



Document 522

Post-Assessment Report

Chapter: [EWB DC Professional Chapter](#)

Country: [El Salvador](#)

Community: [Santa Clara](#)

Project: [Santa Clara Project](#)

Prepared By:

[June 26, 2015](#)

ENGINEERS WITHOUT BORDERS USA
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Post-Assessment Report Part 1 – Administrative Information

1.0 Contact Information *(correspondence regarding report reviews will be sent to the listed President, Project Leads, Mentors and Faculty Advisors)*

Project Title	Name	Email	Phone	Chapter/ Organization Name
Project Lead				EWB-DC
President				EWB-DC
Mentor #1				EWB-DC
Mentor #2				GWU
Faculty Advisor (if applicable)		NA	NA	NA
Health and Safety Officer				EWB-DC
Assistant Health and Safety Officer				EWB-DC
Education Lead				EWB-DC
Community Contact				NA
Local NGO Contact				ADESCO
U.S. Check-In Contact				EWB-DC

2.0 Travel History

Dates of Travel	Assessment or Implementation	Description of Trip
8/19/06 – 8/24/06	Assessment	Data Collection and Health Assessment
6/1/06 – 8/31/06	Assessment	George Washington University graduate student data collection and public health assessment
3/22/07 – 3/26/07	Assessment	Data Verification and Community Engagement
1/6/08 – 1/13/09	Assessment	Catholic University students surveying of site and building of grey water pit
3/1/09 – 3/8/09	Assessment	Catholic University students build the foundation for the water management office

4/2009	Assessment	Public Health Team trip
1/3/10 – 1/10/10	Implementation	Meet and Greet. Kick off Project. (Tank, Distribution, Pump, Power to Pump)
5/12/10 – 5/17/10	Implementation	Review progress and make recommendations. (Tank, Distribution, Pump, Power to Pump, Greywater Disposal)
9/22/10 – 9/26/10	Implementation	Review Progress, Introduce US and El Salvador Rotary Clubs, Measure Future Distribution Phases
6/11/11 – 6/18/11	Implementation	Meet new Peace Corps volunteer (PCV) and orient him to the community and the project, assess construction of distribution system and make recommendations, perform feasibility study for using solar energy, and assess health program.
1/1/12 – 1/8/12	Implementation	Asses installation of chlorine metering pump and system, asses design of prototype grey water pit, present grey water pit design to Salvadorian Ministry of Health.
8/24/13- 8/31/13	Assessment/Monitoring	Conduct an assessment for a new clean-burning stove project and to simultaneously conduct follow-up monitoring for the existing potable water project.
5/23/15- 5/31/15	Assessment/Monitoring	Conduct an assessment and experimentation for the clean-burning stove project and to simultaneously conduct follow-up monitoring for the existing potable water project.

3.0 Travel Team

Name	E-mail	Phone	Chapter	Student or Professional
			EWB-DC	Professional
			EWB-DC	Professional
			EWB-DC	Professional
			EWB-DC	Student
			EWB-DC	Professional

4.0 Health and Safety

4.1 Incident Reports

Did any health or safety incidents occur during this trip? ___Yes ___X_No

If there were any health and safety incidents during the trip, check “Yes” and submit your completed 612 – Incident Report document as a separate attachment with this report. For further details, refer to this section in the 522 – Post-Assessment Report Instructions. If there were no incidents, check “No.”

5.0 Planning, Monitoring, Evaluation and Learning

5.1 Canceled/Non-functioning Projects

Has the status of any of this program’s past-implemented projects changed to Canceled or Non-functioning? ___Yes ___X_No

5.2 If this was the first assessment trip for the program, is the 901 – Program Plan and Baseline Study included with this report?
___Yes ___No ___X_Not the First Assessment trip

5.3 If this was not the first assessment trip for the program, is the 901B – Program Impact Monitoring Report included with this report?
___Yes ___X_No

5.4 Is the signed 902 – Project Partnership Agreement included as an appendix to this report? ___Yes ___X_No

6.0 Budget

6.1 Project Budget

	BUDGET (PRE-TRIP)	ACTUAL EXPENSES (POST-TRIP)
DIRECT COSTS		
Travel + Logistics		
Airfare (5 people at \$600 a ticket)	\$3,000	\$2,500
Food + Lodging (5 people at \$100 per person)	\$500	\$500
Other Travel Expenses (\$60 each way for airport transportation, \$120 for travel to investigate material sourcing, \$60 for incidental travel)	\$300	\$290
Sub-Total*	\$3,800	\$3,290
Labor		
In-Country Logistical Support (\$200 for translation and cultural assistance)	\$200	\$200
Local Skilled labor (\$200 for stove prototype building assistance)	\$200	\$0
Sub-Total*	\$400	\$200
EWB-USA HQ (this section is auto-calculated based on trip type)		
Program Quality Assurance/Quality Control + Infrastructure*	\$2,000	\$2,000
Less EWB-USA HQ Subsidy*	\$1,395	\$1,395
Owed by Chapter Sub-Total*	\$605	\$605
Project Materials + Equipment (itemized, as appropriate)		
Fire bricks and clay for construction of stove prototype	\$200	\$65
Sub-Total*	\$200	\$65
Misc. (details required)		
Travel/Visa Fees (5 people at \$70 per person for exit fee)	\$350	\$50
Sub-Total*	\$350	\$50
TOTAL DIRECT COST*	\$5,355	\$4,210
IN-KIND CONTRIBUTIONS		
Community In-Kind Contributions to Project Costs		
Labor		\$200
Materials		
Logistics		
Sub-Total*	\$0	\$200
TOTAL IN-KIND CONTRIBUTIONS*		

6.2 Professional Mentor Team Hours

Name(s) of Professional Mentor(s)	Pre-trip hours	During trip hours	Post-trip hours	Total Hours
	1	0	0	1
	1	0	0	1
	20	40	4	64

7.0 Project Discipline(s): Check the specific project discipline(s) addressed in this report. Check all that apply

Water Supply

- Source Development
 Water Storage
 Water Distribution
 Water Treatment
 Water Pump

Sanitation

- Latrine
 Gray Water System
 Black Water System

Structures

- Bridge
 Building

Civil Works

- Computer Service

- Roads
 Drainage
 Dams

Energy

- Fuel
 Electricity

Agriculture

- Irrigation Pump
 Irrigation Line
 Water Storage
 Soil Improvement
 Fish Farm
 Crop Processing Equipment

Information Systems

8.0 Project Location

Latitude: 13°22'36.83"N
Longitude: 88°22'55.04"W

9.0 Project Snapshot for Publicity

9.1 Problem identification (*one sentence*)

A community assessment revealed that two public health projects, a potable water system and improved cookstoves, would have a major impact in the community.

9.2 Project goal (*maximum three sentences*)

The goal of this project is two-fold. The first portion is related to the already-functioning potable water system, for which we provide technical assistance as well as organizational guidance. The second portion is the development of more efficient, cleaner-burning wood cookstoves in the community, in an effort to improve public health as well as protect the surrounding environment.

9.3 Project status (*maximum 100 words*)

The water system has been functioning well for the past five years. All bacteria tests came back negative, indicating that not only are the mechanics of the system up to par, but that the well is still uncontaminated. Following this most recent visit, a draft design of an improved cookstove has been completed and the next step will be to determine the best way to implement this design.

Post Assessment Report Part 2 – Technical Information

1.0 Executive Summary

The EWB-DC Professional Chapter, Santa Clara Program traveled to Santa Clara May 24 – May 31, 2015, to conduct an assessment for a new clean-burning stove project and to simultaneously conduct a monitoring trip for the existing potable water project. The goals of a clean stoves project would be to develop a stove design that reduces the amount of fuel (firewood) used for cooking and reduces the amount of smoke the women and children are exposed to, while meeting the cooking needs of the community. The goals of the water system were to implement a sustainable, clean drinking water system that provides running water to households throughout the community.

The trip activities included:

- Met with the ADESCO to follow-up on the community's water system and learn about future plans
- Met with the system operators to discuss best practices for operation and to deliver the operating manuals EWB-DC prepared for the community
- Met with the health promoter to discuss the status of the system
- Updated map of water system and air release valves
- Purchased local materials and assembled a pilot stove using design information gathered through preliminary testing
- Met with local school children to conduct a workshop on the differences between improved stoves and to review the scientific process
- Met with local women to conduct a workshop about different stove designs and gather additional information about their preferred design details; community women were very interested in alternative stove designs that might reduce smoke
- Conducted experiments on three different stove designs: one control, one Salvadorian design, and one made from locally-made bricks
- Met with local government/leadership to discuss the vision for financing a more permanent health promoter position

2.0 Program Background

The potable water project in Santa Clara began in 2006 with a needs assessment of the community, and since then, EWB-DC has worked with the community to implement a potable water system and a sanitation education program with health promoters that visit households and encourage good sanitation practices as well as helping with implementation of the potable water system. The potable water system was completed in 2012, and EWB-DC is now monitoring the water system and providing consultation support for the system. For example, EWB-DC conducted a technical audit of the system, inspected key system components (e.g., valves, tank, VFD), and provided operational recommendations to the community.

EWB-DC is now completing a clean-burning stoves project based on data collected on the last assessment trip in August 2013 and data gathered through pilot testing here in DC. The first assessment trip provided valuable data on current cooking practices and corroborated the

community's interest and desire for a clean-burning stoves project. This trip provided data on the performance of different locally-available stoves and how some women perceived those different stove types.

3.0 Project Description

The cooks (typically women) in Santa Clara cook over a wood-burning open fire and are exposed to great amounts of smoke throughout the day, every day of their lives. Many stoves are inside the house, or just outside the house, and the smoke is pervasive throughout the houses. Many children are also exposed to significant amounts of smoke because they are often around the house during the day. While some women say they are used to the smoke, all said they would prefer to not have so much smoke. The original needs assessment of the community revealed many cases of respiratory irritation and during this assessment trip we met two women with respiratory problems who had been ordered by a doctor not to cook.

Additionally, deforestation is seen throughout the community and the region as the population grows and because people use wood for cooking. Among the many environmental problems associated with deforestation, erosion is one consequence that the community feels as roads erode lower and lower every year and floods during the rainy season make travel in some areas impossible.

The clean-burning stoves project will introduce an alternative stove design to the community. The stove design is tailored to the preferences of the cooks and reduces the amount of fuel (wood) used as well as the women's exposure to smoke. The method of implementation used will be determined in the coming year, based on data gathered in the August 2013 trip and May 2015 trip, as well as research performed by the team. The method of implementation will include a strategy that ensures all households throughout the community have access to EWB-DC's work.

4.0 Trip Description

Four EWB-DC professionals and one student traveled to Santa Clara, El Salvador in May of 2015 to monitor the water system that was completed in 2012 and to conduct an assessment for the feasibility of implementation of a pilot improved stove design in the same community.

As part of the stoves assessment, the team utilized local materials to construct a pilot design for further implementation in the community. The team conducted two workshops for members of the community to see the design, make suggestions to improve it, and to help brainstorm ideas for implementation. Additionally, the team measured emissions of particulate matter from the pilot design and compared these emissions to those from a more traditional stove.

As part of the water system monitoring, the team conducted a technical inspection of key components of the water system, and met with the water board and operators to update current maps with new homes on the water system and air valves. The team found the water system operating well, and went over previously provided recommendations to the water board and community where technical and organizational improvements could be made. The team also

delivered an operations and maintenance manual for the system that had been developed during the time since the last community visit.

Meetings conducted with the ADESCO to check in with the community and hear about other development projects were productive. Meetings with the water committee and system operators also provided information on the system status and potential opportunities for improvements and upgrades. Additionally, the group met with the newly-elected mayor to talk about the feasibility of financing two health promoters on a full-time basis. The mayor agreed to fund at least one promoter until government funding could take over.

5.0 Data Collection And Analysis

5.1 Past Stove Projects

Approximately 17 years ago there was a Lorena stove project which ultimately failed. The stoves fell apart and people did not have the interest or capacity to maintain them, nor the capacity to purchase a new one or build another one. Comments about the stove included that they were dangerous because the wood feeder opening was too low to the ground, and that they were less desirable because wood had to be cut smaller and fed more frequently. Info gathered during this trip indicated that people liked the Lorena design but the stoves were built outside and fell apart quickly due to exposure to the elements.

5.2 Community Interest in a Stove Project with EWB

During the community workshop, many women expressed interest in the idea of improved stoves. It was apparent that people – men and women alike – agree that smoke is unpleasant, uncomfortable, and unhealthy. In fact, many community members said that they are interested in an improved stove, which would reduce the smoke that bothers their eyes and causes respiratory problems. A common constraint found during previous assessment trips is the limited amount of money that a household would be able to invest in the project. By sourcing local materials and using very limited improvements to an existing stove, we were able keep the materials cost very low for our pilot stove.

5.3 Current Stove and Cooking Method Features

- Everyone cooks with wood over an open fire
- The wood is typically a large diameter log fed into the open side of a three-sided rectangular combustion area.
- Embers in the wood are typically left burning to avoid re-starting a fire for the next meal.
- Some people also have a two-burner gas stove, which they will use to reheat items or cook small things such as eggs and coffee, but only briefly because of the high cost of propane
- The cooks use a *comal* – a large, round, clay griddle – for tortillas.
- They use a pot, like clay *olla* for soup, beans, etc.

5.4 Pilot Stove Features

- Visible smoke production was reduced, and the visible ash content of the smoke that was produced was lower.
- The stove easily accommodates use of the *comal* in addition to pots or pans.
- The stove opening is large enough that big pieces of wood can be inserted, making the feeding process less onerous.
- The stove is a good height for cooks, and less heat escapes through the outside; this keeps the sides of the stove cool and prevents children from burning themselves

5.5 Acceptability of New Water System

The majority of households in the community are active users of the water system. An estimated 10% still use their wells in addition to the water system. An estimated 40% of Santa Clara households use wells, and are not connected to a water system. A major goal of the system and its promoters is to get additional users to join. The number of users has increased since the last community visit.

We accompanied the health promoter and system operators on a technical evaluation of the system. We took bacteria samples, and all of them came back negative, indicating that the system is not contaminated and is being properly chlorinated.

Most people say they like having water all the time – for the mere convenience. Generally, people say that the water system is good and believe that the quality of the water is good also. Most people we spoke with use the system water for most purposes, often including for household animals (cows and horses) and laundry, but sometimes continue to use their household well occasionally to keep it working and prevent it from drying up – just in case.

6.0 Photo Documentation



Meeting with the local ADESCO.



Conducting an improved stoves project with local schoolchildren.



Two improved stove options being tested.



Conducting the workshop for community women.



Updating the system map with the water system operators.



Performing bacteria testing on the system water.

7.0 Lessons Learned

We came back from this trip with a number of good answers to our questions about improved stove design. We were able to solidify potential material sources for the improved stoves project, which were both local and affordable. We were also able to settle on stove dimensions that maximized heat transfer to the cooking element and added enough time and temperature to the smoke-burning process to burn off excess particulate matter.

8.0 Project Status

Assessment Continues	Design	Cancelled
	X	

9.0 Project Monitoring

9.1 Project Status Table

Project Type	Project Discipline	Date of Completion (mm/dd/yy)	Functionality (enter one range per project)			Periodic Maintenance (yes or no)	Community Capacity (yes or no)
			0-50%	50-75%	75-100%		
Water Supply	Water Storage, Water Distribution, Water Treatment, Water Pump	01/01/2012	80%			Yes	Yes

9.2 Project Functionality Indicators (Include 3 per Project Type)

Project Type	Project Functionality Indicator (select from Document 906)	Monitoring Result
Water Supply	Delivery of water to community members	System is functioning properly.
	Chlorination of water to community members	System is functioning properly.
	Sustainable business management of the system.	More users can (and will) be brought onto the system; community needs to begin saving for eventual replacement of the system. At this point the community has not effectively begun saving for future repairs.

9.3 Periodic Maintenance Indicators (Include 3 per Project Type)

Project Type	Periodic Maintenance Indicator (select from Document 906)	Monitoring Result
Water Supply	Pump functions and there are signs of routine maintenance.	Pump functions properly and appeared maintained.
	Water is adequately chlorinated.	Bacteria testing was negative.
	Adequate water pressure at randomly selected homes and absence of leaks.	No visible leaks along system. Adequate water pressure at every home where bacteria testing took place. Pump is functioning but periodic maintenance is not being done.

9.4 Community Capacity Indicators (Include 3 per Project Type)

Project Type	Community Capacity Indicator (select from Document 906)	Monitoring Result
Water Supply	A plumber is employed by the community.	The plumber who was initially trained during project implementation continues to be employed by the community.
	A pump operator is employed by the community.	The pump operator who was initially trained during project implementation continues to be employed by the community.
	The system operates properly.	Water is being delivered to member homes.

9.5 Additional Information

While the water system is not completely financially self-sufficient at this juncture, the newly-elected water board recognizes the importance of saving for eventual replacement and is looking for the best ways to do so.

10.0 Professional Mentor Assessment

10.1 Professional Mentor Name and Role

Project Co-Lead

10.2 Professional Mentor Assessment

This trip was a very successful trip, in which the team accomplished all its goals and gained key insights for the project. One key challenge since the last trip was to identify feasible, appropriate stove designs, and the team successfully achieved that in the past year and through their work during this trip. The team overcame one of the biggest barriers of design, which is involving the end user in the design process. By inviting community members to partake in their exploration of appropriate designs, the team allowed real-time feedback on designs. By identifying local materials and locally available stove, the team was able to narrow design options to appropriate, feasible designs.

One of the most challenging aspects of implementing a stove project is that it is not a community resource, but a resource that would need to be provided to every household in the community, which is approximately 350 in Santa Clara. The implementation approach will therefore be the most challenging next step facing the team. By inviting community members to take part in the stove testing, the team kick-started this implementation effort by planting the seed of improving current stove designs, so the community members can begin experimenting with alternative designs themselves, especially since one of the alternative designs shown cost less than \$5.

The water monitoring aspect of the trip was very promising because key concerns from the previous trip had been addressed, and the operators were effectively using the pump log provided more than one year ago. The water committee and operators were very receptive to and thankful for recommendations, and there is a good working relationship between EWB and the community.

10.3 Professional Mentor Affirmation

I have been actively involved in this trip preparation and accept responsibility for the course this project is taking.