The Grand Ethiopian Renaissance Dam, Egyptian National Security, and human and food security in the Nile River Basin

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Abstract: For centuries and emboldened by colonial treaties, Egypt has enjoyed overwhelming hydro-hegemony in the (NBR) Nile Basin River region. However, Egyptian dominance over the NBR has been challenged by Ethiopia following her unilateral construction of the Grand Ethiopian Renaissance Dam. Using a qualitative, deductive approach based on multiple sources of evidence, this paper analyses the historical imbalance in the Nile colonial treaties that gave Egypt monopoly over the waters of the NBR. The article also describes various human security threats in the Benishangul-Gumuz region, where the dam project is located and the geopolitical implications of this development against the backdrop of climate change and the coming of new actors and donors such as China, including the leasing of land to corporations and countries such as India, Qatar, and the United Arab Emirates. We recommend collaborative and holistic management instead of the dominant state-centric water development approach in this international waterway. The development of sustainable cooperation over this shared waterway will help meet climate change challenges and mitigate the contemporary conflict between Ethiopia and Egypt, including other countries within the region.

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PUBLIC INTEREST STATEMENT
Following the unilateral construction of the Grand Ethiopian Renaissance Dam (GERD) on the Nile Basin River (NBR) by Ethiopia without Egypt’s consent, the relationship between both countries has been tense. The dam which is seen by Ethiopia as a key to its development in both electricity production and irrigation, is a threat to Egypt’s hydro-hegemony and food security. This paper analyses the existing conflicts for water between the two countries, including Sudan and other Nile basin countries. The paper explores the exacerbating factors, and how they can be resolved. Also, donors such as China, the United States of America, and Qatar are engaged in large-scale agriculture in the region, and their presence influences the trajectory of relations between countries in the region. In the interest of public and regional peace, this paper proposes mutual respect and collaboration in the management of the NRB.
1. Introduction
For many centuries, countries around the Nile Basin River (NBR) have been embroiled in water, energy, and national security misunderstandings regarding the equitable utilization of the NBR. Many factors seem to have compounded the rift between Ethiopia and Egypt over the use of the Nile waters, including the unilateral construction of the Grand Ethiopian Renaissance Dam (GERD) by Ethiopia, which undermines Egypt’s water security interests. Compounding factors include climate change, desertification, population growth, and the advent of investors around the Nile such as China (perceived as the financier of the construction of GERD), land lease/sale to India, Qatar, the United States of America (USA), and the United Arab Emirates (UAE), all competing for water rights in the basin. Furthermore, Ethiopia has accused the US government, who have been the arbitrator between Ethiopia and Egypt over the GERD of being biased and siding with Egypt. This is in the wake of the US Secretary of State approving a plan to hold up an estimated USD 130 million of foreign assistance to Ethiopia as a means of pressuring her to the negotiating table (Gramer, 2020). How will this new development affect both Ethiopia and Egypt’s attitude as they go to the negotiation table? What are the broader implications of the GERD project for the riparian states and beyond? How will the coming of new development and investment actors reshape the geo- and hydro-politics of the NBR?

The Blue Nile runs through 11 countries of East and North Africa, including Tanzania, Uganda, Burundi, Rwanda, the Democratic Republic of Congo (DRC), Ethiopia, Kenya, Eritrea, South Sudan, Sudan, and Egypt, before reaching the Mediterranean Sea (Figure A1). The Blue Nile contributes about 86% of the Nile’s water and originates in the Ethiopian highlands, while the White Nile, which contributes about 14%, originates from Burundi and flows through the Equatorial Lakes (Victoria, Kyoga, and Mobutu) to the Sudd swamps of Sudan (Swain, 2011). The Nile covers about one-tenth of the African continent and is the primary source of water for about 430 million people (Freitas, 2013; Salman, 2013). The GERD project, which started in 2011, is being constructed over the Blue Nile (the main tributary of the Nile). It spans about 1529 km and is located about 15 km east of Ethiopia’s frontier (in the Benishangul-Gumuz Region). It is expected to hold 63 billion cubic meters of water, generate 6,450 MW of electricity that could be the largest hydroelectric power plant in Africa and the tenth largest in the world (Josephs, 2018; Kalpakian, 2015; Waleij et al., 2016). Once completed, the dam is estimated to take about 5 to 15 years to fill with water (Ahmed & Elsanabary, 2015).

Egypt lies downstream of the dam and is vigorously opposed to its construction because it will reduce the quantity of water it gets from the River Nile (Josephs, 2018; Salman, 2013). Beyond Egypt’s concerns, the GERD is envisaged to facilitate intra-basin power trade between Ethiopia, Egypt, Sudan, and beyond the Eastern Nile subsystem. Despite unilateral approaches to dam development in the Nile basin, the GERD, which is the most significant hydropower infrastructure in the region, presents both opportunities and challenges. It can foster cooperation, mitigate climate change uncertainties, and catalyze greater market integration and trade. However, to realize these benefits, there is a need for a basin-wide framework that incorporates the most appropriate legal, political, and institutional framework among the down and upstream riparian states that have misunderstandings over their entitlements to the Nile’s water resource (Yihdego et al., 2016, p. 504). Whereas Egypt and Sudan (downstream riparian states) invoke their historical use rights, upstream nations considered those claims as being antithetical to the principle of equity, reasonable utilization, and participation (Salman, 2013; Yihdego et al., 2016)
As a basic human right, access to water is enshrined in international and regional Conventions, including access to safe drinking water and sanitation. This includes the right to sufficient, safe, acceptable, physically accessible, and affordable water for personal and domestic uses (United Nations Conference on Environment & Development, 1992). These Conventions, alongside Agenda 21 adopted at the United Nations Conference on Environment & Development (1992), recognize water and sanitation as constitutive of the right to an adequate standard of living and a fundamental aspect of human security. They further oblige (State parties) to ensure everyone’s access to enough safe drinking water for personal and domestic uses, that is, water for drinking, personal sanitation, washing of clothes, food preparation, and private household hygiene. States are further enjoined to progressively ensure access to adequate sanitation, as a fundamental element for human dignity and privacy, and to protect the quality of drinking water supplies and resources (United Nations Conference on Environment & Development, 1992).

Generally, developmental projects such as the construction of dams face multifaceted criticism. Even though a credible environmental impact assessment over the construction of the GERD is yet to be ascertained, however, environmental groups have criticized that the dam will flood over 1,680 square kilometers of forest, submerge communities, and displace more than 20,000 people (American Security Project, 2017). One of the most serious consequences of the construction of GERD is the international tension between the Nile river basin states, including Ethiopia and Egypt. With increasing tension as diplomatic solutions over the NBR recedes, military confrontation is a growing possibility. In 2013, the then Egyptian president Mohamed Morsi publicly stated that all options were on the table, including military action if the construction of the GERD continued (American Security Project, 2017). Studies conducted on the GERD have mostly been reported in print media, some based on the perception of the reporter. This leads to more controversy and political tension mindful of the increasing population explosion in the African region, associated with rapid urbanization, poverty, environmental degradation, climate change, and political instability, especially among the NBR countries. Therefore, this literature review synthesizes multiple sources of evidence, including written secondary materials comprising of peer-reviewed articles, reports, conventions, books, and internet sources, including data from International and Non-Governmental Organizations such as the World Bank (WB), Food and Agricultural Organization (FAO). The paper begins by looking at the historical background of Egyptian hydro-hegemony in the NBR. Secondly, we discuss the human security paradigm that forms the theoretical framework of this paper followed by the methodology. Thirdly, we describe various human security threats in the Benishangul-Gumuz region, where the GERD is located. Fourthly, we analyze how the coming of new donors are reshaping the use of the Nile water and weakening the Western power that has always been hesitant to provide loans to upstream countries for hydroelectric projects. Fifthly, we attempt to reconcile the effects of climate change through effective water governance in the NBR trans-border waterways. The penultimate section is the conclusion and recommendations for effective water management in the NBR.

2. Historical background of Egypt’s hydro-hegemony in the NBR

The NBR has been the source of long-standing protracted conflict and political tension among the riparian states. There has been no basin-wide agreement or governing mechanism ratified by all riparian states over the waters of the Nile. In the colonial era (1902), Great Britain signed the Nile Treaty in Addis Ababa, Ethiopia, between the Anglo-Egyptian Sudan, Ethiopia and Eritrea on one side, and Egypt and Sudan on the other hand. This treaty constitutes the source of acrimony and friction between Ethiopia and Egypt over the Nile, including the claims that no government organ ratified the treaty. In addition, Article III of the English and Amharic versions of the treaty were said to have different interpretations (Degefu, 2003, pp. 96–99; Salman, 2013). Thus, Ethiopia refused to ratify the treaty. At the same time, Egypt insisted that the treaty be binding, and it prohibited Ethiopia from undertaking any project without Egyptian approval. The treaty has remained a source of disagreement between Ethiopia and Egypt, including Sudan (Salman, 2013).

Another treaty that granted Egypt hegemony over the Nile and remained a source of disagreement is the 1929 Nile Waters Agreement signed between Egypt and Britain (representing its East
African possessions of Kenya, Uganda, and Tanganyika), including Sudan. The treaty granted exclusive rights to Egypt over the waters of the Nile—it outlawed any irrigation works or construction or generation of electricity along the Nile that could diminish the quantity of water flowing into Egypt (Salman, 2013). It, however, made no obligations to the other riparian countries except Sudan. It has remained the unchallenged legal basis of water allocation in the Nile basin (Kieyah, 2007). This agreement was, however, later rejected by Kenya, Uganda, and Tanganyika (later Tanzania) because they were no parties to it, and in line with the Nyerere doctrine agreements reached during the colonial era, the treaty had to be renegotiated within two years (Salman, 2013). To justify the continuous validity of the 1929 treaty, Egypt invoked the principle of state succession and maintained veto power over the Nile (Salman, 2013; Tvet, 2010).

In 1959, another contentious agreement, the Nile Waters Agreement (Batstone, 1959) ensured Egypt’s full utilization of the Nile. This treaty was reinforced by the Free Egyptian Officers (FEO), who captured power through a coup d’état in 1952 to build the Aswan High Dam. They required an agreement on the allocation of the Nile waters and the amount of compensation payable to the inhabitants of the Wadi Halfa, Sudan. This is because their land was to be submerged by the waters of the dam’s reservoir. The FEO, therefore, deemed it necessary to reach an agreement with Khartoum. The waters commanded by this gigantic project displaced inhabitants and submerged parts of the Sudanese territory to a distance of 170 kilometers along the valley of the Nile and up to the contour line of 0.182 kilometers above sea level (Abdalla, 1971; Kieyah, 2007). The agreement further reinforced Egypt’s grip over the waters of the Nile by establishing the overall annual flow of the Nile at 84 billion cubic meters. It also allocated 55.5 km³ to Egypt and 18.5 km³ to Sudan. The remaining 10 km³ represents the evaporation and seepage at the large reservoir created by the Aswan High Dam in southern Egypt and northern Sudan. Agreement between the United Arab Republic and the Republic of Sudan made Egypt and Sudan to allocate the entire flow of the Nile to themselves (Abdalla, 1971; Kieyah, 2007; Salman, 2013). Apart from endorsing the construction of the Aswan High Dam (Egypt), and the Roseires Dam on the Blue Nile in Sudan, the agreement laid down the institutional apparatus for the co-management of the Nile but further alienated the other riparian states who rejected it since they were no parties to it. They perceived the agreement that grants authority over the Nile to Egypt as an infringement of their rights to a reasonable and equitable share of the Nile waters, mindful of the fact that the entire flow of the Nile originates within their territories” (Salman, 2013).

Salman (2013) claims that the Nile Cooperative Framework Agreement (NCFA) (Entebbe Agreement) of 2010 was premised on a “no harm principle” that complemented other trans-border river treaties. Based on this principle, nations are deterred from using the flow of the Nile waters in ways that would harm downstream states. The agreement was signed in May 2010 and endorsed by Ethiopia, Kenya, Uganda, Rwanda, Tanzania, and Burundi. It was a replacement to the 1923 Convention that had disproportionately awarded Egypt and Sudan rights to water from the Nile and significantly shrunk Egypt’s absolute power over upstream projects. This is happening at a time when climate change, unprecedented desertification, and population increase, are taking their toll on riparian states, thereby making the availability of the Nile’s water for both households and large-scale industries a much sought-after resource (Swain, 2011; Waleij et al., 2016), as well as a threat to the region’s peace and security. The various colonial treaties—the 1902 and 1929 treaties, whose validity is contested by the upstream riparian states as well as the 1959 bilateral agreement—were the sources of Egypt’s hegemony over the Nile River for many years. Decades of feigned cooperation by Nile basin states, especially Egypt’s policy of self-help—national but not water policy—can be attributed to the reliance on prejudice to boost legitimacy as manifested in Egyptian policy discourse and actions towards both Ethiopia and Sudan (Kalpakian, 2015). Even more damaging is the lack of a basin-wide management framework over this international waterway and the failure of cooperative efforts towards improving communication between the Nile riparian states (Salman, 2013; Swain, 2011).
3. Theoretical framework

This paper adopts a holistic human security paradigm. According to the Commission on Human Security (CHS), this paradigm “protects the vital core of all human lives in ways that enhance human freedoms and human fulfillment. Human security means protecting fundamental freedoms that are the essence of life. It means protecting people from critical (severe) and pervasive (widespread) threats and situations. It means using processes that build on people’s strengths and aspirations. It means creating political, social, environmental, economic, military, and cultural systems that together give people the building blocks of survival, livelihood, and dignity.” (Commission on Human Security, 2003, p. 4). This concept focuses on the security of individuals, their protection, and empowerment against the traditional state-centric concept of security that only focused on countries’ safety from military aggression. According to the paradigm, attention is drawn to many threats that cut across different aspects of human existence, highlighting the relationship between human security, development, and human rights. It also promotes an integrated and well-coordinated people-centered approach to advancing peace, security, and development within and across nations (Commission on Human Security, 2003). This people-centric approach to human security brings together human security, rights, and development in an inter-disciplinary, multi-sectoral, comprehensive, context-specific, and prevention-oriented manner (Tadjbakhsh & Chenoy, 2007). The emphasis on human security relates to the interconnectedness of threats and responses that are mutually reinforcing in a domino pattern. That is, violent conflicts deprive people and generate many problems, including increasing poverty, deplete resources, and leading to the outbreak of infectious diseases and education deficits, etc. A violent threat within a specific area or country can also spread to other regions or countries, causing negative externalities that affect regional and international security.

Using the human security paradigm, we looked at how water access as a human right depicts an eminent clash and uneasiness between Egypt’s national security interests and Ethiopia’s socio-economic development. Issues relating to freshwater bring about security threats (human and food), drought, and desertification that threatens the wellbeing of people [United Nations Economic Commission for Africa (UNECA), 2017]. The broad conception of security decenters the state-centric view of security. Still, it simultaneously encapsulates both state and human security that individuals’ actions within the ecosystem represent (UNECA, 2017; UN Water, 2008). A State-centric regional security complex and a people-centric [based] on a transnational security complex are competing in the NBR Nile basin region (UNECA, 2017). This imposes the need for riparian states to ensure development and security outcomes through effective water governance and collaboration by sharing information and interest (Barnett, 2001; Lindberg, 2010).

The securitization of human wellbeing to ensure security in which the expanded concept of human security encapsulates (individual, community, and national security) emphasizes threats that “degrade the quality of life of the inhabitants in the state” or limit available options for those inhabitants (Barnett, 2001, p. 130; Lindberg, 2010, p. 10; Matthew et al., 2009, p. 6). At a universal level, basic human needs such as water and sanitation, development, and rights are some of the concerns that the human security paradigm seeks to address. It brings together previously diverging policy strands, including security, development, and environmental sustainability. Its constitutive components include food, economy, health, and the protection of the environment, personal, community, and political rights as encompassed in the “concern with human life and dignity” mantra, as stated in the 1994 UN Human Development Report (Lindberg, 2010, p. 11). The components of human security are interdependent, and threats to human security stall development. The mutually reinforcing link between the various dimensions is strengthened/supported by the rule of law, good governance, and citizens’ political participation in the decision-making process. Prevention is the key to achieving human security (Dalby, 2009, p. 41; Lindberg, 2010; Matthew et al., 2009, pp. 247–249). The dam development such as the GERDP causes changes in different sectors both locally and nationally with various economic and social systems, providing a safety net against challenges such as climate change and likely to destroy ecosystems, traditional
ways of life, competing uses of land and water resources in other sectors as well as the use and needs of environmental systems (UN-Water, 2013)

Access to freshwater as a basic right

As a natural resource, water scarcity poses problems to both individuals, communities, and nations. Its national security dimension is well articulated by the Statement of the UN Secretary-General at Devos, Switzerland, on 24 January 2008: “our experiences tell us that environmental stress, due to lack of water, may lead to conflict, and would be greater in poor nations.” Freshwater scarcity, real/perceived unequal access, hegemony, and control over water by dominant individuals, groups, and nations such as Egyptian hegemony in the Nile Valley can fuel conflict, threaten national and regional security, weaken and destabilize fragile states, and exacerbate ethnic tensions. Furthermore, the threats can be accentuated by limited economic participation and weak and dysfunctional institutions as instantiated by weak democracies and institutions (Homer-Dixon, 1994; Klare, 2001, pp. 138–147; Powell et al., 2017) as found in countries of the Nile basin. The present global water and sanitation crisis is attributable to a combination of interlinked factors—poverty, inequality, and unequal power relationships (Homer-Dixon, 1994; UN-Water, 2013; Zeitoun, 2011) as well as climate change, social and legislative constructions, rapid population growth, and further technological/economic developments that result from migration patterns threatening the overall security situation (Klare, 2001, pp. 138–147, cf. Lindberg, 2010, p. 5). Social and environmental challenges such as the accelerating pace of urbanization, climate change, increasing pollution, and the depletion of water resources have exacerbated and amplified these challenges and will act as a conflict multiplier. It will further exacerbate water and food insecurity (Ketzek & Mazo, 2014, p. 143).

As a basic human right, access to water is enshrined in both international and regional Conventions. The former includes—the Convention on the Rights of the Child (1989), the Convention on the Elimination of all Forms of Discrimination against Women (CEDAW), (1979) [art.14 (2)] and the Convention on the Rights of Persons with Disabilities; (2006), (art. 28). The latter include the African Charter on the Rights and Welfare of the Child (1990) and the Protocol to the African Charter on Human and People’s Rights on the Rights of Women in Africa (2003). The abovementioned conventions explicitly uphold human rights obligations related to access to safe drinking water and sanitation. This is in line with the United Nations Committee on Economic, Social and Cultural Rights adopted in 2002 (Comment No. 15) which defines the right to water as everyone’s entitlement “to sufficient, safe, acceptable, physically accessible and affordable water for personal and domestic uses”. These Conventions, alongside Agenda 21 adopted at the United Nations Conference on Environment & Development (1992), recognize water and sanitation as constitutive of the right to an adequate standard of living and a fundamental aspect of human security. They further oblige [State parties] to ensure everyone’s access to sufficient amounts of safe drinking water for personal and domestic uses, that is; water for drinking, personal sanitation, washing of clothes, food preparation, and personal household hygiene. States are further enjoined to progressively ensure access to adequate sanitation, as a fundamental element for human dignity and privacy, and also to protect the quality of drinking water supplies and resources.

According to the guidelines for the realization of the right to drinking water adopted by the Sub-Commission on the Promotion and Protection of Human Rights “the right to sanitation [encompasses] the right of everyone to have access to adequate and safe sanitation that is conducive to the protection of public health and the environment” (United Nations Human Rights Office of the High Commissioner, UN Habitat & WHO, 2010, p. 6). Furthermore, Water security is defined as:

The capacity of a population to safeguard sustainable access to adequate quantities of acceptable quality water for sustaining livelihoods, human well-being, and socio-economic development, for ensuring protection against water-borne pollution and water-related
disasters, and for preserving ecosystems in a climate of peace and political stability (UN-Water, 2013: vi).

The concept of integrated (comprehensive) human security implies that state security and the wellbeing of its citizens are intertwined and that there is a need for a balance between the sustainability of the nation-state and the security of the people living within its frontiers (Barbier & Homer-Dixon, 1999; UNECA, 2017). Additionally, environmental stressors, economic depression, energy, and food crises affect individual, societal, and state differently. Human security is an all-encompassing concept that goes beyond the state-centric notion of security but recognizes that individual-centric security is about the co-existence of state-centric and human-centric security (Eriksson et al., 2016b).

4. Method
A qualitative, deductive approach based on multiple sources of evidence, including written secondary materials comprising of peer-reviewed articles, reports, conventions, books, and internet sources, was used to elicit the data for this study. Other main content consisted of newspaper articles, and the Nile Basin Initiative (NBI) website as well as reports from international organizations such as the WB, the United Nations Development Programme (UNDP), FAO, and the World Food Programme (WFP). These were further augmented by Google and Yahoo search engines to track information unavailable from other databases. Together, these sources provide real-life information (Teorell & Svensson, 2007, pp. 49–53) of the complicated situation and the conflict panorama in the Nile Basin. Data from the NBI provided the views of all the riparian states (Lindberg, 2010).

5. Discussion
5.1. Human and food insecurity
The NBR is the source of societal goods and services for the riparian states. It contributes an estimated 40 to 60% of the gross domestic product (GDP) of the Nile riparian countries (Nile Basin Initiative, 2012). Among the NBR riparian states, Ethiopia is the most populated and has the fifth-fastest population growth rate in the world (3.18%) (Mazur, 2012). Based on the latest United Nations estimate, Ethiopia’s population as of 2017 was approximately 106,855,022 (World Bank, 2017). Following is Egypt, with an estimated population of about 84 million people (Kalpakian, 2015). Despite the inability to accurately predict the direction of climate change and its impact around the Blue Nile Basin, population trends remain more threatening (Kalpakian, 2015) with human and food security implications. Table 1 below captures population projections of three riparian states—Ethiopia, Egypt, and Sudan.

The challenges of poverty and food insecurity remain a considerable threat, especially in Ethiopia and Sudan, and a decrease in the per capita water availability poses a threat to peace (Swain, 2011). Additionally, population explosion, agricultural expansion, and urbanization tremendously contribute to land degradation (Fransen & Kuschminder, 2009; World Food Programme, 2014).

The GERD is located in the Benishangul-Gumuz region of Ethiopia, which has been impacted by climate change leading to deprivation and low living standards. According to Mcsweeney et al. (2010), between 2040 and 2059, there will be a 1.8°C (degrees Celsius) increase in global temperatures. This implies rainfall would further decline in most parts of the tropics of Africa, including Ethiopia. As a result, there will be an increasing need for water and food. The projected increase in temperature and associated population explosion and climate change implies that there will be increased population vulnerability to diseases, hunger, and starvation, poverty, as well as crime in low and middle-income countries (Mcsweeney et al., 2010). The Benishangul-Gumuz area is consequential to the ongoing, progressive shorter rain seasons (April-May and October to November). This phenomenon is relatively worse than in the past when there was inadequate
rainfall, but not as low as it is now (IRIN News, 2008). This implies decreased food production, reduced amounts of potable water, and an increase in water-related diseases (Gummadhi et al., 2018). The effects have already been observed in the Benishangul-Gumuz Region, where among other things, there is a gradual fall in agricultural and livestock productivity, including inadequate fodder (shortage of pasture), death of animals, water shortage, increased incidence of water and vector-borne diseases, extinction of indigenous crops, drought and famines, seasonal migration due to drought, and conflict over land and water (Morka & Tesfaye, 2018).

Drought risk remains one of the core drivers of food insecurity in Ethiopia (Awulachew et al., 2008, World Food Programme, 2014). The frequency and magnitude of droughts in the Ethiopian Highlands affect water quality and quantity in downstream Sudan and Egypt, threatening human and food security (Awulachew et al., 2008Tafesse, 2006). Droughts and floods both result in crop failure and subsequent starvation among citizens who solely depend on small-scale and/or subsistence farming for their food security (World Food Programme, 2014). According to Homer-Dixon (1994), a decrease in the availability of physically controllable environmental resources such as clean water, land, and food would provoke interstate conflicts or resource wars. The author further posits that the degradation and depletion of agricultural land, forests, water, and fish are more likely to contribute to social turmoil than climate change or ozone depletion (Homer-Dixon, 1994). According to the human security paradigm, a single problem could act as a nidus for other issues with multiplier effects. Atmospheric problems will interact with other demographic and economic pressures that have gradually eroded some societal buffering capacity (Homer-Dixon, 1994). Furthermore, population growth, juxtaposed with the lack of adequate clean energy sources, has been blamed for the severe depletion of woodlands as a source of charcoal and firewood for energy. The area in question (where the GERD is constructed) has witnessed indiscriminate harvesting of bamboo, eucalyptus and rubber trees, and gum forests for economic purposes, raising environmental concerns.

Like Sudan, myriad human security risks bedeck Egypt and any mismanagement of the Nile waters will adversely affect her growing population and lead to food insecurity. In 2017, for instance, Egypt surpassed Russia in importing food products (mostly wheat) from Russia. Her food import comprised mostly of wheat, about 44% more compared to 2016. Egypt’s food security and energy needs depend on water availability for irrigation from the River Nile. For decades, this explains why Egypt has assumed a preponderant role in controlling the Nile’s waters through colonial treaties. As the statement goes, “No Nile no Egypt” (Abdalla, 1971). Egypt is witnessing shrinking access to arable land and the acute shortage of strategic resources, including energy (Nile Basin Initiative, 2012; Salman, 2013; Swain, 2011). This shortfall in renewable resources can sharply increase demands on key institutions, such as the state, while simultaneously reducing their capacity to meet those demands. Such pressures increase the chances of state fragmentation or make it to become more authoritarian (Homer-Dixon, 1994). Although a net importer of energy to run its economy, it faces a shortage of fresh water, for which the Nile remains the only source.

| Table 1. Population estimate and projection of some Nile Riparian States |
|-----------------------------|--------|--------|--------|--------|--------|
| **Country**     | 2010 | 2020 | 2030 | 2040 | 2050 |
| Ethiopia        | 87   | 112  | 138  | 164  | 188  |
| Egypt           | 78   | 91   | 102  | 113  | 122  |
| Sudan           | 35   | 44   | 55   | 66   | 82   |

Source: United Nations, World Population Prospects: The 2012 Revision (New York: United Nations, Department of Economic and Social Affairs, Population Division, Population Estimates and Projections Section, 2013); http://esa.un.org/unpd/wpp/unpp/panel_population.htm (cf, Kalpakian, 2015).
Additionally, climate change has led to desertification, coastal erosion, and salinization. Other challenges are posed by high population growth rates and urbanization (Salman, 2013; Waleij et al., 2017). Even far more critical is the political chaos and the volatile security situation along its frontier that preceded the 2011–2013 Arab Spring that has been disturbing for the leadership in Cairo. It is against this macro-security context that the GERD construction must be understood (Waleij et al., 2017).

Several authors have debated that water resources are significantly affected by global drivers such as rapid population growth leading to an unprecedented increase in human security risks and vulnerabilities (Horner-Dixon, 1994; Nile Basin Initiative, 2012; Swain, 2011; UN-Water 2013; World Food Programme, 2014). Shifting demographics, including population growth, increases the demand for water, needed for various reasons like domestic, agricultural, and industrial use. Anthropogenic activities such as deforestation, changes in land-use patterns, and pollution (water, environmental, and air) affect the hydrologic cycle, and later on, water availability (UN-Water, 2013). Additionally, available water resources are likely to be strained by increasing demand and competition for these resources across sectors; food production, hydropower production, and the construction industry, among others (Freitas, 2013; UN-Water, 2013). It is now widely recognized that environmental and climate changes may significantly alter the basin’s water flows in the coming decades due to increased agricultural, industrial and domestic usage (Freitas, 2013; Swain, 2011). Unfortunately, communities residing around the basin have limited ability to cope with the negative impacts of climate variability. Countries of the basin would need to adopt a series of proactive resilient measures to build resilience to current climate variability while enhancing adaptive capacity for future threats (Nile Basin Initiative, 2012). They would also need to expand water-storage infrastructure, jointly coordinate reservoir operations, undertake and share research findings, and promote agricultural trade among the countries and between the basin and other regions (UN-Water, 2013).

5.2. Conflict over the waters of the Nile and the GERD project

There is significant variation in interests by the Nile Basin states towards utilizing the Nile waters. The variation in the utilization of the Nile waters, with the different competing state interests, has been a constant source of conflict and disagreement. Egypt, Sudan, South Sudan, and Ethiopia have very high stakes in the Nile, including Uganda. On the other hand, Tanzania, Kenya, Burundi, and Rwanda have moderate stakes, whereas countries like Eritrea and the DRC are believed to have low stakes over the Nile (Salman, 2013; Yihdego et al., 2016). Ethiopia accounts for an estimated 86% of the Nile waters’ total flow (Salman, 2013, p. 18). However, almost the entire flow of the Nile has been controlled by Egypt and Sudan. Under the 1959 Nile agreement, Sudan obtained rights to use about 18.5 km3 of the Nile waters, while Egypt, on the other hand, has been using more than 55.5 km3. This is one of the core issues at the heart of the disputes between various riparian states over the Nile Basin’s waters. These disputes are embedded in what has come to be known as The Nile Colonial Treaties (Salman, 2013; Swain, 2011) that emboldened Egypt and gave it a monopoly over the waters of the Nile at the expense of Ethiopia’s socio-economic development.

Because of Egypt’s overwhelming reliance on the waters of the Nile, she insisted that the construction of the GERD be shelved as a conditio sine qua non for negotiations. Egypt further sought regional support for its interests and instrumentalist position by going on a diplomatic offensive to undermine support for the construction of GERD. Media reports, including the authoritative Washington Post, had it that Egypt was hashing plans to sabotage the GERD project (Abtew & Dessu, 2019) because it seriously threatens its food, energy, and national security interests (Washington Post of June 5 2013). Other nations in the Nile Basin Initiative, including Sudan, accused Egypt of further provoking the situation. Cairo dispatched a delegation to Uganda to seek cooperation in opposing the construction of Addis Ababa's GERD. Apart from labeling Egyptian proposals over the dam project as “day-dreaming,” Ethiopia countered the perception that the dam will harm the downstream water flow by conceding that it will instead augment water flows
to Egypt. Instead, Egypt is bent on increasing its share of the Nile’s water flow to 90% (Washington Post, 5 June 2013). For decades, Egypt and Sudan repeatedly lobbied the African Development Bank (ADB), the World Bank (WB), and the European Investment Bank (EIB) to refuse much needed financial resources for the realization of planned water projects on the Nile, which is now mainly being funded by China (Kalpakian, 2015; Swain, 2011; Tesfaye, 2015).

The relationship between Egypt and Ethiopia regarding the GERD project has been that of mistrust and laced with power innuendoes. Egypt is documented to have once requested permission from the Ethiopian government to conduct independent technical and environmental impact assessments on the proposed dam to ascertain its short and long-term ecological repercussions on the Nile water and the surrounding natural habitat. The Ethiopian government ignored this request as it was viewed as a maneuver by Egypt to undermine Ethiopia’s authority and sovereignty (Waleij et al., 2016). This is an indication of simmering mistrust and inertia to cooperation regarding the GERD (Kalpakian, 2015, p. 46). The US government has recently hatched a plan to halt foreign financial support to Ethiopia to pressure the government to succumb to selfless negotiations with Egypt about the GERD (Gramer, 2020). Apart from the GERD, Ethiopia intends to construct some other smaller dams on the Nile, which would generate 6,000-MW electricity.

Heightening tensions between Ethiopia and Egypt are fears of a temporary reduction in water flow while the GERD’s catchment basin is filling up—expected to spread out minimally between 5 and 7 years (Waleij et al., 2016). The time required to fill the GERD depends on both the agreed annual release and the storage in Lake Nasser when filling begins. The uneasiness and lack of agreement among riparian states on the reservoir filling strategy are compounded by climate variability. Egypt is also worried about a severe water supply reduction resulting from evaporation and slowed water flow from the reservoir once construction is completed (Waleij et al., 2016). Additionally, the GERD construction is intertwined with competition over access to water resources in the region—with access to the Nile entangled with the national security of all Nile States (Waleij et al., 2016). The GERD construction has indeed changed the security dynamics of the water regime in this part of Africa. For most of the states around the river, the Nile is embedded as a strategic component of their foreign and domestic policies (Waleij et al., 2016).

On 23 March 2015, the GERD declaration that seemed to alleviate some of the tensions and fears around the GERDP was signed. It makes provision for cooperation and equitable access of Nile water (equal state sovereignty) to meet Egypt and Sudan’s needs on the one hand and Ethiopia on the other hand. Signatories took an obligation not to inflict any harm or damage (no harm principle) on any of them and reaffirmed just and fair use of the Nile water as well as sustainable development and regional economic integration (Waleij et al., 2016). Unfortunately, the resolution fails to include any specific technical guarantees of Egypt’s rights to Nile water. Nor does it stipulate any commitment on the part of Ethiopia not to jeopardize Egypt’s and Sudan’s shares of Nile water following the completion of the dam. The declaration may, therefore, carry political messages more than anything else” (Waleij et al., 2016).

Of recent, Nile basin countries comprised of Ethiopia, Uganda, Rwanda, Tanzania, Kenya, and Burundi reached a deal to end Egypt’s control of the river’s waters. Egypt has since opposed the Entebbe Agreement, which calls for the redistribution of historic Nile water quotas (Salman, 2013). Egypt is apathetic that its share of water would dramatically reduce if a dam is set up. Compounding the problematic situation is the fact that Egypt and Sudan are still to ratify the Entebbe Treaty. Uganda has consistently insisted on the Nile Basin Cooperative Framework agreement, according to which all members of the Nile Basin states are equally entitled to reap the benefits from its waters. According to Yoweri Museveni, climate change imposes the dire need for electrification in the basin countries to serve as a deterrent from the chopping down of trees for fuelwood. On 23 March 2015, in Khartoum, Sudan, an agreement was reached to resolve various issues related to Ethiopia’s decision to construct the GERD on the Blue Nile. However, it failed to address the broader, still contentious matters of sharing the Nile River waters among all riparian
states (Kimenyi & Mbaku, 2015). The persistent conflict over the equitable, fair, and reasonable allocation and utilization of the Nile River waters remains unresolved.

Recent mediation efforts between Egypt and Ethiopia over the GERD filling up have been compromised by the US-led mediator role's alleged ambivalence. The US has swung from observer to power broker, such as imposing sanctions against Ethiopia (Gramer, 2020). Such actions may worsen the situation leading to the deterioration of tension between the two countries. After years of wrangling and military action threats against the GERD, Egypt, Ethiopia, and Sudan reached a preliminary agreement in Mid-January 2020. However, on February 28, USA Treasury Secretary Steven Mnuchin cautioned Ethiopia to put the filling of the dam on hold pending a final agreement. Ethiopia, which had boycotted the Washington talks, slammed the US for being “undiplomatic” and diverging from its role as mediator. Ethiopia is vigorously opposed to the draft agreement prepared by the US and the World Bank (Van Eyssen, 2020).

5.3. The coming of new donors is a game changer

Another critical dimension to this issue of water management in the Nile basin is the coming on board of investors. The coming of these new donors such as China, India, and the Gulf states have disrupted the delicate balance of water cooperation in the region. This has significantly weakened Western donors' power, who have always been hesitant to provide loans to upstream countries for water projects (Kalpakian, 2015; Swain, 2011; Tesfaye, 2015). In 2017 alone, private Chinese investment in Ethiopia was worth US$269.4 million, mainly in manufacturing, construction, real estate, consultancy, and other sectors, making China Ethiopia's largest trading partner. Trade volumes between both countries reached 6 billion dollars in 2015, while Indian and Dutch firms came in the second and third positions, respectively (Nicolas, 2017). Concurrently, Chinese companies have thrown their financial weight behind numerous hydro projects in upstream countries, including Burundi, Ethiopia, Kenya, Tanzania, the DRC, Uganda, and Sudan, posing a significant threat to Egypt (Mahlokeng, 2017). Additionally, the signing of the Cooperative Agreement in 2010 by Ethiopia, Uganda, Kenya, and Rwanda without any intrusion from Egypt and Sudan further engendered a loss of grip over the Nile hydro-politics agenda by Egypt and Sudan (Kalpakian, 2015). We believe this is an attempt by upstream riparian countries to put up resistance against Egypt's dominance over the Nile River. This is happening while there is internal political instability in Egypt orchestrated by the Arab Spring and the Muslim Brotherhood activities that are inevitably weakening the country (Kalpakian, 2015; Mahlokeng, 2017). Egypt is further witnessing a recession in trade and tourism that is negatively affecting its economy compounded by Egypt's reliance on financial assistance from external aid, including the USA.

India, China, Saudi Arabia, Qatar, the United States, and the United Arab Emirates are undertaking large-scale agricultural investments in the Great Lakes region—Ethiopia, South Sudan, and other East African nations to provide food and agrofuels for their burgeoning population. In November 2008, the government of Qatar leased 40,000 ha of high potential land in the Tana River delta from Kenya so that Qatar may use it to produce horticultural products for Qatar (FIAN International, 2016, p. 5). These governments and corporations are also contestants for water rights in the Nile. Since 2000 and accentuating after the 2008 food crisis the Worldwatch Institute estimates that 16.8 million hectares of land in East Africa have either been sold or leased to foreign corporations from Saudi Arabia, India, the United States, and the United Arab Emirates for the cultivation of water-intensive crops like rice that will accentuate food insecurity in Ethiopia and Sudan where there is perennial famine, loss of yields on local fields and water used to grow them (Lamere, 2012). Apart from the toll they will take on the region's water resources, these agro-industrial developments will lead to the eviction of poor people, often without adequate compensation for their land, food insecurity, and the destruction of ecological systems (Kariuki & Ng'etich, 2016; Pemunta, 2019). Furthermore, it will lead to land scarcity and conflict pitting individuals and communities (Pemunta, 2019) in the struggle to secure their livelihood (Kariuki & Ng'etich, 2016, p. 79). From a human rights perspective, several human rights will be trampled upon, including the rights to adequate food, housing, access to resources, the right to work and the rights to
information, and political participation (FIAN International, 2010, p. 5, Pemunta, 2019) as well as right to water.

Unlike Western donors, China does not attach any human rights and democratic strings on its aid (Pemunta, 2018). Furthermore, China’s non-interference policy in African countries’ domestic affairs is more acceptable to authoritarian leaders of the continent who have developed a thick skin to Western democratic and human rights scrutiny (Swain, 2011). Thus, the new donors offer reasonably flexible and less conditional loans without any special interest in democracy and governance systems being used by African dictators. Apart from providing affordable loans and speedier execution of projects than Western donors and companies, China’s investment in Ethiopia seems to disadvantage Egypt in the negotiation of power dynamics (Kalpakian, 2015; Mahlakeng, 2017).

Egypt has been very successful in convincing international and regional financial institutions, including the World Bank, EIB, and the ADB, not to finance the construction of water/power generation infrastructural projects along the Nile. The World Bank was opposed to the GERD and was unwilling to bankroll the project without Egypt’s endorsement. In 1990, Egypt vigorously opposed an ADB loan to Ethiopia for the construction of the Tana-Beles project, which was to provide water for 200,000 farmers in new settlement areas and consequently to reduce the flow of the Nile (Tesfaye, 2014). In 2009, the ADB and EIB forwarded social and environmental concerns over the construction of the Gibe III project, a dam on the Omo River, and turned down a US$ 500 million loan to fund the project (Mahlakeng, 2017). The International and Commercial Bank of China (ICBC), however, came to Ethiopia’s rescue with the money for financing the project.

The Chinese are increasingly allowing national governments to go ahead with narrower, national ambitions while overlooking their schemes’ impacts on other regional partners, thereby further complicating cooperation in water governance (Freitas, 2013; Swain, 2011). There has been a change in the power dynamics in favor of Ethiopia in the Nile with the emergence of China as the financier of dam projects as well as an intensification of Sino-Ethiopian diplomatic and trade relations and investment in the Ethiopian economy—including a large infusion of foreign aid, and concessional loans. Even more critical is Ethiopia’s strategic position as headquarters of the African Union (AU) and the UN Economic Commission for Africa. China’s close ties with Ethiopia makes it a privileged third party to AU decision-making. This is evident with the Chinese Government dollying out US$ 200 million to support the construction of the AU’s conference center and culturally branded it with a traditional Chinese-style garden (Shinn, 2014). Thanks to Chinese funding, Sudan has, among other projects, completed the construction of the Merowe Dam project while Ethiopia has apart from the GERD, constructed the Tana-Beles modern hydropower dam complex (460-megawatts) on the Nile and a 188-m-tall hydropower dam on the Tekeze River for hydropower production (Swain, 2011).

5.4. Reconciling climate change and water governance
Climate change has led to a sharp variability in the water flow of the Nile River and transformed it from a shared river, being the source of water-peace to that of water-war in the basin (Swain, 2011). Egypt’s antipathy to the construction of the GERDP creates challenges in reconciling the debilitating effects of climate change with water governance in trans-boundary waterways where it serves as a threat to human and international security (UN-Water, 2013; Zeitoun, 2011). Water is a quadruple local, national, regional, and international issue governed at multiple scales (Veilleux, 2013). Global interdependencies create the need to address the cumbersome global freshwater crisis (Magsi, 2015) since global trends and drivers impact water interaction. Fast-paced change makes new human security threats and vulnerabilities, water scarcity, droughts, and floods and resulting in local armed conflicts. This implies that the Nile’s freshwater challenges at any level of governance will become more accentuated in the future. The centrality of water to livelihood and the multiple scales to which water is imbricated makes it the gossamer linking a web of securities (Magsi, 2015; UN-Water, 2013). Climate change
poses risks to international security. It will act as a conflict multiplier by amplifying existing environmental stresses, creating new ones, exacerbating water and food insecurity, and adding to the pressures on weak, corrupt, or repressive governments (which by their nature will find it hard to respond to such situations) but will also threaten more stable and effective ones (Homer-Dixon, 1994; Ketzek & Mazo, 2014, p. 143).

Powell et al. (2017) state that “Enabling water security requires more than being attentive to conflicts of interests between stakeholders, it requires recognizing that different position-holders make competing claims, not over divergences in interests but rather over who should have agency in the enactment of governance.” We posit that conflicts of interest and conflicts of position frame water governance among riparian states in the Nile Basin. Climate and water cycles are intertwined. The intrinsic biophysical link between the two offers supports to the neo-Malthusian view that anthropogenic climate change will play a significant role in exacerbating/amplifying preexisting water scarcity and might likely lead to violent conflict (Homer-Dixon, 1994). Population growth can result in depleted and degraded supplies of freshwater. Also, poorly managed development and weak governance hamper sustainable development and underscore the need for cooperation between major-water-use-sectors—agriculture, industry, energy, navigation, domestic use, and sanitation (Homer-Dixon, 1994; UN-Water, 2013).

Cooperation, an adequate legal and institutional framework, joint approaches to planning, and the sharing of benefits and related costs are the best solutions to transboundary impacts and conflicting interests (an integrated approach; UN-Water, 2013), that will guarantee both human and state security. Cooperation and constant dialogue are required to forestall the potential of friction and conflict engendered by the setting up of large-scale projects, including hydroelectric power development and water extractions. The food and energy security of downstream communities who may depend on fisheries for their livelihood might be negatively affected (Wolf & Newton, 2008). Trans-border water cooperation and security can be a catalyst for regional collaboration when international legal instruments back them. They also constitute the basis for economic and sustainable development (IPCC, 2008; United Nations Department of Public Information, 2011; UN-Water, 2013; Wolf & Newton, 2008).

Integrated, cross-sectoral policies, coordinated decision-making, and enforceable legal instruments and institutional mechanisms are needed to ensure that water acts as a linking factor to achieving security. Additionally, integrated management helps to adequately manage competition among sectors for limited water resources.

6. Conclusion
In this paper, we have illustrated how Egypt, through various colonial treaties and water agreements, has exercised power and control over the utilization of the Nile water over the years. Ethiopia’s decision to construct the GERD challenges Egypt’s historical control over the Nile River, leading to tension between the two sovereign states. We argued against the backdrop of the fact that the increasing impact of climate change, whose implication is diminishing resources needed to satisfy the domestic and economic needs of the rapidly growing population amid scarce resources (energy, water, and land) accentuate threats to human security. We employed the human security paradigm to show how a single security issue could generate more complicated human security problems that can spread across borders. This is evident in the rising incidence and prevalence of non-communicable diseases and communicable diseases (infectious diseases) and neglected tropical diseases, which further weaken individuals, communities, and nations’ economic productivity. Furthermore, the influence of new investors coming to the NBR, including China—the main financier of large-scale hydropower projects such as the GERD, has been explored. Donors/investors are reshaping the power dynamics and changing trans-frontier water governance’s political landscape in the NBR. Additionally, investors focus on exploiting resources and making profits from their investments, without paying much attention to human rights and democracy or maintaining a policy of non-interference in African countries’ domestic affairs.
(Pemunta, 2017). Widespread political instability in the region can fuel individual, community, and ethnic tensions over shrinking natural resources, including water and endanger the entire region’s stability and security.

This paper has also highlighted how the Western donor community (especially the USA) is allegedly offering biased mediation in favor of Egypt, to the extent that foreign aid to Ethiopia has been halted to expedite talks over the GERD. It is our ardent opinion in this paper that the whole conversation risks ceasing to be about the disagreements between Ethiopia and Egypt, but competition for power between China and the USA, whose battleground is the GERD. The transformation of the region’s water politics and dynamics could usher in a new era in water cooperation in the basin. The Nile basin’s water regime remains a significant component of the strategic and security policy of states of the region. We have also shown that access to the Nile water is a guarantor of economic prosperity for both households, communities, and large-scale industries in the region. At the same time, any interference could provoke political, economic, and military retaliation from countries of the region.

However, this paper posits that through functional joint management of the Nile water resources, riparian countries should build trust and mitigate the occurrence of conflicts. The Nile basin on which the GERD project is built crosses national frontiers, and so, no one single country must claim hegemony over its management. Activities conducted on the Nile may likely affect other countries’ water needs who rely on this source of water. The countries must foster an environment of dialogue and collaboration. Amidst potential conflicts and regional instability, the Nile basin countries must continue to seek cooperative solutions. They depend on the Nile’s water resources, and their economic destinies are therefore intertwined. Equitable access and utilization of the Nile’s water (equal state sovereignty) is the ideal solution. The mitigation of conflict in transboundary water management schemes must ensure the promotion of equitable use for current and future users, increase access, share benefits, and encourage broad participation.

The need for joint management of the waters of the Nile basin as the ideal solution cannot be overemphasized. As demonstrated in this paper, the Nile water basin is affected by myriad trans-border factors that mitigation should not be preserved in a single country. In a situation where the riparian countries' immediate national interests are taking priority over the basin-wide strategy, a combination of sub-level, bilateral, sub-regional, and multilateral arrangements appear to be a more appealing and more effective way to address diverging interests and differing approaches. Suppose the engagement of non-state actors at multiple scales becomes necessary, their objective should be to help rectify the power imbalances among riparian and ensure fairness over arbitrariness in the NBR.

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Appendix

Figure A1. The blue and the while Nile as they empty into the Mediterranean Sea (source: https://en.wikipedia.org/wiki/Nile#/media/File:River_Nile_map.svg).

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