

VISIT TO Q'ERO COMMUNITY IN PERU

BY JASON OBERGFELL AND BRAULIO ROJAS IN APRIL 2014

Report submitted August 4, 2014

The purpose of this report is to formally document the visit made by Jason Obergfell and Braulio Rojas to the Q'ero Community of Quico. What follows is a formal summary of the trip and includes additional photographs (in Attachment 1).

Trip Itinerary

Braulio Rojas, the Director of the not-for-profit Suma Jayma, and I were asked by Water Engineers for the Americas (WEFTA) to visit the Q'ero community located near Cuzco, Peru for the purpose of evaluating basic sanitation options for the people living there. The trip was not a paid visit, but rather a trip that only included the reimbursement of direct expenses. Braulio and I donated our time. The following is the itinerary for the trip that was made:

Sunday (April 20, 2014): Jason Obergfell travels to La Paz (2 hours)

Monday (April 21, 2014): Braulio and Jason travel to Cuzco (16 hours)

Tuesday (April 22, 2014): Braulio and Jason meet with Bertha Ramirez Rozas, the local contact, and travel to Q'ero community of Quico and visit houses. Spend the night in a house in Quico. (11 hrs)

Wednesday (April 23, 2014): Braulio, Jason, and Bertha visit with people in Quico and hold a meeting with community. Travel back to Cuzco. (12 hours)

Thursday (April 24, 2014): Braulio and Jason meet to discuss ideas. Braulio and Jason meet with Bertha to share ideas and discuss potential options and future steps. Purchase return tickets and begin travel to La Paz. (5 hours)

Friday (April 25, 2014): Braulio and Jason continue travel to La Paz. (12 hours)

Saturday (April 26, 2014): Jason travels to Cochabamba. (2 hours)

General Observations:

The Q'ero communities are quite isolated, even from each other. We only visited the one community that is more easily accessible by a gravel road. Even though there was a road for auto traffic to the community of Quico, we had to hike the last 3 hours or so. The snow on the road was too slippery for the taxi to continue advancing up the hill. A 4-wheel drive vehicle would probably have been able to make it all the way to the community, but it was too slippery for the taxi that was contracted. Photograph No. 1 depicts the road conditions where we began hiking. Photograph Nos. 2 through 5 depict the Quico community.

The other five Q'ero communities were more isolated than Quico. Photograph No. 6 depicts a snow-covered mountain with a small foot path that leads to another of the communities, named Yanaruma. Bertha had planned for our visit to be to the most easily accessible community, which

was Quico. Upon our return from Quico, we realized that was a wise plan. Photograph No. 7 was taken facing the same mountain trail that leads to Yanaruma; however, the mountain trail is not visible due to the dense fog. It would have likely been a dangerous return hike from Yanaruma on a small, snow-covered mountain trail immersed in dense fog. It seemed as though Yanaruma was the next most-accessible Q'ero community after Quico.

Current Status of Bathrooms in the Q'ero Communities

In the community of Quico, there are some bathrooms that already exist. The positive is that they built those structures from the local rock. The negatives are that:

1. They have piping directly to the river, and
2. Most of the bathrooms had piping that was clogged with feces.

The second drawback seemed somewhat positive in that it generally prevents direct discharge of human waste to the river, which would occur under normal operating conditions. The river appears to have high quality snowmelt water flowing in it, so contaminating such a water resource with raw sewage is an undesirable option. Photograph Nos. 8 through 12 depict some of the bathrooms in Quico and their condition.

The understanding is that the other communities have less bathroom infrastructure than Quico. We were unable to evaluate the potential for contamination in the other Q'ero communities, since we did not visit those communities or see pictures from them.

Technical Comments and Potential Bathroom Ideas:

One of the factors we considered in developing potential bathroom ideas was concept of keeping any solution relatively simple. Our understanding based on email conversations prior to our trip was that any bathroom option(s) would need to be easy to construct and relatively inexpensive in order for WEFTA to consider future involvement in the Q'ero communities. Based on these primary criteria and the conditions that we observed, the following "ecological sanitation" options were described at the community meeting held in Quico on April 23rd:

- *Retrofit existing bathrooms to incorporate a "Bucket Toilet" Design:* Use the existing bathroom infrastructure by incorporating a "bucket toilet" concept and adding external storage chambers to naturally process the feces. Urine could be infiltrated, stored, or discharged.
- *Construct new ecological bathrooms:* Replace existing bathroom infrastructure in the community using a relatively standard ecological bathroom design. Local rock would be used instead of bricks for construction.
- *Build "movable" ecological bathrooms:* Replace existing bathroom infrastructure in the community using a "movable" ecological bathroom design.

Incorporating a “Bucket Toilet” and Adding External Storage Chambers

This concept would use the existing infrastructure to the highest extent possible while also modifying the functionality and effectiveness. The existing bathrooms generally do not work due to blockages of the piping with feces. Human feces is the primary concern relative to bathroom waste, so this option would isolate the feces for natural processing. Without feces blocking existing bathroom piping or being a contributing contaminant, the urine could potentially be discharged to the river through the existing piping. Other options for the urine would be infiltration (into the soil) or collection (for use as fertilizer and/or insecticide). The feces would be collected in the “bucket toilet” for weekly deposition in one of the two newly constructed, external storage chambers. These chambers would be relatively easy to construct with local materials and would provide containment during natural processing of the feces. This is essentially a typical ecological bathroom option, except that the components of the ecological bathroom are simplified and separated into independent parts. An example of a simplified “bucket toilet” is provided in Photograph No. 13. This photograph was shown to people that attended the community meeting. A sketch of this option is provided in Photograph No. 14.

Constructing Completely New Ecological Bathrooms

A more typical ecological bathroom construction was also explained, but with the significant modification of using local rock for the entire structure (and maybe local mud rather than cement between the stones). The members of the community at the meeting seemed more interested in this option. The people in attendance seemed to agree with having a hole in the floor rather than having an ecological toilet. This construction would be simpler than many ecological bathroom constructions but more complex than the option proposed above. It was said that the Q'ero people could obtain wood, so wood was suggested as a potential flooring material (as opposed to a reinforced concrete floor). The people in the Quico community seemed to be in agreement with the idea of using local rock for the structure and nearby-accessible wood for the floor. A sketch of this option is provided in Photograph No. 15.

Utilizing a Movable Ecological Bathroom Design

The “movable” ecological bathroom option would be one in which the two storage chambers would be holes dug in the soil rather than structures built above ground. The third option is more applicable when the entire bathroom structure is easily moved. In these communities, I would anticipate the structure being constructed with local rock and staying in one place. The third option would either require space to dig future storage chambers (with previous chambers being covered with soil) or need cleanout of each chamber/hole after an appropriate time for degradation (similar to a typical ecological bathroom). This option could create a more stable structure (not being constructed over chambers built with local rock), but it would be somewhat more difficult for chamber cleanout. A sketch of this option is provided in Photograph No. 16.

I don't anticipate these communities frequently moving bathroom structures for this type of option or other similar options (like shallow pit latrines). This expectation is due to the houses being built of stone, indicating this is the preferred construction material. Stone bathroom infrastructure would not be easily moved. The people in the community of Quico did, however, say that they could obtain wood for construction purposes. This would be more movable.

Pictures from the community meeting in Quico are provided in Photograph Nos. 17 to 19. Additional images from the community of Quico are provided in Photograph Nos. 20 to 30. It should be noted that Photo No. 30 depicts the hydroelectric generator for the community. This generator provided electricity for the entire community for approximately 15 years; however, it currently needs repairs that are estimated to cost \$3,000. This could be an additional project for WEFTA to consider supporting, if possible.

Conclusions:

Before leaving Cusco, Braulio and I met with Bertha to discuss our visit and potential bathroom options. I provided Bertha with sketches of 3 options describe above and explained the benefits and drawbacks of each option. The option that seemed to be preferred by members of the community of Quico, and by Bertha, was the construction of new ecological bathrooms using local materials to the maximum extent possible.

Braulio discussed the ways that Suma Jayma could potentially be involved in the Q'ero communities in the future. For example, he suggested the possibility of a small pilot project in Quico, if WEFTA would be willing to provide the necessary funding. Such a project would involve the construction of a few example bathrooms by employees of Suma Jayma, with the following goals:

1. Test the use of local materials for the construction of the bathroom option chosen by WEFTA and the community.
2. Train members of the community to construct the bathrooms.
3. Provide examples of the bathrooms, so that the community could try them prior to doing a larger project for the whole community.
4. Provide WEFTA with data on the use of the bathrooms constructed. If the pilot project bathrooms are used and maintained, a community-wide project could be considered.

For future visits to Cusco, Braulio mentioned the idea of driving his truck to the community if any sort of project goes forward. That could shorten the travel time and provide more flexibility while in Cusco. It could also provide a more secure transportation option, as taxis are typically small, 2-wheel drive cars as opposed to his 4-wheel drive sport utility vehicle.

Potential Future Steps

During our meeting with Bertha, Braulio expressed an interest in continuing to work with the Q'ero communities. I could potentially also be involved. The preference would be to pursue a small pilot project first, as described above. Some of the potential future steps for WEFTA to consider for working with the Q'ero communities might be:

- Review this report and the accompanying photographs to evaluate whether WEFTA has questions and/or would be interested in investing funds in a bathroom project in Quico.
- Contact Braulio or me for additional information, if necessary.
- Determine which of the bathroom options WEFTA would like to pursue. Individuals within WEFTA could also suggest other options based on their experience.
- Request a proposal from Suma Jayma for the type of project desired by WEFTA. The proposal request should include the approximate budget that WEFTA would be willing to commit as well as the general scope of the project.
- Suma Jayma would prepare a proposal, including the scope, budget, and schedule.
- WEFTA evaluates the proposal and provides funding for the work.
- Suma Jayma executes the project and provides a summary report.
- The community uses and evaluates the bathrooms constructed.
- Individuals from WEFTA and/or Suma Jayma visit the community after several months to evaluate the use of the bathrooms by the community. Suma Jayma would be paid for such a visit (both expenses and staff time). I could potentially visit on WEFTA's behalf.
- WEFTA, Suma Jayma, and the Q'ero communities determine whether another project will be pursued.

Questions or Comments?

If you have any questions or comments regarding this report, please feel free to contact me via email at: obies12000@hotmail.com or by phone at: 591-7-271-7463. A Skype call can also be arranged.

Braulio is also available for questions or comment. His email address is: suma_jayma@hotmail.com.

ATTACHMENT 1. PHOTOGRAPHS



Photo No. 1



Photo No. 2

ATTACHMENT 1. PHOTOGRAPHS (cont.)



Photo No. 3



Photo No. 4

ATTACHMENT 1. PHOTOGRAPHS (cont.)



Photo No. 5



Photo No. 6

ATTACHMENT 1. PHOTOGRAPHS (cont.)



Photo No. 7



Photo No. 8

ATTACHMENT 1. PHOTOGRAPHS (cont.)



Photo No. 9



Photo No. 10

ATTACHMENT 1. PHOTOGRAPHS (cont.)



Photo No. 11

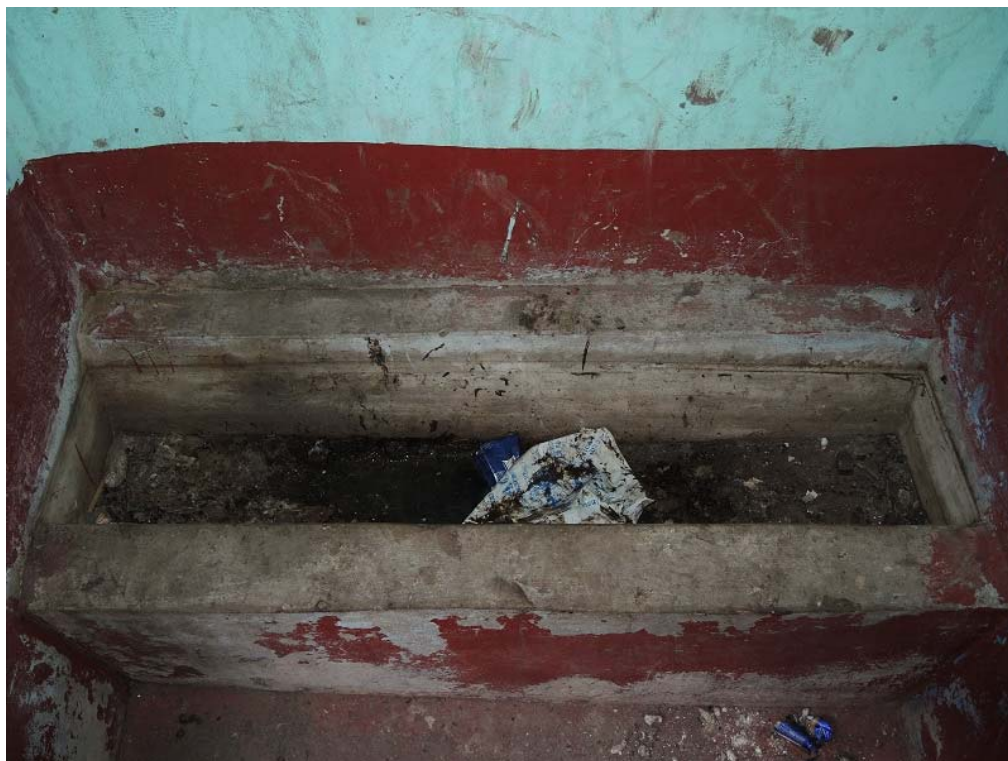


Photo No. 12

ATTACHMENT 1. PHOTOGRAPHS (cont.)



Photo No. 13

ATTACHMENT 1. PHOTOGRAPHS (cont.)

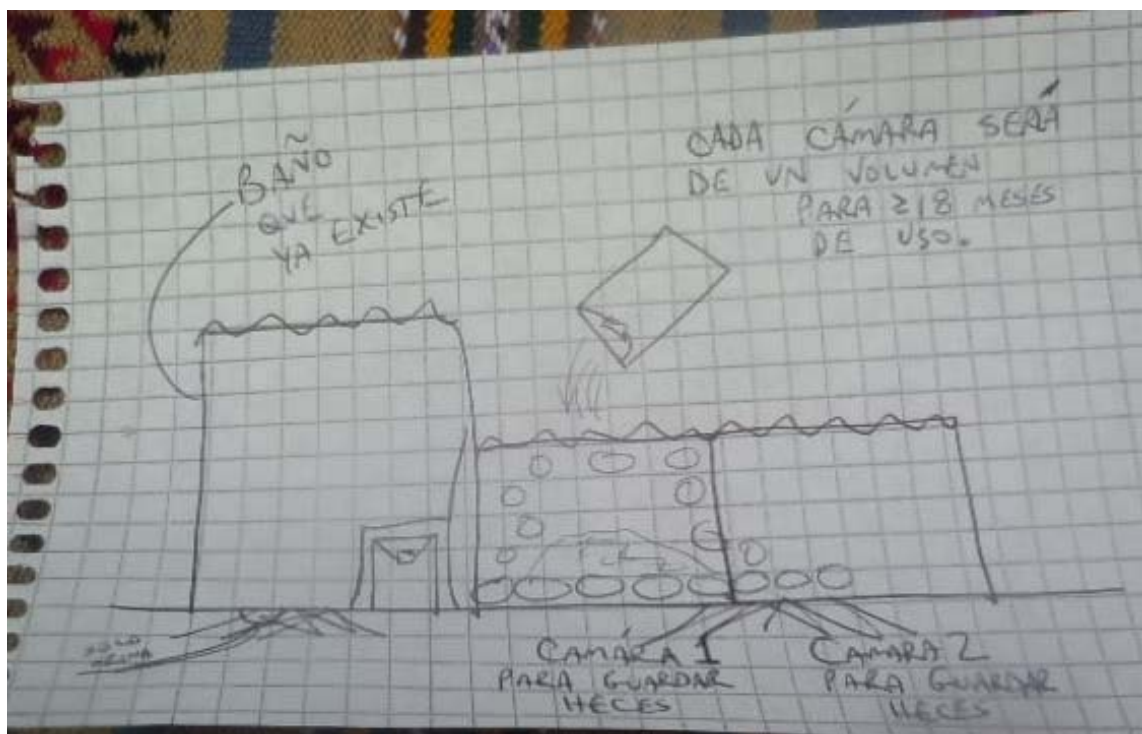


Photo No. 14

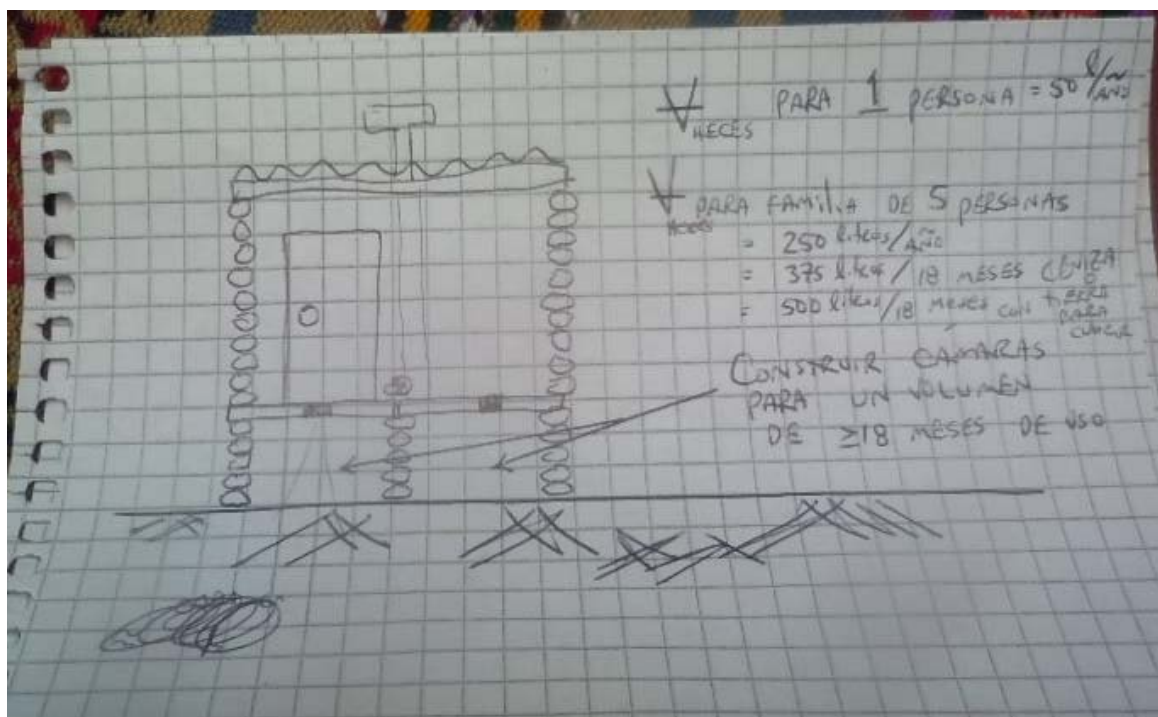


Photo No. 15

ATTACHMENT 1. PHOTOGRAPHS (cont.)

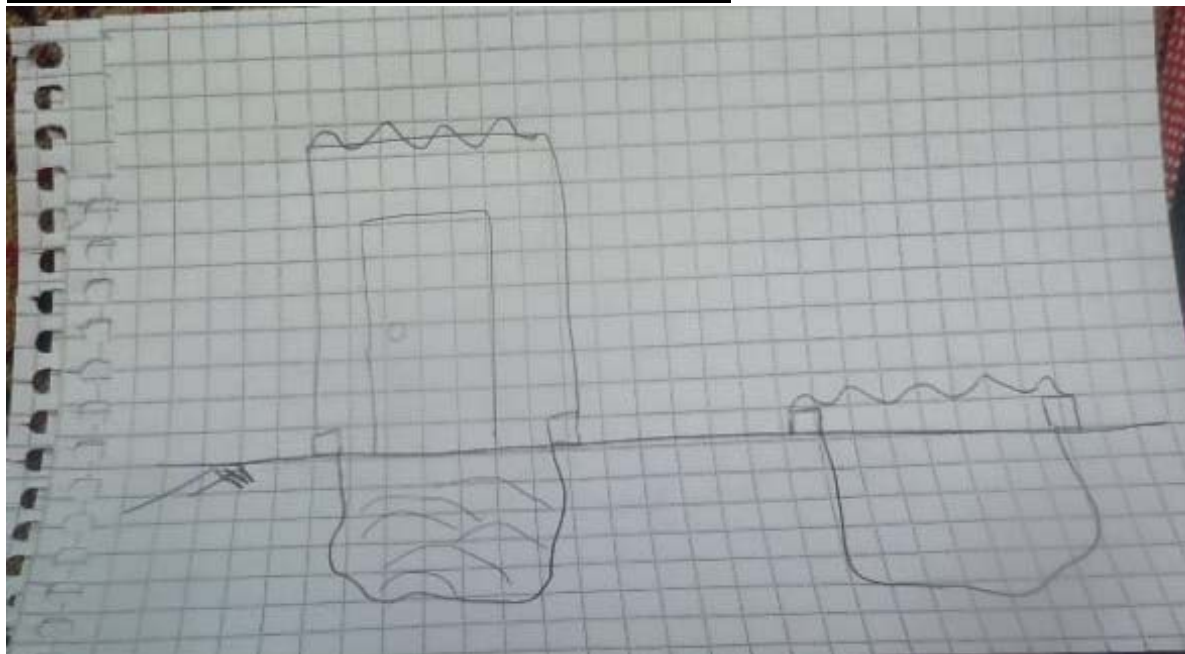


Photo No. 16



Photo No. 17

ATTACHMENT 1. PHOTOGRAPHS (cont.)



Photo No. 18



Photo No. 19

ATTACHMENT 1. PHOTOGRAPHS (cont.)



Photo No. 20



Photo No. 21

ATTACHMENT 1. PHOTOGRAPHS (cont.)



Photo No. 22



Photo No. 23

ATTACHMENT 1. PHOTOGRAPHS (cont.)



Photo No. 24



Photo No. 25

ATTACHMENT 1. PHOTOGRAPHS (cont.)



Photo No. 26



Photo No. 27

ATTACHMENT 1. PHOTOGRAPHS (cont.)



Photo No. 28



Photo No. 29

ATTACHMENT 1. PHOTOGRAPHS (cont.)



Photo No. 30