Assessment – Pre-Trip Plan

Community:	El Cisne de Conchan
Country:	Ecuador
Chapter:	Worcester Polytechnic Institute
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Scope of Assessment (100 words)	The goal of the first assessment trip is to begin evaluating the feasibility of implementing a new water distribution system for the community of El Cisne de Conchan and to identify other potential projects within the program. The assessment will involve the collection of flow measurements and water data, meetings with the community and other technical contacts, and focus groups with community members to determine the possibility for another project in the community if the water project is determined to be infeasible. The travel team will begin developing other contacts and establishing relationships in the community and around Cuenca.

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1.0 Objectives of Site Assessment Trip

During the first assessment trip to the community of El Cisne de Conchan Ecuador, EWB-USA WPI aims to accomplish goals within the following categories: identify and assess possible projects within Conchan, collect technical data regarding the communities water needs, gain an understanding of the social and educational environment, strengthen communication, and make connections. During technical evaluation, the club will identify the current technical resources and capacity of the community, focusing on water resources, which was indicated as the community's greatest need. Investigation into water resources will include confirming possible water sources, collecting initial flow measurements, and testing the quality of these sources. EWB-USA WPI will later collect water data during the dry season and then analyze all of this collected data to determine the feasibility of a water project within the scope of our resources and technical expertise. Focus groups with community members will be conducted to identify other possible need areas or projects within the program if the water project is determined to be infeasible. EWB-USA WPI will work to establish personal relationships with people in the community and End the Cycle of Poverty (ECP), to help ensure strengthened communication for monitoring and data collection purposes year round, simplify future travel accommodations, and incorporate more contacts and resources into the project. The travel team will work with the leaders in the community to begin introducing the Project Partnership Agreement during the trip as well. In discussions with the community and community leadership, the travel team will emphasize that the feasibility of a water project can only be determined after the dry seasons, thus any construction that might take place regarding the project would not be done until next year, (2017), at the earliest.

2.0 Data Collection and Analysis

EWB-USA WPI had the ability to gather preliminary data from the community through both communication with End the Cycle of Poverty (ECP), primarily through the director, Suzanne Thurston, and through limited interaction with community members via both Skype and Facebook Messenger. The plans of data collection listed below include some of the previous methods used by EWB-USA WPI since the establishment of the program in July 2016. The data collection and analysis methods expand on the already performed data collection and include plans leading up to the assessment trip to provide a more holistic understanding. In attached documents 1 and 2, “Monthly Reports”, monthly project reports which outline community communication and project process can be found, showing some of the previously collected and analyzed data.

Program & Project Feasibility Data Collection and Analysis

Baseline Community Technical Resources & Capacity

Through communication with community members and ECP, pictures provided by ECP, and the 501 report, EWB-USA WPI has limited information about the technical resources and capacity of the community members. While the community has widely echoed their desire for a water project, recent reports of no water in the community concern the chapter that a water project may be technically unfeasible for this chapter. Thus, the travel team will evaluate the potential for other projects within the community. The attached document 3, “Baseline Technical Capacity” includes some of the information that the travel team will collect to provide a baseline for project development in the community as well as to alert the chapter of any other potential projects within the program.

Water Project Feasibility Data Collection and Analysis

The community of El Cisne de Conchan reported in their 501 that the main concern is lacking water quantity in the community. This concern has been supported by ongoing communication with the community. As a result, EWB-USA WPI is focusing a large portion of the data collection and analysis on water sources. However, a full assessment of the community will be performed to learn about other possible needs and gain a complete understanding of the community.

Assessing Existing Water System & Quantity of Existing Water Storage

From conversations with the project NGO and community members, EWB-USA WPI has some information about current water access in the community. Currently, the community is using a water distribution system made of a web of hoses. The water is drawn from a spring at the top of a nearby mountain. The spring has three large rubber hoses going to three communities, including Conchan. The large hose that goes to Conchan runs into a blue storage tank (Figure 1), and then passes into a concrete tank (Figure 2). From this tank, a system of smaller, rubber hoses distributes the water to homes in the community. Some of the smaller rubber hoses are connected to a tap in the homes. It has been reported that the spring source often runs dry during the summer months. During these times, the community members report that they walk to a small stream at the bottom of their community called Rio Maluay for their water. The quantity of water during the dry season does not appear to be sufficient. Community members report that the spring source runs dry on occasion. If both of these sources are dry, community members purchase soda and water. EWB-USA WPI will assess the existing system to determine the level of functionality and any problems community members may be having with it.

Determining a baseline of the amount of water the community is currently able to store, as well as the extent to which this capacity is being met during the wet season, will help determine the quantity of water currently in the community. It appears from both pictures and reports from community members and ECP that the current quantity of water is not sufficient to meet the community's basic needs, and is far lower than the World Health Organization standard of 20 liters of water per person per day. Establishing a water storage quantity baseline will determine whether this lack of a sufficient water quantity is due to a physical lack of water or lack of storage capacity (having enough storage to sustain the community through the dry season). It is believed that the community depends primarily on the previously described communal water system that brings water from a spring to two major storage areas in the community, which then flows directly to community homes. Currently the travel team is aware of two shared water storage systems and has seen images of additional individual water tanks in the community as well. Figure 1 shows the most recently implemented tank that was incorporated into the system. The intention of the community in implementing this tank was to better distribute the water, since a few homes at the top of the community were receiving substantially less water than houses at a lower elevation. It was reported that the tank was buried by community members when it was implemented through a *minga*, or community based project. EWB-USA WPI has technical concerns with the design of this buried tank. There is a high probability that during the wet season when water flows through the soils towards the tank, it will collect under and around the tank, eventually causing the tank to float out of the hole that it is currently buried in. This will likely cause damage to the tank itself, a substantial loss of water, as well as a disruption to the water supply.

Figure 2 shows the main tank in the community where it is believed that 23 homes receive their water from. Figure 3 shows a three-tank water storage system that EWB-USA WPI is not sure is incorporated into the community system. It is believed that some of the homes in the community are not attached to the system at all.

In addition to the shared water storage, the individual water storage of homes will be assessed. The travel team will survey the community to identify the number of individual households with water storage. If individual water storage systems exist, the volume of this storage will be noted. If possible, the travel team will also identify the number of people relying on each household's water storage system. The ability of the stored water to meet the needs of each household will then be evaluated by dividing the water volume by the number of people in each household.

Figure 1: Water storage tank that primary hose runs into from spring source

Figure 2: Concrete tank where the large hose from the spring source runs after the blue tank. Starting point for the rest of the distribution hoses for the community

Figure 3: Three water storage tanks in or around the community. EWB-USA WPI does not know if they are somehow incorporated into the current distribution system

Water Quantity Bucket Testing at Spring Source and Rio Maluay

To assess the quantity of water available from each source, the travel team will conduct flow testing at the Rio Maluay and at the spring located at the top of the community. EWB-USA WPI previously sent

instructions in both Spanish and English to complete this testing to the community members, found in attached document 4, "Flow Measurement Instructions". This testing was not completed to EWB-USA WPI's knowledge. It is unclear as to whether the tests were not completed due to a lack of water or an unwillingness to participate in the testing due to the far distance to the water source from the community. The community members have reported that they have previous experience with this type of water flow testing from a previous university study that was conducted in March 2014, however, the measurements in the study were taken during the month of highest average rainfall and do not reflect the dry season data which will be required for determining the feasibility of the project. The travel team intends to directly instruct community members interested in helping with the project to continue to take the measurements on a weekly or biweekly basis when EWB-USA WPI is not in country to determine the change in flow of the water for further assessment of the viability of the water project based on quantity. If community members are able to continue the testing after the travel team leaves, EWB-USA WPI will be able to determine the quantity of water at the spring which will help determine the feasibility of a water project. These measurements will have to be taken during the driest season which is in July and August.

This testing will require a container of known volume and a timer that measures in seconds. Many community members have smartphones with timers to complete these tests when EWB-USA WPI is not in-country. The large hose, shown in Figures 4 will be disconnected from the smaller hoses, (Figure 5), that lead to the community, allowing the total flow of the water source to fill the container. If this hose cannot be isolated, the test will be conducted at each smaller hoses and the sum of those flow values can be used to determine the total flow. The time that it takes to fill the container will be measured and recorded, allowing the travel team to calculate the total volume of water coming from each source over a fixed amount of time. The travel team will teach a few community members how to perform the bucket tests so that they can continue collecting data when EWB-USA WPI is not in country.

Figure 4: The large hose in the community disconnected from the smaller hoses in the distribution system to perform a bucket test

Figure 5: Some of the smaller hoses in the existing distribution system

Water Quantity Discrepancies Based on Location with Existing System

As indicated in the initial community application, discrepancies in household water flow exist based on location and elevation within the community. As reported by community members, homes at the bottom of

the mountain receive much higher water flow than homes higher on the mountain. The travel team will observe the current water distribution system for any households that receive significantly lower water flows, and note the locations of these households.

Rainwater Data

To assess the feasibility of rainwater harvesting and to understand more about the quantity of water at the source, the travel team will work to obtain long term accurate rainfall data. While internet searches have been able to provide preliminary data on rainfall, this has only provided estimated averages with unknown sources for Cuenca. The city of Cuenca, located six kilometers from the community, has a significant elevation difference that could impact the quantity of rainfall for the community in comparison to Cuenca. The travel team intends to find local rainfall data from existing institutions or organizations that would have reliable and accurate data. Historic rainfall data will enable trends of rainfall to be observed for Cuenca that would likely be applicable to a nearby community, regardless of the elevation difference, providing data to determine the preliminary economic and technical feasibility of implementing rainwater harvesting systems.

The travel team will work to reach out to ETAPA (Empresa Publica Municipal de Telecomunicaciones, Agua Potable, Alcantarillado y Saneamiento), the local university, and the local airport prior to traveling to determine if any of this data is available. If there are no responses prior to traveling, the travel team will reach out in person to these organizations to try to obtain the data.

If data is not obtained prior to traveling or during meetings on the trip, EWB-USA WPI will determine whether the use of a rain gauge in the community should be used. EWB-USA WPI successfully used a rain gauge in a project in Guatemala for collecting local rainwater data for analysis of rainwater harvesting feasibility. The rain gauge model that EWB-USA WPI found the most effective and would consider utilizing in Conchan is the RainWise® RainLogger™ Data Logging Rain Gauges, shown in Figure 6. This rain gauge collects rainwater data and stores it on a memory card within the device. The data can be periodically downloaded and sent electronically for analysis. This would enable the instrument to be left in the community at a location determined safe and unlikely to be tampered with, vandalized, or stolen, and ECP can periodically retrieve the data to send back to EWB-USA WPI.

Figure 6: RainWise® RainLogger™ Data Logging Rain Gauge previously used by EWB-USA WPI in Guatemala to collect rainfall data

EWB-USA WPI is working to adapt a previously-developed computational Excel model used to determine the required storage capacity to support families in Conchan. Rainwater data collected by the club will then be input into the model to determine the required storage capacity and analyzed along with the flow data from the other water sources to determine the feasibility of a water project. The data

provided from the model will likely be used to determine if rainwater harvesting would be a viable supplement to another water source for the community.

Aquifer Depth & Groundwater Use Testing

There have been no reports of community members having dug wells in Conchan for additional water supply, but community members have reported that some nearby communities have had success with pumped wells. Prior to beginning testing, EWB-USA WPI will try to determine if any community members have attempted to hand-dig wells to supplement their water sources. EWB-USA WPI intends to test the depth of the groundwater by having community members try digging a few shallow wells, spread out across the community. Hand dug wells are typically successful in locations where the ground is soft and the water table is shallow. While unsure of the water table depth, from available pictures, the soil appears grainy, fine clay-like and malleable, allowing hand wells to be dug. Based on the ability of the community to dig a hole for the tank to be buried in, EWB-USA WPI does not anticipate any difficulties with hand digging a test well. The well will be dug until the water table is reached, where groundwater begins to fill the hole, reaching the saturated zone. Since the tests will be completed during the wet season, the unsaturated zone, where the space between soil and sediments is filled with air, may be only a few meters deep. In drier months, such as July and August it would be anticipated that depth of the unsaturated zone would drop, requiring a deeper dug well to reach the water table. EWB-USA WPI will inform the community of potential risks and hazards of digging these shallow wells prior to digging.

While this data collection will only determine whether the implementation of shallow wells is feasible to supplement water demand, the rate at which the hole fills should give an idea as to the quantity of water in the aquifer. If this test is able to be completed with community members, then it can be repeated to provide EWB-USA WPI additional information regarding water quantity as the community enters the dry season late next spring.

Water Quality Testing

One of the aspects of determining the feasibility of completing a water project in the community is assessing the quality of the water from the potential sources. While many contaminants can be removed, the treatment for some could present a technical challenge outside of the capabilities of the chapter. Water quality testing during the first assessment trip will thus be focused on possible contaminants which are difficult to treat, specifically testing for unsafe levels of lead, iron, and pesticides. The travel team will additionally test for other harmful contaminants to begin assessing whether further filtration of the water might be necessary if a water project is determined to be feasible.

Water quality tests will be performed at each source on two separate occasions, taking into consideration recent weather events or changes in the source between visits. The water for the tests will be collected at the same time and by the same group as those completing the flow measurements. The two tests at each source, (spring at the top of the community, Rio Maluay, and any groundwater found around the area of the river), will be carried out on different days during the trip to monitor if there are drastic changes in contaminant content. Tests from the Watersafe WS425B Drinking Water Test Kit will be used following their specified procedures. This kit includes tests for lead, iron, pesticides from agricultural uses, chlorine, nitrates, pH, and water hardness. The Watersafe Kit provides a relative comparison of the contaminant levels to EPA standards, providing the travel team with a general idea if these contaminants are present in potentially harmful levels in any of the sources. If a desired water source contains harmful levels of the

contaminants, the chapter can use this information to guide research and discuss possible treatment options or decide that using this water source is infeasible.

In addition to the water quality tests, additional investigation around the water sources will be done to try and determine the source of the contaminants. A general inspection of the watershed and recharge areas will be done to gain a better understanding of the source of the water and the contaminants that may influence it. The travel team also plans to meet with ETAPA, the local utilities provider who has completed water projects in the area of the community. In this conversation, the travel team will discuss general water contaminant concerns in the region that they have observed during their work in neighboring communities. From this discussion, the travel team can evaluate if there are additional potential contaminants that should be tested for in the water. For more agenda items regarding the ETAPA meeting, see section 'Meeting with ETAPA' below.

On future trips, it would be advantageous for travel teams to have access to a water quality lab in or around Cuenca to test samples. During the meeting with ETAPA and the Catholic University of Cuenca, the travel team will ask if they would provide access to their labs or know of any labs which future trips may be able to use on future trips if it is determined that a water project is feasible in the community. Travel team members will continue to reach out to other contacts in Cuenca to determine if there are other labs that may be available for them to conduct water quality tests.

The travel team will also conduct bacterial testing using leftover Petrifilm and Coliert tests from the previous project. These tests will be collected twice at each source and pocket-incubated for 22 hours. The tests will determine if there is Ecoli in the water sources and can quantify the water quality with regards to the bacteria using the World Health Organization's standards. Although bacterial testing is not the most essential for this trip, and will be eliminated if the travel team does not have sufficient time, it would provide a basis for comparison of water quality over time if a water project is determined to be feasible. Collection of this data would also reveal the need for filtration or other forms of treatment if a water project is determined to be feasible.

Meetings

The travel team will conduct a number of meetings during this first assessment trip to build relationships with current project partners and to broaden connections and the resource base for the new project. All meetings with the exception of meetings with ECP will be conducted in Spanish. Two of the travel team members and one mentor speak Spanish at a high level. Meetings with current project partners will be attended by the entire travel team to develop relationships and introduce EWB-USA WPI to the current project partners. These include meetings with the community at the beginning and the end of the trip, a meeting with community leadership, and meetings with ECP. Additional meetings to develop new project contacts will be held with two travel team members, at least one who speaks Spanish. It is anticipated that these will include meetings with contacts at ETAPA (regional utilities and water provider), Catholic University of Cuenca, other NGOs in Cuenca, GAD (municipal government of El Valle), and other communities around Conchan.

These meetings are a very important aspect of the trip as they will expand the resource base for EWB-USA WPI for the entire program. These contacts, both existing and new, are anticipated to be valuable resources for both in country and remote collaborations. The relationships established and contacts made during these meetings will be extremely helpful for any project completed by the chapter in the community, even if a

water project is found to be infeasible. Due to the logistics of the trip occurring over the New Year holiday, these meetings will be scheduled in advance. The travel team received confirmation that ETAPA and the Catholic University of Cuenca both resume operations on January 2nd.

Initial Community Meeting

Goal: Introduce the travel team, the framework of EWB, and the purpose of the trip. Discuss the basic itinerary and how the community members can learn more and participate in the project.

The travel team will discuss plans for the initial community meeting with in-country community contacts so that they will be able to spread awareness about the meeting prior to the travel team arriving. This meeting will most likely be held the first weekend the travel team is in country in order to maximize attendance. At this initial community meeting, the team will begin by introducing the travel team members and a bit about their background, in efforts to begin to establish relationships and trust among all project partners. Team members will then introduce the framework of EWB nationals to the community, explaining how a typical EWB program works. This explanation will include a summary of the types of projects EWB completes, the typical process an EWB project follows (including the 3 types of trips), and what is expected of the community members in such a collaboration. The purpose of this first assessment trip in Conchan will then be discussed, with the goals of what is anticipated to be accomplished clearly outlined. The travel team will then emphasize that this trip is an assessment trip only, and that they are looking for as much information as possible across multiple engineering disciplines to determine a feasible project for the EWB-USA WPI chapter.

For this meeting the entire travel team, including all mentors, will be present to ensure that the best possible relationships and first impressions can be formed. By introducing everyone at one time, the community can identify the team who will be working with them, and will hopefully be more comfortable when the team is working in the community throughout the week. This will also maximize the number of Spanish speakers present, allowing for more efficient initial communications and understanding of community responses.

Key Points to Address:

1. Introduce EWB members traveling
2. Thank and congratulate community for work filling out 501 application, establishing initial communications with the travel team
3. Describe the EWB framework and how a typical EWB project runs
4. Define the purpose of this trip, including a brief overview of the itinerary and what they can expect to directly affect them, explain No-Go Criteria and how the structure of the trip was designed to identify any possible feasibility problems
5. Identify the club's expectations of the community members in the project, including their 5% financial commitment and labor contributions
6. Answer any questions and address any concerns from community members

Final Community Meeting

Goal: Summarize what was accomplished during the trip. Thank the community for their help and hospitality. Identify what the next steps for the club will be in regards to the program. Set clear goals for future communication with the community and the chapter.

In the final community meeting, the team will discuss what was completed during the trip, reviewing all pertinent and appropriate data and information gathered. Any major changes or breakthroughs that directly impact the community should be announced, and the successes along with challenges should be shared for transparency and trust among all project partners. The team will then restate the goals of the club and the trip, ensuring the community fully understands that the club will be considering the feasibility of a number of development projects, and that the club has not committed to a water project at this point.

The team will then shift the conversation to the next steps that EWB-USA WPI will be taking upon return of the travel team to the US, and what communication from the club they can expect in the future. Any water flow data collection or shallow well digging tasks to be performed by the community over the following months will be outlined and confirmed by the travel team. The importance for continued data collection will be emphasized so that EWB-USA WPI has a large amount of water data available to make the most informed decision regarding the feasibility of a water project. It should be made clear that if a water project is deemed infeasible for the chapter, the club is willing to address another developmental problem in the community, and will attempt to find another organization to aid the community if this too is improbable. The travel team will also mention that other potential projects are optional and the community does not have to commit to a partnership with EWB-USA WPI if providing water is unfeasible. The travel team will express that they are looking forward to working collaboratively with the community. To conclude the meeting the team will address any final questions and concerns, thank the community for their help, and say final goodbyes. The whole travel team will again be present in the final community meeting.

Key Points to Address
1. State what tasks were completed and what information was gathered
2. Reiterate the goals of the club and the current program
3. Inform the community what the next steps of the club will be
4. Set expectations for what the community can expect next in regards to the project
5. Thank the community and answer final questions

Community Leadership Meeting

Goal: Establish project baselines. Clearly identify intentions of assessing the feasibility of both a water project and potential other development projects. Communicating No-Go criteria and chapter limitations. Ensure the leadership understands that if EWB-USA WPI cannot help them, the chapter will work to find another chapter/group which can.

In this meeting the team plans to introduce EWB and how the organization itself and EWB-USA WPI operates. It is important to let the leaders first give an introduction including who they are, what their position is in the community, and give their perception of the water challenges in Conchan. The team members should then have similar introductions to establish quality relationships and first impressions. The travel team will communicate the trip intent of a holistic evaluation of the program in addition to the more focused assessment of the proposed water project. The team should communicate the No-Go criteria for the community project and the technical restrictions given by our chapter. It is important that the community leadership understands the technical limitations of our chapter and the physical limitations of obtaining water in the region. Thus, it is important to open the discussion about other potential projects that EWB-USA WPI can conduct in the community.

Next the chapter's previous project will be described and how Guatemala's community leadership participated will be outlined. This will begin discussion of what Conchan's leadership team expects their role to be in the program, as well as what the chapter expects of them. Both the community leadership as well as the travel team will outline their expectations for the project to mitigate early miscommunication and establish the foundation for a productive relationship. Finally, an overview of the trip should be given, with an emphasis on what the club needs from the leadership team in order to be successful. Any tasks that require community members' participation should be laid out, and any additional collaborations and or meetings should be planned.

Key Points to Address:

1. Introduce the EWB framework, the EWB WPI chapter, and the individual team members
2. Establish expectations with regards to the project for both the leadership team as well as the club
3. Communicate club limitations and describe the possible scenarios that would make this project and/or partnership infeasible
4. Review the itinerary of the trip and request any resources required (including manpower) that the leaders could provide

Meeting with End the Cycle of Poverty (NGO)

Goal: Communicate criteria for project feasibility. Discuss and outline roles envisioned by ECP for future in project. Clearly define project objectives/chapter capabilities and intentions. Continue development of club relationship with Suzanne (ECP director).

Throughout the trip, meetings will be held with the project NGO to update them on our technical and social work within the community. These meetings will both help the travel team process and identify the most important information collected every few days, as well as help strengthen the relationship between the travel team and ECP. A final meeting will be held with ECP to discuss the accomplishments of the trip and the anticipated next steps for the program. During this meeting, the travel team will discuss the future role of ECP in the project. ECP has been instrumental in helping establish communication between the chapter and the community in addition to providing the travel team with logistical support. EWB-USA WPI holds weekly Skype calls with ECP to provide updates on project work and to get data from the community. The meetings with ECP during the trip will serve the same purpose as the travel team works directly with the community.

The travel team intends to have a number of these meetings throughout the trip, with ideally as many members from the travel team present as possible. The club's current point contact at the ECP speaks English, and therefore makes these meetings valuable to the entirety of the travel team. These collaborations will serve as an excellent way to keep the travel team up to date on the accomplishments of the club, as well as a way to develop more relationships and connections at our NGO. While the travel team intends to have these direct meetings and conversations with ECP, they hope to have Suzanne and other members of ECP at community meetings.

Key Points to Address:

1. Regular updates on progress made both socially and technically throughout the trip
2. Establish how ECP envisions themselves contributing to the program both in the immediate future and more long-term

3. Identify what was accomplished at the conclusion of the trip, along with the expected next steps for the project

Meeting with ETAPA (Regional Utilities and Water Provider)

Goal: Create valuable contacts in an organization that has a large wealth of technical resources and information. Gain information about rainwater data, any water-related limitations in Conchan and the general area of El Valle. Discuss the possibility of getting access to a water quality lab.

One of the key meetings of the trip will include meeting with the primary utilities and water provider in the region; "Epresa de Telecomunicaciones, Agua Potable, Alcantarillado y saneamiento de Cuenca" or ETAPA. This organization previously evaluated the feasibility of connecting Conchan to their water system, but deemed it too expensive (>$100,000). At this meeting EWB-USA WPI wishes to create valuable contacts in an organization that specifically works on water projects in the region and knows the technical requirements and limitations. EWB-USA WPI hopes to discuss the availability of annual rainwater data, common water contamination issues in the region of El Valle, and any other potential obstacles they foresee the chapter experiencing based on their prior work in the region. In addition, the travel team hopes to identify possible laboratories in Cuenca which can be used for water sample testing in the future, and believes that ETAPA, as a water provider, may be to able offer recommendations. The travel team will additionally inquire about other known engineering problems they have identified in the region, both in the regards to water projects and other developmental projects, in order to seek out other options if our current community's projects are deemed unfeasible for our chapter.

Key Points:

1. Introduce team members
2. Describe what EWB is and the framework the club works in
3. Introduce the community the team is working with and the conditions the team is facing
4. Understand technical challenges related to conducting a water project in the area (soil information, typical water contaminants, watershed information etc.)
5. Inquire about rainfall data and ask about any known water quality labs in the area
6. Ask about any other possible developmental projects in this region

Meeting with Catholic University of Cuenca

Goal: Establish collaboration with university members to share resources. Determine if use of their facilities would be possible or helpful for future trips. Attempt to find someone with knowledge about the 2014 study and its proposed system.

In 2014, a student at the Catholic University of Cuenca completed an analysis of the current water situation in Conchan and designed a new system to provide more water to the community. This study included a number of maps and technical water flow data as well as other general community information. EWB-USA WPI has verified the community maps created by the study and have discovered a number of limitations of the proposed water distribution system. Community members have told EWB-USA WPI that the student who completed the study is no longer in Ecuador, but the team hopes to identify a professor or other collaborator who participated in or understands more about the study. The travel team has not yet found a contact at the University, but is continuing to reach out to possible contacts, university professors, through the WPI Project Center and ECP.

Additionally, EWB-USA WPI hopes to determine whether the University has a water quality testing lab which they could use to test samples. The meeting will help build a relationship with faculty of the university to gauge their willingness to allow us to share resources. It is important to meet with professors from the engineering department whose personal research interests match up with the project.

Key Points to Address:

1. Discuss the 2014 study with emphasis on how data was collected and the proposed costs were determined
2. Seek connections to laboratory access for future water quality sampling testing
3. Establish a number of university contacts, with an emphasis on engineering faculty who would be willing to contribute to the project.
4. Offer to connect University with WPI Project Center in Cuenca or share any project data that we might collect with University.

Meetings with Other NGOs

Goals: Widen network of contacts in and around Cuenca. Determine if another NGO would be willing to partner with EWB-USA WPI on project for greater support (possible future monitoring, future money/supply handling etc.)

While ECP has been critical in establishing connections with the community, providing information to establish initial assessment plans, and creating relationships within Cuenca, they have voiced concerns that they may not be suitable to fully support a large scale technical EWB-USA project. Some of this concern comes from the large time requirement acting as a liaison between the community and EWB-USA WPI, in addition to the large amount of materials that may need to be ordered and organized if the project moves to the implementation phase.

Worcester Polytechnic Institute has a global project center based in Cuenca, Ecuador in which EWB-USA WPI has worked with, and will continue to work with, to establish more relationships with potential NGOs that may be a better suited partner for the implementation phase of the project. Additionally, our current NGO is working to come up with a list of possible NGOs in the community that might be able and willing to fill this role. Once this list of NGOs is finalized, the travel team will come up with a list of meeting notes and questions for interested organizations. Because of the Christmas-New Year holiday at the time of our trip, the travel team will be cognizant of people's vacations and schedule the meetings when representatives of the NGOs are available. The travel team will have at least one Spanish speaker at these meetings in order to ensure an efficient and productive meeting.

Key Points to Address:

1. Identify what local work each potential NGO currently performs
2. Determine if each organization has an interest in contributing to our project and in what capacity
3. Collect the contact information from these newly acquired contacts in order to allow for future communication

Meeting with Municipal Government (GAD)

Goals: Find contacts/build relationship within the larger government of El Valle. Establish continued municipal support of development projects in the region.

When Conchan's application for a program was accepted, the president of the municipality of El Valle joined a community member from Conchan and the project NGO on a Skype with the chapter to show his support for the program. The travel team plans to meet with President Paute in person to continue this positive relationship and gain any support from the municipality. GAD might also be helpful in providing information about water availability, distribution, and consumption in the larger surrounding district of El Valle. The municipality might also be able to provide a list of contacts for other possible program partners in the region or know of organizations which would be valuable as a resource for the travel team. The travel team plans to have as many representatives of EWB-USA WPI as possible to show respect for President Paute and the municipal government.

Key Points to Address:

1. Reconnect with President Paute and thank him for his initial communications and support
2. Identify in what capacity the municipal government, if at all, would like to contribute and be kept up to date on the project
3. Request any other contacts or possible program partners they believe may be helpful

Meeting with Neighboring Community Leadership (Tazion)

Goal: Make our presence in Conchan transparent to others in the area and communicate our intentions. Determine other communities' experiences with getting water from spring. Determine how drawing water from spring might affect their water usage. Learn about well dug in neighboring community, how much water they get/what problems they have encountered.

During previous Skype calls with ECP in preparation for the trip, EWB-USA WPI learned that a neighboring community to Conchan dug a well and is using that as a source for water. The travel team hopes to secure a meeting with this community to ask about the process they used to choose the spot for the well, how they dug the well, how they are extracting water from the well, if there is a sufficient quantity of water in the well to support the full community, and any other problems they faced regarding their well. This meeting will provide insight into problems the chapter may have digging a well near Conchan and other considerations that would help the chapter assess the general feasibility of pulling groundwater for everyday use. This meeting will require at least one Spanish speaker and the REIC. The travel team will likely need to be accompanied by a member of Conchan.

Key Points to Address:

1. Introduce the travel team, EWB's framework, and what work EWB-USAWPI will be doing in Conchan
2. Determine to what extent Tazion uses the communal spring and gauge their impact that our project will have upon them
3. Discuss how they acquire water in their community, particularly during the dry season
4. Inquire about the well that they are currently using for water, including the drawn water's, quality and quantity.

Focus Groups

Focus groups will predominantly be used to collect social data and gain insight into community dynamics. Additionally, focus groups will provide a way for travel team members to establish relationships with individuals in the community and improve communication with a larger number of community members. There will be 3 focus groups composed of women, 2 focus groups of men, and a focus group/program for

children in the community. Questions will be specifically designed for each of these demographics and will inform the travel team of general community relationships and their way of life. In the focus groups, questions regarding water, community infrastructure, energy and electricity, sanitation, and technology will be used to gauge general interest in development projects related to areas besides water. Assessing general community needs with focus groups will enable the chapter to develop new ideas for other potential projects in the community if the water project is determined to be infeasible. By observing the dynamics of the focus groups, the travel team can also best determine how to work in the community and how their presence may impact the community. This insight will be valuable for any project carried out in the program.

Methodology

Focus groups will be conducted with groups of women, men, and children to begin to build relationships and develop a deeper understanding of the community. These focus groups will last about two hours each and will be facilitated by at least one Spanish speaker from the travel team. Gathering specific, personal information from community members is not the top priority, but specific questions will be used to try to build a full picture of the community through different perspectives provided by each of the three demographics. The goal is to facilitate a discussion between the travel team and community members. The men and women's focus groups will be asked questions which are similar in topic but may be phrased or tailored to be appropriate for the experiences of the group. The specific topics that the groups will cover include water, community infrastructure, community institution, sanitation, technology and the project framework and expectations. The children's focus group maintains the same goal of learning more about the community as a whole, but will not be conducted as a discussion. Instead, the focus group will be centered on activities which are related to their experiences with the topics outlined above. This activity-based program will help to engage the children and build relationships with them. During the most recent monitoring and evaluation trip to Guatemala, EWB-USA WPI conducted a children's session in which the children drew pictures of the sources in which they get water from as well as created a brief skit to explain how they clean the tank. These activities were enjoyable for the children and also provided the chapter with valuable information about how the project has impacted the lives of the children and how much they have learned from it. Below is a list of the focus group topics and the main discussion points that will be addressed.

Discussion Points by Topic

Water: Each individual family has a different living situation regarding water access, quantity and use. Due to this difference, there will be focus groups in order to hear more specifically about a family's personal relationship with the local water problem. This will include talking about how water is retrieved, any differences in water access or retrieval during the wet and dry seasons, along with who is involved in each step of the process. Additionally, groups will discuss how water is used in the community. The travel team will also talk about whether the community stores water in preparation for the dry season and the amount of space they currently have available for storing water. Groups will discuss any methods the community has tried in the past such as rainwater harvesting and/or digging wells.

Community Institutions: Identify how the community meetings and mingas, (collaborative working sessions), run and gather basic information about the majority of the community. Observations will focus on the level of participation of each community member in these meetings, and questions will address the level of education and the average length that each community member has lived in the area. Groups will also discuss what the land tenure is like in the community and the relationship between Conchan and the rest of El Valle. The role of the church and religion in the community will also be determined.

Sanitation: Ask about current sanitation practices that already exist (whether related to water, cooking, personal hygiene, etc.). Additionally, ask about how they think sanitation could be improved, both on an individual family basis and as a community.

Technology: Determine what type and levels of technology are commonly available in the community. Identify what level of internet access community members have, what they typically use the internet for, and where they go if internet is not available to them. Determine approximate percentage of the community that has access to cell phones and what is included in this access. Ask about basic services such as electricity and other forms of communication and their general reliability and cost.

Project Framework: Due to the fact that this community has never worked with an EWB chapter before, it is crucial to know what their opinions are of the project process and what their expectations are for the project moving forward. Understanding their views and opinions about the project and project framework is imperative because the community members' collaboration, enthusiasm, and communication with us is critical for the success of any project within this program. Any misunderstandings or uninformed expectations should be addressed as soon as possible, which can only happen if the club is aware of these concerns from the community.

3.0 Schedule of Tasks

The proposed itinerary for the trip is outlined in the attached document 5, "Gantt Chart". The team understands that since this is an assessment trip, there will likely be unforeseen delays and other tasks which will come up during the trip. For this reason, the Gantt Chart is considered a loose itinerary, and there are some flexible blocks of time. The itinerary was developed with the assumption that the travel team will work in two groups. Each group will have one Spanish-speaking student to facilitate communication with local contacts and one. In attached document 6, "Prioritized List of Trip Tasks", the tasks from the itinerary are listed in order of priority on the trip. Priority 1 are the tasks most important to complete on this assessment. The justification for the rankings is also included. The travel team prioritized many of the data collection tasks related to water which will aid in determining the feasibility of a water project, as the community has repeatedly expressed their desire for a water project. Tasks to identify other potential projects were also identified.

4.0 Go/No Go Decision

Events or concerns that may arise which would prevent the chapter from carrying out the project were identified and separated into five categories: safety, geographical, technical, financial, and social considerations. Regarding the safety of the travel team, any serious health or safety risks experienced during the first trip (i.e., altitude sickness), US DOS travel warnings, or university restrictions on travel would prevent the chapter from taking on the project. As Ecuador is a seismically active area, the chapter decided that they would re-evaluate the need for and the feasibility of a project within the community if an earthquake or other natural disaster were to occur in the area of the community.

While the scope of the assessment trip is broad to assess all potential projects, since the community members have shown the most interest in a water project, there is the potential that if a water project is not feasible, the community may not want any other project. As a result EWB-USA WPI has focused some of the No-Go criteria on the technical and financial feasibility of a water project. If the No-Go criteria fails in the water project feasibility category, EWB-USA WPI will inform the community that the water project is

not feasible and determine if there is another project the community would be interested in. Current concerns with the feasibility of a water project is that there is not enough water physically available around the community to create a sustainable distribution system, especially when taking into consideration the impact of water sources available to the surrounding communities. If there is physically not enough water in the area, the project will be defined as unfeasible. The chapter deemed that if the cost of obtaining water is deemed too high for the number of people it would serve, they will be unable to complete the project. This is also the case if the engineering required to obtain water for the community is deemed outside of the technical capabilities of the chapter. High levels of contaminants that could not be purified or water that EPA would classify as brownfield would also prevent the chapter from carrying out the project.

Social considerations were also examined to determine the feasibility of projects in the community. Community support is essential for the success of a project, thus if community members are unwilling to work with the chapter, provide the 5% monetary contribution, or contribute in-kind labor, the chapter cannot carry out any type of project within El Cisne de Conchan. Additionally, if an extensive amount of time passes where the chapter cannot find an NGO that is willing or able to provide the in-country supported needed, the project will be closed.

All No-Go criteria and methods of evaluating project barriers to success are outlined in the "No-Go Criteria Chart" that can be found in attached document 7. Many of the No-Go criteria discussed are defined in the most extreme cases, before the chapter determines that the project is infeasible based upon the above criteria, there will be many discussions held with the project NGO and the community to ensure that all involved parties understand the reasoning for the decision and that all steps have been made to mitigate the situation.

List of Attachments

1, 2-Monthly Reports (2)
3-Baseline of technical capacity
4-Flow Measurement Instructions
5-Gantt Chart
6-Priority List
7-Go/No Go Criteria Chart

Attached Document 1: Monthly Report 1

Month/Year: July, August 2016
Community: Conchan
President: Evelyn Grainger
Vice President: Karen Orton
Project Lead: N/A
PMEL Lead: N/A

Recent Communications regarding the Project

- Skype with Suzanne July 30th
  - Evelyn and Karen
  - discussed the current water layout for Conchan and set up communication
- Facebook communication with Fernando late July & August
  - Karen is working on this communication with few responses from Fernando

Social Updates/Changes within the Community

- Fernando is currently our only contact in the community. Suzanne would like all contact to be through Fernando unless it is in regard to trip preparations
- Communication with Fernando has been very limited and Karen is leading those conversations over Facebook
- Fernando found pdf maps from the previous study completed by a university student in 2014. The maps include topography, water sources, community map with household names, soil types. EWB is beginning to work with them

Technical Updates/Changes within the Community

- The community has implemented a 2500L blue tank to change the water pressure that is making water go primarily to 2 houses, the blue tank then connects by hoses to a brick tank. The tank is supposed to control the amount of water going to those houses before going to the main storage and distribution source. The tank was $350+ and was reported to be purchased by the entire community. It was implemented through a Minga (community collaboration session).
- Calculations were completed that prove that the tank implemented by community members has a high possibility of popping out of the buried hole that it is in based on buoyant forces
- The hoses are plastic and cannot be increased by diameter without changing to PVC. They are glued together by melting the tube and putting a tacky tape material around it
- Instructions were sent down to the community to take measurements of the water flow in the community. They have reportedly created a system of people who are taking them every Sunday. No results have been sent from the community yet.
- The water source distance from community has been disputed. Suzanne has never seen the source because Fernando won't take her there. Some conversations have the source 3 hours by walking while others report it much closer
- Initial look into Rainfall data shows that rainwater harvesting may not be a viable technical solution

- The May 2014 report from the university student collected water flow data in March, one of the rainier seasons of Ecuador. The quantity of water reported by flow does not seem to be large enough to sustain a 40 family community suggesting a different water source may need to be found.

NGO

- Suzanne is acting as the in country NGO. She has been very supportive in travel arrangements and helping establish communication with the community.

Upcoming Plan

- Technical/Social
    - Work to improve communication with Fernando and find additional person for communication
    - Soil analysis and translation based on pdf document
    - Get results from water flow tests and begin understanding the quantity of water we have to work with at the source
    - Determine methods of mapping the community beyond what we already have
    - Research into additional ngo that may be closer related to our project--Kerry looking into public health related NGO (Ayuda en Accion)
    - Review the 2014 university report to determine what other information we have to work with
    - Develop water quality testing plan

Important Deadlines Approaching

- Pre-assessment report due 8 weeks prior to traveling

Attached Document 2: Monthly Report 2

Month/Year: September
Community: El Cisne de Conchan
Project Lead: Kerry Muenchow
PMEL Lead: Alana Sher
President: Evelyn Grainger
Vice President: Karen Orton

Recent Communications regarding the Project:

- Weekly Skype calls with Suzanne for 1 hour
    - 9/2: discussed role of End the Cycle in project and community communication issues
        - We have talked about outlining what we will need from an NGO for a more in depth conversation in country once we have met in person
    - 9/16: learned community water updates, ETAPA location and role of End the Cycle
        - There is an ETAPA office in El Valle, near the community
    - 9/23: discussed trip logistics, community demographics, and communication issues

Social Updates/Changes within the Community:

- Suzanne has been trying to increase communication directly between the community members and the chapter
- Learned that there is a large economic disparity between some families in the community
    - We intend to measure this through a census evaluation when in the community
    - Using methods like poverty indexing is being discussed
- The community is very well defined in terms of who identifies as a member of Conchan (for now, we have our doubts about this changing if water is supplied to Conchan)
    - Defining this area is important as we begin to develop the project because we want to know which homes are included in the project
- The community is currently working on a minga to create a new soccer field
    - Funding for the minga is unknown

Technical Updates/Changes within the Community

- Rio Maluay at the bottom of the community has been dry for over a month, we have not received any water flow data based on the instructions previously sent. It is not clear as to whether this is because the water is not flowing or if the community is not willing to take the measurements
- Suzanne says water in Rio Maluay (when there is some) is very filthy and contains pollutants especially from animal waste
- A neighboring community to Conchan dug a well

Community Communication:

- Suzanne encouraged Fernando to delegate communication which he did, creating a project team comprised of himself; community President, Luis; and Luis' daughter.

- Karen has successfully been communicating with Adri, (Luis' daughter). We are trying to get pictures of the spigot connections in the homes, water flow tests, and general community information. We have successfully gotten pictures from her.

NGO

- Suzanne hopes that End the Cycle can help us with logistics etc. for the first trip and then we can establish a wide network of contacts to help in the future on the project
    - She is looking into planning some sort of networking event while we are in country to meet other potential support contacts in Cuenca
- Learned about NERO, a private company who did water projects in other communities in El Valle but has a very bad reputation in the area
- Club began researching and reaching out to other potential NGOs in the area

Travel Logistics

- Hostel reservations made (for students)
    - Will arrange for workspace in hostel
- Government offices closed Dec. 22-Jan. 2nd
- From draft itinerary and goals, it looks like the project will require at least 2 assessment trips
    - If membership permits, would like to look at a May trip

Club Work

- Developed No-Go criteria for how we will decide whether the project is appropriate for our chapter. This is one of the required sections of the pre-trip report.
- Created a preliminary water quality plan
- Checking accuracy of community map produced in the previous university study with Google Earth and coordinates sent from Suzanne
- Club researching and presenting on basics of different water distribution systems
- Created a list of all of the tasks that need to be accomplished on the January trip
    - In the process of organizing all of this information into an itinerary and gantt chart
- Developing focus group questions and plans for meetings that we will be having (organized by Suzanne)
- Developing daily collaborative sessions where we will work with the community members to provide them with technical information of what we are completing each day and gain any information from them about their community. These will help share technical information and involve the community members in the technical evaluation of the project if they are interested

Upcoming Plan

- Itinerary planning/discussion meeting

Important Deadlines Approaching

- EWB Nationals pre-travel form due 11/2
- Will be sent to mentors for review and comments between 10/9 and 10/24

Attached Document 3: Baseline of Community Capacity

The purpose of this document is to be a preliminary guide for the travel team to use to assess the entire community, looking at what technologies they have and which may be needed by the community. This will broaden the scope of our assessment from just water resources

Technology	Questions to Guide Assessment	Results
Electricity	-Roughly what percentage of the homes are connected to electricity? -Do electric wires look safe? -What is the functionality level of the electricity? -Is electricity affordable? -Is electricity reliable? -How dependent do community members seem on electricity? -Has the community expressed a desire for more electricity?	
Sanitation (Latrines/Septic Tanks)	-How many homes have outhouses? -Are the latrines mostly found in each individual home, or is there shared latrine for a portion of the community?	
Energy	-What are the main power sources? -Are there any energy sources besides electricity/stoves? -For homes not connected to electricity, how do they produce energy to cook etc? -What is the monetary cost associated with the energy?	
Roads	-How many roads are in the community? -Do the roads connect to all the major locations in the community (community center, church, etc.) -Are the roads in decent enough condition for automobile travel? -What are the other methods to connect homes/the community besides roads?	
Bridges	-Are there any bridges in the community? -Do they appear to be damaged or broken in any way? -Do community members rely heavily on the bridge for daily use?	
Cooking Ventilation	-Has the community complained of symptoms that could be a result of cooking ventilation issues? -Is it possible to observe any stoves or cookware in the community?	
Communication Technology	-Is there a common technology in the community? -Do most community members have a cell phone? -Is there a way to discern an approximate number of community members that have access to internet? (either data or wifi) -Is there a general interest in introducing more or new technology in the community?	
Community Structures	-Do any community structures appear to be in an unsafe state of disrepair? -What are the "community" structures?	

Attached Document 4: Flow Measurement Instructions

Dear Suzanne and Community Members of Conchan,

On behalf of EWB-USA WPI, we are excited to begin work with you on developing a new water system for the community. We would like to recommend that some data be collected that may help the future development of the project. It is our understanding that Cuenca, Ecuador is currently in the driest period of the year. During this period is when a water source is usually at its lowest yield. It would be ideal for a system design to be able to sustain the community through the dry periods.

To determine how much water the community has available, we recommend a community member or small group of community members take a weekly water measurement using the directions below. Collecting this data will give a better idea of how much water is available and help make better plans.

Instructions

The objective to measure the total quantity, or volume of water that is coming from the spring source over a fixed period of time.

The testing location should be taken before the water is split and distributed to the entire community. The large hose, before it is distributed to the smaller hoses, should be temporarily isolated from the smaller hoses and the test should be performed with the flow from the larger hose. If the large hose can not be isolated the test should be performed at all of the small hoses in the community, any place where water is leaving the source.

If it is possible, this measurement should also be taken at the large hoses of the other communities. Taking these measurements at the other communities will help us know the overall spring opposed to just the water available to Conchan.

Materials Needed:

Timer that can measure in seconds
Bucket with known volume (example, 5 gallon, 2 liter)

Step-by Step Instructions:

1. Record the date and name of the person(s) taking the test.
2. Use a large container with a known volume. Record the volume of water the bucket can hold.
3. At the large hose, disconnect the flow of water to the smaller hoses, allowing the total flow of the water source to go into the bucket. If the large water hose can not be isolated this test should be performed at all of the smaller hoses.
4. As soon as water enters the bucket start the timer. When the bucket is filled stop the timer. Record the amount of time it took to fill the bucket.
5. Repeat this test every week at the same location using the following example as a template for data collection.

Date	Person Collecting Data	Location Water Collected	Volume of Container	Time to fill bucket

Español:

Estimada Suzanne y los miembros de la Comunidad de Conchan,

A nombre de EWB-USA WPI, estamos entusiasmados para comenzar a trabajar con ustedes en el desarrollo de un nuevo sistema de agua para la comunidad. Les pedimos comenzar a recopilar algunos datos que facilitarían el desarrollo futuro del proyecto. Según lo que entendemos, en este momento Cuenca atraviesa una sequía por lo que las fuentes naturales de agua se encuentran en sus rendimientos más bajos. Sería ideal desarrollar un sistema que pueda garantizar el abastecimiento de agua durante estos periodos del año.

Para determinar con qué volumen de agua cuenta la comunidad, les pedimos que un miembro o un grupo de miembros de la comunidad tomen medidas de agua semanales utilizando el método a seguir.

Instrucciones:
El objetivo es medir el caudal, o el volumen de agua que proviene de la fuente hídrica durante un periodo de tiempo fijo. Las medidas deben realizarse en el troncal principal antes de cualquier bifurcación en este. En su caso, deben tratar de medir el agua que pasa por la manguera gruesa. Para lograr esto, es necesario aislar el troncal del resto de las mangueras más pequeñas que distribuyen el agua. En caso de esto no ser posible, se puede medir el caudal en cada pequeña manguera de distribución en la comunidad.

En lo posible, les pedimos que también realicen las mismas medidas en las mangueras troncales de las otras comunidades. Esto nos permitirá calcular los niveles de agua disponibles para la región aparte del agua disponible en Conchan.

Materiales Necesarios:
-Cronómetro
-Tambor con una capacidad conocida

Instrucciones Paso a Paso:
1. Tomar nota de la fecha y los nombres de los participantes del estudio.

2. Tomar nota de la capacidad del contenedor en el que se juntará el agua.
3. Aislar el troncal de las mangueras de distribución y comenzar a llenar el contenedor. Si no es posible aislar el troncal, entonces deben realizar las medidas en cada manguera de distribución.
4. Usando el cronómetro, medir el tiempo que toma llenar el contenedor.
5. Tomar nota de los resultados.
6. Repetir el estudio cada semana en la misma ubicación utilizando la siguiente plantilla para guiar la recolección de los datos.

Fecha	Persona Recolectando Datos	Ubicación de la recolección	Volumen del contenedor	Tiempo para llenar el contenedor

Attached Document 5: Gantt Chart

	# Spanish Speakers	31-Dec		1/1/2016 (Sat)		1/2/2017 (Sun)		1/3/2017	
		am	pm	am	pm	am	pm	am	pm
Activity									
Travel	0								
Bearings in Cuenca	0								
Cell Phones	1								
Meeting with NGO	0								
Meeting w/ Community Leadership	2								
Community Mtg	3								
Find Spring/Collect Data	0				*				
Find Rio Maluay/Collect Data	0								
Groundwater Investigation	0						*	*	*
Investigate Current System	0								
Focus groups	1								
Meetings	1								
Team Re-Evaluation^									

Color Code	
All	
Meeting time not determined	
1 spanish, 1 non spanish	
No spanish, technical	
REIC	*

^this will be a time for the team to come together collectively and ensure that the tasks outlined for the rest of the trip are appropriate with regard to the data collected thus far on the trip

1/4/2017		5-Jan		6-Jan		1/7 Sat		1/8/2016 (Sun)	
am	pm	am	pm	am	pm	am	pm	am	pm
			^^						
								*	
		*	*						
Women's	Children's Program			Women's		Women's	Men's	Men's	
ETAPA*	University	Municipality		Other NGOs		Other Communities	Other Communities		

^^ this will be used as time to look around at hardware/construction stores in Cuenca to determine general availability and quality of locally available resources

Attached Document 6: Prioritized List of Trip Tasks

Priority	Task	Justification
1	Community Meeting	-Establish initial relationship with community -Ensure understanding that this project is to assess the feasibility of a water project -Emphasize that EWB-USA WPI is also looking for other projects in the community unrelated to water
1	Baseline assessment of Community Technical Resources & Capacity	-Assess the full program -Identify other possible projects within the program -Gain a better understanding of the community environment, resources
1	Water Quantity Measurements of Main Source	-Begin collecting data to determine the feasibility of completing the community's requested water project
1	Additional Surface Water Source Exploration	-Begin collecting data to determine the feasibility of completing the community's requested water project
1	Groundwater Investigation	-Begin collecting data to determine the feasibility of completing the community's requested water project
1	Heavy Metal/Pesticide Testing	-Determine if there are contaminants that will be impossible or too difficult for chapter to treat, resulting in an infeasible water project
1	Meeting with ETAPA	-Gain insight into geology and water resources of area -Get rainfall or other technical data? -Discuss feasibility and challenges of water project
1	Frequent Meetings with NGO-Cycle of Poverty	-Establish a stronger relationship with the NGO -Determine potential limitations of project support -Establish expectations for both parties
1	Focus Groups	-Identify other possible development projects -Begin establishing relationships with the community outside of the topic of water
2	Meeting with Catholic University of Cuenca	-See if anyone is still there who was involved with the study -Get lab access? -Access to rainfall data?
2	Meeting with Leadership of Other Communities	-Understand possible challenges for water projects in area -Identify other possible methods used in region to obtain water -Communicate intent to have no negative effect on area resources -Establish transparency of our work in Conchan
2	Bacterial Water Quality Testing	-Provide baseline for water quality -Determine filtration requirements if water project is determined feasible
2	Locating/Inventorying Hardware Stores/Materials	-Important to understand the types and amount of materials available in the area
2	Meeting with GAD (municipality)	-Show respect for municipality -Gain resources for project
3	Find additional NGO partners	-Important but not as necessary for this first assessment trip
3	Identify potential expat donors	-Will become more important for the implementation phases where project costs are higher

Attached Document 7: No-Go Criteria Chart

Type	Concern	Considerations	Ideas for Mitigation	No-Go Criteria
Safety	**-US Department of State travel warning or IGSD* stops allowing students to travel to Ecuador** **-Altitude sickness/ other health risks**	-Crime rates spike significantly in Ecuador/unsafe community or area to be in -International relationship between Ecuador and USA	-Personal decision by traveling individuals similar to the zika travel decision -Work remotely -Consider risk of altitude sickness based on the first trip and IQP teams what the likelihood of students getting altitude sickness is	-If IGSD deems it unsafe to travel to Cuenca or the community at any point due to US DOS warnings or any other factors -If the team feels uncomfortable or unsafe in the community or Cuenca or if there are any threats to travelers' health and safety
Geographical	**Natural disasters ie. earthquake Mudslides/landslides**	-- IGSD opinion -- Magnitude of the disaster -- May redo the work if disaster ruins parts of the system, dependent on the phase of the project --Climate change-could become more frequent and less predictable	-- Avoid trips during months where mudslides are more likely to occur	-- IGSD travel restriction -- If disaster shifts the community needs with water no longer being a priority --If disaster changes technical feasibility of project
Technical	**There is no/not sufficient water or highly contaminated**	-Climate change considerations, general trends in water availability -Feasibility to access water supply -High level of contaminants that could not be purified or what EPA would classify as a brownfield	-Get solid numbers for financial knowledge as to how much we can afford, how much we can raise for the project, how much we spent on last project --explore other solutions; fog harvesting, rainwater harvesting	-If the cost of obtaining an amount of water is deemed too high for the number of people it would serve/the good it would do -if it is technically unfeasible to obtain sufficient water -Too difficult or costly to remove contaminants

		-If there is not enough water to meet WHO criteria, do we work to give them more than they have even though it won't be "enough"?		
	Implementing a solution is outside of club technical ability	--Based on mentor support and their ability to assess the project and know the limitation of students	--Can work to recruit students of certain backgrounds but will have to trust research and mentor input regarding our abilities as a club	--If a solution is deemed outside of the technical capabilities of the chapter
	Community gets water project from someone else	--If ETAPA wants to take on the project --If they have found another company/engineering firm	--Ewb becomes an advocate for the community and there would be oversight to make sure the whole project gets completed and the goals get met and the club would take on another project	--We should find a new project because we have achieved goals of the project
	The community or others severely disagree about water rights and usage **Cannot define the community**	--Continued conflicts or problems with the neighboring communities over land or water rights --Conchan's hostility toward other communities? -Not showing system to others -Not acting as a model community	--Reach out to other EWB chapters about the issue? --Explore other sources (fog or rain water) --Community governments work to mitigate problems with our support --Define beneficiaries from start	-If a consensus cannot be made regarding water rights issues, we cannot continue to work on this project in the area
Financial	**Cost of project is too high for the amount of water being supplied**	-Keep the project reasonably within our fundraising capabilities -Holding ourselves to a certain standard within the ability to bring water (cost/benefit analysis) -Club retention if it becomes a fundraising project	-Get solid numbers for financial knowledge as to how much we can afford, how much we can raise for the project -use connections in Cuenca to fundraise	-X amount of water per person for X cost would make it possible

Support Social Considerations	**Not received well by community** **Some in community take advantage of project**	-Majority of support (if there is a large amount of people who don't agree) -what level of community is being corrupt (government, everyone) and what type of corruption (selling system parts etc.)	-Talk with community about expectations from start -Promote community ownership of the system and support community based conflict resolution	-If the community is unwilling to work with us or individuals use it for personal gain
	Community cannot afford their 5% share of the project cost or doesn't understand EWB framework	-Do we continue if they can't afford the amount, look at different poverty levels in community -Irresponsible for us to build a system that they can't afford or understand -Sense of ownership, sense of this is their project and have investment -Demands too much/ expectations are unrealistic for our EWB chapter to obtain especially the timeframe	-try to mitigate cost while preserving technical integrity in design -continue communications about abilities, project framework and capability from project onset -make sure to avoid making claims about things we don't know (ex. Using the words potable water) -make timeline clear to community and to NGO	-Project cannot continue without community support (both financial 5% and in-kind labor) -If cannot afford 5%, try to find another organization to implement the design
	Denied by ETAPA	-If they say it is not technically feasible -If ETAPA gives us technical material that shows it is not feasible	--Balance their assessment with mentor consideration, may be area-specific knowledge that ETAPA has more technical experience with -check their considerations with our own research	-Re-evaluate the technical capabilities of the chapter with the new data or considerations
	Cannot get NGO support	--We don't find a suitable NGO --Suzanne's NGO falls through --Lose contact with NGO	--Talk with Gary, Laureen for other connections --continue to make connections in and out of country	--If X amount of time passes where we can't find a NGO willing to provide the support we need

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