

# Building the Grand Ethiopian Renaissance Dam (GERD), – The Optimum Solution or means of Dilution?



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## **Abstract:**

On the 2<sup>nd</sup> of April 2011, Ethiopia commenced with the construction of the yet to be largest hydroelectric dam in the African continent – The Grand Ethiopian Renaissance Dam (GERD), also known as the Millennium Dam. The dam which is being built on the Blue Nile River, just upstream of the Ethiopian-Sudanese borders in Ethiopia is anticipated to produce 6000 MW of energy. Ethiopia is the source of the Blue Nile which provides 85% of the total Nile river water flowing through Egypt and Sudan.

Generation of electric power from clean and renewable energy for Ethiopia and other African countries is what Ethiopia officially aims to achieve by constructing the GERD. According to the Ethiopian leaders, the GERD will lead to a new era of equitable utilization of the river Nile and shall be used as a tool for the socioeconomic development of the country. However this rather controversial project has raised many concerns and fears with the downstream countries, with Egypt in particular, fearing that the GERD may lead to catastrophic impacts on its water security. Other than recent diplomatic interventions between Ethiopia and downstream countries of Sudan and Egypt there is virtually no agreement to date between the parties, this which makes the situation rather potentially volatile.

The aim of this paper is to assess and criticize Ethiopia's decision to build the dam from an environmental perspective and identify how the decision was made and what were the set criteria for the project. The assessment will inevitably also consider the economic and social aspects within Ethiopia as well as other neighboring countries being affected.

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## **Background:**

With 96.5 million inhabitants, a population growth rate of 2.5% in 2014 and an income of 550\$ per capita; Ethiopia is one of the world's poorest countries today. The country represented by its government is striving to change things for the better (World Bank, 2016). Although Ethiopia faces many challenges ranging from poverty, high illiteracy rates, environmental degradation, poor governance and corruption, the country did achieve great improvements in the past decades in terms of its economy, thanks to the Chinese investment and intense government projects aimed at achieving the country's Millennium Development Goals (MDGs) of attaining middle income status by 2025 (Africa and the world, 2016).

One of these strategic projects that the Ethiopian government has high hopes for in terms of promoting the country's further and future developments is the building of the Grand Ethiopian Renaissance Dam (GERD). The Ethiopian government is funding 70% of the project through selling of bonds and donations from within the country and overseas; while the remainder funds were secured from China (Abdelhady et al., 2015, p.73). The construction began five years ago by an Italian company (Salini Impregilo) and was expected to be completed in 2017 (Veilleux J.C, 2015, p.1). However due to financing difficulties, the project is several years behind schedule (ECADF, Ethiopian News and Views, 2015). According to Ahramonline (2014) in an interview with the Ethiopian President in 2014, 40% of the dam's construction has been completed.

Although the dam is being built within the Ethiopian soil and sovereignty, the plan and decision to build the dam was conducted in total secrecy by the Ethiopian government (Dallol Financial, 2015). There was no information on the project plan, engineering documents or dam operations, not until the Tripartite International Panel of experts leaked a report to the International Rivers Organization (a non-profit, non-governmental, environmental and human rights organization) (Dallol Financial, 2015).

The ongoing construction of the rather controversial dam on the Blue Nile River is to date creating serious concerns and tensions between Ethiopia and the downstream countries namely Egypt and The Sudan (Swain. A. and Chen H., 2014, p.12). The Egyptians in particular, whose only water source is the Nile, are concerned about the limited understanding of how the dam could influence and affect the water availability and hence their water share from the Nile. Although the Ethiopian officials say that the Dam will have no ill effects on these downstream countries and in fact claim that benefits will be

gained by all parties; feedback from the Panel of Experts report reveals just the opposite (International Rivers, 2014). According to a Bloomberg reporter who has reviewed the Panel of Experts report, the document concludes that the GERD will cause detrimental effects on Egypt's water share and accordingly its hydro power generation sector. The document, according to the reporter also emphasizes on the need for a comprehensive additional study of the dam's impact on water resources and identifies the GERD project analysis as very basic and lacking sufficient level of details and reliability that would match a project of such a magnitude (International Rivers, 2014).

Today the building of the GERD became a symbol of Ethiopian nationalism and renaissance, not only to the Ethiopian government but to also to the Ethiopian nation being the tax payers who are contributing in financing this mega project.



Figure 2: Location of The Grand Ethiopian Renaissance Dam (GERD) along the Blue Nile river route (Yale Environment 360, 2015).

## **Decision to build the GERD:**

In order to be able to criticize the decision taken by the Ethiopian government to build the GERD, one must first understand how the decision was made; under what circumstances it was taken and what were the driving motive(s) or criteria (if any) behind it.

As discussed earlier the decision to build the dam was conducted in total secrecy. It was only on the 2<sup>nd</sup> of April 2011, when Ethiopia officially announced its intention to build one of the largest dams in the world on the Blue Nile River (Brookings, 2013). The timing of announcement could have not been better for the Ethiopians since both downstream countries Sudan and Egypt were busy with their internal affairs, with Egypt trying to deal with its civil uprisings and Sudan being divided into two countries (Abdelhady et al., 2015, p.73).

According to the International Rivers (IR) organization's issued report about the potential environmental repercussions of the dam; two key points of concern were highlighted. One of which was the lack of transparency with regards to the planning and progress of the project and another about the lack of any evidence of an environmental Impact Assessment (EIA) on both upstream and downstream areas of the dam (Power-technology.com, 2013).

The building of the dam "at least from the Ethiopian government's perspective" serves as a hope and a life line in alleviating Ethiopia's citizens from current poverty related challenges by 2025 (Veilleux J.C, 2015, p. 3). According to the Ethiopian officials the key driving factor for building the dam lies in the development process of generating electricity. With the availability of reliable electricity, the government sees the opportunity in replacing the current biomass burning used for heating and cooking and nevertheless means for reducing the ongoing deforestation for fuel (Veilleux J.C, 2015, p. 3). Other than increasing its current hydroelectric power generation through the GERD from 2,000 MW to 6,000 MW; the government has an interest in being the "green energy" hub in the East African region. So far, a number of contracts have already been signed between the Ethiopian government and neighboring countries, such as Djibouti which is willing to purchase energy generated from the GERD (Veilleux J.C, 2015, p. 4).

In summary, the energy-hungry Ethiopia believes and hopes by building the GERD, it can secure its own energy needs, export the surplus to neighboring countries and by this improve its economy and consequently be able to achieve the country's Millennium Development Goals (MDGs) (listed below) of attaining middle income status by 2025.

Ethiopia's Millennium Development Goals:

- Eradicate Extreme Poverty and Hunger
- Achieve Universal Primary Education
- Promote Gender Equality and Empower Women
- Reduce Child Mortality
- Improve Maternal Health
- Combat HIV/AIDS Pandemic, TB, Malaria and Other Diseases
- Ensure Environmental Sustainability
- Develop a Global Partnership for Development. (Ministry of Finance and Economic Development Federal Democratic Republic of Ethiopia, 2012, p. iii, iv, v, vi and vii)

### **Discussion of decision:**

Though the decision behind building the GERD may have been influenced by the MDGs the Ethiopian government is striving to achieve by 2025, the approach by which the decision has been made in terms of lack of transparency and concealing the project's information and progress so far, may contradict with some of the set goals. Examples of such a conflicting approach to the decision making and processing and few of the set millennium goals are quite indicative. For instance one of the MDGs states to ensure environmental sustainability, however to date, there has not been any publicly disclosed environment impact assessment or social impact report of the GERD (Swain. A. and Chen H., 2014, p. 14). Another MDG states "Develop a global partnership for development" however Ethiopia's non-transparent approach with regards to building the GERD does not indicate that it is willing to develop any cooperation or partnership.

Another way to assess Ethiopia's decision for building the dam is by analyzing the World Commission on Dams (WCD) report which provides a comprehensive understanding of the impacts of large dams and suggests a policy framework to achieve sustainability per universally agreed values, one of which is, Participatory Decision Making and Accountability (Swain. A. and Chen H., 2014, p.12). The WCD report introduces its innovative way for decision making with seven strategic guidelines (listed below) (Swain. A. and Chen H., 2014, p.12). For the purpose of this paper the focus will primarily be on the environmental aspects however nevertheless the economic, social aspects and consequently the overall sustainability of the GERD will also be briefly assessed.

**The seven strategic guidelines listed in the WCD report:**

1. ***Gaining public acceptance:*** This entails the effective involvement and participation of all interested and affected groups into the decision making process in order to have all parties rights recognized and addressed (Swain. A. and Chen H., 2014, p.13).

In the case of the GERD's planning it was a top-down approach where the participation of both the affected indigenous locals and the Ethiopian population (tax payers) has been totally neglected.

2. ***Comprehensive option assessment:*** Involves thorough institutional, political and technical

options for seeing alternatives to the building of these mega dams. The assessment process takes the environmental, economic and social aspects into consideration. Throughout this process all potential risks to the environment, economy and society need to be identified and weighed. The basic criteria for the comprehensive option assessment is to ensure that any potential negative impacts that could be created by constructing the dam will either be totally avoided or minimized to a certain acceptable level. (Swain. A. and Chen H., 2014, p.13)

It may be true that the GERD once in operation, may well provide Ethiopia with the energy requirements it needs, contribute to alleviate poverty and strengthen the country's vital agriculture sector and hence economy. However all these latter benefits and possible negative impacts should have been considered in a comprehensive option assessment context. For instance potential climate change impacts like variability of rainfall not only within Ethiopia but also within the downstream countries should have been taken into consideration and formulated in a publicized comprehensive option assessment, so that all affected parties and countries could provide their inputs, assessments and hopefully altogether simulate the best possible scenarios with regards to the decision making of building the GERD.

3. ***Addressing existing dams:*** Assessing the benefits and impacts of existing dams in a region serve as vital information for any decision making to build new ones in the same region (Swain. A. and Chen H., 2014, p.14).



With regards to the GERD, there was no evidence -at least not officially- that key existing dams along the Blue Nile River in downstream countries (Merowe in Sudan or Aswan in Egypt) have been reviewed or analyzed by the Ethiopian government prior to their decision for building the GERD (Swain. A. and Chen H., 2014, p.14). Mutual cooperation between Ethiopia and the downstream countries into addressing and or optimizing the operation of the existing dams could have provided the Ethiopian government with better technical advices for the designing of the GERD if not at all provide other alternatives than building the dam in the first place.

4. ***Sustaining rivers and livelihoods:*** Construction of large dams could have detrimental effects on the ecosystems of river basins. It is vital that clear protection plans and adequate compensation measures shall be included and be an integral part of any decision making process for building these dams. This is extremely crucial, especially when the subject entails the threatening of endangered species. (Swain. A. and Chen H., 2014, p.14)

Though, to date, there has not been any official environmental impact assessment report presented by the Ethiopian government, however environmental changes related to the project are becoming more indicative through time. Impacts such as loss of biodiversity, sediment issues and flooding of forests has so far led to serious criticisms by the Ethiopian civil society.

There was also no official sedimentation risk analysis of the GERD, though the Ethiopian highland is one of the most erosion-prone on earth (Swain. A. and Chen H., 2014, p.14). The effects of rainfall and climate change may have adverse impacts not only on the environment but on the GERD's power output and efficiency.

5. ***Recognizing entitlements and sharing benefits:*** Usually, people affected (for e.g. displaced locals) by these dams are unaware of the generated benefits from these projects. Any decision making process needs to identify the societal impacts and risks if any and recognize the rights and compensation plans of any affected people. In addition to any compensation, sharing direct and/or indirect benefits of the water

management is always to be considered and included in the decision making and planning processes.

So far, no such approach seems to be happening or has taken place during the decision making process of building the GERD.

6. ***Ensuring compliance:*** Ensuring the compliance with the national and international policies and guidelines helps promote and strengthen the project from a sustainability perspective, since all social, environmental and economic aspects are considered and addressed.

Lack of the GERD's transparency all the way from the decision making process up to the project's construction raises many questions and concerns with regards to the sustainability of the project not only within Ethiopia but also among the downstream countries and their nations.

7. ***Sharing rivers for peace, development and security:*** Conflicts and tensions among riparian countries over trans-boundary rivers are quite common. Expressing true will for cooperation, transparency, and exchange of information and expertise between countries usually helps diffuse tensions and provides fertile grounds for achieving a win-win situation for all parties.

The Ethiopian government did receive support from few of the riparian countries (e.g. South Sudan and Uganda), however there is much more collaboration needed especially between Ethiopia and the downstream countries. The decision making of building the GERD should have been discussed with the riparian countries and addressed any environmental, social and economic issues that may be affected by the project or of any concern to the affected countries.

### **Potential environmental impacts:**

The following section lists potential direct and indirect environmental impacts that may occur due to the GERD's construction and operation. Below list of environmental impacts have been presented in a Directed Study Project for the Executive Master of Natural Resources (XMNR) program at Virginia Tech's Center for Leadership in Global

Sustainability (CLiGS); where the GERD project is analyzed according to the characteristics of sustainable development (Swanson. A., 2014, p.11).

The purpose of presenting the following environmental impacts is to provide an indication of the magnitude and extent of effects that may not have been considered by the Ethiopian government during the decision making process.

- Effects of the dam and reservoir may likely span at least 200 km. The ecology of the river system may likely be affected, should there be no mitigation plans in place.
- Habitats for some native species could be disrupted while some non-native species may be drawn into the reservoir.
- Effects on the hydrological process may affect downstream habitats and soil conditions. Alteration to soil conditions and consequently to the natural sedimentation level along the river may lead to the erosion of the riverbanks and eventually changes to the Nile Delta.
- Alterations to the Blue Nile's parameters (e.g. water levels, temperature, flow rate) due to the construction of the GERD may have adverse impacts on downstream's aquatic and riparian biodiversity.(Swanson. A., 2014, p.11)

## **Conclusion:**

Just like any other country, Ethiopia should be able to have the full right to seek what is in the best interest for its nation. Yes it may be true that the GERD once operational will help Ethiopia at least secure its energy requirements and strengthen its economy. The GERD may also be the ultimate catalyst required to enable Ethiopia achieve its Millennium Development Goals by 2025. However Ethiopia's approach so far with regards to the decision making and commencement of the GERD's construction does raise serious questions about the project's environmental impacts and its sustainability altogether.

Lack of transparency in the decision making, planning and assessments of such a huge project does nothing but create lost opportunities in acknowledging and addressing the environmental impacts that will inevitably be created by the GERD. Without any scientific-technically sound and thorough environmental assessment shared by the Ethiopian government to its own citizens and nevertheless regional countries; it is rather difficult to say that the GERD promotes Sustainable Development.

It is never too late for the Ethiopian government to review its decision for constructing the GERD. Sharing the project's design information, operational plans and performed

environmental and social risk assessments to the public and the potentially affected countries; would without doubt provide huge opportunities for improvements on the environmental and social fronts and the sustainability of the project as a whole. This approach would also help diffuse tensions between the riparian countries, promotes collaboration and exchange of experiences and benefits creating a win-win situation among and within the countries of concern.

Using the seven strategic guidelines prescribed in the WCD report discussed earlier may serve as a good starting point and grounds for the Ethiopian government to review, assess and hopefully revise at least parts of its decisions related to the building of the GERD.

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