

# **What the Data Say?**

## **A Case why Ethiopia Needs to Build Grand Ethiopian Renaissance Dam (GERD)**

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*Lately, Ethiopia, Egypt and Sudan are escalating the long-aged conflict over the Nile River because Ethiopia is close to completing a hydropower dam on the river to generate electricity. Although several talks and negotiations have been taking place to solve the conflict and reach an agreement based on evidences each country provides, a final and binding agreement is yet to come.*

*Increasing population in the region and greatest demand for energy especially by Ethiopia have become among the many driving forces for the effective use of water resource in the region. But challenges such as river ownership, water right, water allocation, water control, mistrust, lack of mutual understanding and cooperation among the states stalled the agreement from moving forward.*

*Contributing what we know and what we think that may add to better understand the issues to hone a reasonable and fair judgment is paramount importance. With that in mind, it is helpful to look into datasets that provide information about population, electricity production, access to electricity, and distribution in these three countries that are involved in the acute river conflict. These data are available from World Bank and CIA Fact Book. Analysis and visualization of these datasets are of high value, and presented below.*

### **1. Introduction**

Nile River is the longest river mainly consisting of two major tributaries (White and Blue Nile) merging at Sudan's capital, Khartoum, flowing north ward by crossing through Egypt to end at the Mediterranean Sea. While about 15% of water is coming from White Nile, 85% of the water comes from Blue Nile which originates in Ethiopia. Nile River is the home of oldest human civilization connecting many East and Central African countries in culture, economy and history. The river basin incudes a huge area, and is dwelled in with large number of peoples of Africa. Burundi, Democratic Republic of Congo, Egypt, Eretria, Ethiopia, Kenya, Rwanda, South Sudan, Sudan, Tanzania and Uganda are the counties located in this basin area.

Despite Nile River being the source of cultural, historical and economic ties among several nations, it also remains to be the bone-of-contention, mistrust and cause of conflict among number of countries sharing this water resource, especially Egypt, Ethiopia and Sudan. Ethiopia, as the main source of the river water, has never used the river towards its economic development. More than sixty percent of its population has no access to electricity. On the other hand, Egypt has been using the river since time of immemorial. Almost 100 percent of its population has access to electricity.

Recently, Ethiopia planned and executed a building of the biggest in the region, if not in the continent, river dam (aka. GERD) to produce hydropower electricity, and alleviate its acute shortage of energy and the chronic poverty that the country is known for years. Ethiopia's action alarmed and threatened Egypt who refers itself as "the child of Nile" because the river is the only source of livelihood for its people. Sudan is also worried, not knowing which way to argue because often times it weighs the matter through mixed political and economic benefit. While there is an attempt to address these concerns and worries through negotiation, debate, argument and mediation within the three nations to reach a peaceful solution, some of them are tacitly equipping themselves for the worst option which is using military power. It is obvious, this last option is not a choice for any nation, as it has been proven to be a devastation for economic and human life. Instead, well thought understanding, planning, cooperation and integration ought to be established to lead to mutual benefit and growth. And this should be better based on facts, data, science, fairness and morality.

It is undisputable that decisions that are made based on facts, data, scientific analysis and fairness are long lasting. The solution to the Nile conflict should not be any different. It should be based on the facts and data available. With that in mind, focusing only on the energy aspect, some datasets are acquired, processed and presented (in visualization) to give more understanding and clarity on the Population, Access to Electricity, Electric consumption and per capita distribution in the three counties that are actively in negotiation over Nile river conflict.

## **2. Data**

Data are collected and extracted from World Bank and CIA Fact Book, and processed using Python (pandas) programing. Among the data element extracted and processed are:

1. Total population of Egypt, Ethiopia and Sudan from 1950 through 2020. (Data: World Bank)
2. Percent population accessing electricity in Egypt, Ethiopia and Sudan. The data covers the years from 2000 through 2017. During data cleaning, outlier values are replaced by mean values and the data was smoothed by moving/rolling average of a three years window. (Data: World Bank)
3. Electricity per capita distribution that covers the years 1971 to 2016. (Data: World Bank)
4. Electricity production and Consumption in the latest. (Data: CIA Fact Book)
5. Electricity consumption, Average electric power in kilowatt per person per year, Average power per capita in watts. (Data: CIA Fact Book)

## **3. Observation**

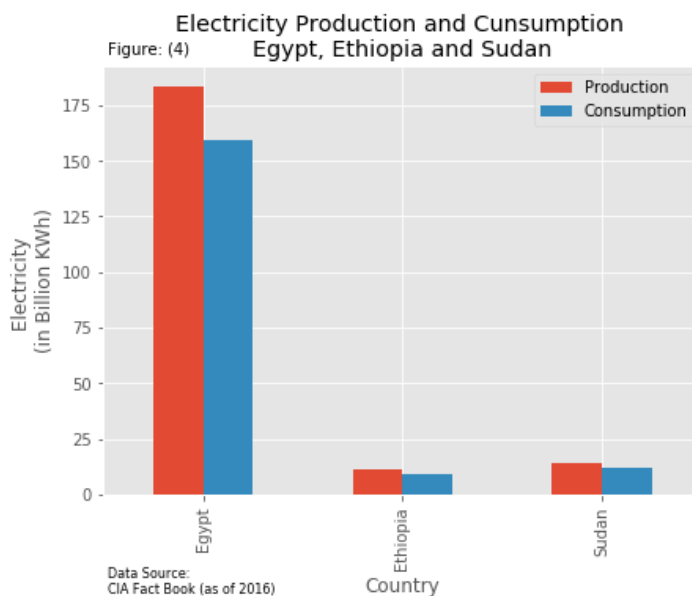
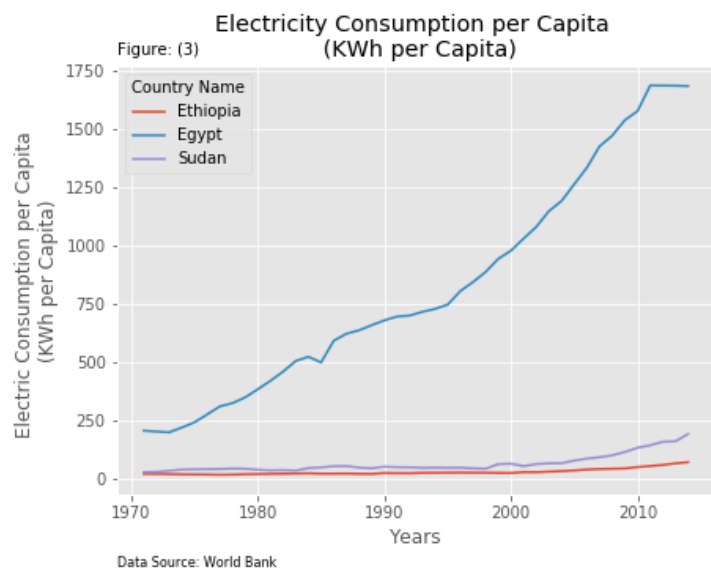
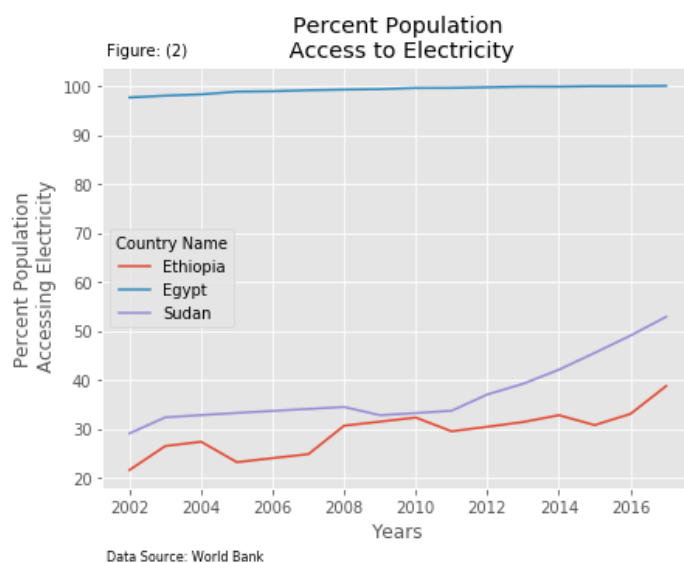
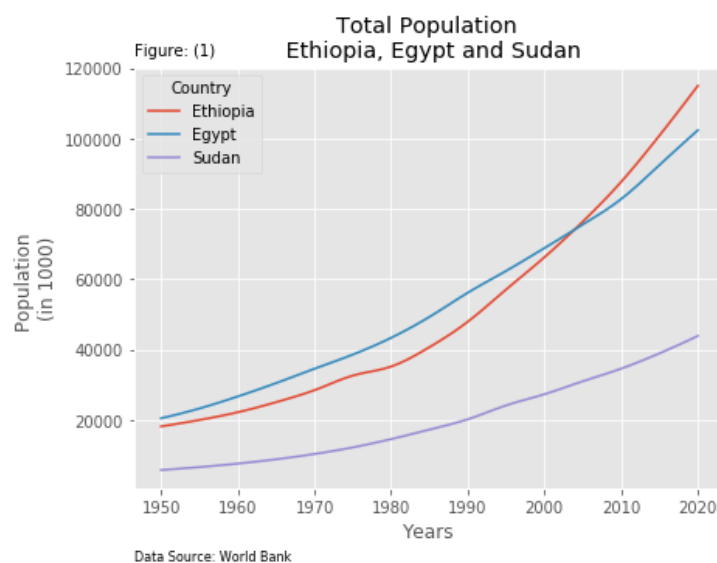
As indicated in the beginning, the intent of this short and mundane analysis is to listen/see what the data say with respect to population, access to electricity and distribution in these three counties, i.e. Egypt, Ethiopia and Sudan.

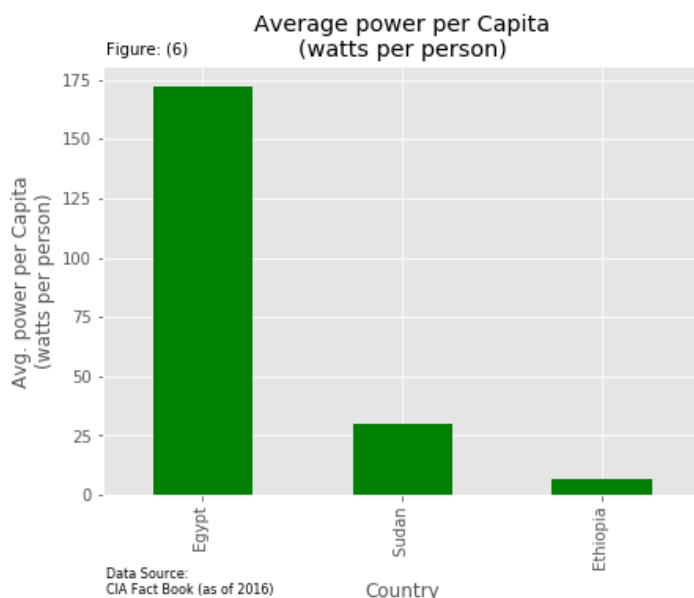
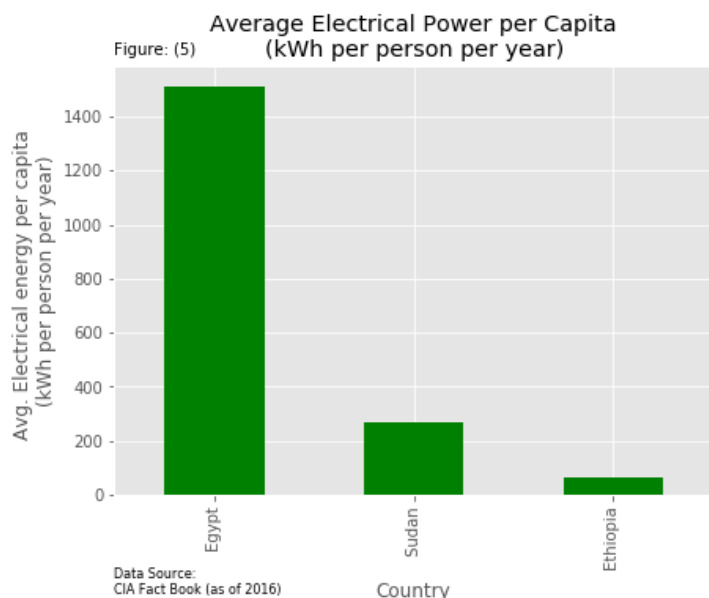
Comparing population in the three countries (Figure 1), Egypt used to have higher population among the three countries but was surpassed by Ethiopia in the mid of the first decade of 2000. Currently Ethiopia's population is increasing exponentially at a faster rate than Egypt. Sudan's population, although still increasing, is not as fast as either countries, and is roughly half of Egypt or below half of Ethiopia.

Regarding access to electricity (Figure 2), percent population accessing electricity in Ethiopia is the lowest of low. As shown on the graph, Ethiopia was able to provide only about 40% of its population with electricity, while Sudan and Egypt are providing about 55% and 100% of their population with electricity respectively.

Historic and latest electricity per capita distribution (Figure 3) shows Ethiopia and Sudan have very low electricity per capita distribution at all times, sadly, Ethiopia being at the bottom. On the other hand, it is clearly shown that the per capita distribution of electricity in Egypt is enormously high compared to the two countries even attaining the highest in 2010 and later. The rate of increase in per capita growth in Egypt is significantly higher than that of Ethiopia and Sudan which is almost stagnant.

Electricity consumption per capita per year and direct per capita distribution (Figures 5 and 6) also shows that Ethiopia stands at the bottom among all the three countries.





#### 4. Conclusion

Conflict among nations over scarce resources, especially water that involve rivers crossing many national and international boundaries is not strange phenomenon. The Nile river is one of the oldest and greatest examples of all time of such a problem. Lately, the Nile conflict has become a huge issue among the three nations (Egypt, Ethiopia and Sudan) as Ethiopia has started to build the Grand Ethiopian Renaissance Dam (GERD) for hydropower generation. While the three nations are trying to forge negotiations among themselves on the rights and uses of the river, at times the contention and conflicts intensify due to mistrust, frustration and fear of loss. Even some of the countries are seeking help from super powers and regional allies to influence the other. It is also an open secret that each country, especially Ethiopia and Egypt, are preparing and equipping themselves for the worst option which is a military confrontation to solve the problem by military might. But history has proven time and again that solving such conflict by power is not a lasting solution as power and alliance constantly change and shift through time. Instead, solving such a problem based on understanding the root causes through sound analyses of facts, data, scientific evidence, and most of all fairness and morality has by far the best and everlasting solution. This as a result that leads to cooperation, integration, mutual respect, peace and prosperity to each and everyone.

*Note: If anyone is interested about the data, processing or has question, the author can be reached via email [belachewg@yahoo.com](mailto:belachewg@yahoo.com).*

**Reference:**

1. Population and Percent Population accessing to electricity

<https://data.worldbank.org/indicator/>

2. Countries with electricity Consumption (as of 2016)

[https://en.wikipedia.org/wiki/List\\_of\\_countries\\_by\\_electricity\\_consumption](https://en.wikipedia.org/wiki/List_of_countries_by_electricity_consumption)