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Introduction

David W. Orr once said, "The plain fact is the planet does not need more successful people. It needs people of moral courage willing to join the fight to make the world habitable and humane." Orr's words directly highlight the goal of the Engineers Without Borders (EWB) Nepal Team at the University of Florida. Our team has a five-year partnership with the community of Khanalthok and believes that by helping them gain access to water, we can improve their standard of living, stimulate their economy, and establish a peaceful environment.

The Importance of EWB

The UF chapter of Engineers Without Borders is dedicated to serving communities around the world in need of engineering expertise. Our team of aspiring engineers will apply our technical skills to a problem that can be solved by collaborating with people on the ground. Our lives are enriched by the chance to work with a partnering community on an international project of this magnitude.

Communications and Supporting Organizations

Our communications team consists of four Nepali natives who are students at the University of Florida. They serve as translators during meetings over the phone and onsite in Nepal. Every trip we bring two of these Nepali students with us to act as translators. Our team has four mentors who guide and verify the feasibility of our plans. We have established partnerships with two NGOs in Nepal: Rural Tourism and Environment Development Nepal (RTEDN) and Kathmandu University.

Assessment & Initial Implementation

In May 2014, our team traveled to Khanalthok for the initial assessment phase of the project to determine the current situation of the village. We collected water samples, conducted household surveys, and led focus group interviews. The results showed that the water was contaminated with harmful bacteria. The community expressed particular concerns regarding the sanitary situation at Shree Janahit Secondary School including contaminated water, lack of a dependable water supply, and unsustainable water practices. Unfortunately, a 7.8 magnitude earthquake in April 2015 delayed our next trip until the following August, when our team traveled to Khanalthok to assess the community's conditions again. We were distressed to see that many homes were demolished, the secondary school's water tank was cracked in several places, and the girls' latrines were destroyed.

To address the lack of water cleanliness and safety at the Shree Janahit Secondary school, our team traveled back to Khanalthok as soon as we could, in May of 2016. Upon arrival, the administrative committee at the Secondary School and our team eagerly moved forward with our plan to install a wash station, new female latrines, rainwater catchment system, and temporary tank. The wash station was installed between the male and female latrines. We reconstructed the female latrines alongside private contractors, which alleviated social constraints resulting from only having male latrines. Additionally, we completed the installation of the rainwater catchment system to fit all of the facilities at the secondary school. As temporary storage for this catchment system, a 2000L HDPE prefabricated water tank was installed.

Proposed Solution

While investigating different solutions, we had to ensure that the chosen solution was effective and sustainable, yet easy for the community to use and maintain. After thorough analysis of the household surveys, focus groups, and meetings with the secondary school's faculty, the community and our team concluded that the best solution would be a new water tank to complement the rainwater catchment that was installed in 2016 as well as ceramic filters to further decontaminate the water.

The new water tank will be a 30,000 liter reinforced concrete tank. The vast size of the tank will allow the secondary school administrators to store excess water during the rainy season to save for the dry season.

One unique advantage of poured concrete is that the concrete will, over time, decrease the corrosiveness of rainwater by leaching into the water. This advantage of concrete tanks results in a desirable taste imparted to the water by calcium in the concrete being dissolved in locations where there is slightly acidic rainwater. For potable water systems, it is essential that the interior of the tank be plastered with a high-quality material approved for potable use. Our contact in Nepal, Shree Krishna Dhital, has stated that his NGO (RTEDN) can get this high quality material used for waterproofing. Additionally, he has had past experience constructing the same type of tanks within nearby areas.

We are also planning on implementing filters to complement the wash station and rainwater catchment system that was installed May of 2016 at the Shree Janahit Secondary School. These filters consist of ceramic materials that are easily accessed by the community and are extremely effective at removing contaminates. Each filters costs approximately $20 USD and we plan on providing five as well as excess funds to be used for repairs and replacements.

Promoting a Peaceful Community

The essence of peace is the idea of freedom from worry, from conflict, and from doubt. By implementing our proposed solution, we can help relieve students of worry. Attending school will be something every student and parent looks forward to. The purified water from the ceramic filters will further eliminate the cause of most water borne illnesses, thus allowing children to attend school and further their education. This education promotes a self-sufficient community, and allows them to harness agricultural practices to stimulate their economy. Lastly, and most importantly, by establishing a water storage system in the form of a reinforced concrete tank, students will never again doubt their ability to change their situation and make a better life for themselves as well as their families.

Sustainability

The community members of Khanalthok have taken ownership not only on an economic basis, but also in a way that they feel that their help is valuable to the project. This has become clearly evident once they readily agreed to the Engineers Without Borders requirement that the host community fund 5% of the total project cost. Additionally, they have already helped us with our past endeavors and they have agreed to continue to do so for future implementation. Since the community members feel connected to the project, they are more likely to properly maintain it for years to come. In addition, this project will instill a sense of pride in the work completed by the village and inspire all community members to develop a passion for lifelong learning and healthy living.

Future Plans

During the Summer of 2017, an eight-member team will be returning to Khanalthok to install the reinforced concrete tank and ceramic filters. Costs associated with this portion include purchasing eight round trip tickets travelling from Gainesville to Khanalthok (this cost has already been fundraised through team-member contributions as well as other fundraising efforts), funding transportation in Khanalthok, as well as purchasing materials for the construction of the reinforced concrete tank (our biggest cost at the moment). Although raising funds can often be daunting, this project is a necessity for the community of Khanalthok. Until our return to the village, team members will be busy designing the project, fundraising to ensure all costs are covered, and maintaining contact with the community to continue strengthening our relationship and empowering them for a brighter, healthier future.