

# GERD, a Path, or Hindrance toward SDG 6.5 in the Nile River Basin? <sup>†</sup>

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**Abstract:** This paper explores the possibility of achieving SDG 6.5 by 2030 in the Nile Basin by exploring the hydro-politics between the three main riparian states, Egypt, Ethiopia, and Sudan. Through a literature review of relevant sources, it is ascertained that, historically, Egypt has maintained a hegemonic control of the Nile through disputed treaties negotiated by Great Britain. However, the state-financed construction of the Grand Ethiopian Renaissance Dam (GERD) has the potential to shift this hegemonic control of the Nile Basin in favour of Ethiopia. While this construction may act as a source of political tension and low-scale conflict in the region, this paper critically examines how the implementation of a sustainable dam filling rate, Integrated Water Resource Management (IWRM), and the Nile Basin Initiative (NBI) can foster transboundary water cooperation between the three major players. In line with previous research, we argue that the GERD's main effect is mostly positive, especially if the three main riparian states are actively cooperating and are considering advice from the scientific community.

**Keywords:** Nile River Basin; Grand Ethiopian Resistance Dam (GERD); Integrated Water Resource Management (IWRM); Ethiopia; Sudan; Egypt; Sustainable Development Goal 6.5; water; Helsinki Rule



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## 1. Introduction

The River Nile is one of the world's longest rivers, running from the great lakes of East Africa to the drainage basin of the Mediterranean Sea. The importance of the Nile in the region cannot be overestimated, as it runs through 11 countries, covering almost 7000 km, while providing fresh water to approximately 400 million people. It is for this reason that the Nile has become almost synonymous with transboundary water conflicts in an area that is characterized by poor rainfall, intense droughts, and increased risks from climate change [1]. Economic development and rapid population growth in upstream countries have also augmented their demand for energy and arable land, increasing the pressure on the Nile, changing its natural flow rate and pattern [2]. It is for this reason that this paper will present a case study of the largest development on the Nile in recorded history, the self-financed Grand Ethiopian Renaissance Dam (GERD). This hydroelectric dam, with a technical capacity of 6000 MW, is located on the Blue Nile, which is responsible for 85% of the Nile River's overall flow and volume. Through this case study and an exploration of the existing and proposed water laws and treaties in the area, the goal of this paper will be to ascertain whether GERD will act as a source of cooperation between the three main riparian states or whether construction will exacerbate tensions and lead to the emergence of a "water war" in the drought-prone region. While early signs point towards cooperation within the basin, based on a 2015 agreement, it is still overshadowed by a fundamental conflict between upstream riparian states insisting on their right to develop their water resources. This development could significantly impact downstream river flows,

especially in Egypt, which strives to maintain current downstream flows and its historical hegemony over the Nile River. The paper will start with a description of the Nile Basin and challenges within the area and proceed to a study of the potential of Integrated Water Resource Management (IWRM) and the GERD dam to abate conflict in the area.

## 2. Study Area Description and Challenges in the Nile River Basin

The Nile is formed by two tributaries, the White Nile and the Blue Nile, and flows through 11 riparian states, namely, Egypt, Sudan, South Sudan, Eritrea, Ethiopia, Uganda, Kenya, Tanzania, Burundi, Rwanda, and the Democratic Republic of Congo (DRC), with a length of approximately 7000 km (Figure 1) [1]. The White Nile originates in the Great Lakes region of Central Africa, snaking through Tanzania, Uganda, and South Sudan. The Blue Nile on the other hand originates in the highlands of Ethiopia and flows downstream into South Sudan and Sudan from the southeast [3]. The two rivers meet near the Sudanese capital of Khartoum, where they form a confluence. The flow of the river then continues through the Sudanese desert to the Egyptian delta. Even though the White Nile flows for a longer distance (3700 km) than the Blue Nile (1450 km), it is the Blue Nile that provides the Nile River with approximately 85% of its flow and volume [3]. The source of the Blue Nile is the highly variable monsoon-driven rain from the Ethiopian highlands. Historical rainfall data show that Ethiopia has a much lower dependence on the Nile for water than the other riparian states as they experience approximately 2032 mm of rain per year in some areas. On the other hand, Egypt and Sudan only get about 10 mm of rainfall per annum, making them high-risk drought areas [4]. The challenge is compounded by the rapid rise of the population of the basin countries; over the period 1960 to 2010, the population of the basin countries grew fourfold, thereby resulting in declining per capita water availability [4]. This increased level of irrigation causes riparian states to draw more water than their internal renewable resources can sustain [3], thus highlighting how the Nile Basin is fast becoming one of the global hotspots in the quest for the food, energy, and security that water provides [1]. The flow rate of the Nile compared to other major rivers is also very interesting to consider. In relative terms, the Nile does not transport much water: approximately  $84 \text{ km}^3/\text{year}$  when compared to the Amazon River's  $5518 \text{ km}^3/\text{year}$  and the Congo River's  $1250 \text{ km}^3/\text{year}$ , which are of similar lengths [3]. This can be directly attributed to low amounts of rainfall and a high evaporation rate in the region. The tributary on the border between Ethiopia and Sudan is of particular importance because it is where the GERD Dam has been constructed, placing Sudan at the centre of the hydro-political tensions between Ethiopia and Egypt (Figure 1) [4]. Construction of this USD 5 billion dam began in 2011 and is set to be completed in 2023 [5]. When completed, the dam will have an energy generation capacity of 6.45 gigawatts, making it the largest hydroelectric power plant in Africa and one of the biggest in the world. The structure of the dam is made up of the main dam, a high rock saddle dam, a reservoir, and three spillways [6]. This design was suggested by the International Panel of Experts (IPoE) as the most efficient, equitable, and cost-effective way of generating hydroelectricity for Ethiopia without harming water access for downstream countries [7].



**Figure 1.** Map of the Nile River Basin that flows from the upstream southern states (Uganda, Ethiopia, and South Sudan) toward the downstream northern states (Sudan and Egypt) [8].

### 3. GERD: Hindrance or Facilitator of SDG 6.5

#### 3.1. Benefits of the GERD to Ethiopia

The construction of GERD could act as a counter-hegemonic play for Ethiopia to gain political control of the Nile [1]. While this newfound control by damming the Blue Nile provides Ethiopia with an avenue to improve its hydropower generation, it presents threats to the food and energy security of the other downstream riparian states [6,9]. Ethiopia was able to self-finance this dam through an increasing GDP growth rate of 10.9% per annum from 2004–2014, making it the fastest-growing economy in the world during this period [10]. This growth has allowed Ethiopia to embark on an ambitious infrastructural development scheme which includes but is not limited to a new railway to Djibouti, East Africa's first light rail system, and the construction of Africa's largest airport and hydroelectric dam [11]. The GERD dam is probably the most significant of these projects politically and economically. Not only does it shift hegemonic control in the region in

favour of Ethiopia, but it also provides basin countries with the opportunity to meet their growing energy needs. Ethiopia, in particular, will have the opportunity to satisfy the power and energy demands of 234 million people [12]. To put this into perspective, Ethiopia has a population of 109 million, meaning that Ethiopia can become a net exporter of energy, earning approximately USD 1 billion per annum from energy sales. This also allows the opportunity to improve energy access for its citizens, who use only 66.199 kw of energy per capita, which is amongst the lowest energy usage rates in the world [2], thereby inducing a double-sided multiplier effect which will improve the quality of life and economic growth in the country. From an agricultural point of view, the Rocky Mountain Institute shows that electrifying small rural farms will also lead to USD 4 billion of potential economic opportunity [13]. On the other hand, the official Egyptian stance on the GERD dam is very clear. The authorities are against any developments of the Nile that will disrupt water flow into the region and are willing to use military force to ensure that their hegemonic control of Nile resources continues. Climate change, low rainfall, and increasing population [3] have made Egypt's need to control the Nile even more imperative, as research shows that Egypt has begun to use more water than their internal resources can produce and faces heightened water insecurity in the future [14], especially in high-drought years [15,16]. The underlying cause of this increased water consumption is the population explosion within the last 30 years. It is estimated that Egypt's population has almost doubled from 45 million people to 80 million people (90% of whom live along the Nile Basin) within this period. This has, in turn, led to an indiscriminate and unsustainable drawing of water resources for irrigation to provide food and energy in the region [16].

### *3.2. Impact of the GERD on the Riparian States*

This section of the paper will deal with the more technical aspects of filling the dam. It will study the effects of the three filling rate scenarios that have been presented by Ethiopia and negotiated with Egypt and Sudan. For SDG 6.5 to be achieved and a water war avoided, in the region there needs to be an agreement on the filling rate that is employed to fill the reservoir of the Ethiopian Dam. Progress has already been made towards this with a dispute resolution mechanism ratified by Egypt, Ethiopia, and Sudan in 2015; however, conflicts remain over the rate of filling of the reservoir of the GERD dam [16]. Egypt prefers that the reservoir be filled as slowly as possible, preferably over 10 years, while Ethiopia wants to engage in filling as fast as possible over a much shorter period. If managed in the correct manner, shifting water supply (storage) from the Egyptian desert to the Ethiopian Highlands may in fact increase Egypt's water supply over time [17], since Ethiopia has a much lower average temperature than Egypt, which implies that the evaporation rate of water will be slower in the Ethiopian reservoir than the reservoir in the Aswan Dam. However, this also allows Sudan to use the dam as a source of irrigation, which will have permanent and detrimental implications for Egypt [9].

A study found that with limited cooperation between Ethiopia and Sudan on the management of the GERD in the long term, the Blue Nile flow would still be steady enough to allow significant irrigation expansion [18]. The overall gain to Sudan's agriculture sector from executing the proposed irrigation schemes throughout 2020–60 was discovered to be approximately USD 13.5 billion depending on the cropping pattern [18]. The type of cropping pattern is crucial to expanding economic benefits [18]. The GERD is responsible for Sudan's expected GDP increase, anywhere from USD 48–82 billion depending on whether there is a collaboration between Sudan and Ethiopia and the type of cropping pattern implemented [18]. The Egyptian basin evaporation loss is likely to decline by 9.922%. However, the influx of water is going to decrease by 2.755% because of the effect GERD has on the High Aswan Dam [19]. Although the GERD is set to reduce energy production by the High Aswan Dam by 5.243%, it is expected to increase energy production capacity by 15,000 GWh for the eastern part of the Nile basin [19]. Since this energy is sold for a much cheaper price in Egypt, the energy loss should not present a significant issue.



The GERD benefits Ethiopia and partly Sudan during the impounding phase; however, it has economic costs to Egypt, particularly when Egypt is in a series of dry years [15]. The adverse consequences of the GERD on Egypt's economy are overturned when the GERD is operating [15]. Research suggests that Egypt is inefficient in terms of irrigation and general use of the Nile water as a resource [20]. Studies have shown that Egypt can greatly benefit from the implementation of the GERD if they adapt to it by making retrofits and if they cooperate with Ethiopia [15,20]. Firstly, Egypt can halt the use of plants that consume a lot of water such as rice so that they can save one billion cubic meters (BCM) of water yearly [21]. By replacing rice with other agricultural plant species that are economically beneficial and that use significantly less water, Egypt can prepare its country against drought periods during the filling of the GERD. Egypt can also upgrade its irrigation system by transforming miniature field canals from the surface canal to pipes, which can save 42% of water loss from leakage and evaporation [22]. This retrofit would save Egypt around 7.4 BCM per year [15]. A study also found that both Egypt and Sudan would benefit from an increase in profit in the agricultural and energy sector by USD 4.9–5.6 billion due to the GERD, which provides additional flow [23]. Elsayed (2020) has demonstrated that depending on the fill rate, Egypt would lose 9–19% of its food production and 3–9% of its hydropower production during the impounding phase of the GERD [6]. In contrast, during the GERD's operation, food production is to be 4% reduced, whereas hydropower generation is to be 7% reduced [6]. For Sudan, the hydropower generation may decrease by 2–29% during the impounding phase, whereas the irrigation supply reliability may decrease by 50% [6]. Sudan is mainly to benefit from the operation of the GERD, which is set to increase their hydropower generation by 6% as well as improve their irrigation supply and reliability [6].

### *3.3. Impact of the GERD on Achieving SDG 6.5 in the Nile Basin*

In the short term, the GERD is unlikely to help achieve SDG 6.5 in the Nile Basin. This is because Egypt argues that its water availability from the Nile River Basin will decrease and, currently, they still sit in the unknown, without any experience of the extent of the effect that the GERD will have on its country. In general, people tend to feel losses more deeply than gains of similar magnitude [24]. Thus, if Egypt does not feel like they are gaining enough from the GERD, it will continue to oppose the GERD. Moreover, since Egypt's influx of water is going to decrease, they will feel this loss more acutely considering that, in general, people feel water losses more deeply than almost any other commodity [25]. This feeling of water loss may become more acute during the dry season, which could subsequently translate into an evolving tension with Ethiopia and water panic between irrigators and civil society, which could be exacerbated with social media [26]. However, in the long-term, the GERD is more likely to achieve SDG 6.5 due to more cooperation and discussion between the riparian states, mainly Egypt, Ethiopia, and Sudan. Egypt will also come to realize that the water losses are not significant enough for a continuation of opposition to the GERD. Meanwhile, Ethiopia is optimistic with regards to the effect of the GERD in the long run and is anticipating a mutually beneficial result for the Nile riparian states. Although Egypt might be concerned about the low levels of water in their HAD reservoir, they are likely to become less anxious sooner or later [26]. A study demonstrated that the GERD could be constructed without significantly affecting the water supply and the irrigated agriculture of Egypt [27]. As the year goes by, with the GERD implemented, Egypt should come to realize that its impact is insignificant and that it can benefit through cooperation, changing its crop species, and retrofitting its water supply system. This can happen through discussions between the three states and if Egypt takes on the advice from scientists with regard to its crops.

The rhetoric by the Egyptians has also not helped the push towards achieving SDG 6.5 in the Nile River Basin. The former Egyptian president, Muhammad Morsi, once threatened military action against Ethiopia due to the GERD project [28]. At first, Egypt declared an official rejection and then contemplated sabotaging the dam, followed by future contribution to trilateral discussions and agreements, demonstrating acceptance of

the GERD, which shows that Egypt was originally ill-equipped to deal with this project, especially when they were preoccupied with internal political and economic alteration [28]. Sudan, on the other hand, showed support for the GERD and downplayed its negative effects while applauding the advantages of the GERD, such as its capacity to regulate flows and its ability to expand irrigated agriculture by the Sudanese Blue Nile [28]. Sudan plays an important role in relation to achieving SDG 6.5 in the Nile River by taking a mediating role between the two states and presented its intention to achieve mutually beneficial agreement between the three states and suggested implementing the International Panel of Experts' (IPoE) recommendations [28]. The IPoE was composed of two experts from Sudan, Egypt, and Ethiopia, and four neutral international experts [7]. It was initiated to evaluate Ethiopian studies on the GERD, assess whether it is aligned with international standards, and determine its effect on downstream countries [7]. The IPoE gave recommendations to Ethiopia with regard to implementing engineering studies on the height of the dam and its capacity and safety [7]. Ethiopia's goal was always to implement the dam in a way that would benefit all the riparian states. Ethiopia claims that it is not part of the 1959 Treaty and is permitted to an "equitable share" if there is no significant harm to downriver states [29].

#### 4. Challenges and Opportunities for IWRM in the Nile

##### 4.1. SDG and IWRM Goals

The Sustainable Development Goal 6 focuses on "ensuring availability and sustainable management of water and sanitation for all" [30] (p. 11). This SDG Target 6.5 aims to "implement integrated water resources management at all levels, including through trans-boundary cooperation as appropriate by 2030" [31]. Indicator 6.5.1 monitors the degree of integrated water resource management implementation as a percentage [31] with respect to four components: enabling environment, institutions and participation, management instruments, and financing as a way to monitor the progress toward the implementation of IWRM [31]. By building on this theme, the Global Water Partnership defines IWRM as "a process which promotes the coordinated development and management of water, land and related resources, to maximize the resultant economic and social welfare equitably without compromising the sustainability of vital ecosystems" [32]. IWRM is a broad framework in which decision makers can decide the goals of water management and implement the use of various mechanisms to accomplish them [33]. IWRM is an extensive, ongoing process that should be tailored to unique, different situations [34]. Therefore, the goals of IWRM vary across countries and various weights are set on the importance of economic, environmental, and social impacts [33]. In this section of the essay, we reflect on the potential for achieving SDG 6.5 in the Nile Basin through the construction of the GERD as well as whether it helps or hinders progress toward SDG 6 in the Nile Basin.

Our preliminary findings are that the three major states, Egypt, Sudan, and Ethiopia, must cooperate and implement rules and regulations in line with IWRM so that SDG 6.5.1 can be achieved in the Nile River Basin by 2030. We also find that the other riparian states must also be involved and informed of the changes that are being made to the Nile River with regard to GERD and other projects to foster holistic cooperation. Wheeler et al. (2016) showed that management and cooperation between these three major states should include an agreement on a yearly release from the GERD, a drought policy for the High Aswan Dam (HAD), and a precautionary discharge from the GERD if the HAD water level drops under a vital level [35]. This ensures that Egypt's needs are achievable with the collaborative management of the upstream infrastructure in Ethiopia and Sudan [35].

##### 4.2. Existing Laws and Frameworks

One of the challenges that hinders the way toward achieving the SDG 6.5 is the long-standing international law between Egypt and Sudan, that is, the 1959 treaty. The first Nile River Agreement between Great Britain (Sudan) and Egypt was signed on 7 May 1929. This treaty was meant to bind Sudan to receiving Egypt's approval before any irrigation plans and also gave Egypt the right to use Victoria Lake and other water bodies around the Nile

River [36]. The treaty specifically asserts: “Egypt has a claim to the entire timely flow at an amount of 48 billion cubic meters per year; Egypt has a right to on-site inspections at the Sennar dam; Egypt is guaranteed that no projects would be developed along the river or on any part of its territory, which would threaten Egyptian interest” [36] (p. 17). The arrangement for sharing the Nile River water was revised in the 1959 treaty between Sudan and Egypt [36]. The treaty states that both countries can fully utilize the Nile water and that Egypt was allowed to use 55.5 billion cubic meters of water per year, which allowed them to construct the Aswan Dam, while Sudan was granted 18.5 billion cubic meters [37]. This agreement did not include any other riparian countries of the Nile (including Ethiopia), which means that they did not have water allocated [36]. More than 60 years later, the 1959 treaty still has not ended the conflict arising from water usage and is still highly contested by upstream states. These issues led four countries (Ethiopia, Rwanda, Uganda, and Tanzania) to sign the Cooperative Framework Agreement (CFA) in 2010. The main disparity between the CFA and the 1959 treaties is that instead of specifically quantifying the amount of water allocated to a country, the CFA encourages a framework to stimulate integrated management, sustainable development, mutual use, and conservation of the water so that it benefits every riparian state equally in the present and long-term [38].

#### 4.3. International Legal Instruments

Another water law that differs significantly from these early agreements on the Nile and offers some hope for guiding riparian states in a mutually beneficial direction is the Helsinki rule. The Helsinki Rules applies to groundwater connected to surface water and the use of water in an international drainage basin [39]. The Helsinki rules, which were issued in 1966, marked the first time that transboundary groundwater was addressed by any international legal instrument [39]. Although these rules had no legally binding effects, they remained the most widely quoted set of rules for regulating the use and protection of international watercourses until the United Nations Convention 30 years later [39]. One of the Helsinki Rules states that “consistent with the principle of equitable utilization of the waters of an international drainage basin, a State: (a) must prevent any new form of water pollution or any increase in the degree of existing water pollution in an international drainage basin which would cause substantial injury in the territory of a co-basin State, and (b) should take all reasonable measures to abate existing water pollution in an international drainage basin to such an extent that no substantial damage is caused in the territory of a co-basin State” [40]. This rule implies that a state must abate water pollution, which is a threat to the health of its people. In the context of the GERD, Ethiopia has to ensure that during the construction of the dam no significant amount of pollution is added to the River at the expense of another state’s access to an adequate amount of clean water. The two aspects of the Helsinki Rules that are the most well-known are the cardinal principle of the equality of all the riparian states in the utilization of the watercourse and the factors for ascertaining equitable and reasonable use [39]. The Helsinki Rules are the legal foundation for the use of international basin water and have been included in the UN Convention and the Berlin Rules [39].

The UN Watercourses Convention (UNWC), formally titled ‘The United Nations Convention on the Law of Non-navigational Uses of International Watercourses’, is another framework of rules that must be followed to ensure cooperation between the Nile Basin riparian states. This comprehensive convention is divided into seven parts and contains 37 articles. Importantly, it states that “an international watercourse shall be used and developed by watercourse States to attain optimal and sustainable utilization thereof and benefits therefrom, consider the interests of the watercourse States concerned, consistent with adequate protection of the watercourse” [41]. The legalities related to IWRM are important to understand when implementing projects along the Nile River so that no international legal instruments are neglected and so that everyone can benefit from its implementation. However, previous studies show that the seven factors considered in Article 6 of the UNWC lack measurability, which can elicit doubts about its applicability

and interpretation [42]. Egypt has quoted the ‘no harm’ rule as it argues for equitable and reasonable utilisation of the river while also invoking the prior notification rule as a means to inspire the international community to compel Ethiopia into pausing or halting the construction of the GERD [1]. This tactic was successful in previous years and Eldardiry and Hossain (2021) show that Ethiopia was not able to receive funding from the World Bank and the African Development Bank for its water development project due to Egypt’s opposition [43]. However, the arrival of China as a superpower in Africa altered the situation in Ethiopia’s favor owing to Chinese firms’ interest in assisting Ethiopia to utilize its hydropower [43].

These aforementioned treaties, laws, and conventions ultimately resulted in the Declaration of Principles signed on 23 March 2015 between the three main states associated with the GERD and contains 10 principles. The first principle states that mutually beneficial cooperation aligned with international laws is necessary so that upstream and downstream states’ water needs are met [44]. The subsequent principle declares that the three main countries must prevent significant damage being done to the Blue/Main Nile, that downstream states must gain priority access to the energy created by the GERD, and that interpretational conflict should be resolved through consultations or negotiations [44].

#### *4.4. Nile Basin Initiative and Cooperative Framework Agreement*

To achieve a shared vision of sustainable socio-economic development through the equitable utilization of the common Nile Basin water resources between riparian states, the Nile Basin Initiative (NBI) was launched in 1999. The NBI established a comprehensive cooperative program whereby riparian states may work collectively on large-scale projects, including numerous investment developments that could create socio-economic benefits for all states in the long term [28]. All the 11 riparian states that the Nile flows through initially signed up as part of this coalition apart from Eritrea, which maintains observer status [11]. The initial goal of the NBI was supposed to act as a temporary stopgap till the region could set up a Cooperative Framework Agreement (CFA) to act as a permanent agreement between the riparian states. It was expected that this CFA agreement would double as an inclusive legal and institutional framework to govern the hydro-politics of the region and ensure a more equitable distribution of Nile resources. However, the negotiation of the CFA has come to a serious impasse. The CFA encourages a framework to stimulate integrated management, sustainable development, mutual use, and conservation of the water so that it benefits every riparian state equally in the present and long-term, rather than allocating specific quantifies of water to a country [38]. This is in direct contrast to the 1959 treaty ratified between Egypt and Sudan.

This impasse led to four countries (Ethiopia, Rwanda, Uganda, and Tanzania) signing the Cooperative Framework Agreement (CFA) in 2010, to the dismay of Egypt and Sudan [28]. Sudan and Egypt reacted by ending their involvement in all NBI undertakings and projects [28] in June of 2010. Sudan eventually returned to the NBI in November of 2012 after realizing that basin-wide cooperation is essential, especially after the GERD project was launched in 2011 [28]. Sudan’s response to the GERD was positive and improved the NBI, indicating that the GERD inadvertently gave positive attention to the NBI and the inevitability of basin-wide cooperation (so that everyone can benefit from shared use of the Nile River) [16,28]. Thus, the GERD constitutes an opportunity to improve states’ national interests by benefiting from its energy production (Ethiopia vowed to sell hydropower to Egypt and Sudan at a cheaper price), sustainable usage of water, and socio-economic advantages [28,43]. Nevertheless, the CFA has been questioned by Egypt and is yet to be approved by an adequate number of Nile Basin states to come into operation [18].

In terms of the current responsibilities in the region, the Nile Basin Initiative operates three main programs to improve water cooperation in the basin. These include the Shared Vision Program, the Eastern Nile Subsidiary Action Program, and the Nile Equatorial Lakes Subsidiary Action Program [4]. The Shared Vision Program is a basin-wide program that focuses on building institutions, sharing data, information, and training, essentially creating



avenues for dialogue and region-wide networks needed for joint problem-solving. The Eastern Nile Subsidiary Action Program is managed by the Eastern Nile Technical Regional Office in Ethiopia and seeks to develop the Eastern Nile Basin sustainably for more equitable distribution of resources in that specific geographic zone. The last program that is supported by the NBI is the Nile Equatorial Lakes Subsidiary Action Program which focuses on reducing poverty, promoting economic growth, and reversing environmental degradation. Funding for the NBI is sourced from the World Bank, the Global Environmental Facility, and the African Development Bank. These funds are augmented by contributions from the NBI member countries. The governments of the United States, Switzerland, and the European Union are also stakeholders within the NBI, acting as conflict resolution facilitators rather than main funders of the initiative [11].

## 5. Conclusions

In conclusion, this paper has improved our understanding of the official positions of Egypt and Ethiopia regarding the GERD. Through research the reasoning behind Egypt's decision to previously oppose the GERD project and Ethiopia's motivation to build the GERD have become more apparent. The exploration of the existing laws and international legal instruments has also managed to highlight the benefits/drawbacks of the GERD based on scientific research and has allowed us further to ascertain how the GERD will create a path toward SDG 6.5 in the Nile River Basin. The result shows that the GERD can be perceived as a great opportunity for achieving SDG 6.5, provided that there is continued cooperation between the three main riparian states. Through hyper-hybrid coordination between Ethiopia, Egypt, and Sudan, Egypt should be able to improve its water use efficiency, Ethiopia its energy generation, and Sudan its access to irrigation [20]. This hyper-hybrid coordination is meant to create the most effective coordination between Egypt, Ethiopia, and Sudan by suggesting that they collaborate to strengthen regional integration through resource management, reconciliation and security, investments, trade, and informative programs [20]. Current rainfall trends also forecast that drought is an unavoidable eventuality [4] in the future, further highlighting the need for a thorough basin-wide management plan agreed on by the three main riparian states. This plan must and should contain a management policy for the GERD [26] that will reduce the impacts of droughts in the region. These plans should indicate how the decreased flow of the Nile will be distributed when storage is drained in both reservoirs and will require balanced power generation and usage [26]. Although Egypt continues to oppose the rate of filling of the reservoir, researchers suggest that this reaction is normal in the short-term and that in the long-term acceptance of the GERD is more likely to result, since Egypt should continue to have an adequate amount of water as a resource according to the scientific literature [15,20,25,27].

The NBI also plays an important role in achieving SDG 6.5 by creating permanent mutually beneficial agreements between all riparian states. The increased attention that the NBI has received during/after the construction of the GERD has prompted Sudan to return to this platform in 2012 [28]. However, this framework cannot be successful without the return of Egypt, meaning that it is not working as effectively as it could. For now, it seems more likely that these hydro-political issues will be resolved through IWRM over time, especially when Egypt, Sudan, and Ethiopia start to cooperate actively with each other through the declaration of principles signed in 2015. This agreement raises the likelihood of reconciliation in the future through the NBI and eventually the establishment of the CFA as more scientific research and discussions of the positive externalities of the GERD in relation to Sudan and Egypt continue to be published.

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