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Municipal Water and Sanitation Mapping in Honduras

Water For People–Honduras recently conducted a monitoring program and found that 97% of its projects supported since 1998 are still functioning (for results from the pilot monitoring trip, see http://www.waterforpeople.org/pmr_honduras.html). Data suggest that Water For People–Honduras and its part-

ners are achieving great success at the community level.

The next challenge for Water For People is to bring its successful community-level approach to scale, so that coverage at the municipal level can be increased and real progress made toward achieving Millennium Development Goal targets in Honduras. Water For People–Honduras is currently implementing a five-year strategic plan (2007–11). Its overall goal is to increase water and sanitation coverage and achieve meaningful change in hygiene behavior in three of the poorest Honduran municipalities: Chinda, Santa Bárbara; San Antonio, Cortés; and El Negrito, Yoro (Figure 1). Implicit in this goal is to strengthen the municipal governments so that they are able to plan and monitor water and sanitation projects within their areas of jurisdiction and ensure that all water and sanitation interventions are sustainable. If ambitious coverage targets are to be achieved, local governments must have the personnel and skills necessary to ensure that coordination, oversight, and planning are performed accurately and that these steps involve all stakeholders. In its role as a facilitator and capacity-builder, Water For People–Honduras is uniquely poised to support local govern-



PHOTO: KATE FOGELBERG

Water For People Water Corps volunteer Larisa Rivera takes a water quality sample from an unprotected source in San Antonio, Honduras.

ment planning efforts and bring various stakeholders, from community members to national government institutions, to the table.

WHY MAP?

A key constraint to program expansion within geographically defined areas, such as districts, municipalities, and departments, is that proper planning, based on accurate community and district level data is often lacking. Efforts to go to scale often fail for numerous reasons. Before going to scale, it is necessary to answer the following questions: How many communities have operational systems? How many systems that are considered operational need to be rehabilitated? What is the actual coverage in an area, and, based on that, what can be done over a period of five years to increase coverage in a sustainable way? How can we monitor improvements in coverage on a yearly basis in a way that is independently verifiable?

An important tool that is increasingly being used internationally to answer these questions is mapping. Mapping entails physically marking all water points (water sources, treatment locations), along with their operational status, on a global positioning system (GPS). Once all GPS points are plotted on an actual district or municipal map and analyzed, the maps become the basis for planning and monitoring. The maps provide a baseline that allows a host of players, e.g., local government, nongovernmental organizations, and donors, to understand what the current level of coverage is within a geographic boundary,

track progress, and allocate funding in a systematic manner that will ensure coverage levels over time. Plans can be developed to help a specific number of villages in year one, additional villages in year two, and so on. Fundraising is helped and financing for clearly identified communities (name, location, population, systems requirements, financial requirements, implementation plans) can be secured well in advance of the work, ensuring that program momentum is not undermined by the vagaries of funding.

HONDURAS PILOT

In March 2007, Water For People completed a mapping and needs assessment of water systems and sanitation in 141 communities within the three municipalities of Chinda, San Antonio, and El Negrito. The program included water quality analyses as well as plotting of the communities using GPS. This effort included 42 participants from Water For People—Honduras, Water For People World Water Corps volunteers (see <http://www.waterforpeople.org/volunteer.html>), Honduran university students from Universidad Tecnológica de México, technical water and sanitation staff from Servicio Autonomo de Agua y Alcantarillados (SANAA), municipal water and sanitation techni-

cians, and representatives from the Honduran Ministry of Health.

The purpose of the mapping and needs assessment was threefold.

- To collect baseline information regarding water and sanitation status within each municipality. This baseline information is needed to plan, prioritize, and monitor program work so that people are served with water and sanitation according to government regulations. This baseline informa-



PHOTO: WENDE VALENTINE

Water For People Water Corps volunteer Julie O'Neal takes a water sample in El Negrito, Honduras.

Honduras

FIGURE 1 Three municipalities mapped by Water For People for Honduran water and sanitation study



tion will be used to define existing coverage levels within each municipality and serve as a reference for future improvements.

- To provide a visual representation of the water and sanitation status at the community level within each district or municipality.
- To enable local leaders to develop an effective implementation plan to raise coverage levels in their areas of jurisdiction.

The mapping and needs assessment methodology was developed by Water For People–Denver staff and World Water Corps volunteers, with key input from Water For People–Honduras staff. It was designed to be simple, effective, replicable, and easy to use by people with a variety of skills. There are six key components of the process.

- **Community and public institution interviews.** Simple two-page questionnaires were used to assess the water source, system functionality, water quality, water quantity, sanitation, and hygiene at the community level and at public institutions, such as schools and health posts. The questionnaires were

completed in each community with members of a local water board or other leaders. At public institutions, interviews were conducted with teachers, headmasters, or other key personnel.

- **Water quality testing.** A specific, sophisticated test was conducted at each site to measure bacteriological, chemical, and physical water quality and to measure levels of heavy metals within local water supplies, as required by SANAA.
- **GPS coordinates.** Various locations in each community, including the approximate center of the community (or school and/or church) and the associated water source (tank, well, and/or spring), were identified to be used with a global information system.
- **Photos.** Digital photos documenting existing water supply systems, sanitary systems, and solid waste disposal challenges within the communities and public institutions were taken at each site.
- **Data processing:** Data from the questionnaires were entered into a spreadsheet developed by the World Water Corps team. The spreadsheet automatically scored

answers, allowing for a subjective rating system.

- **Maps.** While in the field, teams plotted results on a paper map to be left in the municipality until the digital maps were finished. Each community or public institution is represented by a colored circle, divided into quadrants. Each quadrant represents water, sanitation, hygiene, and water quality, with green showing a good situation; yellow, an intermediate one; and red, a poor one (Figure 2). Maps will be periodically updated, showing progress in the area, and a final exercise will be performed at the end of the 2007–11 period.

RESULTS: ACCURATE COVERAGE AND ACTION PLANS

The two-week exercise showed that coverage levels in two municipalities were considerably lower than existing government data suggested. Table 1 includes the official government statistics for water and sanitation by municipality. Official statistics show that coverage in the selected municipalities is below the country's averages of 80% for water and 68% for sanitation, with the exception of sanitation in El Negrito. The mapping data show that actual sanitation coverage is much lower in all three municipalities compared with government data. The true water coverage is lower in both El Negrito and San Antonio, but it is higher in Chinda. This is most likely the result of the installation of water systems by other organizations that was not coordinated with the local government. The rural/urban divide, which is not available by municipality from government statistics, shows a more nuanced picture consistent with global water supply and sanitation. Table 2 shows that even the lower coverage rates shown in Table 1 are some-

TABLE 1 Official coverage versus mapping coverage

Municipality	Government of Honduras*		Mapping	
	Water—%	Sanitation—%	Water—%	Sanitation—%
El Negrito	75	79	60†	60
San Antonio	74	55	52	42
Chinda	69	59	78	45

*Source: INE, 2001.

†Data pertain to only rural coverage; data on urban coverage are forthcoming.

TABLE 2 Rural and urban water and sanitation coverage from mapping exercise

Municipality/Country	Water		Sanitation	
	Rural—%	Urban—%	Rural—%	Urban—%
El Negrito	60		61	57
San Antonio	50	60	37	70
Chinda	74	95	37	75
Honduras*	70	90	50	88

*Source: INE, 2001.

TABLE 3 Results for fecal coliforms by municipality

Municipality	Average Fecal Coliforms 100 mL	Range of Fecal Coliforms 100 mL
El Negrito	29	0-> 200
San Antonio	67	0-> 200
Chinda	20	1-83

what skewed by higher urban coverage rates.

Rural access to water supply is lower than the national rural average in all municipalities except Chinda. Rural access to sanitation is lower than the national rural average in all municipalities except El Negrito. It should be noted that although there is a distinction between rural and urban within the municipalities, all urban areas have populations of fewer than 10,000 people, making them more similar to small towns than urban areas.

In addition, neither data set describes access in terms of safe drinking water. Coverage is measured in terms of access to a tap, not a tap producing potable water. This is consistent with the way in which global water access is assessed through the Joint Monitoring Programme and the way in which the government of Honduras measures access. Water For People-Honduras and its partners, however, were interested in analyzing water quality issues in the identified municipalities. During the

mapping exercise, samples for bacteriological, chemical, and physical water quality and levels of heavy metals were taken and processed. The most common problems encountered were high turbidity, increased color, and the presence of *Escherichia coli*. Water quality results are shown in Table 3.

However, if coverage was expanded to mean that water sources meet government standards for quantity and quality, the actual coverage rates reported here are much lower. None of the communities in Chinda and San Antonio met government water quality guidelines, meaning that coverage was essentially zero by this definition. Twelve of the 88 communities in El Negrito had measured parameters under government-defined water quality regulations.

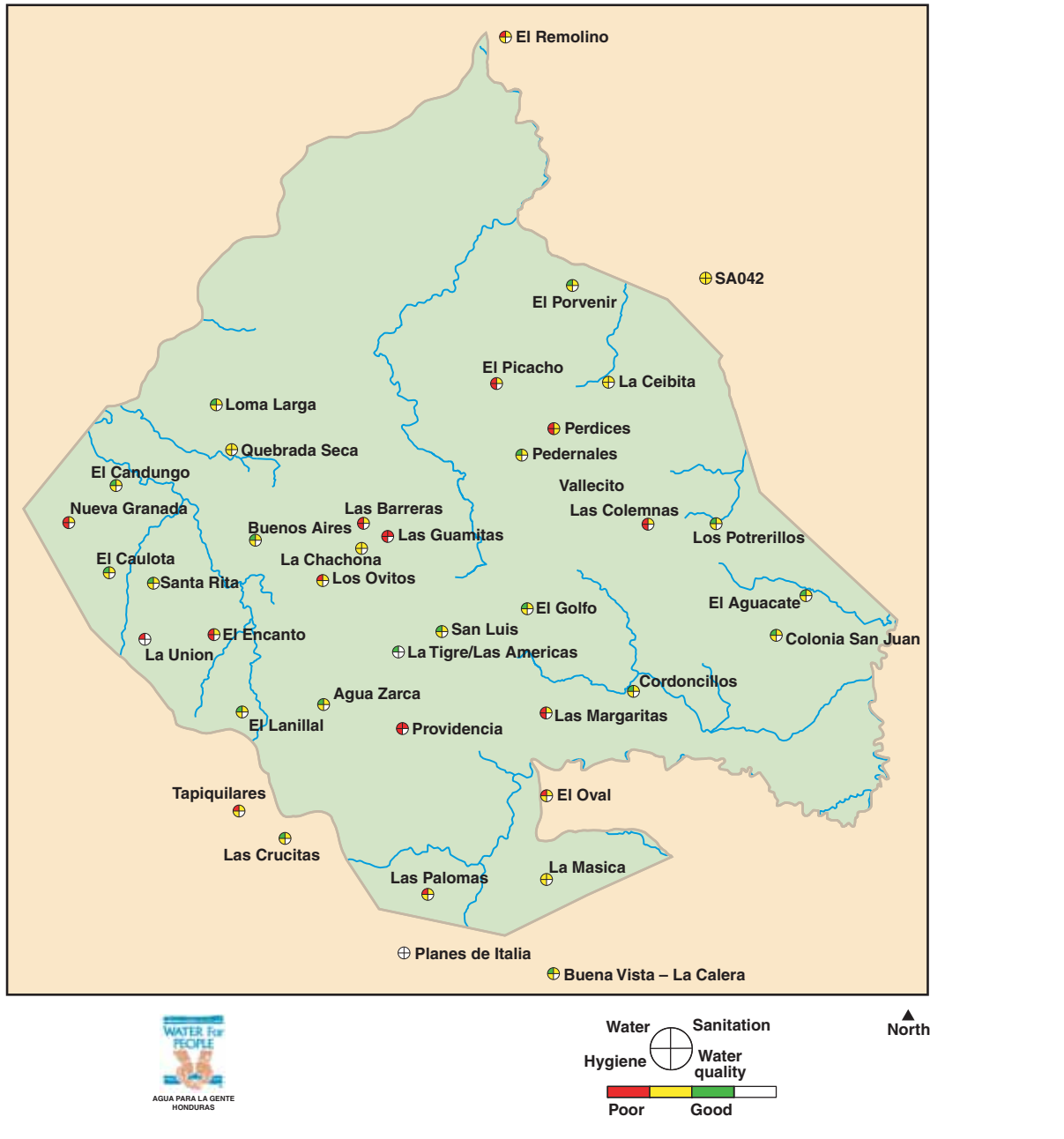
Using this data, Water For People-Honduras and its partners can plan and prioritize their work for 2008-11. The mapping exercise has provided actual data that create the conditions for a more transparent planning process that can, if well managed, avoid issues of favoritism and patronage.

Through a participatory planning process among key players and Water For People-Honduras, communities will be prioritized as follows:

- communities that have never had a water system;
- communities with less than 50% coverage (i.e., more than half of the community members do not have access to the system in operation within their community);
- communities with water systems that are older than 20 years and in poor condition; and
- communities that have more than 50% coverage but are lacking sanitation.

It was agreed that all water system interventions will include san-

FIGURE 2 Example of final output map of San Antonio, Honduras



itation. Other criteria identified by the participating communities to help with planning and prioritizing include:

- communities must have at least 15 houses;
- communities must have an available and adequate water source;

- members of water committees must either be a member of the local association of water boards or be willing to join;
- a tariff policy that is sufficient to cover ongoing costs, including chlorination, must be developed and implemented;

- clear desire to be trained in system operations and maintenance, financial management, and hygiene education must be shown;
- management of the micro-watershed must be taken into consideration; and

- cash contributions must be made from households when water systems are rehabilitated.

MORE THAN MAPS—THE EFFECT OF THE EXERCISE

In addition to accurate data and visual representation via maps, the mapping exercise had several other results that were not immediately anticipated when the program was designed. Demand for services, leveraged funding, and entire community participatory planning have been direct results of the Honduras mapping pilot.

Demand generation. One of the most remote communities visited, El Remolino, San Antonio de Cortés, had dire water and sanitation situations. The community is situated on a bank high above the polluted Ulua River, which is the primary source of water for El Remolino's 200 residents. The municipal technician remarked that no one from the municipality had visited El Remolino in 15 years because it is so remote—2 hours by foot from the main road. Within a week of the visit from the mapping team, a woman from the community traveled to the municipality and was requesting water for her community.

Leveraged funding. The maps and data collected provide an excellent fund-raising tool in addition to a planning tool. Municipal needs are easily seen and work can be prioritized. Because of the work done in the field and the excellent information that has resulted from this work, Water For People–Honduras and the municipality of Chinda were able to leverage additional funds from another organization to execute a project in El Cablotal, a community that was not even recognized by the municipality despite being located within it. The people from El Cablotal are now “on the map” and have been prioritized this year for water and sanitation.

Participatory municipal planning. An initial planning meeting for 2007–11 was held last year in San Antonio and included approximately half of the leaders from communities within the municipality. At that meeting, communities that were literally not known to the municipality when this initial planning process was undertaken were identified. To address this problem, a second planning exercise was held in August 2007 with full representation of all 44 communities. The purpose of the planning meeting was to discuss the results of the mapping exercise, highlight progress made in 2007, and plan for 2008. Never before had all of the communities participated in a municipal plan for water and sanitation services. Members from water boards and other leaders prioritized communities for 2008 and, using the maps and results from the mapping exercises, prioritized the communities with nonexistent or very poor water coverage (marked in red on the maps). The collective voice of the communities was heard, and there is evidence that participatory community planning can be scaled up to participatory municipal planning with tools such as mapping.

REFERENCE

INE (Instituto Nacionalde Estadística), 2001. National Census. Honduras.

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FUTURE AWWA EVENTS

Information about the following events is available from AWWA, 6666 W. Quincy Ave., Denver, CO 80235. For information regarding registration, housing, or exhibits for the following events, visit AWWA's website at www.awwa.org, or call 1-800-926-7337. For program information, call Susan Gunzer at 303-347-6210.

ACE08

Atlanta, Georgia
June 8–12, 2008

ACE09

San Diego, California
June 14–18, 2009

ACE10

Chicago, Illinois
June 20–24, 2010

SPECIALTY CONFERENCES

Customer Service Conference & Exposition

Detroit, Michigan
March 30–April 2, 2008

AWWA/WEF Information Management & Technology Conference & Exposition (IMTech)

Detroit, Michigan
March 30–April 2, 2008

Water Security Congress

Cincinnati, Ohio
April 6–8, 2008

DSS: Distribution Systems Symposium Conference & Exposition

Austin, Texas
September 21–24, 2008

Water Quality Technology Conference & Exposition (WQTC)

Cincinnati, Ohio
November 16–20, 2008