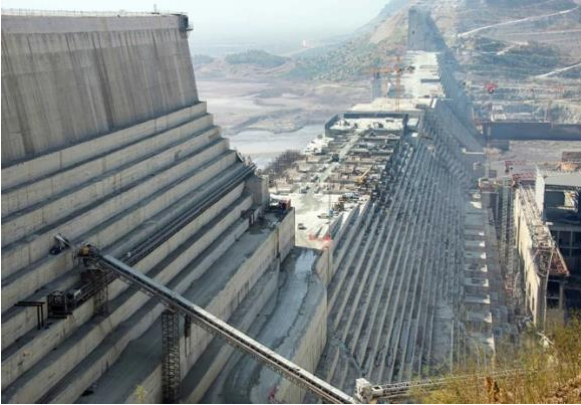


Grand Ethiopian Renaissance Dam and the Nile

International Cooperation and Divisions

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December 2020

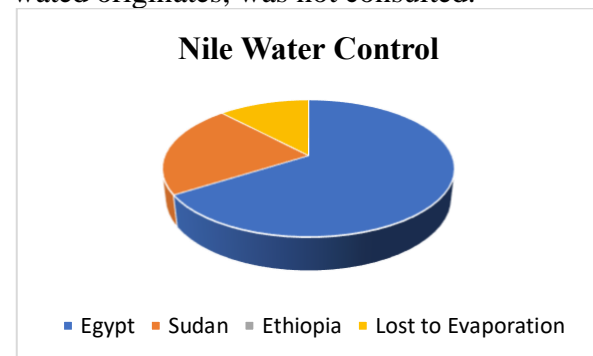


The Nile is a major north-flowing river in north-eastern Africa, which has two major tributaries – the White Nile and the Blue Nile. The Blue Nile begins at Lake Tana in Ethiopia and is the source of up to 86% the water (and rich silt) that flow through the Nile proper. Egyptian civilization and Sudanese kingdoms have depended on the river since ancient times, and 97% of modern Egypt's fresh water needs directly fulfilled by the Nile.

Over the past 50 years, six Nile Basin countries have built 25 hydroelectric dams (which includes Africa's largest—Aswan Dam in Egypt). Since the beginning of construction of the Grand Ethiopian Renaissance Dam (GERD) on the Blue Nile in 2011, the potential impacts of the dam on the downstream states (Egypt and Sudan) have been the source of severe regional disputes (Ethiopia and other upstream riparian on the other side). The recent announcement (July 2020) from Ethiopia that it had started filling the GERD reservoir has exacerbated the internationally conflict over the allocation of the water of the Nile river. With Egypt fearing the GERD would cause major reduction on its national water supply, also induce drought and desertification to its most populated agricultural region on the Nile Delta; and Ethiopia arguing that the GERD will benefit regional energy starved nations as a huge source of clean affordable electric power and a major droughts/water salinity management mechanism for the Nile.

Background

Colonial-era treaties, brokered by Britain, formed the foundation of subsequent accords on the allotment of the Nile's waters. In May 1929 the <Nile Water Agreement> was concluded between Egypt and Great Britain (as a repetitive of Uganda, Kenya, Tanzania and Sudan) regarding the utilization of the water of the Nile River, which gave Egypt unconditional veto power over any upstream construction projects that it believed "would affect her interests adversely". In 1959, a further agreement signed by Egypt and Sudan to supplement the previous accord. It gave Egypt the right to 66% of the entire Nile's average annual flow and Sudan 22% the rest of which was considered to be lost to evaporation. Ethiopia where most of the water originates, was not consulted.



The Renaissance Dam

Upon completion, the Grand Ethiopian Renaissance Dam (GERD) will generate 3 times more energy than the second largest dam on the Nile, Egyptian Aswan High Dam (6,450MW/year versus 2,100MW/year). The primary dam will span an area of 1,780 square kilometres and will store approximately 15 billion cubic metres of water behind its 155-metre-high wall, which is expected to be finished in early 2023 with the first filling of the GERD's reservoir announced this summer.

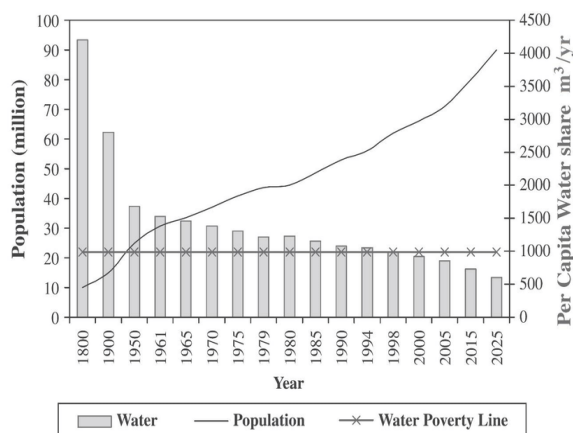
And GERD's reservoir at full supply level has planned surface area of 1,874 km² (in comparison with the 1,569 km² area of great London)

GERD's Cost and Financing

The construction cost of GERD is estimated to close to US\$5 billion, corresponds to 5.7% of Ethiopia's GDP in 2017 (US\$87 billion). As a result of economical ability and the strong willingness of Ethiopians in the country and abroad, Ethiopian government is financing the entire cost of the GERD's construction from selling bonds, taxation, and private donations such as all government workers contributing amounts equivalent to a month of their salaries. The construction of the GERD is so far without explicit support from western financial institutions (long been alleged to Egypt's pressure), Chinese banks are reportedly financing the turbines and associated electrical equipment of the GERD which costing about US\$1.8 billion. The parallel comparisons between the designing, construction and financing of the GERD and Egypt's High Aswan dam (which was almost entirely supported by the Soviet Union) are stark reminders that foreign involvements in such infrastructure projects can have lasting ripples on the socio-economic and political landscape of the region.

Polarity between Stakeholder Interests Egypt, the Nile and the GERD

The UN considers any country with under $1,000\text{m}^3$ of per capita water share per year as "water scarce", with a rapid growing population (98.42 million in 2018) Egypt has just 530m^3 . (The graph below shows the historical and near future forecast of per capita water share in Egypt)



The water used to power the GERD's turbines will be returned to the river downstream from the dam. Thus, the GERD will not decrease

the flow of water to downstream Egypt over the long term, but it will decrease flow rate during the period it takes to fill the reservoir. The timetable for accumulation has been the subject of a decade of negotiations between Egypt and Ethiopia, but there is still no agreement on these crucial issues. Adding urgency to the matter, the dam is so near completion that Ethiopia started first filling of the reservoir this summer. Egypt is determined to stop the filling until an agreement has been reached, threatening to turn to the UN Security Council for help or even to go to war. In preparation, it has successfully negotiated an agreement with the government of South Sudan to build a military base near the Ethiopian border. While the two countries are trying to avoid an open conflict and consultation continues on and off, Egypt is becoming more aggressive and the situation might get out of control.

Downstream reservoirs in the Nile such as Lake Nasser in Egypt loses 12% of its water flow due to evaporation as the water sits in the lake for 10 months in a year. Through the controlled release of water from the GERD's reservoir to downstream, evaporation at Lake Nasser can be dramatically decreased and according to studies conducted by <Daily News Egypt> this could facilitate an increase of up to 5% in Egypt's water supply

Sudan and the Nile

In the early 1900s under the British colonial rule, one of the world's largest irrigation project the Gezira Scheme was built close to the confluence of the Blue and White Nile in then Anglo-Egyptian Sudan. By 2008 half of the Sudan's total agriculture land was under irrigation of the modern expanded Gezira Scheme, and the main "cash crop" cultivated in the region has been Egyptian-type long stable cotton (which is a water-intensive crop) from 1914. At the same year, the crops of Gezira Scheme irrigated agriculture contributed about 64% of Sudan's GDP. Water from the Blue Nile and the high clay content sediments brought by the river are crucial for the natural running of the irrigation canals and keeping down water losses from seepage.

The Ethiopian Highland (which covers most of the country) where the upper course of the Blue Nile originates is predominant tropical monsoon climate, with a dry season from October to February, a light rainy season from March to May, and heavy rainy season from June to September. The average annual rainfall in the Ethiopian Highland is approximately 1,200 mm, with certain areas receive close to 2,000 mm (in comparison with London which average about 106 rainy days each year and receives a total of 583.6 to 621 mm annual precipitation.)

In September 2020 (monsoon season), the profuse and continuous torrential monsoon rains in Ethiopian Highland has caused a devastating flood across most parts of Sudan. With the water level of the Blue Nile reaching more than 17 meters “unprecedented since 1912”, floods destroyed about 100,000 homes and left more than 100 deaths. It is expected that climate change to cause more frequent periodic bouts of droughts and flooding in Sudan due to the varying amount of rainfall excess in the Ethiopian Highland.

GERD's Impact on Sudan

During the summer monsoon season the Blue Nile erode a vast amount of fertile soil from the Ethiopian Highland and carry it downstream as silt. The GERD is expected to retain silt content in the Blue Nile flow which is detrimental for the efficiency of Sudan's Gezira Irrigation Scheme (as discussed above), impoverish the farming land under its irrigation and thus posing challenges to Sudan's food security. But this reduction of silt will prolong the useful life spans of downstream Sudanese hydroelectric dams. (sedimentation like silt deposit in water flow increases loads on the dam and gates, damages turbines and other mechanical equipment, and so to impact the safety of dams, reduces energy production, storage, discharge capacity and flood attenuation capabilities)

The clear surplus of electricity generated by GERD (especially in rainy seasons when there is plenty of water for hydropower generation) is expected to export to neighbouring countries such as Sudan. With Sudanese

capital Khartoum located only 400km away from the GERD, the GERD is seen by some as a potential affordable electricity source for Sudan. Since the Blue Nile is a highly seasonal river (reaches its maximum flow rate in the rainy season from June to September), by retaining the rainfall excess in the reservoir formed from Ethiopian Highland's deep gorges, the GERD is predicted to reduce seasonal flooding in the Sudanese portion of the Blue Nile.

Ethiopia and the Nile

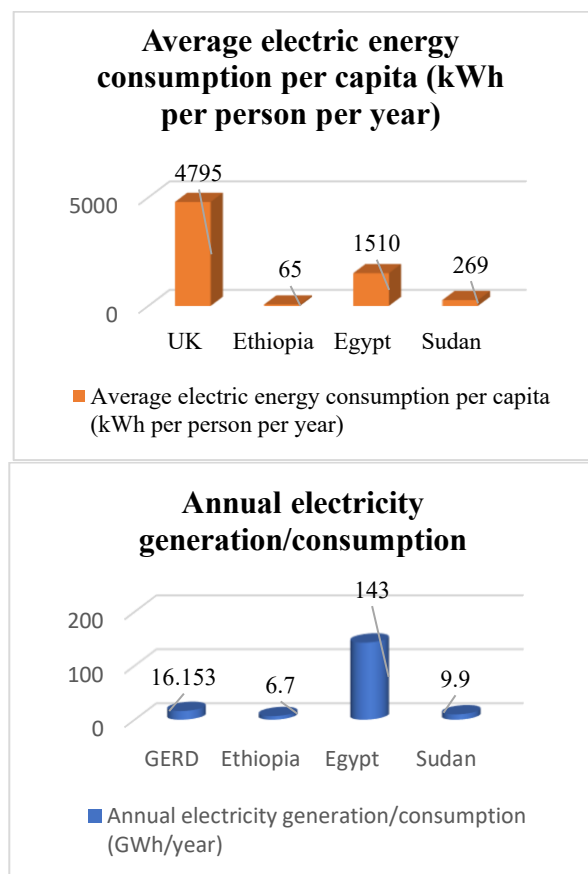
Over the years, Egypt has used its extensive diplomatic connections and the previously mentioned colonial-era agreements to successfully prevent the construction of any major infrastructure projects on the tributaries of the Nile. As the consequence, Ethiopia has not been able to make notable utilization of the Blue Nile's waters.

GERD's Impact on Ethiopia

About 65% of the Ethiopian population (109.2 million, 2018) is not connected to the national power grid. And Ethiopia has one of the lowest average electric energy consumption per capita in the world—the average British consumes as much power as 74 Ethiopians. And increasing electricity generation and consumption can and will improve Ethiopians' quality of life and increase economic growth. The hydroelectrical power produced by the GERD will be to act as a stable backbone of the Ethiopian national grid and have a multiplier effect for the country's development rural and urban areas alike. Not only does the building and operating the GERD itself provide local jobs, (e.g., for the 10 million metric tons of concrete the GERD construction is expected to demand, the Ethiopian government has pledged to use only domestically produced concrete; as of April 2013, one concrete batch plant has been finished in Ethiopia and another one under construction.). And when the electricity generated makes its way to Ethiopia's underdeveloped rural areas as planned, it is expected to make certain jobs, especially farming more productive. According to a recent report from America's

Rocky Mountain Institute, there is around \$4 billion in potential economic opportunity just from electrification of Ethiopia's small rural farms, making their processes more efficient, which is the equivalent of around 5% of the nation's GDP.

According to the Ethiopian government, the prime purpose of the GERD is for its large power generation capability (planned Annual electricity generation of 16.15 GWh) to relieve Ethiopia's severe energy shortage, which would also give the country a major power surplus given the current electricity consumption in the country is less than half of GERD's planned capacity (see comparison chart below). The plan of possibly selling and exporting the surplus hydroelectric power to Djibouti, Uganda and Tanzania etc, according to the World Bank, would make Ethiopia the largest power exporter in Africa – earning around \$1 billion per year.



According to one UK diplomat stationed in Addis Ababa: "For Ethiopia, the dam is the symbol of its industrial ambitions and of its determination to escape the historical poverty that afflicts its population."

Political Contentions

At the peak on Egyptian protests in July 2020 (coincided with the initial filling of the GERD's reservoir), Ethiopian Embassy UK official Twitter account used flag banners with hashtag "It's My Dam"

In July 2018, the then chief project manager Simegnaw Bekele who was considered the "public face" of the GERD project, was found shot dead in Ethiopian capital Addis Ababa. His death sparked protests and conspiracy theories.

The US announced in September 2020 that it would cut some aid to Ethiopia after it began filling the reservoir behind the dam in July. Egypt is implementing diplomatic initiatives to undermine support for the GERD in the region as well as in other countries supporting the project such as China and Italy (the main contractor of GERD's construction Webuild SpA is an Italian company).

Endnotes

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