**University of South Florida**

**CGN 4122/4933 (3 Credit Hours)**

**Professional and Ethical Issues in Engineering**

**Project 2: Global Case Study Investigation.** The final project embodies much of the material covered in this course. For this project, you are required to understand and apply the ethical and professional responsibilities of engineers, the Sustainable Development Goals that serve as a "blueprint" to achieve a better and more sustainable future for all, and the application of critical thinking to assess scenarios for ethical, legal, and professional obligations in real-world and community or regional situations.

**CASE STUDY**

Recently, the tensions among Egypt, Sudan, and Ethiopia over the Grand Ethiopian Renaissance Dam (GERD) have escalated, notably after Ethiopia announced that it had started filling the GERD's reservoir (which can hold the entire annual volume of the Nile River), an action contrary to Egypt's mandate that the dam not be filled without a legally binding agreement over the equitable allocation of the Nile's waters.

The dispute over the GERD is part of a long-standing feud between Egypt and Sudan - the downstream states - on the one hand, and upstream Ethiopia on the other, as well as other riparian’s (including Tanzania, Uganda, the Democratic Republic of Congo, Rwanda, Burundi, Kenya, Eritrea, and South Sudan) over access to the Nile's waters, which are considered a lifeline for 437 million people living along its shores.

Ethiopia, whose highlands supply more than 85 percent of the water that flows into the Nile River, has long argued that it has the right to utilize its natural resources to address widespread poverty and improve its people's living standards. Egypt, which depends almost entirely on the Nile waters for household and commercial uses, sees the dam as a significant threat to its water security. Sudan is caught between the competing interests of Egypt and Ethiopia. Khartoum (the Capital of Sudan) fears that the GERD operation could threaten Sudan's dam safety and make it much more difficult for the government to manage its development projects. It could also impact seasonal flooding and nutrient replenishment of its agricultural lands.

**Each team of three** will be assigned a county to: (1) identify the issues (both positive and negative), (2) thoroughly vet the dam's purpose and social, economic, and environmental benefits and consequences to their country and neighbour countries, (3) identify which Sustainable Development Goals of your assigned country that the dam project will most greatly influence positively or negatively, and (4) offer solutions that best address their assigned country's needs, concerns, and long-term stability of their country **and** region.

Focus your efforts with the hope that the peoples of the Nile River Basin may find courage and foresight to come together and negotiate in good faith to develop and adopt a legal and institutional framework that will enhance their ability to live together peacefully, allocate the waters of the Nile River Basin in a reasonable, equitable, and sustainable manner, and create the

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wealth needed to deal effectively and fully with poverty and deprivation.

The operation of the dam comes with many concerns to consider, including:

* Water quality and quantity (and the timing of such) downstream;
* Impacts on food production;
* Who has the right to what water, when, and for what purpose (*e.g.,* downstream country rights);
* What are the potential impacts of long-term flooding or drought, the result of climate change;
* Impacts on regional peace, security, communities that are flooded in the process, and the environment;
* The right to develop one’s own natural resources; and
* The historical and cultural significance of past historic treaties about the use of the Nile;
* ADD YOUR OWN TOPICS AS WELL

Also, consider solutions in the form of

* A legal regime (*e.g.,* a resource-sharing agreement) for the management of this critical watercourse that could resolve the conflict over water-use rights among the riparian states, and also help define concepts such as equitable and reasonable use and significant harm;
* How could mediation be facilitated by neutral parties (such as the European Union, U.S. and World Bank) and organizations such as the African Union?
* How might judicial intervention by, for example, the International Court of Justice be used to abrogate the Nile Water Treaties or strengthen them through updates and agreements?
* How might innovations such as monitoring from space play a role in finding acceptable solutions? What other means of monitoring and reporting might be implemented?

Final reports (10-15 pages single spaced) will consist of the following:

1. A detailed description of the case study (cited above);
2. The role that engineering practitioners play in providing a solution (design and strategy) to the case or contributing to the identified problem;
3. A list of stakeholders including a detailed description of the challenges, benefits, and potential solutions of your assigned stakeholder;
4. "Lessons learned" section that may change your original understanding of the case study.
5. Reflections on the conduct of professionals (politicians, engineers, scientists, business owners, etc) in the case study; and
6. Thoughts on actions you would want to have taken if you were involved.

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There are volumes of information available through a simple web-based search. To get you started, I have referenced a few below. **Your finished project should include at least 15 references.**

* The controversy over the Grand Renaissance Dam - <https://www.brookings.edu/blog/africa-in-focus/2020/08/05/the-controversy-over-the-grand-ethiopian-renaissance-dam/>
* Cooperative Framework Agreement - <https://nilebasin.org/nbi/cooperative-framework-agreement>
* Agreement between the United Arab Republic and the Republic of Sudan for the full utilization of the Nile Waters - <http://www.salmanmasalman.org/wp-content/uploads/2013/01/Nile1959AgreementEnglish.pdf>
* Declaration of Principles' signed by Egypt, Sudan and Ethiopia - <http://english.ahram.org.eg/News/125941.aspx>

# Grand Ethiopian Renaissance Dam: Can Downstream Problems Be Solved? - <https://www.youtube.com/watch?v=48wSyiG-1Sc>

# Why can't Egypt and Ethiopia end the Nile dam dispute? | UNPACKED - <https://www.youtube.com/watch?v=2tEtKqWRlt0>

* Tension on the Nile: Could Egypt and Ethiopia really go to war over water? - <https://www.youtube.com/watch?v=PZC-vZPxC_M>
* Nile Water Conflict: Who owns it? - <https://www.youtube.com/watch?v=5uEXJL7UBYs>
* Talk Africa: The Grand Ethiopian Renaissance Dam - <https://www.youtube.com/watch?v=RD72UStS-yI>

# The Battle for Ethiopia | People and Power - <https://www.youtube.com/watch?v=xQ2NVXuzjww>

# Nile Basin Initiative – [www.nilebasin.org](http://www.nilebasin.org)