

# Logistics of Construction in Agbokpa, Ghana

**Fletcher D. Podosek**  
California Polytechnic State University  
San Luis Obispo, CA

In August of 2019, three Cal Poly CM students will travel to the remote fishing village of Agbokpa in Ghana. Our project is to install a water filtration system that will create potable water for the villagers that currently have to walk miles to obtain clean water. We will be laying nearly 1000 ft of pipe, installing a solar powered pump, and building a water filtration system hours away from any electricity. A project of this type requires a great deal of logistical planning in order to ensure that all aspects of the project is thought of and planned for. My project focuses specifically on the logistics of construction in a foreign country such as Ghana. Along with a site map of the construction site, I have created a logistics plan that covers logistical issues such as what to do with materials, where and how we will procure extra labor if necessary, catering and food, etc. With this logistics plan, I will ensure that everything is accounted for and prepare our team for a successful project.

**Key Words:** Logistics, Ghana, Water Filtration, Solar

## Introduction

I have always had a mindset that one should always help the less fortunate if they are ever in a position to do so. This project has allowed me the opportunity to make a difference in another part of the world that I would not have had otherwise. The overall project involves two Cal Poly clubs, NECA and MCAA, where together we will complete the construction of a solar powered community center in a remote fishing village that will house multiple refrigeration units, so that the locals can store their food for longer periods of time, and a water filtration system, so the locals can obtain filtered drinking water without walking miles to the nearest supply.

I am a part of a group of three Cal Poly MCAA students that are responsible for the pumping and filtration portion of the project. The project this paper will be focusing on exclusively will include the logistics of installing a pump located in a lake approximately 1000 feet from the village center, building a water filtration system that will feed into NECA's refrigeration units, as well as making the filtered water available for the village's consumption.

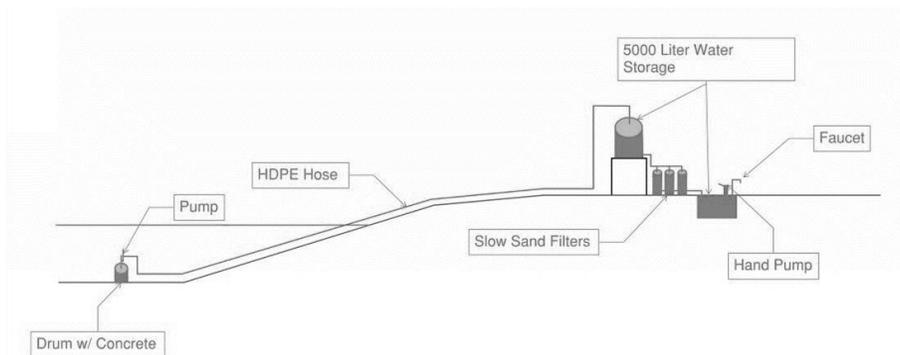


Figure 1: Sketch of MCAA Pump and Filtration System

This project is designed to aid the residents of the remote fishing village that we will working in, Agbokpa. We are asking for nothing in return for building this system because they are allowing us to come into their village to practice our skills and gain hands-on knowledge as we build them a water filtration system. This water filtration

system should help them greatly due to the fact they do not currently have access to filtered water within a 4 mile radius. The refrigeration system that we will be tapping into will also allow this village to keep their catch for a longer amount of days before getting rotten.

The project was first introduced by a physics professor whose wife is the Chief of Agbokpa's daughter. NECA was first brought on to ensure that they could get electricity for a pump and refrigeration system, then MCAA was brought into the project to take over the responsibility of installing the pump, pipe, and filtration system necessary for the refrigeration system to run most effectively.

## **Procurement Process and Research Findings**

The main issue that was associated with the logistics of the project was procurement of materials and labor. It was clear that because we were running on such a short schedule of 20 days that we were going to need to hire labor forces in order to complete the entirety of our scope of work. We decided to focus our attention on hiring nonskilled labor so that we could maximize the amount that our team was focusing on the skilled parts of the job while in country. Hiring nonskilled labor had two main benefits: 1) it would be less expensive than hiring skilled in the city of Accra, and 2) we could utilize locals that lived in Agbokpa and contribute to the local economy.

When procuring materials, I broke it up into two categories. The first category was raw materials that we would use for the project, such as pipe hose, pvc, fittings, water storage tanks, etc. Our team decided that buying the material in country would make the most sense because of two main reasons: 1) the import duties would almost add \$5,000 if we were to ship \$10,000 worth of materials, and 2) the materials we bought in the United States would not match the metric system materials we bought in Ghana if we had to buy extra parts. The second category of material procurement was tools needed to complete the project, such as reciprocating saws, skill saws, pipe cutters, etc. We focused our efforts on obtaining these materials through donations; we saved more money getting the tools donated and paying the import duties than buying all of the tools in country.

The last major procurement items were the means of travel to Ghana. MCAA had to coordinate with NECA to ensure that we were all in Accra, the capital of Ghana, at appropriate times to make sure we were not bussing in and out of the Accra, requiring Professor Heston or other laborers to leave every day. MCAA decided to arrive in country a few days early in order to ensure we could procure all of our material and be on site by the same time NECA arrives.

## **Deliverables**

This Agbokpa, Ghana project was an excellent project because it exposed me to many different preconstruction activities and processes that need to occur before a project can begin and be successful. Although I am going to Ghana to work hands on and build the system, these activities and processes I had to deliver were invaluable and I was able to take a lot away from each. The deliverables that I had to complete in order to ensure the success of our project were as follows:

- Logistics Plan for Construction in a Foreign Country, which included:
  - Materials
  - Material Storage
  - Waste
  - Labor
  - Schedule of Manpower
  - Housing and Sleep Accommodations
  - Catering and Food
- Construction Site Plan

## **Lessons Learned**

Through the preconstruction process, I learned that in order for a project to be successful it has to be thought of meticulously. I was constantly working with all of the team members to ensure I was gathering correct data and creating the proper documents. I was able to apply knowledge I gained in class about due diligence and site preparation and apply it to a completely new and challenging area of the world. I believe I gained a lot of communication skills as well, not only talking with team members but also talking to fellow tradesmen. This project features two teams working on different scopes but all for the same project, therefore, there was a great amount of coordination that took place to ensure all team members were aware of what was expected from each other.

This project was by far the greatest learning experience I have had in all my years at school. This project put me into a real life scenario where I was having to coordinate with team members and fellow tradesmen, perform due diligence on a job in somewhere I have never lived before, and basically map out how we were effectively going to complete the project. All of these activities and skills are necessary for a Project Manager to run an effective and successful project, and I will further build upon these skills that I was able to establish once I start my career.

## **Reflections**

Many things went well throughout this project. First and foremost, communication was key and all of the team members communicated well with each other which helped the project run smoothly. I believe what aided this was the fact the entire project team was meeting every week up until project commencement with action items and milestones that needed to be completed for a successful project. In addition, I think the scopes within our team were divided very fairly and evenly. It made the project feel possible within the time frame we were required to gather information and execute. I strongly believe that the project will be completed on time in the entirety of its scope because of how much time we have planned and prepared for construction to begin.

There were not many things I thought the project could have improved on besides the timing of project. I believe that because of the size of our scope on the project, our team should have been brought on earlier into the project's development. As with any construction project, the earlier a team is brought onto a project the smoother the project will run because there is more time for coordination and information gathering.

This project was great for me personally because I have never been out of the country before and it provided me an opportunity to sharpen my construction skills while experiencing an entirely new culture. I believe I will learn a great deal of hands on mechanical skills that I have not gained in class or on internships. In addition to the technical knowledge learned on the project, I will be set out of my comfort zone and relied upon for the success of a project. I had to perform under pressure on a short schedule, which is one of the most real life scenarios I have ever experienced in all my years at school.