

Gravity-Fed Water Supply System

Cantón Libertad, Guatemala

Background

The Guatemala Program of EWB-MTU has been active since 2006, working on solutions for access to clean drinking water in Cantón Libertad and Fronterizo, two neighboring communities in Guatemala. From 2007-2011, three hand-dug wells were constructed to provide water for the communities.

During the summer of 2011, the region experienced a severe drought, and all three wells ran dry or provided insufficient water for several weeks. Community members resorted to collecting drinking water from highly contaminated shallow wells initially, and then later the nearby Ixcán River.

This event re-focused the community priority on the availability of local water supplies. In order to address this need, the EWB team traveled to Guatemala to assess new water supply alternatives. The EWB team and community members also worked together on maintenance of the three existing wells and pumps.



The Need

The greatest problem faced in Cantón is access to adequate quantities of clean water. Currently, most of the water used in Cantón comes from shallow unprotected wells, since a protected hand dug well is not operational year round. Fronterizo also provides Cantón with some drinking water during the dry season when necessary. The river is not a safe source of drinking water since it is contaminated and makes the community members ill after drinking it. Approximately 300 people live in Cantón, and the desire for a sustainable, clean water supply is great.

The EWB-MTU design team proposed several alternatives to address the need for water, including new wells, repair of the older wells, and a gravity-fed water system sourced by a spring. The community and design team agreed on the gravity-fed system with a spring box and storage tank. This alternative has strong community support, the materials are readily available, and the system is robust and serviceable.

EWB-USA Response

EWB-MTU completed a trip in January 2018 to evaluate the status of the hand-dug wells and collect data for the gravity-fed water supply system, including spring flow measurements, water quality tests, and topographical surveying. The spring is located approximately two kilometers to the southwest of Cantón. The spring is active year-round, and the water quality test showed no presence of *E. coli* or fecal coliforms.

In March 2019, the team's NGO partner spent three days in Cantón and obtained the signatures of five community members who pledged to represent the community and work with the team throughout the duration of the project.



Engineers Without Borders™-USA (EWB-USA) is a non-profit organization established in 2000 to partner with developing communities worldwide in order to improve their quality of life.

The EWB-MTU chapter formed a design team for the project in January 2020. Since then, the team has worked to design a spring box, gravity-fed aqueduct, and storage tank for the community. Currently, materials quantities are being finalized and costs estimated for budget planning. The team includes undergraduate students from a variety of majors working to design a reliable and affordable solution for the community. The team is also maintaining regular communication with the community to ensure project plans are still in line with their priorities.

Moving Forward

Project implementation is planned for spring 2021, with the EWB-MTU team traveling to Guatemala to help construct the final design. COVID-19 restrictions may prohibit travel during that time, in which case staff from the EWB-USA Guatemala office may be able to step in and work with the community. Monitoring and evaluation of the project, along with continued community education and technical support, will occur through future EWB-MTU trips and regular communications with the community.

