SOCIOPOLITICAL IMPLICATIONS OF THE GRAND ETHIOPIAN RENAISSANCE DAM IN THE NILE RIVER BASIN

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By

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On my honor as a University student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments.

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The countries of the Nile River basin rank near the bottom in terms of economic productivity. In fact, the World Bank reports that the 2020 gross domestic product (GDP) per capita in Egypt is approximately 3547.90 USD while Ethiopia and Sudan have GDPs per capita of 936.30 and 595.50 USD, respectively (World Bank, 2021). As a result of this, the citizens of this region have become extremely sensitive to external factors which may influence the prices of goods. These factors include things such as geopolitical stressors, climate change, and pandemics.

Currently, Joseph Siegle, the director of research at the National Defense University, states that Africa is facing record food insecurity as a result of food inflation caused by the COVID-19 pandemic and international tensions (Swanson, 2022). While a majority of these circumstances are out of one country's control, the Nile River basin is experiencing a substantial change which has become a source of significant controversy. In the past decade, Ethiopia has designed and began constructing the Grand Ethiopian Renaissance Dam (GERD) which stands to be the largest hydropower plant in the entirety of Africa (Roussi, 2020). For Egypt specifically, it is estimated that 90 percent of the freshwater used in the country is provided by the Nile River (Mutahi, 2020). As Sudan and Egypt depend on the Nile headwaters which flow through Ethiopia, the GERD has become a source of tension between these countries due to the threat of water security issues in downstream nations (Cage, Granados & Ovaska, 2021). Ultimately, this controversy has the potential to cause significant harm to the relationships within the region (Mbaku, 2020).

Development of any infrastructure along the Nile River will have complex implications as the river is a shared resource. In this instance, a shared resource is a natural resource which multiple countries have an interest and a reasonable claim (Mayda, 1978). Because the Nile is a

shared resource, the GERD will have implications on those beyond the borders of Ethiopia. Within Ethiopia, the GERD project will have stakeholders similar to other hydropower projects such as contractors, authorities, local communities, etc. (Wang et al., 2019, p. 327). Externally, the GERD project with influence stakeholders in the downstream countries of Sudan and Egypt (Chen & Swain, 2014, p. 11). As a result of this, stakeholder sentiments not only vary within a country but also across countries.

Therefore, the primary objective of the thesis project is to understand the complex implications that the GERD will have on the Nile River basin, with particular emphasis on Egypt, Sudan, and Ethiopia. The technical report, whose technical advisor is Venkataraman Lakshmi, focuses on quantifying the economic impact of the GERD and is jointly written with Charles Bass, Matthew Fitzsimmons, Thomas Lam, and Adam O'Neill. This is a tightly coupled report with the STS research paper which expands the analysis of the repercussions caused by the GERD.

While the technical report seeks to answer the question of what impact the GERD will have on the economies of the region, the STS research will seek to answer the question of what the GERD's sociopolitical impacts will be in the Nile River basin. Through this question the STS research will analyze which social groups are impacted by the construction of the dam and what the impact on the particular group or relationship between groups will be. In order to answer the STS research question, the GERD project will be analyzed using Actor Network Theory (ANT), introduced by Law and Callon, in order to identify relevant social groups and relationships present within the Nile River Basin (Law & Callon, 1988, pp. 284-297). From there, ethical considerations for the GERD will be discussed. Using this analysis, future sociopolitical implications of the GERD can be better predicted.

ACTOR NETWORK ANALYSIS OF GRAND ETHIOPIAN RENAISSANCE DAM

The GERD project has a substantial number of internal and international actors which all have unique perspectives and will consequently be impacted by the dam in different ways. To begin, there are several instances of ANT being applied to other hydropower projects around the globe. While each scenario has significant differences which cannot be applied to one another, the analysis of the GERD using ANT will build upon and adapt this research. In China, research demonstrated how from an owner's perspective there are significant actors which play a role in the success of a hydropower project (Wang et al., 2019, p. 328). Elsewhere, research conducted by Agbemabiese and Byrne (2005) demonstrated how human actors are not always benefitted from hydropower projects. Building off of this research the GERD will have a number of social groups which will be both positively and negatively affected.

THE GRAND ETHIOPIAN RENAISSANCE DAM INTERNATIONAL NETWORK

Expanding upon previous research, the GERD project will be analyzed using ANT with two different scopes. Within the Nile River basin, the three main countries of interest are Egypt, Ethiopia, and Sudan as they all rely on the Blue Nile River where the GERD is located. This network of international actors can be illustrated in Figure 1 on page 4. In this network, the countries have different motivations which reflect the fact that the human actors of each country are impacted differently (Veilleux, 2013, pp. 1-3). The primary motivations of interest for the GERD project are economic, political, social, and environmental. In the broader scope of the

Nile River basin, the country of Ethiopia is driven primarily by economic and political motivations. The prospect of greater access to electricity could be a dramatic boost to the Ethiopian economy and give the country a greater influence in the region, especially considering the dam will double the electricity production of the country and may allow for energy to be exported to neighboring states (Mutahi, 2020).

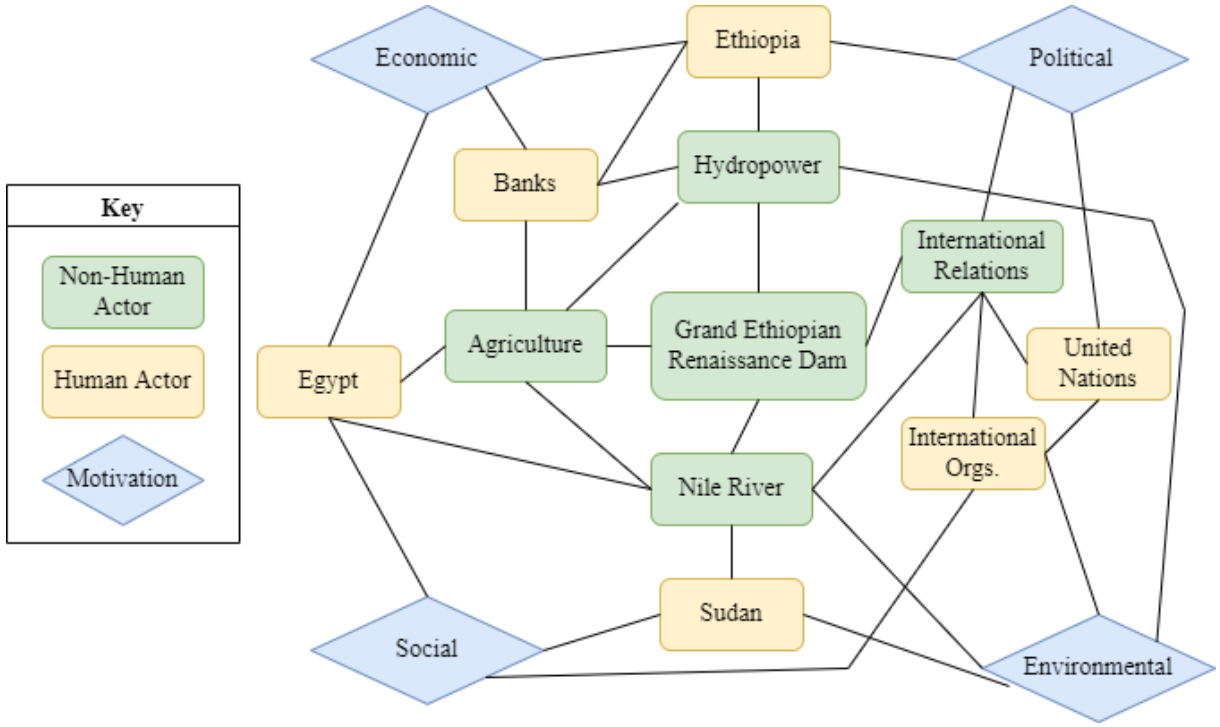

Figure 1. Actor Network Diagram: Nile River Basin. This diagram depicts the network of actors present in the Nile River region while using the Grand Ethiopian Renaissance Dam as the central technology. (Keith, 2022).

From the Egyptian perspective, there are concerns regarding the potential for greater water scarcity (El-Fekki & James, 2021). Water scarcity would greatly impact the autonomy of the country, specifically in terms of agricultural production and the ability of citizens to be productive. When discussing other actors within the international network it is important to note that Sudan, being in between Egypt and Ethiopia, does not have the same set of risks which

motivate Egyptian disapproval of the GERD project. While Sudan has an economy driven by agriculture, there is less concern for lack of water security as it is able to withdraw from the river before Egypt. However, its proximity to the dam presents environmental risks such as flooding in the event of dam failure. This ultimately influences social groups located in the area as they could be displaced.

GRAND ETHIOPIAN RENAISSANCE DAM NETWORK WITHIN ETHIOPIA

The risks facing local groups in Sudan are shared by certain individuals within the country of Ethiopia. Figure 2 provides a depiction of the network of actors in Ethiopia connected to the GERD project. The motivations are similar to those found in the broader network but actors are limited to those within the country.

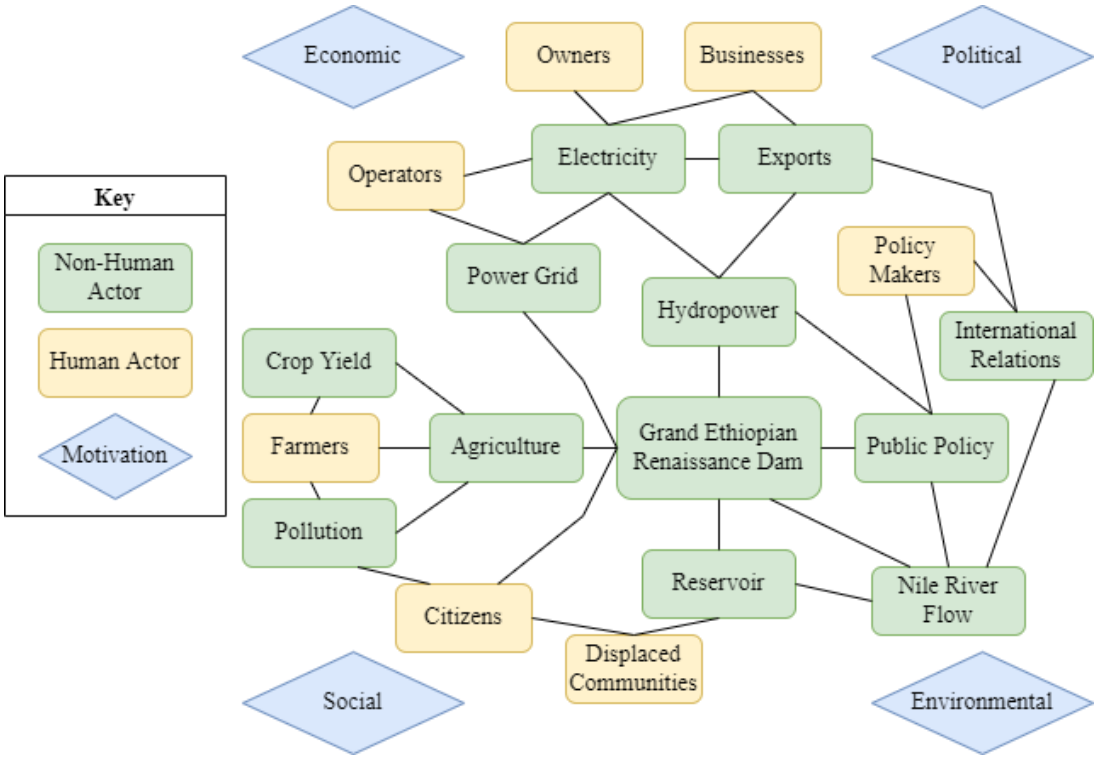

Figure 2. Actor Network Diagram: Ethiopian Perspective. This diagram gives an overview of the actors of Ethiopia and their relationships with one another. (Keith, 2022).

One main point of interest in comparing the two network perspectives is the number of human actors located near the economic motivation in the Ethiopian perspective. With respect to the economy, the GERD produce substantial amounts of electricity but also change the agricultural capabilities of the surrounding area. Additionally, the GERD will place a strain on local groups which will be displaced as a result of the reservoir. This will then place a responsibility on policy makers to provide for those actors that lacked the autonomy to act in their own interests.

COMPARISON OF PERSPECTIVES USING ETHICAL THEORIES

Due to the large variety of actors and perspectives present in both the local and regional networks, there is no consensus on the correct argument, and therefore controversy in the region has continued (El-Fekki & James, 2021). In evaluating the rationale behind each perspective, ethical theories can be used to determine what justification is used by each party. With this understanding, steps can be taken to alleviate the concerns of each actor. In this scenario, the four main ethical theories by which these perspectives will be analyzed are rights ethics, duty ethics, utilitarianism, and virtue ethics. As defined by Martin and Schinzinger (2010), rights ethics pertains to the fact that human rights are held paramount in any decision, and duty ethics, although connected to rights ethics, shifts to focus on deriving rights based on duties we have to ourselves and others (pp. 49-54). Utilitarianism, on the other hand, has one main requirement for an action to be classified as moral, and that is to provide the most good for the most people (Martin & Schinzinger, pp. 55-56). Finally, virtue ethics places moral righteousness on whether

individuals uphold virtue pertaining to both human life and the individual's profession (Martin & Schinzinger, pp. 60-61).

In the case of the GERD, each of the four ethical theories plays a role in determining how the project is implemented and how the dam will be operated in the future. This is depicted in Figure 3 where the GERD acts as the central technology and each ethical theory acts on the dam independently.

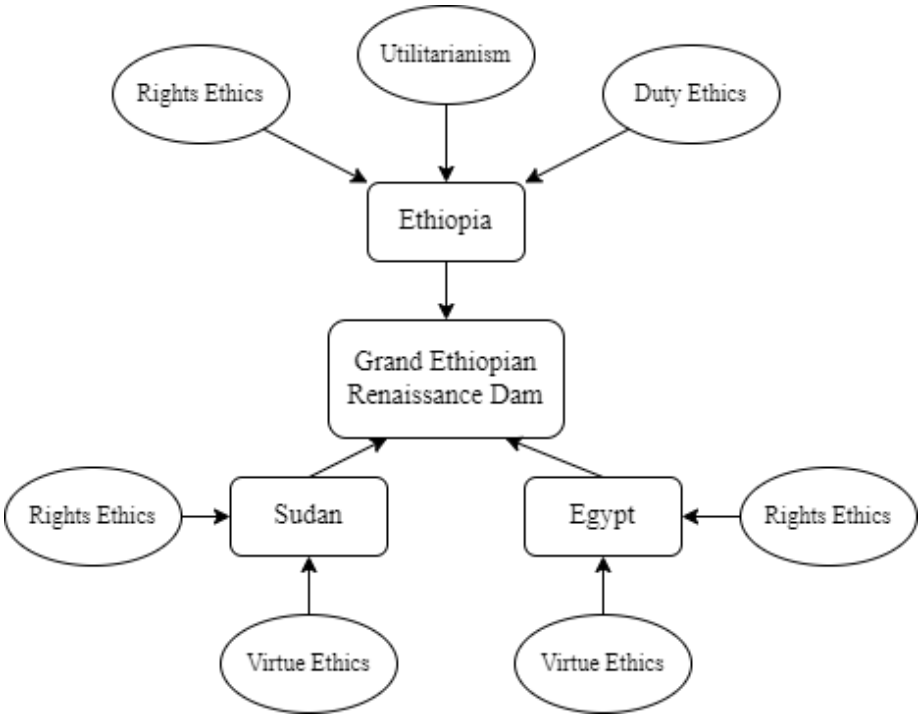

Figure 3. Ethical Considerations for Grand Ethiopian Renaissance Dam. This graphic depicts how no singular ethical theory can be used to argue for or against the Grand Ethiopian Renaissance Dam project. (Keith, 2022).

From the Ethiopian perspective, the GERD can be viewed as the country exercising its right to personal autonomy, thus is justified under rights ethics when viewed on the international scale. Additionally, with the potential for greater electrification of the region, the GERD could be explained as providing good to a greater number of people, and therefore be explained under

utilitarianism. Finally, from the Ethiopian perspective, the GERD could be seen as a duty to improve the quality of life for its citizens. There is the argument that the dam displaces individuals within the country but this could be alleviated through proper reimbursement unless the land which the dam and reservoir now occupy is significant and not able to be found elsewhere.

From the Egyptian and Sudanese perspectives, the argument against the GERD could be in reference to the potential that it may infringe on the ability of the country to exercise personal autonomy. If Ethiopia were to limit the release rate of the dam and decrease the stream flow of the Nile River in times of drought, the countries of Egypt and Sudan would be greatly limited in terms of the actions they could take to alleviate stress caused by a drought.

The future actions regarding the management of the GERD and the natural resources which it controls could also present arguments against the dam with regards to virtue ethics. One of the main human virtues which is accounted for in this ethical theory is fairness. As the Nile is a shared resource, if actions are taken which disproportionately harm one group versus another without proper compensation there is an argument that the GERD's development and management do not uphold the principles of virtue ethics. While the dam is still under construction and future events remain unknown, the morality of the project will remain unknown. There are considerations, highlighted by the perspectives of downstream countries, which could make the project unethical if not accounted for.

FUTURE POTENTIALITIES OF THE GRAND ETHIOPIAN RENAISSANCE DAM

Potential outcomes of hydropower infrastructure can vary significantly. According to Raman (2021), renewable energy has the potential to allow for greater energy democracy, but it is dependent on the institutions which develop the infrastructure (p. 118). This sentiment is shared by Rumpala (2018) who argues that alternative energies can serve to reorganize the political configuration of the area which it is developed (p. 88). While this can serve as a significant benefit to underrepresented communities, there is potential for these changes to be very negative in how they ultimately influence the autonomy of the individual and local communities.

Alternative energies may also serve as a significant energy driver (Mazza, 2002, p. 158). While the technical report focuses on the direct implications on the economy, Mazza stresses that the shift toward alternative energy provides unquantifiable characteristics which may drive economic growth through outside investment. As with most emerging markets, the Nile River basin, and more specifically Ethiopia, presents significant risks to foreign investment as a result of an underdeveloped financial system (U.S. Department of State, 2021). However, in recent years, alongside the GERD project, economic reforms have been taking place within Ethiopia through the Public Private Partnership (PPP) proclamation which is attempting to allow for greater private investment in the energy sector, a sector that is primarily run by the government in Ethiopia. According to the Economist Intelligence Unit (2019), however, the unorthodox organizational structure of the PPP Directorate and lack of information on evaluative criteria used to sign off on projects could mean that approved ventures would not consider social, environmental, or risk management goals. This is particularly important in Africa as the sheer

quantity of and dependency on natural resources mean that changes can have profound impacts on the quality of life.

In research conducted by former executive director of the African Centre for Technology Studies Judi Wakhungu (1996), the abundant natural resources in Africa have not meant that renewable energy projects have been successful (pp. 35-36). In the description of previous projects, Wakhungu (1996) states that one reason there has been a history of failure is the poor transfer of information and the limited scope to which the impact of projects is considered (pp. 38-39). Now, when considering the GERD, it is important that there is proper compensation and agreement amongst parties to avoid failure of the project, whether is take the form of dam failure causing a natural disaster or the collapse of international relations in the region. One particular area of interest is with regards to change in water security as the water crisis in Egypt is reaching dire levels (Swain, 2011, p. 688). Without proper agreements, the water scarcity predicament may cause issues to escalate within the region.

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In examining the current state of the region, it is important to note that the agreements regarding water usage rights are constantly evolving. The first established rights to the Nile River waters date back to the 1920's and most recently in 2015 an agreement was made between Egypt and Ethiopia, with Sudan as intermediaries, to restructure the allocation of the shared resource for the future, as it was acknowledged that previous agreements were unsustainable (Kimenyi & Mbaku, 2015).

As this research is looking into the future implications of the GERD, there will inherently be sources of uncertainty. This can come from changes in climate, changes in policy, or changes in the macroeconomy. One example of this can be seen in soaring energy prices which could not have been predicted previously (Alvarez & Molnar, 2021). As all of these factors influence the construction and future operation of the GERD it is important to note that the implications of the dam will shift and are not concrete. While there is potential for positives as a result of the GERD, this uncertainty of future actions and regional climate places creates additional risks for a region which is already significantly marginalized.

UNDERSTANDING THE COMPLEX INFLUENCE OF THE GRAND ETHIOPIAN RENAISSANCE DAM ON THE NILE RIVER BASIN

The impact of the GERD on the Nile River basin will be substantial. The benefits and costs will be distributed amongst individuals and countries throughout the region. Through ANT analysis of the GERD and a comparison of the moral arguments presented by affected parties the STS research provides an understanding of the implications of the GERD on the sociopolitical landscape of the region. While the GERD's construction has already begun, the effects which it will have on the region are still unknown. As of right now, the lack of concrete agreements between Ethiopia, Egypt, and Sudan means that water security and management strategies for the dam are still unknown. Consequently, it cannot be determined whether the positive or negative potentialities caused by the dam with be realized. As a result of this, future work will be able to build off of this research and better understand the true consequences as more information becomes available. Similar to the retrospective research on other renewable energy projects conducted by Wakhungu (1996), as the project is completed and the future unfolds, the true

sociopolitical implications of the GERD on the Nile River region will be identified. Until then, however, the complexity of the GERD and its influence on the region will continue to cause stress and controversy for the millions of people residing in the countries of Egypt, Sudan, and Ethiopia.

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