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The Narmada Valley Dam Project

The need for renewable energy is undeniable. However, the final push towards renewable energy projects often comes from internal and external social or cultural factors. Like any implementation of technology, it is crucial for renewable energy projects to not only meet the standards set by the engineers but to be conducted ethically. India is an example of a country that has made efforts to generate renewable energy through the Narmada Valley Dam Project. This project involved constructing "30 large, 135 medium and over 3,000 small dams on the 1,312-km-long Narmada river and its tributaries" (Tripathi & Singh, 1988). The desires for independence and to irrigate more farmland were the largest reasons for implementing this project, but it ultimately resulted in environmental and cultural damage as well as several breaches of the National Society of Professional Engineers (NSPE) code of ethics.

There were several factors, both internal and external, that were the driving forces behind the Narmada Valley Dam Project, but in the end, this project destroyed the homes and culture of many people. One of the internal factors that led to this project was rooted in concern for the livelihood of Indian citizens. Some of the major goals of this project were to "irrigate more than 7,000 square miles of farmland and help provide drinking water and electricity to three Indian states - Gujarat, Madhya Pradesh, and Maharashtra" (Siddiqui, 2019). From the government's perspective, they saw that the lack of proper irrigation and drinking water was a problem, so they

thought that this project would be the solution. In an ideal situation, the implementation of this collection of dams would increase the quality of life for many people by increasing their resources. One of the external factors pushing for this project was the recent independence from Britain in 1947. Prime Minister Jawaharlal Nehru advocated for the Narmada Valley Dam Project as a method to aid India's development (Narmada Bachao, n.d.). Having only gained independence in 1947, this project was seen as an opportunity to become more self-sufficient, and therefore less reliant on the British. Achieving this successfully would allow India to further separate itself from Britain and any power it could still have over India due to residual dependence from being colonized. These internal and external factors that were discussed made the Narmada Valley Dam Project appear beneficial for India. This project was long-term, with construction starting in 1987. Throughout the years, the heights of this project's many dams continued to be raised despite the disastrous effects it has had on the people who originally lived near the river. By 2015, one of the bridges from this project, the Sardar Sarovar project, had been raised 400 feet. As a result, almost 250,000 villagers were displaced, and 255 villages were submerged in water (Matthew-Shah, 2015). Another disastrous result of this project was the destruction of tribal cultures, such as the Baiga. According to Saju, "there are 163 kinds of tribal foods found in the jungle that were once a part of the Baiga diet but are now disappearing from their plates" (Saju, 2019). The construction of these dams damaged the ecosystems surrounding the Narmada River, impacting the lifestyles of people who historically lived along the river. Considering that cuisine is a distinguishing aspect of culture, destroying local ecosystems and removing historical food sources prevented the tribal people from making their traditional meals. The displacement of people and suppression of culture are only a glimpse into the destruction

that the Narmada Valley Damn project caused, which makes one question the ethics of this project.

The NSPE Code of Ethics of Engineers lays down the expectations and standards of an engineer's honesty and integrity. If I were a member of the NSPE working on the Narmada Valley Dam Project, my work would have been greatly affected by the NSPE code of ethics. The first fundamental canon is to "hold paramount the safety, health, and welfare of the public" (NSPE Code, n.d.). With this canon in mind, it would have been my responsibility to speak against the continual raising of the height of the dams due to the resulting environmental effects that destroyed peoples' homes. The dams were built higher even though their backwater spread flooded upstream villages during monsoons and displaced villagers did not receive promised compensation such as new land (Siddiqui, 2019). I would be ethically compelled to speak against the authorization of this project without thorough plans to re-locate and re-establish villagers who were at risk of being displaced by the dams. According to the NSPE code of ethics, one of the professional obligations of an engineer is to adhere to the principles of sustainable development in order to protect the environment for future generations" (NSPE Code of Ethics for Engineers). This aspect of the code of ethics would require a more robust analysis on the potential environmental impacts of constructing these dams. Although one of the main goals was to irrigate more land, a well-rounded approach should have been implemented in the planning and assessment stages of the project to account for any unwanted effects. This project also appeared to be authorized without long-term environmental protection as a priority. Negligence of this aspect of the code of ethics was exhibited by the flow of "untreated toxic industrial effluents from the Gulf of Cambay into the freshwater zone" which resulted in inadequate freshwater flow to flush out the toxins that make water undrinkable (Siddiqui, 2019). The

consequences of the Narmada Valley Dam Project show how valuable the NSPE Code of Ethics is for engineers. Had I been an engineer working on this project, the code of ethics would have greatly shaped my work and required me to advocate for further analysis on public safety and the potential environmental consequences of the project.

The Narmada Valley Dam Project was an opportunity to improve the wellness of Indian citizens and to become more self-reliant after reaching independence a few decades earlier. However, this project ultimately harmed the people it intended to help. This project served as an example of how renewable energy projects, despite how well-intended they are, still need a well-rounded analysis so that they do not have negative impacts on the people or land around them. Had the engineers on this project followed a strict code of ethics such as those laid out by the NSPE, many of the disastrous outcomes such as the destruction of land and culture may have been avoided. This project is a reminder of how important it is to speak up and to perform your duty as an engineer honestly and ethically.

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