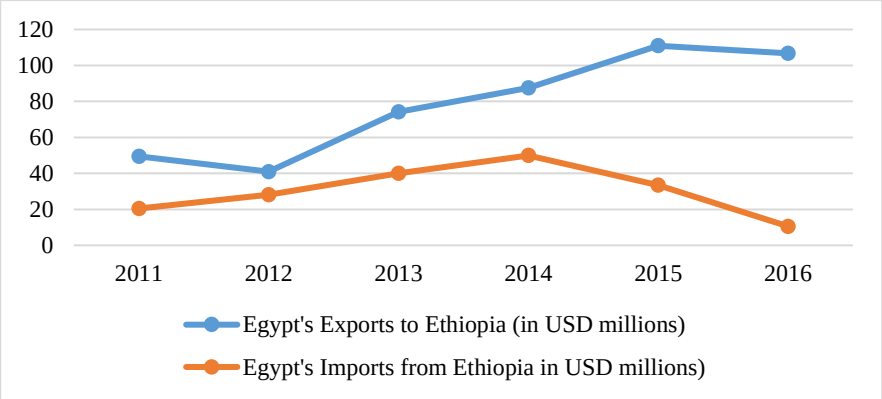
A fourth scenario includes trade in energy resources. Egypt has moderate reserves of oil and gas and it exports more than 150,000 oil barrels per day (Ayenew, 2015, p. 33), whereas Ethiopia have very limited oil reserves and each import large amounts of oil to meet their national demands (Al-Saidi et al, 2017, p. 112). This could be a trade opportunity between Egypt and its Blue Nile neighbors. On the other hand, Ethiopia has rich agricultural lands that can be used to produce biofuels (Ibid). Trade in biofuels introduces an interesting energy source to be included in bilateral trade agreements between Egypt and Ethiopia.

Current Trend of Trade activities between Egypt and Ethiopia

The bilateral trade activities between Egypt and Ethiopia have significantly increased due to the preferential arrangement under the Common Market for East and Southern Africa (COMESA) (Ebaidalla, 2016, p. 5). The political turmoil caused by the announcement of the GERD construction has certainly affected the trade and economic relations between Egypt and Ethiopia in a negative way, however, the economic tensions had not lasted for so long as the two countries have instead used trade and investment as remedial 'pacifying' tool. Despite this

notable increase, the bilateral trade between the two countries is still considered limited in comparison with the trend of the bilateral trade deals between each of the two countries and their other trade partners. It is noteworthy that Egypt's exports to Ethiopia tremendously exceeds its imports between years 2011 and 2016 (Figure 7). This traditional view of the African Market as an exclusively export market needs to change. Egypt needs to invest more in industrial and infrastructure projects in Ethiopia and other African countries.

Figure 7: Trend of trade between Egypt and Ethiopia from 2011-2016



Source: International Monetary Fund, Direction of Trade Statistics (DOTS), 2017

Table 6: Egypt's Top Trading Partners (2016)

	Top Export Partners (2016)	Top Import Partners (2016)
Egypt	United Arab Emirates	China
	Italy	United Arab Emirates
	United States	Germany
	United Kingdom	United States
	Saudi Arabia	Saudi Arabia

Source: International Monetary Fund, Direction of Trade Statistics (DOTS), 2017

Table 7: Ethiopia's Top Trading Partners (2016)

	Top Export Partners (2016)	Top Import Partners (2016)
Ethiopia	Sudan	China
	Netherlands	Saudi Arabia
	China	India
	Somalia	Kuwait
	Saudi Arabia	United Arab Emirates

Source: International Monetary Fund, Direction of Trade Statistics (DOTS), 2017.

Main Challenges to Free Trade Agreement between Egypt and Ethiopia

- Long-standing water tensions between the three countries is a significant impediment to any successful trade arrangement (Ebaidalla, 2016, p. 10). The ups and downs in the hydropolitical relations between Egypt and Ethiopia have slowed down the pace of any development or integration process (Ibid).
- Poor infrastructural systems between the two countries whether physical (e.g. roads) or soft (e.g. ICTs) hampers the process of exports and imports (Ebaidalla, 2016, p. 10). There have been some attempts to enhance road connectivity between the two countries, however, these efforts have not been significantly impactful (Ibid).
- Trade taxes are considered another critical impediment to strong trade relations between Egypt and Ethiopia (Ebaidalla, 2016, p. 10). The two countries hugely depend on trade taxes as an important source of government revenues (Ibid). Removing trade taxes will thus lead to significant output and employment losses (Ibid).

7.4: Concluding Remarks

This chapter aimed to highlight the *basket of benefits* that Egypt and Ethiopia could produce when the countries cooperate beyond the Nile File. When negotiating a water-related issue such as the GERD case, the two countries need to have a wide-range of identified reciprocal benefits in order to allow for more equitable and systematic decisions. In the Egyptian-Ethiopian context, Ethiopia needs to increase its allocation of water for development and Egypt wants to maintain its current shares of the Nile waters to meet its mounting consumption needs. If each country's issue is considered separately, it could easily emerge as all or nothing (win-lose or lose-lose) results. But when each issue is linked to broader mutual benefits, this could possibly lead to win-win outcomes as additional benefits can be shared. Identifying a basket of shared benefits means opportunities can be flexibly modified until the two negotiating parties arrive at pragmatic forms of cooperation. On the other hand, negotiating a single issue means that the two parties can easily reach a stalemate or a zero-sum output.

Chapter 8: Conclusion and Recommendations

> As the story is recited "One time, there was a scorpion who wanted to cross the river. He asked many animals for help, but they all refused to help him until the sheep accepted to do it given that the scorpion promised not to sting him during the crossing or else they would both sink. In the middle of the river, the scorpion stung the sheep and the sheep cried "why?" the scorpion answered "I could not do anything else, I am a scorpion" (cited in Yohannes & Yohannes, 2012, p. 205).

Regardless of who is the scorpion and who is the sheep in the ongoing Nile tensions, this research argues that it is very important for Egypt and Ethiopia to reach a sustainble cooperative framework instead of intensifying water disputes. The study selects the benefit-sharing model and the issue linkage theory as its conceptual framework with an aim to move beyond the narrow perspective of the water-sharing concept and instead adopting a more inclusive perspective that guarantees overall benefits to all parties involved. As the research has shown, the benefit-sharing model is not a novel concept to the Nile Basin and the Nile states have achieved considerable progress in applying it on both basin and sub-basin levels. However, the implementation of the concept had been the real challenge due to Nile countries' preocuupation with water-allocation issues and the lack of necessary experience and funds to carry out benefit-sharing projects. If Egypt and Ethiopia opt for benefit-sharing as a solution to their water issues, the two countries need to start off with creating an environment of sound cooperation.

The research findings show that the GERD project does not promise even benefits between Egypt and Ethiopia, however it represents a wake-up call for the two countries to start looking beyond the Nile River in order to search for more common opportunities. Hence, this study argues that the current issue of the GERD needs to be allocated within a broader framework of cooperation in order to create more opportuities for mutual cooperation. Linking the issue of the GERD to other water and non-water issues will allow the negotiating parties to

reach satisfying trade-offs. As discussed in chapter 7, Egypt and Ethiopia have a number of comparitive advantages that encourage strong benefit-sharing deals in various fields.

Based on the lessons learned from previous cooperation attempts in the Nile Basin, this study proposes three recommendations in order to ensure effective benefit-sharing relations between Egypt and Ethiopia. It is very essential to start with building a strong and professional cadre of water experts who understand transboundary water issues and have the skills to find technical and immediate solutions to any water-related problems. Capacity development should ensure that the two countries have equal skills and knowledge concerning all water-related issues and opportunities. Secondly, transparent information sharing and trust building are key pillars to any successful benefit-sharing and cooperation agreements. Information sharing should not be confined only to hydrological and environmental information, it should include other important economic and social data as well. Open dialogue and information sharing become necessary in order to strengthen the level of trust and confidence among the two countries and eventually allow for overall successful and satisfying outcomes. Thirdly, regular monitoring and evaluation to both short-term and long-term cooperative projects should be in place in order to identify potential opportunities and constraints and allow for quick remedial actions. Evaluation techniques need to be both quantitative and qualitative.

Finally, this study proposes future research on successful water governance systems. The Nile Basin countries have attempted to build governance systems to regulate the Nile affairs, however, those attempts had not been successful enough to accomodate the interests of all the Nile riparians. A strong governance system is a very critical prerequisite to any sustainble wter cooperation. As Nile riparians cannot reach consensus on neither the 1959 water treaty nor the

CFA, more future research is needed on figuring at successful legal mechanisms for the Nile Basin states that secure and guarantee fair benefits to all riparian states

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