

**Aqua Clara International and AMOS – Health + Hope**  
**Water Testing and Filter Supervision**  
**May 2012-November 2012**  
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AMOS – Health + Hope is a community public health clinic located in Managua, Nicaragua. Aqua Clara has had the privilege to partner with such an amazing organization. Today AMOS utilizes over 500 of our filters in rural Nicaraguan communities in which AMOS supplies public health education and services. I had the opportunity to go work with AMOS for six months this year. In my time there I was able to supervise these 500+ filters in rural Nicaragua and test the water of 20% of these filters.

AMOS serves 27 communities in rural Nicaragua, and 10 of these rural communities have Aqua Clara bio-sand filters. Every other week I would head out to live in each of these communities. For all of these trips a driver and another Nicaraguan handy man, Miguel, accompanied me. Groups of University students and volunteers of GlobeMed accompanied me for half the trips. One supervision trip was spent with the doctors and nurses of AMOS. Just about every week these doctors and nurses travel to one of the 27 communities to do health supervisions. On their week off, I had the privilege to teach them how to do water filter supervisions in one of the communities.

While in the field, we would wake up early and hike to find the filters. Some of these hikes would last all day. Once we found a filter, we made sure the filter was still working and that it was being used correctly. We had 41 questions in all that we asked each filter owner. My other job in the field was to test the water. Every rural community we went to, we collected source water, filtered water, and water from the recipient. We did this for 20% of the filters. This was a very tedious process for we wanted to test the same water. Therefore, we collected the source water at 6 pm of the first day, and then collected that same water at 6 am the next day after it had been filtered.

I then lead a microbiology lab in the field. We grew cultures to see how contaminated the source water was with e.coli and other coliforms as well as the filtered water and water from the recipient. Most of the source water was from surface water that was collected in giant tanks and then piped to the houses. This water was very cloudy and contaminated due to it passing through mud and animal dung. The villages with wells usually had cleaner water, but they were still full of e.coli.

After all this data was collected, we presented it at a community assembly at the end of the week. There we let the people know how their filters were working and reminded them of correct filter use. We would then head back to Managua where a co-worker and I entered the data the next week at the AMOS office. Several tests were ran to see correlations of filter use and cleanness of water. The goal was to have the filters rid of 85% or more of the e. coli. For the most part, this was met.

Over 500 filters were supervised and AMOS has decided that Aqua Clara bio-sand filters have been helping the health of these rural communities. I had several parents of children tell me their children are not sick any more and that diarrhea

has been eliminated. Also, several people have told me their stomachs and kidneys do not hurt anymore. AMOS will now decide whether to build more of these filters in other communities they serve.

Another thing we found from these filter supervisions was that our standard for calking the exit tube of the filters was determined not to work due to the debris from smoke in kitchens. The calk collects the debris and becomes unattached from the filter body. Most filters had slow leaks, which although was not a major problem, was making some users of the filters stop use. In the Aqua Clara lab we have determined a fix for this problem without using calk. Our future filters will be built without calk to prevent this problem. AMOS even talked about repairing the old filters with these new parts in the next year's supervisions.

**DATA:**

There was a lot of data collected with these filter supervisions. It was concluded that we collected too much data. Due to limited time, not all the filters in the communities were supervised. Making a shorter, but still specific supervision sheet was something we came up with. Eventually AMOS wants the local health promoters of each community to do these supervisions, so this is something that is very important.

**The most important data is shown below:**

Filters Built (Including Tulip Filters in One Community)	624
Filters Supervised	513
Number of Filters Functioning	577
Flow Rate Greater than 3 Minutes	128
Flow Rate Less than 1 Minutes	39
Flow Rate between 1 and 3 Minutes	220
Houses that Use Filter Daily	421
Houses that Do not Use Filter Daily	16
Houses Where the Water is Sufficient for the Family	450

Houses that Drink More Water with Filter	224
Houses Where Health is Better with Filter	440
Total Cases of Diarrhea	41

House #	Name	Source		Filter		Recipient	
		E-Coli	Total C.	E-Coli	Total C.	E-Coli	Total C.
2	Gregorio Sanchez	0	TMTC	0	0	0	50
3	Carlo Sanchez	0	TMTC	0	0	0	0
10	Ramon Ortiz	0	TMTC	0	0	0	0
11	Pedro Rodriguez	230	TMTC	0	0	0	202
25	Francisco Lira	100	TMTC	0	104	0	99
29	Augmento Morelez	6	TMTC	0	0	0	0
30	Luci Idalia	93	TMTC	0	0	0	0
31	Domingo Santana	0	TMTC	0	0	0	0
31	Julio Ceasar Sanatana	20	241	0	0	0	4
39	Cristina Cruz	10	TMTC	0	63	0	32
55	Juan Ramon Ordoñez	50	TMTC	0	0	0	0
59	Aienor Acuña	0	TMTC	0	0	0	0
62	Julio Acuña	0	TMTC	0	0	0	0
63	Petrona Morales	229	TMTC	0	0	0	243
64	Vismar Morales	184	TMTC	0	51	0	17
78	Gregorio Calderon	267	0	0	0	0	0
117	Juan Vallarier	139	TMTC	0	0	0	39
118	Jairo Vaquedano	252	TMTC	0	0	0	196
119	Victoria Guiterrez	125	TMTC	0	62	0	55
122	Paula Medez	24	350	0	0	0	0

**Water Testing Data from El Obraje (TMTC=Too many to count)**





**Dr. Laura Showing Community Members Their Water Tests**



**Trekking Through the Muddy Roads to a Rural Community**



**The Health Promoter of a Community Performing a Water Filter Supervision**



**University Students Being Lead to Homes for Early Morning Water Collection**



**Presenting Our Findings at the Community Assembly**



**AMOS Doctors Presenting Our Findings at the Community Assembly**



**AMOS Health + Hope Team**