

Final Report

The Tierra Colorada CADE Project

Presented to:

Sombrilla Refugee Support Society

Mgr. Irwin International Development Fund

June 2009



Two Grade 5 Girls Get Ready to Help Fill a Mold with Cement

Project Description: This project focused on the construction of two molds for BioSand Water Filters and the installation of two filters in the primary school in Tierra Colorada, a Canton of Quetzaltenango, Guatemala in order to combat malnutrition and health problems caused by poor drinking water in the canton. In addition, we transported eight more donated laptop computers to the school, and assessed the condition of the computers previously donated. A small amount of time was spent in continuing the English, crafts, and computer lessons begun over the previous 5 years. Furthermore, we held two parent/community meetings to discuss community needs. Parents were in agreement that the school needs additional classrooms built. They also expressed considerable interest in obtaining water filters for each household. We also searched for an agent to carry out financial and technical duties during our absence, and began the process of submitting bids for the classroom building project.

Location of project: Guatemala, Department of Quetzaltenango; Village of Tierra Colorada

Total Amount Awarded: \$7,200.00

This funding was mostly awarded by the Mgr. Irwin International Development Fund to assist with a project that will support the installation of water filters within the rural community of Tierra Colorada Baja, Quetzaltenango, Guatemala in order to combat malnutrition and health problems. Funding was directed towards purchasing and construction of two molds, infrastructure tools and other basic materials, and the consumable materials for the first two filters. The need to purchase media in square meters meant that there remains a significant amount of material available for future filters.

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NOTE: The local partner for this project has been recruited since the proposal was first submitted to the Mgr. Irwin International Development Fund on behalf of Sombrilla Refugee Support Society.

Project summary:

This project successfully completed the main components anticipated for both the BioSand Water Filter and the laptop computer aspects of the project. We also successfully held parent meetings to discuss community needs. *First*, we successfully transported the loaner mold from Antigua to Quetzaltenango. We had been informed by the lenders that they did not believe the local shuttles would transport the mold with us to our destination, so before arriving in-country, we arranged for private transportation for both us and the mold. While in-country, we discerned for ourselves that the shuttle would, in fact, transport the mold back to Antigua, which method we used for the return, making it less costly. *Second*, the construction of the two molds was successfully completed, and we were able to acquire the necessary tools and supplies, and arrange for security of the tools in a storage unit built at the school site. There was some push-back from the Grade 6 teacher, and thus we found ourselves accessing students from Grades 3, 4, and 5, in the construction of the two school filters. For this Phase 1 project, we identified a suitable workspace for construction, although this workspace would not likely work for a more extensive project wherein we hope to build several filters each week. We investigated a variety of sites, but have further work to do in this regard for the next phase. We trained the entire Grade 6 class in daily monitoring of the filters, and identified a person for monthly monitoring of the filters throughout our absence, the same person who will collect funds from the parents (see below). We recognized even before arriving in country that the prospect of moving the filters out of the school is not very feasible, and so we will monitor the student participation in and determine at a later date if it is possible to hire one of the students to maintain the filters during long vacations. *Third*, we successfully transported eight laptops, rather than

the anticipated four, as outlined in the project proposal. We evaluated the condition of previously donated laptops, and purchased five mice to replace non-functioning mice. We brought one laptop from the 2007 donations back to Edmonton for recycling, along with several mice, at the Alberta Electronic Recycling Association. This charity fixes damaged electronic equipment and donates it to needy organizations and individuals.

Fourth, two parent meetings afforded the opportunity to get input on community needs. At the first meeting, parents agreed that the water filter project would be a good targeted need for the community. At the second meeting, parents committed to pay 100Q per family over the next several months toward the construction of two new classrooms. At this meeting, two families gave their first payments toward this project. We introduced them to the agent we had selected from the nearby city of Quetzaltenango, and they seemed relieved to know that an outsider (not a member of the school staff) would be administering the collection of their funds toward the project.

Parents Signing Their Commitment



Parent Meeting



However, time constraints did not permit us to begin developing a formal proposal for the next phase, but we did discuss with the parents a general outline of how we would like to proceed, and obtained their approval to continue. A major concern that Nancy had was that those who have greater financial resources would be able to obtain their filters first, because they would be able to pay first. This problem was resolved by agreeing with the community that, although the list will be generated on a first come-first serve basis, the amount paid toward the filter will not determine where any family lands on the list. So long as individual families keep up their payments, the monthly amount paid in will not affect their position on the list. Unfortunately, the time needed to prepare for and build the filters negated the possibility of much time spent by Nancy in computer instruction, and the English classes she normally conducts, as well as the soccer program that Paul had hoped to conduct. We also deferred determining use for the T-shirts we made before the trip.

This Phase 1 aspect was expensive with the start-up costs, and although this year we identified fairly competitive prices for consumables, the gravel vendor has already informed us that his gravel pit is almost depleted; next time we may have to pay more. In addition, discussions with the school staff and other community members has convinced us that the majority of the families could not afford the full cost, or even a significant portion of the cost, over and above meeting their daily needs. However, we suggested a scheme whereby families pay monthly within their budgeting ability, and they are enthusiastic about paying a portion to obtain household filters. One member of our Canadian team hopes to do some fundraising at local schools here in Edmonton, but if this does not meet the remaining costs, we will apply for more help.

- Project Inputs/Resources

- Uncompensated work provided by school students and staff
- Funds donated by Sombrilla Refugee Support Society
- Volunteer time and effort by two Canadians
- Donated time and effort by a local engineer to make blueprints for projected classroom additions
- Donated time and effort by ARC to analyze water samples brought back to Canada

- Project Activities

• BioSand Water Filters:

The two molds were built and paid for. By March 25 2009, two filters had been installed.

The two successful filters were completed early in the project, but in addition five other attempts were made, one with the borrowed mold and four with the new molds while we discovered and addressed various problems with the molds. We believe we have conquered all these problems and expect to have better success with our own molds next year.

Delivering the New Molds to the School



The Two Completed Filters



- **Laptop Computers:** Eight laptops delivered.



- **Community Needs:** Parent meetings identified community needs and participation capabilities.



Unanticipated Purchases: The lower cost of the molds and media for the filters meant the total costs were lower than projected. This allowed us to buy each classroom their own buckets with taps for storing water. We also used some funds to repair some badly needed student desks and seats.

- **Training:** Nancy trained the staff in maintenance of the water filters, and then with her help the school staff trained the Grade 6 students. Several students from Grade 5 got experience in various tasks

involved in making the filters, which should help the project next year, since we hope some of them will still be in school.

Training the Grade 6 Class



Grade 5 Boys Mix Cement



During the project, Nancy and the school staff provided training on the following topics:

Filter construction

- Sieving and separating into various sizes piles of gravel and sand
- Mixing of cement in proper proportions
- Filling the molds, tamping down the cement mixture and hitting the molds throughout
- Washing the gravel and sand media for inside the filters

Filter maintenance

- Replenishing the filters with water, weekday and weekend needs
- Keeping the filters and especially the exit tube clean
- Maintaining water in the various classroom receptacles, maintaining cleanliness
- Adding chorine to filtered water in the first month
- Cleaning the sand in the filter as needed

General school staff training occurred throughout the project, as did filter construction until the final week, with training of the Grade 6 students in filter maintenance in the final week.

-Project Outputs.

- purchased all necessary tools and most non-consumables for present and future use
- had two molds constructed and tested
- repaired and put into use several student desks and chairs
- built two water filters for the school
- found and trained a local supervisor/monitor for the filters
- found an agent for administrative assistance with future projects
- reinforced and increased community connections
- provided eight more laptop computers for the school
- provided a CD of photographs of the project for the school's use
- bought five mice to replace non-functioning mice from previous computers donated

-Project Outcomes.

- 250 students and 10 school staff have access to clean drinking water during the school day
- 2 families each weekend have access to clean drinking water
- parents representing 60 (of a possible 80) families attended and participated in two community consultations
- students in Grades 4 through 6 have access to an additional 8 computers
- eight to ten students have better desks or chairs to use at school
- 23 Grade 6 students have functional knowledge in purifying water in the filters

- 75 students in Grades 4 and 5 have some knowledge in the construction of filters
- a local welder learned how to build molds and how to adapt them for conditions in this area
- one local agent, ten school staff, and the parents of the school-children have an over-all understanding of various future projects we hope to undertake
- 10 school staff and the parents support soliciting the government for a computer teacher

-Project Outcome Indicators.

- all students and staff did and will participate in transferring the water from the original receiving receptacle in one of the kindergartens to other classrooms
 - Grade 6 students who are on monitoring/maintenance duty each week have agreed to provide water from one filter to the mother who lives next door and will provide them with a key into the school for weekend work, and to take the water from the other filter to their homes
 - parents representing 60 families who attended and participated in two community consultations committed to paying a share toward future projects. This was done in the manner the school usually employs, i.e. non-literate parents gave their fingerprints and the school signed for them, literate parents signed for themselves. Two parents began their donations to the next project at the second parent meeting. The school has provided us with a letter explaining their needs and inability to fund their needs locally.
 - teachers have requested a letter from Nancy indicating her desire that the computers be used regularly. The school director requested both Nancy and Paul's signature on three documents listing the computer donations for the past three years.
 - we saw four desks and four of the chairs put into use when the welder brought them back.
 - Nancy quizzed the Grade 6 students daily for the last week on their duties in purifying water in the filters. Additionally, she left detailed instructions with the Grade 6 teacher. We also left three CAWST manuals in Spanish with: the Grade 6 teacher, a kindergarten teacher, and the school director.
 - the students in Grades 4 and 5 participated in various aspects of the construction of filters and demonstrated their understanding when requested to perform the same work a second time; these same students helped store the unused media for next time.
 - the welder we found was a local gold mine – he actively participated in discussions of problems and provided solutions from his many years experience in metal-working
 - local understanding of various future projects was demonstrated by questions put forward
 - the director requested our signatures on the solicitation to the government for a computer teacher. Additionally, the director informed everyone at a school assembly that he is soliciting the government to change the name of the school to reflect our volunteer work at the school.
- Finally, at the final community meeting, participants provided the following feedback:
- parents and students were very appreciative of both the water project and the anticipated classroom project.
 - parents and students were happy with the immediate results of the water project and the direct benefit their children enjoyed as a result.
 - parents stated their children enjoyed the type of training that was provided. This training attempted to focus very briefly on theoretical concepts and placed emphasis on practical methods that could be easily learned by participants. Grade 6 students themselves, though initially resistant to the training, once they realized it was work they could successfully handle, were enthusiastic about taking on the responsibility.
 - parents specifically highlighted their children's appreciation for learning how to maintain the filters, and the trust implied that they (the students) were to be responsible for this work.

Factors contributing most to the successful outcomes

There are four factors that contributed most to the successful outcomes of this project:

a. Participant Involvement: Students, staff, and parents were excited about participating in the project and as a result it was possible to reach the target of two filters. The welder told Nancy he enjoyed the

challenge of building the molds and his interest helped ensure they were completed in a short time-frame. Paul's Spanish teacher was also interested and agreed to spend much of her teaching time with him shopping for supplies. Nancy's host family also sacrificed time and energy to help with supply shopping.

b. Familiarity with Media: The familiarity that students had with sieving gravel and manual cement mixture allowed for speedy learning of this aspect, which was important given the limited amount of time available to the project team.

c. Successful Community Connection Enhancement: The many years Nancy has spent volunteering at the school, supplemented with Paul's more recent contributions made it possible to quickly earn community trust and interest in the project, and contributed effectively to enhancing connections at the community level.

d. Committed Project Team: The commitment displayed by both the Canadians and the local participants made it possible to conduct an array of activities in difficult logistical conditions and under tremendous time constraints.

Project beneficiaries/recipient involvement:

As stated in the project proposal, we held community meetings to get community buy-in to the water project and to determine future needs of the community. Although we hope to have more involvement in future plans, the short time period spent there this year meant community participation was limited in the planning aspects.

However, in the past few years Nancy has conducted one-on-one interviews with several of the mothers in the community, and the consensus from these interviews would appear to be that the mothers' main concerns for community projects at this point center on education and other improvements to their children's lives.

Regarding implementation, the Grade 4 and 5 students and various school staff were directly involved with the implementation of the water project at the school. The students in particular were responsible for assisting with all aspects of preparing consumables and building the filters. As mentioned above, the Grade 6 students were also involved in the training portion of the project.

Project sustainability

There are three main ways that this project contributes to sustainability:

1. The training that was delivered to the Grade 6 students contributes to capacity building and leadership within the benefited community. These students should be able to go on to helping with the maintenance of filters to be placed in households in later project phases.

2. The experiences of the Grade 4 and 5 students in the construction phases means they should be able to help with this more easily when we begin constructing filters for each household. In addition, each year the new Grade 6 classes will take on responsibility for the filters at the school, preparing them to teach others in the community with household filters.

3. School staff are very enthusiastic and should be able to reinforce training in our absence. This year's trial run with two filters at the school should reveal possible problems for future needs, and teachers and Grade 6 students were encouraged to get to know the manual very well so that they can resolve any first-year problems.

Major challenges

There were a number of challenges encountered throughout the duration of the project.

1. The Project Team had only constructed one filter each previous to this project, and these were constructed under ideal working conditions. This meant that in many ways we were practicing our skills at the same time as we were trying to teach them to the students.

2. The need to use Spanish with the students was a special challenge to one member, and the other member found it difficult to keep switching back and forth from English for the other team member and Spanish for the students.

3. The small space available for construction of the filters added to the stress of working with children, in a second language.
4. CAWST was not timely in answering e-mails that one member sent when we encountered construction failures. This added to that member's stress.
5. We asked the welder to adapt the drawings for the mold to make a one-piece section out of drawings that used three pieces. This led to further unanticipated adaptations that had to be made once the molds were completed. Fortunately the welder was able to help resolve these challenges.

Overseas partner

We are very happy with the quality of the agent for this project. She demonstrated a high level of commitment to the project in the short time she was brought on board, especially given the limited resources available to the project. For example, we gave her less than 24 hours notice to come to the second parent meeting, and she not only made the time, but brought along a receipt book just in case there were parents ready to start paying their donations. This was prescient, since two parents actually did so. She also was thinking forward, for example, suggesting we design a stamp for the receipts. One team member has known this woman for five years, and previously negotiated a micro-loan for her, which the recipient has diligently paid back annually.

**FINANCIAL REPORT:
Budget/Expenses for Phase 1 Project in Guatemala**

Budget/Actual TBD (to be determined)

Item/Description	In Cash	*In Kind	Total	Variance
Personnel 1. Paul Layte – 6 h/day*30 days 2. Nancy Cowle – 6 h/day* 35 days 3. Local Welder – construct 2 steel molds, includes materials 4. Person to monitor 2 filters for 1 year 5. Analysis of water samples	\$1500(\$912) \$200(TBD)	\$9000(\$7500) \$7350(\$5250) \$200(\$200)	\$18250(\$13862)	School closed 2 days we were overly optimistic in our estimates of available time. Welder cheaper in Xela than Guatemala City.
Materials 1. basic tools & materials for set-up 2. cement, gravel, consumables for filters 3. contingency (e.g. assistance with school fees for families in need)	\$1000(\$559) \$300(\$220) \$200(\$52)		\$1500(\$831)	Diligent shopping; local provider of sand & gravel very economical. Repairs to school desks & tables.
Equipment 1. 4 laptops, Nancy time to set up 2. computer repairs and replacement items 3. soccer balls, pump 4. contingency (e.g. non-wood burning stove at school)	\$50(\$30) \$50(\$10) \$400	\$2140(\$4280) \$70 (Nancy's labour)(\$140)	\$2710(\$4460)	We had the space to carry 4 extra laptops.
Training 1. CAWST Training Nov '08 (time, tuition & travel costs) 2. Layte teach welder for molds – 20 h 3. Cowle translate for above – 20 h 4. Cowle – train a monitor for filters-2h	\$1400 ¹ (\$1400)	\$2600 ² (\$2600) \$1000(\$250) \$700(\$350) \$70(\$70)	\$5770(\$4670)	Welder was very experienced; Spanish manual was a time saver.
Transportation 1. Project Administrator - Travel to and from Quetzaltenango, Guatemala 2. Project Resource - Travel to and from Quetzaltenango, Guatemala 3. Transporting loaned molds in-country 4. In-country transportation for Layte/Cowle	\$1225(\$1066) \$1225(\$1066) \$200(\$50)	\$200(\$32)	\$2850(\$2179)	Discount shopping on-line; use of hostel in Guatemala City; returned mold as equipment in shuttle at no cost..
Local administration 1. Developing 2010 Project 2. Assisting with acquisition of welding services, tools & materials 3. Blueprints for school expansion	\$150(\$42) \$100(\$20)	\$0(\$2000)	\$250(\$2062)	
Other direct project costs 1. Room and board Layte/Cowle 6 weeks 2. Print and bind 3 copies of manual (Spanish version)	\$600(\$568)	\$50(\$50)	\$650(\$618)	
TOTAL	\$7200(\$6095)	\$24780(\$22722)	\$31980(\$28682)	

Notes: 1. Tuition costs & lodgings 2. Meal costs and time.