

Amanfro Water Project

Ghana

Columbia University in the City of New York

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**A two-sentence summary of the goals of your project:**

Our project aims to provide water for the community of Amanfro, Ghana in a way that is sustainable for both the community and the environment while also adhering to the World Health Organization standard of 50 liters of water per person per day for normal health and hygiene activities. One of the most important facets of our project is community ownership as we strive to facilitate the formation of the proper community infrastructure to own manage and maintain this water distribution system.

**Did other fund-raising efforts contribute to your project? What were they?**

EWB Ghana pursued a small fundraising campaign extended to the friends and family of the travel members. The Program established a GoFundMe account that could be shared on social media and contained information about the project's history, current plans, and long-term goals. The small amount of funds raised were primarily intended to be used for the team member's personal costs, such as vaccinations, and passport/visa applications.

**How did you come up with the idea for your project?**

EWB Ghana's partnership with the community of Amanfro commenced in 2015. Meetings with community leaders and community surveys revealed a lack of reliable access to potable water a key challenge facing the community. During the initial assessment trip in 2015, the team located the existing water infrastructure at the time, which included streams, springs, at least two hand-dug wells, a borehole with a hand pump, and a defunct borehole. Subsequent water quality testing showed that the water sources were contaminated with high levels of E. Coli and fecal coliform, making the water unsafe for human use and consumption.

Following a thorough alternative analysis of options for increasing the water supply in the community, EWB Ghana proceeded to construct two boreholes in 2016 in the southern part of the community. Later, in 2018, the team constructed an additional two boreholes in the northern part of the community, along with a distribution system that increased the number of water access points in the community by 33%. The purpose of this 2019 trip focused on the rigorous assessment of the water quality and yield of all four boreholes drilled by EWB Ghana in 2016 and 2018. Repairs and maintenance on the boreholes were performed as needed, and further characterization of the water usage and demand was completed through community surveys. In addition, team members attended community meetings to work with community leaders and regional authorities in developing a stable and functional Water and Sanitation (WATSAN) committee for overseeing the operation and maintenance of the water system.

**Why do you think the issue your project is responding to exists?**

The Amanfro community has very few sources of water and minimal government intervention. The natural water sources contain harmful fecal coliforms and are located far from homes, meaning members of the community have to devote a significant time and effort towards fetching water, and largely dry up during the dry season in Ghana. The one government-sponsored borehole that exists in the community has not been functional for many years, demonstrating a failure by the government to provide clean water to Amanfro.

**Why did you choose your host site to work in?**

After completing a water project in the neighboring community of Obodan, the village of Amanfro learned of our program and sent an application to EWB USA to be considered as a potential partner for us to work with. After analyzing the situation and the community's needs, it was determined that a significant impact could be made in improving the health and sanitation within Amanfro and that doing so would be within the scope of the Program's capacity of resources. Meeting with the leaders of the community, they expressed a willingness to contribute to the project as well and work with us for subsequent years.

**What was it like to work in your host site?**

Working in the host site of Amanfro, Ghana was a learning experience for everyone. It required sensitivity to how our customs differed from those in the region, and consideration of how these differences should impact our actions. Although we had to adjust to a lifestyle without the amenities that we were used to such refrigeration and running water, we also got to learn a lot about the food, language, and customs of the region, which was incredibly valuable to establishing a sense of connection to the community.

**Did you feel at any point that the project was not going to work? In what ways?**

One of the greatest challenges faced during this trip was the re-establishment of the WATSAN committee to oversee the operation of the boreholes. When the team arrived, a fractured, dysfunctional committee presided over the water system. Instead, the committee had split into two separate committees for the northern and southern boreholes, respectively, due to tensions surrounding the management of funds. During the trip, meetings with the divided Water Committee were held with the assistance of representatives from the Regional Community Water and Sanitation Agency (CWSA). The CWSA proposed that the existing committees be dissolved, and that a new, unified committee be re-formed. The election for the new, unified WATSAN committee was unable to take place during the team's trip, and is scheduled to take place in the weeks following the team's departure. While EWB Ghana and the Amanfro community are partners in the development of the water supply and distribution system, the community ultimately retains ownership of the system. Without a functioning, unified committee in place, EWB Ghana cannot responsibly continue implementation. Thus, during the tensest points of our arbitration efforts, it seemed unlikely that we would be able to continue working in the community; however, with the help of the CWSA, we believe that we are getting the local management of this project back on track.

**What were the challenges you encountered in communicating with people?**

Although English is the official language, there are many members of the community who only speak Twi, the local language. This made it necessary to have someone present to translate nearly all the time. Also, limited cellular reception or internet connection created difficulties in communication and on-site research.

**How do you define peace?**

Peace means not just an end to external conflicts between nations, but also to internal conflicts between human drives. No one should have to choose between maintaining their health and maintaining their home. No one should have to decide between satisfying their thirst for knowledge and their thirst for water. Through these technical projects, we seek a peace not brought about by diplomatic means, though we recognize their importance. Instead, by engineering solutions that put the community's needs first, we hope to help them achieve a better quality of life in the lives that they choose to lead.

**How does or will your project contribute to peace? Short-term? Long-term?**

In the short-term, creating reliable access to safe sources of water would allow for community members, especially women and children, to focus their efforts on things other apart from basic human drives such as education and entrepreneurship. Additionally, by ensuring the water is free from contamination, we hope to help the members of this community lead healthier, longer lives. Ultimately, the development of these water sources will foster the continued development of the community in all facets of life. When those most basic needs are met, people have the time, energy, and mental bandwidth to be creative, to self-actualize, and to flourish. Our goal in providing water security is to give the members of this community the peace of mind to further their growth as individuals, families, and as a community.

**Has your project changed the way you think about the world? How has it changed you?**

This project has changed the way I view the wealth of a community. While it is important to have money to fix community problems, there also needs to be organization among members in the community and a

willingness and passion amongst members to work together and implement these solutions sustainably. Money alone is not the solution. This project has changed me in that I have become more understanding of the problems we face in the world, along with the complexity in finding solutions, and I am now more motivated to work to try to overcome these challenges. I am also more appreciative of functional infrastructure where it is present. Additionally, this project has been extremely revealing in the sense that it highlighted the difficulties in day-to-day life that come with limited water availability. Traveling and working on this project has made me more aware of the privileges I have from growing up in the United States as well as more aware of the importance of work to increase water availability worldwide.

**Please provide a 1-2 personal statement sentence, suitable for use as a quotation, addressing how and why this project was valuable and what was the most important thing you learned as a result. Indicate the student's name (yours or your teammate's) for quote attribution.**

- Columbia University Engineers Without Borders Ghana Chapter is a passionate group of students that work relentlessly to achieve the common goal of improving the lifestyle of the community of Amanfro. It might be tough to adapt to the living conditions when we go visit Amanfro, but trust me, it motivates you to push yourself and your teammates for the best results. (Carlos G. Perez)
- This trip taught me that while many problems in the developing world require technical work, the non-technical aspects are equally as important. It's almost impossible to solve problems in a community without considering and working directly with many members of that community. (Keenan Lins)
- Building up a community not only requires a technical understanding of infrastructure, but also a societal consideration of the very people who live, work, and grow in that community. Working in Amanfro has helped my personal growth in melding the worlds of engineering and humanities in order to bring about teamwork and a greater appreciation for this developing area. (Desu Imudia)
- My time in Amanfro instilled in me an appreciation for the power of community organization in ensuring the progress and success of infrastructure development. I learned that the humanity aspect of engineering is fundamentally important and a cornerstone of sustainable development. (Joyce Liu)
- This project opened my eyes to the issue of water availability worldwide and challenges that come with working to achieve sustainable solutions for developing communities, all while providing an excellent opportunity for me to learn how to be a leader. (Julie Raiff)

### **Overall Reflections**

During this trip, the team experienced quite a few timeline setbacks. Due to various administrative obstacles with Columbia, the team did not receive the grant until approximately one week before our trip, which affected our ability to plan and purchase ahead for the activities that needed to be completed during this trip. Additionally, once we were in Ghana, we faced unexpected difficulties in coordinating with the community to form a unified water and sanitation (WATSAN) committee. The committee was supposed to be formed during a community meeting with the village elders and the Assemblyman, but elders and Assemblyman did not make the community aware of the meeting. Therefore, no community members showed up and some of the elders were not present. This meant that we had to spend extra time attending to this issue. Finally, when we performed yield testing on the existing boreholes, we experienced a three-day delay in the arrival of a contractor to perform the tests. The results of these tests revealed that the yield in two of the boreholes was too low to continue to have mechanized submersible pumps installed. Instead, it is necessary that hand pumps are installed at these locations. We were unable to receive these test results until after we met with the director of the Community Water and Sanitation Committee, and due to the director's limited schedule availability, we could not meet with him until a few days before we left Ghana. Because the estimated installation and construction time to place hand pumps in these boreholes is approximately two weeks, we were unable to proceed with hand pump implementation, as we did not want construction to occur without our team present. It is absolutely necessary that we install hand pumps at these locations in order for the community to use the boreholes to collect water. As a result, we plan to install hand pumps and construct the corresponding concrete platforms in a future implementation trip, which is where we would like to spend the remaining grant money.