
Water For People

Monitoring Report: Honduras 2010



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From the
World Water Corps®

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1 Abstract

1.1 Introduction

Between May 24 and May 30, 2010 the Honduras Monitoring Team visited 18 communities within the municipalities of El Negrito and San Antonio. The team consisted of four in-country staff members from Water For People (WATER FOR PEOPLE) Honduras and seven volunteers from the World Water Corps[®] (WWC). Each community monitored during the evaluation had previously benefited from WATER FOR PEOPLE provided potable water delivery systems and sanitation solutions as well as hygiene education. With the exception of a pumped groundwater system in Colonia Modelo, all communities relied on gravity-fed systems to send water to private household taps. The most common tank source was an elevated spring or lake; however, Gonzalo Maldonado used a noria pump to fill an elevated storage tank from a spring located lower than the tank. It was common for the beneficiary communities also to have received assistance with improved latrines, usually of the pour-flush variety.

1.2 Water System Hygiene

All community water storage tanks were equipped with hypochlorinators above the main reservoir. Aside from one school tap in Gonzalo Maldonado however, none of the communities monitored met the goal of 0.2 mg/L of free available chlorine concentration in the distribution grid. Many local water committees readily admitted that they replenished hypochlorinators with bleach powder every four days; Water For People recommends daily chlorine replenishment which is intended to create a much more stable and consistent level of disinfection. Many hypochlorinators were broken, possibly from solid residues blocking the pipes leading to the tank, and others seemed to be ill maintained in general.

1.3 Sanitation and Hygiene Components

Nearly all taps had soap within close proximity and most community members explained that they washed after using the latrine and before eating. The hygiene education curriculum for Honduras emphasizes hand washing after using the latrine, before cooking, before eating, and after changing babies' diapers. While not everyone was able to list all four times to wash, community members' answers coupled with observations showed that generally good hygiene was practiced within the communities. The most serious hygiene issue observed was animal activity in and around household water basins and taps. Many of these basins not only contained standing water, but algae and other debris—tadpoles in one case—as well. The risks associated with stagnant water in wash basins include bacterial growth and the potential for disease.

1.4 Water Committee Structure and Financing

The vast majority of community water committees were able to provide limited funds for the repair and maintenance of drinking water systems. Despite that, however, none were able to show financial records proving that they could fully replace the system if necessary. Less than half of the water committees interviewed weren't able to provide financial records due to the short notice nature of the monitoring inspections. The committees that did provide records were able to provide a count of tariff receipts. At least half of the committees with available records also kept track of revenue and income. Most of the observed water committees were organized into sub-committees and understood the need to obtain legal rights to their respective watersheds. Most water committee members understood their duties, but many will require retraining on record keeping and general water system maintenance.

1.5 Volunteer Recommendations

The monitoring team members had the following recommendations for the program improvement:

- Water For People: Honduras Program
 - Emphasize hypochlorinator education and maintenance. Stress the need for a water committee member or dedicated employee to monitor chlorine doses.
 - Provide each community with multiple financial record templates and copies of sound organizational methods to ensure that community records are maintained and updated. Insist that community maintain two copies of financial records in separate locations that are reconciled at regular water committee meetings.
 - Include a discussion of the health problems that may result from standing water at the household basins in all hygiene education programs.
- World Water Corps: Monitoring Process
 - Although the communities should not be given time to prepare for monitoring teams, efforts should be made to ensure a water committee member and school principal are available for interview. Financial records should also be made available for review. This may require two inspection visits: an unannounced visit to check system maintenance and interview community members followed by a second, announced visit to check financial records and conduct any necessary retraining for water committee members.
 - Increase the amount of houses interviewed in order to increase the sample size and get a better representation of the population.
 - To reduce driving time and allow more thorough evaluation of the communities, look into staying in each of the municipalities (e.g. El Negrito) for a few days in order to be closer to the surveyed areas while monitoring.

2 General Overview

2.1 Country Background (Data drawn from the CIA World Fact Book, UNICEF Statistics, and US Department of State)

Honduras is located in Central America and is bordered by Guatemala to the northwest, El Salvador to the south and southwest, and Nicaragua south and southeast (Figure 1). Honduras's 18 departments span from the Caribbean Sea in the north to the Pacific Ocean in the south and house mostly mountainous terrain in the temperate interior with narrow coastal plains and subtropical lowlands. In most parts of the country Spanish is the primary language of the people though English can be found along the coast and many Amerindian dialects are scattered throughout the rural interior. Mostly homogenous in the language as well as ethnicity, Honduras is composed of a roughly 90% Mestizo population.



**FIGURE 1 - MAP OF HONDURAS
FROM: UNITED NATIONS CARTOGRAPHIC**

With a high unemployment rate (27.8%) and an unequal distribution of income, Honduras is the second poorest country in Central America. Just under half of the 7.8 million Hondurans live in cities with the national rate of urbanization growing at 2.9% annually. Such a sudden increase in urban population without proper economic support often leads to faltering quality of life and is partially responsible for more than 65% of the country currently living below the poverty line.

Living conditions remain poor in rural areas with sanitation and access to sources of clean drinking water being of utmost concern. Only 74% of the rural population has access to improved drinking-water while that figure is nearly 95% in urban cities. Likewise, the total rural to urban population that is using improved sanitation facilities is 55% to 78%. Also, local mining activities have led to increased pollutant content of Lago de Yojoa, the country's largest freshwater resource. Even in Tegucigalpa, a more developed part of the country, water is rationed during the dry season to ensure it will last to the next rainy season.

2.2 Monitoring Overview

The team traveled to Honduras on May 23, 2010 and conducted interview training on May 24. The first step in the training process, led by Water For People Staff, was a brief about the goals and mission of the Water For People organization.

Diana Betancourt, the Central American Regional Manager, and Allan Torres, the Honduras iCountry Coordinator, both gave the team a detailed briefing about the main goals of Water For People. The team learned about the process of performing the monitoring assignment while in country, consisting of a series of surveys and observations used to track the progress of previously initiated water projects by Water For People.

The team learned that Water For People uses three surveys to track the progress of their projects. One survey is completed in a sample of households in every community and is called the Household Survey. The other survey is called the Water Committee Survey and requires the questioning of members of the Water Committee in each community. The final survey is a Public Institution survey aimed at understanding the water and sanitation conditions of schools and/or hospitals. Allan and Diana talked the group through each question from each survey, in order to prepare for questioning in the field.

The team also trained on measuring chlorine disinfectant concentrations using two Hach DR/890 portable colorimeters. WATER FOR PEOPLE-Honduras provided the team with four Global Positioning System (GPS) devices in order to geo-locate the monitored sites.

After the morning training was completed, the team traveled to Colonia San Juan, a community of 660 people located in the San Antonio municipality. The purpose of the trip to San Juan was to become comfortable with the monitoring process. Upon entering the community, the best Spanish speaker on the monitoring team located the local water committee members, preferably the water committee president, and began the water committee survey. The other monitoring team members simultaneously began work on the Household Survey by speaking

with community members at their homes. In San Juan, the group paired up into three teams, each administering six or seven surveys and taking GPS coordinates of household taps and latrines. Although chlorination levels were not measured in San Juan, in most of the other communities, water samples were taken from at least one household tap, preferably furthest from the tank. Testing water samples consisted of measuring both free available chlorine and total chlorine by using the Hach colorimeters. Upon completing the surveys, the group measured the flow rate of source water into the tank by recording the time it takes for the inflow water to fill a five gallon pale. The group visually inspected the tank and hypochlorinator. The group obtained GPS coordinates for the tank to complete the monitoring process. Finally, a group member conducted a public institution survey to a school administrator and take down location and elevation. The team followed this process in every community that they visited in order to complete the water monitoring project.

After the first community of San Juan, the monitoring team of six volunteers split up into teams of three in order to cover more ground. The teams visited 17 more communities as part of the six day water monitoring project, and collected data assessing how well communities maintained water systems and how well these systems performed. Team transportation was provided by the WATER FOR PEOPLE-Honduras staff using 4-wheel drive light trucks.

2.3 Team Composition

The following are members of the World Water Corps supporting this Honduras monitoring assessment and from the United States Military Academy (USMA):

- Diana Betancourt: Water For People Regional Coordinator
- Allan Torres: Water For People In-Country Coordinator
- Sergio Reyes: Water For People, Technical Assistant
- Maria Fernanda Tielemans: Water For People, Administrative Assistant
- James Cook: An Environmental Engineering instructor at USMA.
- Ashley Anthony: A junior at USMA, majoring in Spanish and French.
- Mark Anthony Atangan: A junior at USMA, majoring in Environmental Science.
- Francisco Barrera: A junior at USMA, majoring in Latin American Studies.
- Jake Darsey: A junior at USMA, majoring in Environmental Engineering.
- Victoria Oropeza: A senior at USMA, majoring in Middle Eastern Studies.
- Bradley Potts: A junior at USMA, majoring in Environmental Science.

3 Findings

3.1 Introduction

During the 2010 Water For People-Honduras monitoring mission, the USMA team joined four members of the in-country Water For People staff and traveled to 18 different communities within the municipalities of El Negrito and San Antonio. All of the work conducted took place in rural communities of Honduras’ northwestern highlands. Of the 18 communities visited, each had previously benefited from Water For People water delivery and sanitation projects.

3.2 Project Evaluation

Project ratings correspond to data collected for Water Committee Surveys, Public Institution Surveys, and the Household Surveys conducted in each monitored community. Ratings were narrowed to 8 categories shown in Table 1 below:

TABLE 1 – PROJECT RATING CATEGORIES

Category	Survey Instrument	Question Number
Availability of Water	H*,WC**,PI***	19,/25/33-34&41-42
Distance Between Home and Water Tap	H	20-21
Number of Users	H,WC,PI	9/19-20/22
Tariff/Financial Management	H & WC	22-23/35-46/43-52
Water System Management	WC, PI	49-72/32-36&53-55
Sanitation and Sanitation Hygiene	H & WC, PI	24-30/ 73-76/56-67
Hygiene-Hand Washing	H, PI	31-33/68-70

*Household Survey

** Water Committee Survey

***Public Institution Survey (school)

The categories above were analyzed using the results of questions answered in the household surveys (H), water committee interviews (WC), and Public Institution (PI) interviews. All interviews included multiple choice questions where each possible answer was predetermined to indicate either “optimal”, “intermediate”, or “poor” conditions. For example, when asking if the water system was out of service for more than one day in the last 30 days an answer of “yes” indicates poor system conditions, while an answer of “no” indicates optimal system conditions. Likewise, when asking if there is enough drinking water every day, “Yes” indicates optimal conditions, and “No” indicates poor conditions.

In the H, “optimal”, “intermediate” and “poor” conditions often required finding proportions of households and weighing them against predetermined percentages for the rating criteria. These percentages are listed below in the sections under which they were applied.

The same method was used to analyze the WC and PI results except instead of finding the percentage of household conditions for each question, analysis covered the entire community and public institution (in most cases the school). So the percentage of communities with optimal conditions to the question, “Is there a tariff for water use?” is found dividing the “yes” responses by total number of communities questioned.

If a question could not be answered in either the household interviews or water committee surveys, that data was said to be “insufficient”.

3.3 Project Ratings

AVAILABILITY OF WATER

Scoring Criteria

Communities were classified as optimal, intermediate, or poor. An optimal community will provide sufficient water for at least 95% of households, provide drinking water for every day of the year, and if the community has a school, it must provide at least 4 liters per child per day. An intermediate community will provide sufficient water to at least 80% of households surveyed while still providing water every day of the year, and meeting the standard for schools. A poor community will fail to either provide sufficient water for 80% of households, provide water every day of the year, or to meet the standard for schools.

Results

Of the 148 households that we interviewed, 87.2% or 129 households received sufficient water. In these terms, 11 communities were optimal, 2 intermediate, and 5 poor. Of the 17 Water Committees available to survey on the day of the visit, all claimed to have sufficient water for their communities. Schools existed in the communities of San Augustin, Batan, Pescadero, San Francisco, Colonia Guajiniquil, Gonzalo Maldonado, La Pita-Las Palmas, and Buena-Vista Calera. All communities provided drinking water every day with the exception of La Pita-Las Palmas which was repairing pipes in the distribution grid. The cumulative results for water availability across all three survey types are shown below (Figure 2).

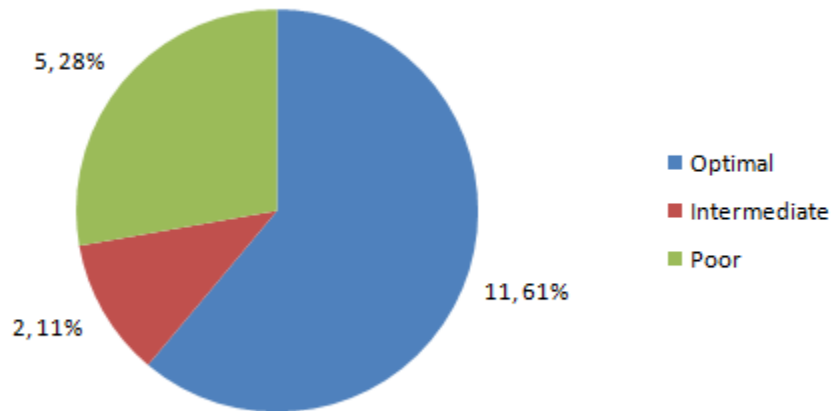


FIGURE 2 - SUMMARY OF WATER AVAILABILITY

Analysis & Discussion

On the day of monitoring, not one of the three households surveyed in El Rodeo had sufficient water because the community was installing new pipes: water availability was usually not a problem for these people. Because the response is still open to community opinion, the 100 liters/day which has become the standard for Water For People projects may suffice for some but not for others. On the day of surveying Agua Zarca, source inflow into the tank was at a standstill because the pipe leading to the tanks was clogged with sediment and vegetation that accumulated during the heavy rains. The longest time any community claimed to be without water was less than one day- this took place during the dry season from October to May. For schools, it was not possible to measure inflow, but administrators in all communities but La Pita-Las Palmas claimed that sufficient water was available.

DISTANCE TO WATER TAP

Scoring Criteria

Communities were classified as optimal or poor on the basis of whether households had a tap within the property. Honduran standards consider traveling within 100 meters for water sufficient, but Water For People wants 95% of households to have water within the family’s living space; if a community meets this standard, it is optimal, if not it is poor.

Results

All of the 148 households surveyed had water within the home property line; therefore all 18 communities are optimal in terms of distance that communitys travel for water.

Analysis & Discussion

Private water taps are recorded as being zero meters for distance traveled. This allowed all households surveyed to have an easily attainable supply of water. Close proximity of taps also decreases the potential contamination of water supply during transport.

NUMBER OF USERS

Scoring Criteria

Communities were classified as optimal, intermediate, or poor on the basis of number of users per tap and number of community members connected to the improved water system. An optimal community will meet the standards of at least 95% of people connected to the improved system. An intermediate community will not exceed the per-tap standards and will have at least 80% of community members connected. A poor community will fail to meet either the tap standards or have less than 80% of the community connected to the improved tap system.

Results

Only 16 of the 18 communitys had water committees available for interview. Because all community samples included households with private taps, 100% of the communities rated optimally for the per-tap standard. As for percentage of community members connected to the improved system, 8 communitys had over 95%, 3 communitys had between 80% and 90% connection, and 5 had less than 80% community connection. Figure 3 shows the numbers of communitys that have achieved various connection goals.

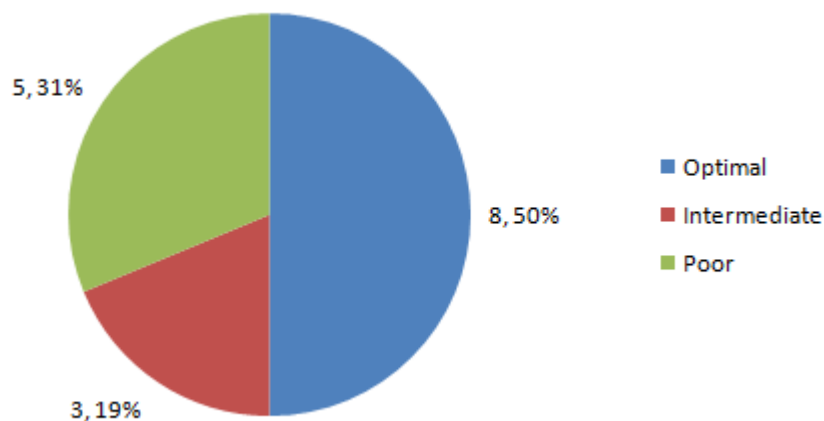


FIGURE 3 – USER CONNECTION PERCENTAGES FOR ALL COMMUNITIES

Analysis & Discussion

Values collected for connection to the improved system are estimates obtained from the Water Committee interviewees. New houses are being constructed in many communities which increases the unconnected population. Because monitoring samples did not include households without taps, water gathering methods for unconnected homes are unknown. It was not uncommon, however, for families without taps simply to share with those who did have taps.

TARIFF AND FINANCIAL MANAGEMENT

Scoring Criteria

Financial management was classified as optimal, intermediate, or poor. A community with optimal financial management had all their records in order, and a tally of both the number of households with water and of monthly payments available for the interviewer to peruse. An intermediate community had at least a record of payments and numbers of households with taps, but no record of monthly income or number of people paying the monthly tariff. A community with a poor financial management keeps no records or only knows the number of households connected to the system.

Results

All the water committee members interviewed were able to provide an accurate count of the number of households connected to each community's tank, bringing the total number of households in the 16 communities to 688. Only 9 of the 16 committees were able to show the interviewer any sort of records. 15 of 16 declared that they charge a tariff; this was consistent with the Household data. Only the San Agustin households answered that they did not pay a tariff. By adding all the total number of households in each of the record-keeping communities we concluded that there is financial information available for 221 of the 688 households. Of the 221 households, 68.77% are up to date on their payments. 7 communities had up to date records of the income for the last month, 6 had records of the income, 5 had record of the expenses, 2 had a positive income balance, 2 could cover most of the expenses with available revenue, and none could wholly replace the system. With this in mind, only one community, (Colonia Guajiniquil) required re-training for bookkeeping. Figure 4 shows the monitoring team's assessment of community financial management.

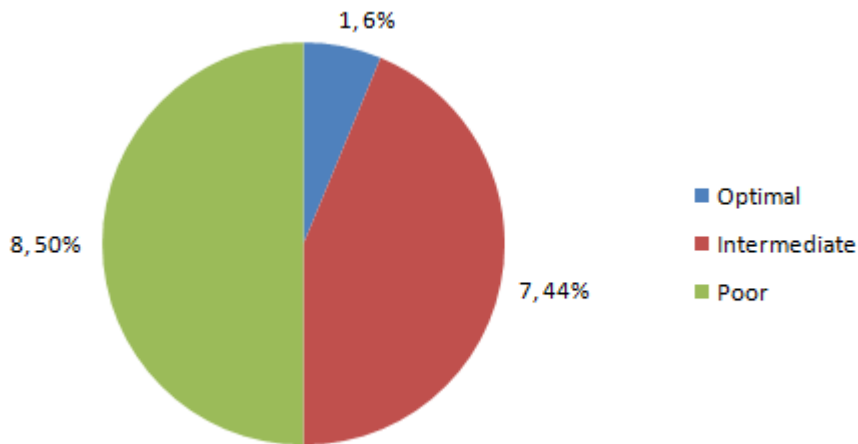


FIGURE 4 - SUMMARY OF RATINGS BASED FINANCIAL MANAGEMENT

Analysis & Discussion

Though certain committees keep receipts, they do not add up the revenue, or have no idea how much the expenses cut their revenue, or are not sure of the plumber’s salary. A great deal of the committees interviewed keep records, but could not show them to the interviewer due to the short notice. Cases such as these skew the data greatly, making it appear as if there are more cases of mismanagement than may actually exist.

WATER SYSTEM MANAGEMENT (COMMITTEE)

Scoring Criteria

Communities were classified as optimal, intermediate, or poor. An optimal community was able to show well maintained records, an active water group, and a functioning system. An intermediate community mismanaged records, inactive group members, and a semi functioning system. A poor community failed to show records, inactive group members, and a nonfunctioning system. A community that had a hypochlorinator, but was not functioning properly was an automatic poor rating.

Results

Of the community leadership that were interviewed, 75% or 12 received a poor rating, 19% or 3 received an intermediate rating, and 6% or 1 received an optimal rating. All the town communitys had functioning systems on the day of the interview with the exception of San Augustin, Los Colmenas, and Once Pinos. (Figure 5)

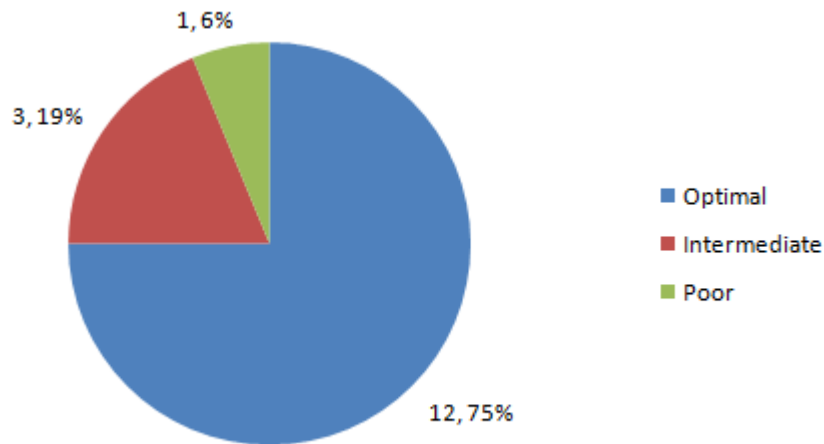


FIGURE 5 - SUMMARY OF COMMITTEE RATINGS

Analysis & Discussion

Of all the community groups, the community Planes de Italia was sub-standard in the sense that their funds were held in a plastic bag and not in a bank. Among the communities that showed records, there was no standard means of accountability when it came to finances. Each town had their own system. Even though each town had its own system, they were still able to keep track of their expenditures and income. None of the communities had enough funds to completely replace the entire system because many of the communities had only begun collecting within the past several months. The functioning of the hypochlorinator is a community responsibility and failure to maintain the hypochlorinator reflected on the committee. Once Pinos intentionally stopped using the hypochlorinator several months prior to the monitoring inspection; this was done in order to use the water for livestock and irrigation. San Augustine did not have a functioning hypochlorinator and did not have sufficient funds to replace their system. The records were not well maintained and the committee could not provide evidence of account management.

WATER SYSTEM MANAGEMENT (PUBLIC INSTITUTIONS)

Scoring Criteria

The scoring for public institution was based on several key questions on the questionnaire that reflected on the serviceability, proper functioning, and maintenance of the latrine and hand washing facility. Public institutions were categorized into poor, intermediate, and optimal. A community that was rated as optimal had well maintained facilities with proper functioning latrines. Intermediate rating schools showed facilities that lacked evidence of general maintenance. A poor rating showed an institution in much need of maintenance and lacked functional latrines.

Results

Of the eight public institutions interviewed, four (50%) scored an optimal rating. Three of the public institutions (37%) received an intermediate rating. Only one community received a poor rating in the public institution survey (Figure 6). The Bataan Community received a poor rating due to poor sanitation and upkeep of the facilities. This data may not accurately reflect the over strength of the entire Water For People program, however, because public institution surveys were completed in only 8 of 18 communities. Furthermore, some public institutions had either dismissed their students and staff or were closed for the day.

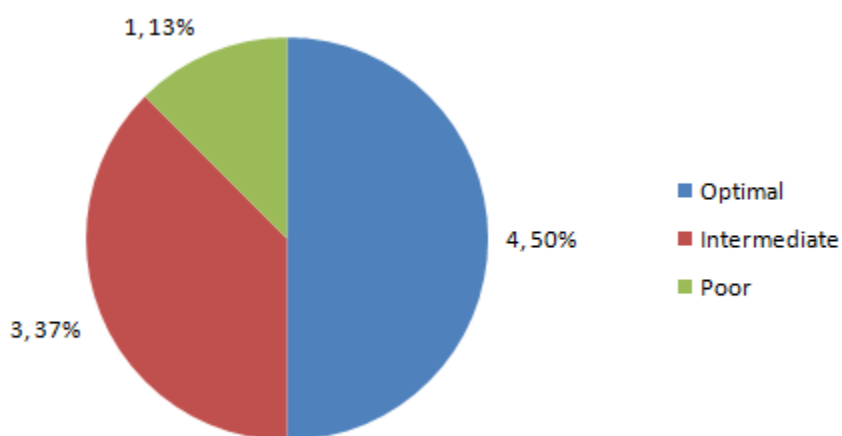


FIGURE 6 - SUMMARY OF SCHOOL WATER SYSTEM MANAGEMENT

Analysis & Discussion

All the communities using SWASH+ noticed a positive impact on sanitation education of children. Those schools that had SWASH+ showed fully functional, healthy, sanitary latrines. School children were able to properly provide hand washing and sanitary techniques. Once Pinos’s public institution was the most efficient school and showed the strongest influence of SWASH+ among all observed communities. The school that needs the greatest improvement is located in Bataan; its facilities were unsanitary and trash was often present in and around the latrines and hand washing stations.

SANITATION AND SANITATION HYGIENE

Scoring Criteria

Sanitation and sanitation hygiene ratings were calculated using the following criteria: water availability for latrines, urine and/or feces on latrine floor/walls/seat, urine and/or feces around latrine, and evidence of latrine use. Schools required at least one stall per

thirty students. An optimal community had water available for latrines, an absence of urine and/or feces in the vicinity of the latrine, and evidence of latrine use. If one of more of the criteria differed, the community received a poor rating.

Results

All schools contained at least one stall per thirty students. Based on the criteria listed above, 89% of the communitys assessed were classified as optimal and 11% of the communitys assessed were classified as poor (Figure 7). Unlike the results of other public institution parameters, this category could be observed without the presence of the local teacher or public official. Thus, all 18 of the monitored towns are included in this portion of the analysis.

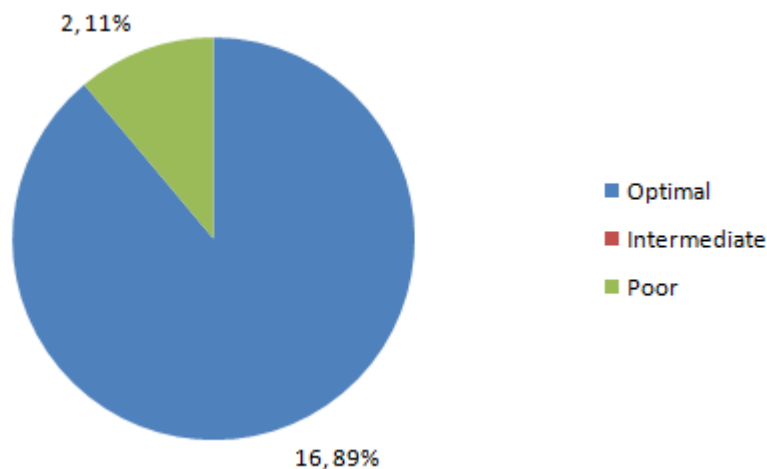


FIGURE 7 – SUMMARY OF SANITATION AND SANITATION HYGIENE

Analysis & Discussion

All communities visited used their improved latrines for urination and defecation. There was water available at each house tap for flushing improved latrines and hand washing. Out of the 18 communities visited, 2 did not meet the optimal criteria because of the presence of feces near the improved latrine. The school in Batan had only two of six operable stalls and the remaining two were very poorly kept.

HYGEINE-HAND WASHING

Scoring Criteria

Communities were classified as optimal, intermediate, or poor on the basis of water and soap availability as well as hand washing knowledge. An optimal community had water and soap available within three meters of 95% of household latrines and all school

latrines (if applicable). Also, due to hygiene education, at least 50% of households and 10% of students knew to wash hands before eating or cooking, and after using the latrine or cleaning a baby’s bottom. An intermediate rating was achieved by 80% water and soap availability but without knowledge of all appropriate hand washing times. A poor rating results from lack of soap or water in a community or school.

Results

Of the 18 communities in which the group conducted household surveys, five achieved a rating of optimal, 6 intermediate, and 7 poor (Figure 8). Of the eight schools available for survey, three were optimal including those of Colonia Guajiniquil Tribu, Gonzalo Maldonado, and La Pita-Las Palmas, while the rest were poor.

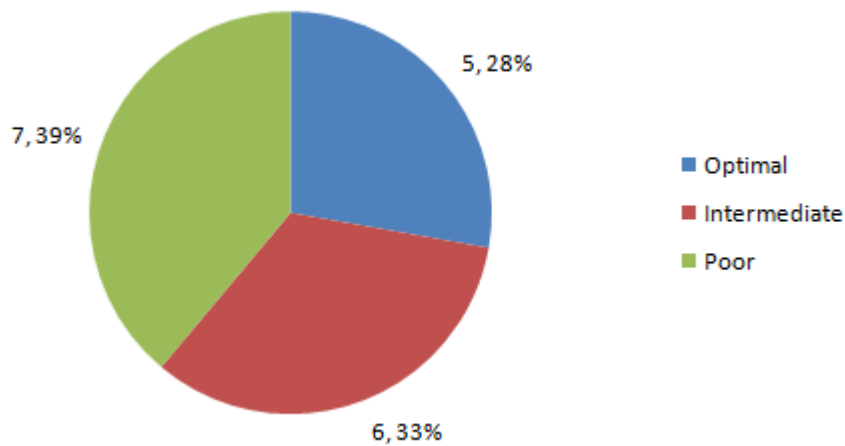


FIGURE 8 – SUMMARY OF HYGEINE-HAND WASHING

Analysis & Discussion

The most concerning find was a general lack of soap in the community of San Francisco; only 33% of houses surveyed had soap available. Responses to the question, “When do you wash your hands?” varied across all communities, but most people listed bathroom use and eating as activities which require washing. The Water For People standard for hand washing includes after using latrines, cleaning babies’ bottoms, before eating, and before cooking. Many people could not list all four times when hand washing is appropriate.

CHLORINE USE BY COMMUNITY

Scoring Criteria

The monitoring team checked each community hypochlorinator for evidence of routine maintenance and chlorine replenishment. The team also tested household taps in

certain communities for the presence of disinfectant throughout the water distribution grid. Between these two measurements, it was considered more important to find evidence of chlorination at the consumer location (household tap) than merely at the storage tank.

Results

A summary of community chlorine use at the storage tank and at household taps is given below in Table 2.

TABLE 2 – CHLORINE USE IN ALL COMMUNITIES

Community	Municipality	Chlorine in Hypochlorinator?	AVG Chlorine Concentration at Tap (mg/L)
Gonzalo Maldonado	El Negrito	Yes	0.20
Colonia San Juan	San Antonio	Yes	N/A
Pescadero	El Negrito	Yes	0.07
Guajiniquil Tribu	El Negrito	Yes	0.00
Nueva Jerusalem	El Negrito	No tank visited	N/A
Las Colmenas	San Antonio	Yes	0.02
El Rodeo	El Negrito	Yes	0.09
San Francisco	El Negrito	Yes	N/A
El Potrero	El Negrito	Yes	N/A
La Pita/Las Palmas	El Negrito	Yes	0.10
Planes De Italia	San Antonio	Yes	N/A
Once Pinos	San Antonio	Yes	0.06
Batan	San Antonio	Yes	N/A
Agua Zarca	San Antonio	Yes	0.02
Cerro Prieto II	El Negrito	Yes	0.00
San Agustin	El Negrito	Yes	N/A
Buena Vista-Calera	San Antonio	Yes	N/A
Colonia Modelo	El Negrito	Yes	0.05

N/A: No household tap chlorine measurements collected

Analysis & Discussion

Every monitored community showed evidence of chlorine disinfectants being employed at storage tanks. This is an insignificant result, however, because it does not give any indication that disinfection is actually being achieved for the water consumers. All but one tap chlorine concentration was unacceptable when compared to the Water For People-Honduras goal of 0.20 mg/l of free available chlorine. This implies that even though communities are using chlorine, they are not using enough to achieve required

disinfection levels. Those communities are placing community members at risk of consuming contaminated water.

SIGNIFICANT ISSUES

Results

A by-community summary of any significant issues observed is given below in Table 3.

TABLE 3 – SIGNIFICANT ISSUES

Community	Significant Issues in Water Distribution System
Las Colmenas	Chlorine residuals were low at household taps, animal feces and trash were present in the vicinity of many of the faucets
San Agustin	Chlorine residuals were not at an acceptable level at household taps, water basins were unsanitary, trash was around the water basins
Pescadero	New houses were built above the water tank area and were not able to have access to clean water. The community leaders clearly did not know how to manage the water system and were unaware of how to efficiently use the hypochlorinator.
San Francisco	A number of households were being constructed on top of a hill significantly above the water tank. The community leadership was unaware if those had or were planning on using an improved sanitation.
El Potrero	Because the system was recently constructed, there were no immediate problems. The community leader was knowledgeable on maintenance of the system and was able to explain how to effectively use the hypochlorinator. The records that were presented to the team were well maintained through April 2010 and showed expenditures dating back to the beginning of the project. The records also showed accountability of houses that had paid or not paid their water tariffs. There was nothing saved up because tax had just begun two months prior. Because of heavy rains the day before, the water was dirty, leading people to not drink the water for the day.
El Rodeo	The water distribution grid was being serviced that day with new pipes and expanding to new houses. The financial records show that there was a sufficient amount of funds to maintain the system, but not enough to replace the entire system. The records prove that the leadership had been keeping track of expenditures in previous years, but did not complete the

months of 2010.

Once Pinos	Once Pinos had intentionally stopped using their hypochlorinator for the season and used the drinking water for agricultural use. The rationale for this was explained that the chlorine will destroy their crops and hurt their livestock. When asked about problems with the system, the leadership expressed insufficient funds and resources. The financial records presented to the team supported this claim.
Guajiniquil Tribu	Despite chlorine being found in the hypochlorinator and dripping into the storage tank, the chlorine concentration found at the household taps was below the accepted value range.
Nueva Jerusalem	People in the town were not as educated as the other towns in regards to hygiene and sanitation. Tariffs were extremely high compared to other communities and the community's primary water committee representative did not have an active role in maintaining the system.
La Laguna	Team was unable to reach community due to heavy rains and inadequate road system. No further information is available
La Pita/Las Palmas	Hypochlorinator did not contain chlorine, families did have adequate water
Bataan	The treasurer of the community water group was unavailable, but the water committee member who doubled as the plumber interviewed showed proficiency in managing the water system and knowledgeable in maintenance. Some maintenance appeared necessary for the water tower structure because it was damaged by an earthquake last year. Professional analysis of the structure is recommended.
Agua Zarca	Chlorine was found as sediment in hypochlorinator. A filter at the water source was not working so sand and other sediments were present in the storage tank.
Buena Visa-Calera	The sand filter was not working to standard, so sediment was present in the holding tank.
Planes de Italia	Records are well maintained by the committee group and are competent in managing the system. However, retraining is necessary because the treasurer held the reserve funds in a plastic bag.
Cerro Prieto II	Chlorine was found as in the hypochlorinator, but the chlorine concentration at the household taps was low.

Gonzalo Maldonado Every family and plenty of water, and the school had an acceptable concentration of free available chlorine at the tap.

4 Observations and Recommendations from the Monitoring Team

4.1 Project Strengths

- Water availability: a sufficient source inflow to tank and tank flow to taps was apparent in all communities.
- Nearly all community members were satisfied with the water service they received.
- Every household monitored had a tap available.
- Water For People educated adults and children about the importance of personal hygiene and sanitation as a means to prevent sickness and poor health.

4.2 Project Weaknesses

- Infrequent chlorination and poor upkeep of the systems was problem in most communities. It appears that community water committees do not understand the need for regular chlorination or are unwilling to conduct regular replenishment of hypochlorinators.
- All but one tap had insufficient free available chlorine concentrations.
- Financial records were scarce, and only a few communities provided accurate or organized records.
- Not one water committee had enough funds available to replace an entire drinking water system.

4.3 Volunteer Comments and Recommendations

- Provide a template standard financial records packet to water committee and stress the importance of using the template.
- Mandate daily chlorine input into the hypochlorinator so that water chlorination levels are more stable. This will put less chlorine into the hypochlorinator at one time which can also prevent caking and blockage of the hypochlorinator
- Although communities should not be given time to prepare for monitoring teams, efforts should be made to ensure a water committee member is available to answer questions and that financial records are available for review.

- To reduce driving time and allow more thorough evaluation of the communities, look into staying in each of the municipalities for a few in order to be closer to the surveyed areas while doing the monitoring.