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RESEARCH ARTICLE

TRANS-BOUNDARY WATER DISPUTE: A REVIEW OF THE RIVER NILE WATERS.

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ABSTRACT

Background: The use of Aerobic exercises and The Nile flows for about 6,700 kilometers through ten eastern African countries namely Rwanda, Burundi, D. R .Congo, Tanzania, Kenya, Uganda, Eritrea, Ethiopia, the Sudan, and Egypt before emptying into the Mediterranean, and is the longest international river system in the world. During the colonial era, boundaries were created so as to demarcate territories for easy governance by the majorly Europeans masters. The boundaries created a sense of ownership of natural resources including mountains, valleys, lakes and also rivers that neighbored or passed through various states. While these resources management and sustainability requires the partnership of all the communities around them, their use in social, economic and other livelihood advantages remains a source of dispute among the same would be beneficiaries. A formula for equitable sharing of the water body resources remains elusive for decades with blame games and accusations peddling hostility to almost war levels between the countries that share them. The river Nile region of the world is such an example. The constant attempts to bring all the emissaries together to come up with an agreeable approach to manage and utilize what the waters provide has often failed, with each individual states supporting a certain course hidden behind self-seeking agenda. However all is not lost, as solutions, though few, can be drawn from successive trans-boundary water management initiatives in other regions of the world where a take and give approach among other formulas are deployed.

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INTRODUCTION

"International waters," and interchangeably, "trans boundary waters", are water resources that are shared by two or more sovereign states and include international fresh water, international ground water and international Large Marine Ecosystems (LMEs). International waters also include "boundary" water resources where the boundary between two or more sovereign states is formed by an international lake or river, and they include "successive" water resources where an international river (or underground aquifer) flows from one sovereign state to another"(Paisley, 2013) The world has more than 263 trans- boundary water basins that cover almost have of its total land surface. This is 60% of fresh water supply supporting more than 2 billion of world's population. About 145 nations have their territories within Trans -boundary water with about 30 of them lying entirely inside the basin. The competition for the scarce resources can occasionally be a source of conflict between states that share their boundaries (El-Nashar, 2017). The interest in economic development and biodiversity conservation roles of these basins, makes governance particularly challenging.

When basins encompass multiple sovereign states, a paramount concern is how to design and sustain institutions to equitably share and protect water resources. Bi-lateral and even the more binding treaties are more likely to prevent riparian conflicts and alleviate the deleterious consequences of water scarcity for international security. By coordinating and collaborating together via a single entity, parties will be able to generate more data and information for the shared resource, enhance collective expertise in basin characteristics and management, and develop a cadre of managers and experts who have a unique knowledge of the particular basin (Water in crisis, 1993) The role of mitigating conflicts and promoting cooperation by enabling resource users to the dynamic changes in physical or political conditions is easier when handled collectively. There is no approach that can fit all basins since the issues are of a wide range and history in political, economic, ecological and social aspects. The context that follows try to look into the R. Nile Trans boundary governance and the possible future development to bring in cooperation and sharing of information.

The Nile (6 825 km or about 4 266 miles) is the longest river basin in the world in terms of both drainage area and the quantity of water it carries in its course, which is estimated at 84 billion m^3/year of water. Nile has declined at Aswan in Egypt: from 1,100 billion cubic meters during 1870-99, down to 84 billion during 1899-1954 and to 81 billion during 1954-96 (Ezzat, 1996). The Nile has more riparian states (Burundi, Egypt, Ethiopia, Eritrea, Kenya, Republic of Congo, Rwanda, Sudan, Tanzania, and Uganda) than any international river basin in the world (Fig 1) (Britannica, 2013). The Ethiopian water towers provide 86 per cent of the waters of the Nile with Blue Nile 59 per cent, Baro-Akobo (Sobat) 14 percent, Tekesse (Atbara) 13 percent while the contribution from the Equatorial Lakes region is only 14 percent (SWAIN, 1997). While other countries may have alternative energy sources, a significant percentage of the peoples of these states depend directly on the Nile River for their livelihood and as a source of energy for industrial and domestic needs. A recent study suggests that within 25 years, because of population growth and economic development, almost one in two people in Africa will live in countries that are facing water scarcity or "water stress". Water scarcity is defined as less than 1 000 m^3 of water per person per year, while water stress means less than 1 500 m^3 of water per person per year. By 2025, according to the report, 12 more African countries will have joined the 13 that already suffer from water stress or water scarcity Moreover, Lester Brown, the influential head of the.

Environmental research institute 'World Watch', believes that water scarcity is now 'the single biggest threat to global food security. He states that if the combined population of the three countries that the Nile runs through (Ethiopia, Sudan and Egypt) rises as predicted from 150 million today to 340 million in 2050, there could be intense competition for limited water resources (Brown, ?). There is already little water left when the Nile reaches the sea. The increasing water intensity of modern development, including irrigation and hydroelectric power, has raised the stakes on sharing and common use. In May 1999, the management of all matters pertaining to Nile was officially handed to Nile Basin Initiative (NBI). The NBI, which is supported by the UNDP, World Bank and other donors, includes the ten Nile riparian countries as equal members in a regional partnership to promote economic development and fight poverty throughout the basin. Its vision is 'to achieve sustainable socio-economic development through the equitable utilization of, and benefit from, the common Nile Basin water resources'.

Historical governance on the nile: During the colonial administration a number of agreements on the Nile were signed between Egypt and the UK, such as the 1929 agreement, which has been viewed as protecting the interests of the more developed Egypt at the expense of the underdeveloped upstream states. It is expected that the downstream riparian countries of Sudan and Egypt to cooperate and understand that their water needs are best served through cooperation and conservation of the Lake Victoria Basin catchment. Downstream riparian countries should contribute meaningfully to conserving catchment in the upper riparian states to see this framework swiftly concluded and operationalized to save Lake Victoria and assure the livelihood of the more than150 million habitants on the basin. All affected countries should be engaged further on the conservation, utilization and subsequent development in the basin.

The downstream states are apparently keen only to foster their development agenda with less interest in that of the upper states, which are still languishing in poverty and are in dire need of development. Conditions for shared water resources that have been set by development partners require riparian states to obtain consent from other riparian states for new projects or planned measures. The East African countries at the source of the world's longest river have complained for years about the treaty. Ethiopia reputedly rejected the 1959 agreement between Egypt and Sudan. In 2004, Tanzania unilaterally announced the establishment of a 170-kilometre water pipeline from Lake Victoria (where 14 per cent of the Nile originates) to supply water to some dry areas in the country. According to the *Cairo Times*, the project was said to be a direct violation of the 1929 treaty that has so far governed the use of the Nile water by the basin countries. Only months earlier Kenya, another riparian state on the Nile Basin, said that it would 'not accept any restrictions on the use of Lake Victoria and River Nile', and that it would unilaterally withdraw from the 1929 treaty. Kenya, Tanzania, and Uganda, on Lake Victoria, have long claimed that the treaty is a relic of colonial times because foreign rulers negotiated it without referring to their countries' best interests. Tension among the Nile Basin countries arises whenever a new Nile project is proposed.

The water needs of the upper Nile Basin riparian countries are barely being met. In addition, Egypt believes that it is the most in danger of losing access to the Nile waters by development projects in other countries and remains willing and able to intervene militarily to maintain the status quo. The biggest fear is that Ethiopia will develop its water resources. There is therefore a need for cooperation to ensure peaceful and sustainable development of Trans- boundary waters. In efforts to foster cooperation within the states Trans boundary water policy should be developed to assist in the appropriate management of shared waters. The complex physical, political, and human interactions within the Nile riparian states can make the management of the Nile water systems difficult. Given Egypt's 98 per cent reliance on the Nile for irrigation water and fast population growth, securing the Nile's waters is literally a matter of life and death. In fact, Egypt and Sudan insisted that Ethiopia should not undertake any water development without their consent, even though 86 per cent of the Nile waters reaching Sudan and Egypt originate in Ethiopia, and Egypt and Sudan do not contribute any water to the Nile River. Yet, most of the Nile water is used in Egypt and the Sudan. Irrigated agriculture is the largest draw on the waters of the Nile in these two countries. Comparatively, water is one of the least-developed natural resources in the upper riparian states. Consequently, Egypt and the Sudan signed an agreement on the 'full utilization of the Nile water' in 1959. As the Nile riparian's gained independence from Colonial powers, riparian disputes became international and consequently more contentious, particularly between Egypt and Sudan. The core question of historic versus sovereign water rights is complicated by the technical question of where the river ought to best be controlled-upstream or down.

Treaties in colonial era: In the early 1900s, a relative shortage of cotton on the world market put pressure on Egypt and the Sudan, then under a British-Egyptian condominium, to turn to this summer crop, requiring perennial irrigation over the traditional flood-fed methods.

Map. *Encyclopædia Britannica Online*. Web. 12 Jun. 2018. https://www.britannica.com/place/Nile-River?oasmId=204

Figure 1. The Nile River basin and its drainage network

The need for summer water and flood control drove an intensive period of water development along the Nile, with proponents of Egyptian and Sudanese interests occasionally clashing within the British foreign office over whether the emphasis for development ought to be further up-stream or down. With the end of World War I, it became clear that any regional development plans for the Nile Basin would have to be preceded by some sort of formal agreement on water allocations. In 1920, the Nile Projects Commission was formed, with representatives from India, the United Kingdom, and the United States. The Commission estimated that, of the river's average flow of 84 BCM/yr, Egyptian needs were estimated at 58 BCM/yr. Sudan, it was thought, would be able to meet irrigation needs from the Blue Nile alone. The Nile flow fluctuates greatly, with a standard deviation of about 25%. In recognition of this fact, an appendix was added which suggested that any gain or short-fall from the average be divided evenly between Egypt and Sudan. The Commission's findings were not acted upon. The same year saw publication of the most extensive scheme for comprehensive water development along the Nile, now known as the Century Storage Scheme. The plan, put forth by the British, included a storage facility on the Uganda-Sudan border, a dam at Sennar to irrigate the Gezira region south of Khartoum, and a dam on the White Nile to hold summer flood water for Egypt .The plan worried some Egyptians, and was criticized by nationalists, because all the major control structures would have been beyond Egyptian territory and authority. Some Egyptians saw the plan as a British means of controlling Egypt in the event of Egyptian independence.

Attempts at conflict management: In 1925, a new water commission made recommendations based on the 1920 estimates which would lead finally to the Nile Waters Agreement between Egypt and Sudan on 7 May 1929. Four BCM/yr. was allocated to Sudan but the entire timely flow (from January 20 to July 15) and a total annual amount of 48 BCM/yr. was reserved for Egypt. Egypt, as the downstream state, had its interests guaranteed by

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- Having a claim to the entire timely flow. This meant that any cotton cultivated in Sudan would have to be grown during the winter months.
- Having rights to on-site inspectors at the Sennar dam, outside of Egyptian territory.
- Being guaranteed that no works would be developed along the river or on any of its territory, which would threaten Egyptian interests.

In accord with this agreement, one dam was built and one reservoir raised, with Egyptian acquiescence. The Aswan High Dam, with a projected storage capacity of 156 BCM/yr, was proposed in 1952 by the new Egyptian government, but debate over whether it was to be built as a unilateral Egyptian project or as a cooperative project with Sudan kept Sudan out of negotiations until 1954. The negotiations which ensued, and carried out with Sudan's struggle for independence as a back-drop, focused not only on what each country's legitimate allocation would be, but whether the dam was even the most efficient method of harnessing the waters of the Nile. The first round of negotiations between Egypt and Sudan took place between September and December 1954, even as Sudan was preparing for its independence, scheduled for 1956. The positions of the two sides can be summarized as follows:

Egyptian Position

- Existing needs should take priority. These were described as being 51 BCM for Egypt and four BCM for Sudan, out of an average flow of 80 BCM as measured at Aswan.
- Any remainder from development projects should be divided as a percentage of each country's population after subtracting 10 BCM for evaporation losses. The respective population and growth rates led to an Egyptian formula for 22/30 of the remainder, or 11 BCM for Egypt, and 8/30, or four BCM for Sudan.
- There should be one large storage facility, a high dam at Aswan.
- Total allocations would therefore be 62 BCM for Egypt and 8 BCM for Sudan.

Sudanese Position

- Sudan insisted on using the standard value of 84 BCM for average Nile discharge, and insisted that Egypt's acquired rights were for 48 BCM, not 51 BCM that Egypt claimed.
- Sudan also suggested that their population was actually 50% larger than Egypt had estimated, and that resulting population-based allocations should be adjusted accordingly, giving Sudan at least one third of any additional water.
- Storage facilities should be smaller and upstream, as envisioned in the Century Storage Scheme. Consequently, if Egypt insisted on one large project, with comparatively high evaporation losses, these losses should be deducted from Egypt's share.
- Total allocations, therefore, should be approximately 59 BCM (69 BCM less evaporation) for Egypt and 15 BCM for Sudan.

Negotiations were broken off inconclusively, then briefly, and equally inconclusively, resumed in April 1955. Relations then threatened to degrade into military confrontation in 1958 when Egypt sent an unsuccessful expedition into territory in dispute between the two countries. In the summer of 1959, Sudan unilaterally raised the Sennar dam, effectively repudiating the 1929 agreement. On 8 November 1959, the Agreement for the Full Utilization of the Nile Waters (Nile Waters Treaty) was signed (Table 1). Ever since the signing of the Nile Basin Treaty of 1959, there have been various cooperative activities that have taken place between nations within the Nile River Basin. From 1967 to 1992, the United Nations Development Program (UNDP) supported HYDROMET, a project designed to collect hydrometeorology information within the basin. (Register of international rivers, 1978) In 1993, the Technical Cooperation Committee for the Promotion of the Development and Environmental Protection of the Nile Basin (TECCONILE) was formed at the same time as the first of ten Nile 2002 conferences were launched with the idea to create informal dialogue between riparian nations. Nile-COM, the Council of Ministers of Water Affairs of the Nile Basin States, in 1997 was allowed by the World Bank to direct and coordinate donor activities within the basin, which led the Council to work in cooperation with organizations such as the UNDP, the World Bank and the Canadian International Development Agency (CIDA). In May of 1999, the Nile Basin Initiative (NBI) was launched with the understanding that a

Timeline

Year	Event/activity
1920	Nile Projects Commission formed, offers allocation scheme for Nile riparian. Findings were not acted upon. Century Storage Scheme put forward, emphasizing upstream, relatively small-scale projects. Plan is criticized by Egypt.
1925	New water commission is named.
7 May 1929	Commission study leads to Nile Waters Agreement between Egypt and Sudan.
1952	Aswan High Dam proposed by Egypt. Promise of additional water necessitates new agreement.
Sep-Dec 1954	First round of negotiations between Egypt and Sudan. Negotiations end inconclusively.
1956	Sudan gains independence. Egypt is more conciliatory with government after 1958 coup.
8 Nov 1959	Agreement for the Full Utilization of the Nile Waters (Nile Waters Treaty) signed between Egypt and Sudan.
1967-1992	Launch of Hydro met regional project for collection and sharing of hydro meteorological data, supported by UNDP.
1993	Formation of TECCONILE (Technical Cooperation Committee for the Promotion of the Development and Environmental Protection of the Nile Basin) to address development agenda for the Nile basin. First of ten Nile 2002 Conferences for dialogue and discussions between riparian and international community, supported by CIDA (Canadian International Development Agency.) UNDUGU ("brotherhood" in Swahili) was formed at Egypt's behest.
1995	Nile River Basin action plan created within TECCONILE framework, supported by CIDA.
1997-2000	Nile riparian create official forum for legal and institutional dialogue with UNDP support. Three representatives from each country (legal and water resource experts) and a panel of experts draft a "Cooperative Framework in 2000.
1997	Formation of Nile-COM, a council of the Ministers of Water from each of the riparian nations of the Nile Basin.
1998	First meeting of the Nile Technical Advisory Committee (Nile-TAC).
May 1999	Nile Basin Initiative established as a cooperative framework between all riparian (excluding Eritrea) for the sustainable development and management of the Nile.
May 2004	First basin-wide project under NBI, the "Nile Trans boundary Environmental Action Project," launched in Sudan.
2010	Cooperative Frame work Agreement ("CFA"). Despite the opposition of Sudan and Egypt, five riparian, Ethiopia, Uganda, Tanzania, Rwanda, and Kenya, signed the CFA in May 2010.
2011	74km^3 capacity Grand Ethiopian Renaissance Dam (GERD) construction initiative[2]

Table 1. Water allocations from Nile negotiations

Position	Egypt (BCM/year)	Sudan (BCM/year)
Egyptian 1	62.0	8.0
Sudanese 2	59.0	15.0
Nile Waters Treaty (1959) 3	55.5	18.5

cooperative effort in the development and management of Nile waters will bring the greatest level of mutual benefit on the region. All nations of the basin, Burundi, D.R. Congo, Egypt, Eritrea, Ethiopia, Kenya, Rwanda, Sudan, Tanzania and Uganda, joined the organization. The objectives for the NBI include the following:

- To develop the water resources of the Nile in a sustainable and equitable way to ensure prosperity, security and peace for all its peoples.
- To ensure efficient water management and the optimal use of resources.
- To ensure cooperation and joint action between the riparian countries, seeking win-win gains.
- To target poverty eradication and promote economic integration.
- To ensure that the program results in a move from planning to action.

In May 2004, the "Nile Trans boundary Environmental Action Project," the first of eight basin-wide projects under the NBI, was launched in Sudan. Sudanese president, General Omar El-Bashir, declared, "Since environmental hazards are not restricted within geographical boundaries, local and international efforts are required to overcome the dangers and threats in the environmental arena (http://www.nilebasin.org/Documents/TACPolicy.html.). This project is providing solutions to these problems".

Lessons learned: Shifting political boundaries can turn intra-national disputes into international conflicts, exacerbating tensions over existing issues.

- Downstream riparian are not necessarily at a political disadvantage to their upstream neighbors.
- The individuals or governments involved can make a difference in the pace of the negotiations.

Creative outcomes resulting from resolution process: The measure for water allocations is rather elegant, incorporating existing uses as well as providing a measure (population) for allocating additional sources. Some financing arrangements were creative, with Egypt agreeing to finance water enhancement projects in Sudanese territory, in exchange for the water which would be made available. Provisions were made for Sudan to pick up responsibility for up to 50% of costs in exchange for up to 50% of the water, when their water needs required.

Conclusion

Given the cooperative spirit that initially gave rise to the NBI, the negotiation of the CFA been so excruciatingly slow and seemingly unsuccessful because, first, the NBI arguably did little to address the fundamental schism over the options regarding rights and obligations that differ between upstream and downstream riparian. Second, relatively little appears to have been done about problematic water use by certain Nile riparian, including unsustainable practices such as the development of new settlements in the desert, the farming of relatively water-intensive crops and the storing of water in reservoirs with relatively high evaporation rates. Attempts appear to have been made to bridge these gaps by legal word smiting including by introducing the concept of "water security" in the draft CFA. However, the inclusion of this language does not seem to have resolved the issue. On the one hand, Egypt and Sudan seem to think that "water security"

supports their view that water allocations set out in colonial-era treaties should be maintained. On the other hand, the other Nile riparian have argued that "water security" supports their view of a more equal division of the Nile's waters. Third, the process of negotiating the NBI and the CFA has arguably not been sufficiently inclusive. For the most part, only government officials from the Nile riparian and representatives from the World Bank, UNDP and/or CIDA have been in attendance at the negotiations. Very few additional stakeholders have been allowed to participate in the negotiations and opportunities for public involvement have not been substantial. Even after the CFA was signed by multiple countries the text of the agreement was initially difficult, if not impossible, to find. According to Eckstein, "Agreements forged behind closed doors, even those that merely give the appearance of secrecy, often falter because of the lack of public support."Fourth, Ethiopia, one of eight upriver states and the source of most of the Nile waters that reach Egypt, is reportedly now building the largest dam in Africa (Tadesse, 2009). Located on the Blue Nile, 25 miles from the Ethiopian border with Sudan, the Grand Renaissance Dam begins a new chapter in the long, bellicose history of debate on the ownership of the Nile waters, and its effects for the entire region could be profound (Kahsay, 2015). This is only one of many of the new dams either proposed, or under actual construction, in the Nile Basin, which are being built, without World Bank money and without World Bank international environmental and labor safeguards.

Fifth, Sudan, South Sudan and now Egypt have recently been undergoing unusually strong political turmoil, even by Nile standards, and only time will tell when they are ready, willing and able to focus on the Nile a gain. All to say that rather than continue to pull back, now is the time for the international community to redouble efforts to move toward a new Nile River Basin-wide comprehensive governance regime marked by cooperation and joint management of trans boundary resources in contradistinction to one of only partial cooperation and unilateralism which might well dominate for the Nile River Basin decades to come.

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