Filling the knowledge gap: Monitoring post-construction water and sanitation sustainability

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While progress is being made towards MDG 7, emerging research is documenting disturbing failure rates of water and sanitation systems around the world. One step in the right direction to documenting and understanding the challenges of sustainability – defined simply as continuing to function and be used over time – would be post-construction monitoring of functionality and use of systems. Although frequently recommended for the success of sustainable development efforts, post-construction monitoring activities have not been prioritized by international development organizations. This paper describes the post-construction monitoring programme of one international non-governmental organization, Water For People; how it is done, what has been learned, and what programmatic and strategic changes it has produced.

Keywords: monitoring, sustainability, water, sanitation

THE MOST RECENT STATISTICS from the Joint Monitoring Programme state that 884 million people are without access to safe water and that 2.5 billion do not have a private place to take care of their sanitary needs (WHO, 2008). Two million people per year, most of them children who do not live to see their fifth birthday, succumb to one of the more than 25 diseases caused by inadequate access to water and sanitation (ibid). Economic and environmental impacts of poor access to water and sanitation thwart the fight against poverty and worsen many already fragile environments.

On the positive side of the spectrum, the potential benefits of water supply and sanitation improvements have also been well-documented:

- Countries benefit from water and sanitation interventions at the rate of US$3–34 per dollar invested, depending on the place and type of investment (SIWI, 2005).
- Health outcomes, especially diarrhoea, can be improved by 15–36 per cent depending on the type of intervention (Esrey et al., 1991).

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Statistics cited less often are the numbers of 'no longer served'

Emerging statistics are cited less often than the global quantities of the 'withouts'; nevertheless, the numbers of 'no longer served' are quite disturbing. Approximately 50,000 rural water points in sub-Saharan Africa are broken and $215–360 m of investment wasted because of poor programming and careless implementation (Skinner, 2009). The *average* rate of non-functionality in 21 sub-Saharan African countries is 36 per cent, which translates to lost investment of $1.2 to $1.5 bn over the last 20 years (IRC, 2009). In order to come remotely close to meeting the Millennium Development Goal (MDG) 7, of 'Halving, by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation', not only do all of the new water points and toilets need to be functioning by 2015, but the existing ones do, too. A concrete example from Mozambique highlights the need for all current facilities to keep functioning: 22 per cent of hand pumps in the northern part of the country are broken, but if they were operational, the MDGs in Mozambique would have already been met (Wash Cost, 2009).

New water points and toilets are needed by 2015, but existing ones must be functional too

One step in the right direction to documenting and understanding the challenges of sustainability – defined simply as continuing to function and be used over time – would be post-construction monitoring of functionality and use of systems (Cairncross and Feacham, 1993; DFID, 1998; Carter et al., 1999; Lockwood, 2002). Although frequently recommended for the success of sustainable development efforts, post-construction monitoring activities have not been prioritized by international development organizations (WHO/UNICEF, 2000; UNESCO, 2006; Hunter et al., 2009; Winpenny, 2009). This paper describes Water For People's post-construction monitoring programme: how it is done, what has been learned and what changes it has produced.

Water For People background

Water For People is an international non-governmental development organization based in Denver, Colorado, and currently active in 11 countries in Latin America, Africa and Asia. The organization supports the establishment of community water and sanitation facilities and hygiene promotion activities through local government, civil society and private sector partners to fulfil its mission of 'helping people in developing countries improve their quality of life by supporting the development of locally sustainable drinking water resources, sanitation facilities, and hygiene education programs'.

Working in partnerships is a cornerstone of Water For People's work overseas

Water For People's scale of work is at the municipality or district level, which is similar in size to a county in the United States and encompasses anywhere from ten to hundreds of communities. Working in partnerships is a cornerstone of Water For People's work overseas.

The philosophy behind partnering to bring communities water, sanitation and hygiene services is twofold: 1) by working in partnership, resources can be pooled and collectively more people are reached with these basic services; and 2) long-term sustainability of services depends on the skills and resources of a variety of local actors – communities, local governments, local civil society and the local private sector – who need to have the capacity and relationships to sustain work after the external agency has departed.

Water For People did not have a systematic method of collecting data on work it supported

Historically, Water For People did not have a systematic method of collecting data on work it supported. Throughout the years, lots of anecdotal, qualitative information had been collected about the impact of its work through programmatic supervision visits from headquarters staff and irregular donor tours to the work sites, but the organization, like many in the sector, could not speak to the sustainability of its work with quantitative confidence, nor could it draw from lessons learned in the years after the photos have been taken and the inauguration of boreholes completed.

Monitoring in the water and sanitation sector

At the global level, the largest water and sanitation monitoring programme – the World Health Organization (WHO) and UNICEF Joint Monitoring Programme (JMP) – documents the status of water supply and sanitation from a range of country data sets and tries to develop a picture of sector progress towards MDG 7. The JMP uses proxy indicators based on technology (for example, type of facility) to assess whether or not people are using improved water and sanitation sources. The recent inclusion of water and sanitation ladders in JMP monitoring addresses the quality of water and sanitation services, but the data do not show how the served revert to being 'unserved' when systems fail, or how programming can be improved to ensure that those who have become served, stay served.

JMP data do not show how the served revert to being 'unserved' when systems fail

Much of the information-gathering in the sector – whether by public, private or civil society – is referred to as 'monitoring', but there are important differences between the different activities:

- *Project/process monitoring*. Measuring progress during the implementation phase, ensuring that planned activities are completed. A very common activity and usually required by the funding agency.
- *Surveillance/water quality monitoring*. Routine, independent monitoring of the water supply from a public health standpoint (Howard, 2002). Consistent and accurate water quality monitoring is notoriously weak in rural areas and a challenge in many urban areas.

- *Impact monitoring/evaluation*. Data collection to determine whether the programme goals of changing a particular measure (health, time-savings, attendance, etc.) have been reached. Impact evaluations are time-consuming, expensive and not every programme merits one (DFID, 1998; World Bank, 2006).

While they are all important and necessary, none of these monitoring activities looks explicitly at whether or not systems continue to function and be used once implementation has ended. Nor do they systematically document what works and what does not to improve future programming. Yet, often the most interesting learning occurs once implementing agencies have pulled out (and moved on to a new programme). The 'intermediate' space between construction of facilities and the impact of those facilities is an important, but neglected area of learning (Cairncross and Feacham, 1993; DFID 1998; Carter et al., 1999).

The 'intermediate' space between construction and the impact of facilities needs investigation

Constraints to post-construction monitoring are many. Some of the most common include:

- *Finance*. Who will pay for long-term monitoring? Most water and sanitation interventions follow a short-term project cycle with external finance provided for a specific time period. There is typically not much consideration for learning past a 'final evaluation', which may take place anywhere between 1 and 24 months after a project. However, often the most interesting learning happens later, once external agencies have fully withdrawn.
- *Time*. What is the opportunity cost of spending time looking at 'old' projects versus implementing new ones or searching for finance for new interventions?
- *Human resources*. Organizations have to allocate scarce resources; do they invest in people just to monitor and evaluate work? Or does this finance go to new work?
- *Cumbersome methodologies that are not replicable*. The danger of monitoring and evaluation is to create methodologies that are essentially 'overdone' and not of particular relevance to fieldworkers. The point is not to spend months analysing statistical significance, but to make rapid decisions on how to change programming or replicate successes.
- *Unwillingness to admit weakness*. In a world of competition for scarce finance, most organizations would rather highlight their successes than face the programmatic and publicity aspects of their challenges.

Most organizations would rather highlight their successes

- *Prioritization of new projects*. Infrastructure projects are always going to be more attractive than training or learning agendas to typical donors and implementing institutions – governmental and non-governmental alike.

Health outcomes are certainly not achievable if water systems fail, or latrines are not used

Health is frequently the impetus for investing in water and sanitation, and perhaps the one impact that the sector knows quite a bit about (World Bank, 2006). The health benefits of improved water supply, sanitation and hygiene have been documented elsewhere (Esrey et al., 1991; Clasen and Cairncross, 2004; Fewtrell et al., 2005; Pruss-Usten et al., 2008). But health outcomes are certainly not achievable if water systems fail, or latrines are not used, suggesting that gathering information on the functionality and use of systems is at least as important as spending scarce resources on complex health studies. DFID (1998, p. 76) in fact argues that 'Better results come from observing practical outcomes such as the use and maintenance status of facilities, or improvements in hygiene practice' than from attempting to rigorously study health impacts. Health impact studies are rife with methodological challenges; organizations involved in water supply and sanitation must decide whether to allocate funds towards more people drinking safe water and defecating in toilets or towards trying to show, perhaps inconclusively, that approximately 30 per cent of people get less diarrhoea under a given set of circumstances.

Water For People's sustainability monitoring fills a needed gap in the water and sanitation sector and builds on sector leader recommendations by focusing on post-construction sustainability challenges (Cairncross and Feacham, 1993; Carter et al., 1999; Lockwood, 2002; Breslin, 2009; Hunter et al., 2009). Lessons learned from the JMP are that too many indicators will only serve to 'bottleneck the frequency of monitoring progress of trends' (UNESCO, 2006, p. 226). Keeping it simple ensures that it keeps happening.

Methodology

Monitoring is the continuous and systematic assessment of progress against set targets

Defined as 'the continuous and systematic annual assessment of progress against set targets designed to improve performance', monitoring at Water For People is not meant to replace project process monitoring, surveillance or impact evaluations. Because Water For People works in a range of countries around the world that use a variety of water and sanitation systems, it required a methodology that encompassed core water and sanitation principles, common across countries. This methodology would provide relevant information so that Water For People could compare successes and challenges across communities, districts/municipalities and countries.

A team of Water For People staff and partners have designed a transparent, independent, replicable, annual monitoring process of past water, sanitation and hygiene work that successfully addresses the aforementioned constraints. Some of the key aspects of the process include the following:

- *Web-based and transparent.* Results, positive and negative, are being posted on the Water For People website. Photos, site-specific results, summary data of strengths and weaknesses, and a GIS map (forthcoming) are displayed (http://www.waterforpeople.org/site/PageServer?pagename=Int_Monitoring, accessed 4 May 2010).
- *Independent.* The process is designed to be run by World Water Corps® volunteers from North America and in-country. This allows for independent verification of the results, keeps costs down as volunteers pay their own expenses, allows Water For People to keep its staff small, and allows technical experts to assist Water For People and its partners to improve their work in the field.
- *Replicable.* The purpose of this exercise is not months of analysis, but timely programmatic decisions that improve fieldwork. The simplicity of the system allows for a variety of volunteers from North America and other countries to participate in the exercise on an annual basis. The methodology has been used to look at arsenic filters on hand pumps in India and gravity-fed systems in Honduras and is designed to be applicable in any country, allowing Water For People to compare across countries.

The purpose is not months of analysis, but timely programmatic decisions that improve fieldwork

Monitoring is scheduled during the dry season, when water systems are most stressed

The monitoring exercise is scheduled during the dry season in all countries, when water systems are under the most stress, because the organization is most interested in seeing whether water systems are able to meet needs year round. A typical two-week exercise has proved to be sufficient to visit a sample of approximately 30 per cent of past work within a given region.

A manual has been developed that provides the team leader with all of the necessary materials needed to train volunteers, partners and staff. All materials have been translated into local languages where necessary. Volunteers are expected to speak at least the official language of the country: French, Spanish or English. Where indigenous languages dominate, local translators are used. The methodology continues to be refined each year with lessons learned from past experience, but the basic components have not changed:

- interviews with users and managers of the system;
- observations of water and sanitation facilities;
- documentary photos;
- GPS coordinates;
- web-viewing of results.

All of this work is done by World Water Corps® volunteers, in cooperation with Water For People in-country staff and local government and non-governmental partners. In some countries, local university students are also key members of the monitoring teams. While the

external volunteers provide an objective perspective, share the costs of the exercise and bring technical expertise to Water For People's staff and partners, the involvement of all local stakeholders is key to the success of the exercise. As mentioned earlier, Water For People is an indirect implementer, and spends a considerable amount of time training local governmental and non-governmental partners. The monitoring exercise is designed to create a culture of learning, whereby all participants begin to value a systematic learning process and to lose their fear of possible challenges uncovered by monitoring.

The monitoring exercise is designed to create a culture of learning

The methodology includes visiting a sample of at least 30 per cent of past work supported by Water For People. In communities with household taps, skip patterns are developed to ensure a more representative sample within the community. The entire team meets with someone from the water committee or local leadership to explain the purpose of the visit, and then the group splits into two. One group interviews the committee, views financial records, conducts a sanitary survey at the source, and takes a GPS reading. The other group concurrently talks to users and takes photos of individual taps and sanitation facilities, if applicable. Table 1 lists the specific topics monitored by project type: 10 categories are monitored for water interventions; two categories for sanitation interventions; and three categories for hygiene interventions. Each category is measured by at least one question or observation, and several categories include multiple questions and/or observations. While there are country-specific issues, such as arsenic in India, the core indicators are the same across countries. Thus, the organization can compare financial management or water quantity from Malawi to Bolivia. Country-specific regulations are respected. For example, in the case of water quantity, the question that is evaluated is 'does the water system meet government standards in terms of water quantity?' which can be compared across

The methodology includes visiting a sample of at least 30 per cent of past work

Table 1. Factors monitored annually by type of intervention

Water	*Sanitation*	*Hygiene*
Availability of water	Use	Handwashing knowledge
Use	Hygienic maintenance	Presence of water and soap
Management		Environmental hygiene
Financial management		
Operations and maintenance		
User satisfaction		
Standards of distance and numbers		
Sanitary site survey		
Water quantity		
Water quality		

countries. 'How much water does the system produce' does not allow for such comparability.

Data is entered and analysed by the World Water Corps volunteers, keeping the analysis independent of Water For People. Composite indicators for each area (water, sanitation and hygiene) include all of the factors in Table 1 to give a general idea of whether the system (or behaviour, in the case of handwashing) is at an optimal, intermediate or poor level. The data entered on the instruments are processed into a numeric score ranging from 0.0 to 2.0. This score is then transformed into one of three scores: 1.50 to 2.0 (optimal); 0.51 to 1.49 (intermediate); or 0.0 to 0.50 (poor). Individual factors (availability of water, management, source hygiene, etc.) are similarly ranked, so that trends can be identified.

Standardized reporting format provides summary and detailed data findings for each indicator

A standardized reporting format provides summary and detailed data findings for each indicator, a GIS map of site visits, and photos that exemplify both positive and negative aspects encountered.

A similar exercise is conducted at schools, whereby both users and managers are interviewed, facilities are observed, and photos and GPS readings are taken.

Data is entered into Excel spreadsheets throughout the two-week exercise, which allows team members to participate in an initial discussion of results and brainstorming activity on how to use the results to replicate successes or improve challenging aspects. A review board external to Water For People reviews the findings and provides quality control before the results are posted on the website.

An external review board reviews the findings and provides quality control

The average financial cost to the organization is approximately $3,000 per two week trip, which covers all logistics (transportation and meals) for the team. World Water Corps volunteers, who provide the independence in the process, cover their own international travel, lodging and any other costs. In terms of time, it 'costs' the organization two weeks per year to conduct the activity, with a bit of pre-planning time as well (although the latter has greatly diminished as countries have become familiar with the planning needed).

The monitoring process is a dynamic one; modifications have been made over the years and continue to be made to decrease inefficiencies, data entry errors and turn-around time. Improvements coming in the near future include more rigorous training, electronic data collection and improved web-presentation of results.

Results and discussion

This paper covers data through 2009, in which 14 separate trips have taken place in five countries (see Table 2). A wealth of information has been generated through these exercises and it is beyond the scope of

Table 2. Years and locations of monitoring exercise

Country	*2006*	*2007*	*2008*	*2009*
Honduras	X	X	X	X
Guatemala			X X (conducted twice)	X
Bolivia		X	*Cancelled due to political unrest	X
India		X	X	
Malawi		X	X	X

this paper to present all of the results in detail. Rather, this paper will show what can be done with the results: from comparing global summary data, global specific data and country specific data to strategic redirection of the organization.

Global summary data

Four years of data in five countries showed 30 water systems were broken, stolen or had dried up

A global summary is a useful way to view the data. Using four years of data in five countries, 30 water systems were broken, stolen or had dried up; water flowed from 625 taps and pumps in Africa, India and Latin America. Defining sustainability very simply, as others argue that the sector should (i.e. the presence of water during an unplanned site visit) translates to a 95 per cent 'sustainability' rate (Carter et al., 1999); something to be celebrated in a sector where increasing data is showing how *unsustainable* past efforts have been (Breslin, 2009; IRC, 2009; Skinner, 2009; WashCost, 2009).

Global specific indicator data

Too often organizations are not willing or able to reveal the challenges they face

While the previous results are impressive, the point of monitoring is not just to document and share positive results. In fact, more can often be learned by what is not working well. Too often organizations are not willing or able to face and reveal the challenges they face in providing water supply and sanitation in developing countries. Water For People measures financial management by whether or not a tariff system exists, the availability of financial records, whether or not income and expenditure can be reconciled and if the bank balance is sufficient to cover repairs. Indeed, financial management is one of the weakest sustainability factors that the monitoring has uncovered.

As Figure 1 suggests, financial management performance varies across countries, with the majority (71 per cent) of India's sites at the optimal level, while the majority of Guatemalan sites (68 per cent) are at the intermediate level.

Different strategies are emerging in each country to tackle these problems

Different strategies are emerging in each country to tackle these problems. One of the modifications to the Malawi programme is asking communities to contribute cash up-front for their system. While important for participation, community in-kind contributions do

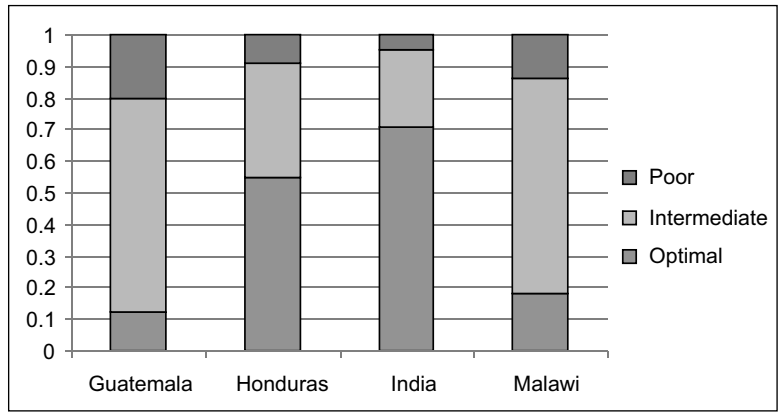

Figure 1. Financial management rating per country

not readily translate into the ability to purchase spares when systems break. Changing the dynamic to up-front contributions will lead to real discussions about what types of technologies can realistically be financially sustained. The communities supported by Water For People-India, which have demonstrated a relatively high level of performance of financial management, are in the midst of rebuilding most of their financial records and training, as Cyclone Aila tore through many of the regions where Water For People works and much of this information was destroyed. Several countries are beginning to experiment with private operators, in both rural and urban settings. It will be interesting to see whether the resultant changes in service provision from community committees to the local private sector have any effect on financial management.

Financial management is definitely an area that needs to be improved upon and Water For People hypothesizes that, with more appropriate payment schedules (perhaps tied to the seasons, for example after a harvest), improved training and ongoing support, these figures will change over time to show more communities operating at a high level of financial management.

Country-specific data

Before the first monitoring exercise in Honduras in 2006, Water For People–Honduras-supported water systems included a standardized drip hypo-chlorinator built on to storage tanks. There was an assumption that this particular type of technology was well-suited to the rural communities where it was being implemented, and that people were using and maintaining the systems. The data showed quite the opposite to be true (Figure 2).

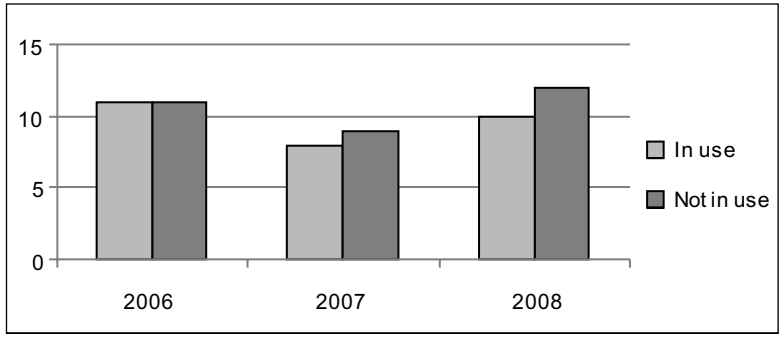

Figure 2. Status of treatment system: Honduras samples

Monitoring data allows us to start to look at longitudinal trends

Monitoring data allows us to start to look at longitudinal trends, and what we see in Figure 2 is that hypo-chlorinator units are actually being used less over time. Moreover, chlorine tests in those units that were being used showed the presence of only residual chlorine in approximately half of the systems in use. Water For People–Honduras concluded that continuing to promote this one option for water quality was producing only a 25 per cent success rate.

Digging deeper fleshed out the story behind the numbers. People were not using the systems for a variety of reasons: no easy access to chlorine, high cost of chlorine, lack of trained personnel, dislike of the taste, lack of back-up support for new plumbers to learn the process, and 'illegal' use of the water on coffee plants, thus non-chlorination during coffee growing season.

The lack of use of the system also reveals that it may not be socially appropriate

A variety of solutions are now being implemented that tackle the technological, social, environmental, supply-chain and support aspects of this particular problem.

Technological. The government of Honduras has promoted this particular option for years, assuming, as Water For People–Honduras did, that it was the best option. This year, Water For People–Honduras is sponsoring several workshops on alternatives to the drip-feed hypo-chlorinator for its staff and governmental partners, not only in Honduras, but in Guatemala and Nicaragua as well.

Social. The lack of use of the system also reveals that it may not be socially appropriate. Water For People is investigating a greater variety of technological options to meet the diverse demands, including household options – from slow-sand filters to chlorine packets.

Environmental. The most basic lesson in treating water is to find the highest-quality source and protect it. Prior to the monitoring exercise, little emphasis was placed on source protection and management. Now, many communities are purchasing the land around their

springs to prevent human and animal activity, and to pursue reforestation, thus promoting water recharge.

Supply chain. Many communities are quite remote and access to chlorine often means a several hour walk and some form of public transportation just to purchase replacement chlorine. The management model being implemented by Water For People–Honduras includes strengthening the Association of Water Boards, which is a civil society organization at the municipal level composed of representatives from each community water board. The Association plays two roles in terms of water quality: 1) it has a chlorine bank in the municipality which is convenient for users to access; and 2) it has been regulating whether or not its member communities are chlorinating their water, thus serving as a civil society monitor.

To attain long-term sustainability, communities need outside support

Support. The example of the Association of Water Boards notwithstanding, communities do not exist in isolation and there is a growing realization in the water sector that to really attain long-term sustainability, communities need access to outside support. The solution Honduras is testing is to support a municipal water and sanitation technician, one of whose duties is to meet monthly with the Association in rotating communities to provide troubleshooting and re-training of key members, such as plumbers, when turnover occurs.

Monitoring shows whether programmatic changes help or hinder people to drink safe water

The power of institutionalized monitoring is that the organization and partners will be able to see whether these programmatic changes help or hinder people to drink safe water in the Honduran highlands.

Sanitation

Historically, Water For People was primarily involved in the provision of safe drinking water, so the sample sizes of sanitation work are much smaller than those of water. However, this trend is rapidly changing, as the organization has moved toward a greater focus on sanitation. Water For People expects to see more data on sanitation in the coming years as a result.

Figure 3 shows an example of what sanitation monitoring uncovered during a World Water Corps trip to Malawi in 2008. A total of 482 toilets were observed by the monitoring teams. Two categories, sanitation use (measured by evidence of use confirmed with observation, and questioning users on which family members use the unit) and sanitation hygiene (measured by the presence or absence of urine and faeces in the toilet, and the presence or absence of flies), served to measure the use and maintenance of toilets post-intervention. The data from Malawi shows that nearly all of the units were still being used, but among non-users, the largest category was children. This piece of

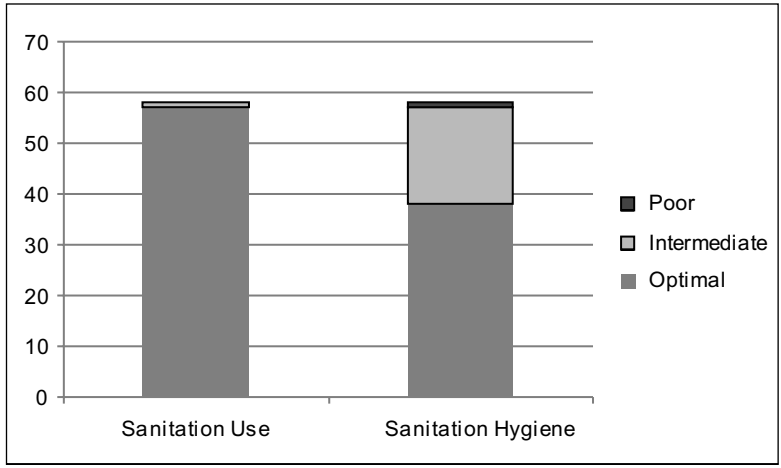

Figure 3. Sanitation status: Malawi 2008

knowledge allowed Water For People to modify its programming, which now includes a simple child-sized and child-friendly potty.

Conclusion

Post-construction sustainability monitoring is an identified knowledge gap in the Watsan field

Post-construction sustainability monitoring is an identified knowledge gap in the water supply and sanitation field. The sector is racing towards meeting the MDGs in 2015, with an emphasis on new connections, but if existing taps and toilets are abandoned, stolen or fall into disrepair, the once-served fall back on to the 'unserved' side of the equation. Donors tend to ask for short-term outputs: how many 'new' people have access to a water source or toilet? Not: how many of these systems will still work in five years? The sector measures success by how many new people gain access to water and sanitation in a given period (year, grant, etc.), not by how many of those investments are sustained over time, keeping people from going back to unimproved water sources and open defecation.

There is a growing call in the sector for improved monitoring, and this paper has explained the experience of one international NGO – Water For People – in developing a simple monitoring protocol that can be used in a variety of contexts. Importantly, the protocol overcomes many of the reasons frequently cited for *not* monitoring:

- *Finance*. The majority of costs are borne by the external participants, the World Water Corps® volunteers.
- *Time*. The organization has found that approximately two weeks is sufficient to visit a sample of approximately 30 per cent of past work.

- *Human resources*. Again, external volunteers and, increasingly, local university students allow Water For People to take advantage of leveraged human resources, rather than having to hire more people.
- *Cumbersome methodologies that are not replicable*. Three years of testing the methodology in a variety of countries has produced an instrument that is efficient in the field and has been used in a range of countries and contexts.
- *Unwillingness to admit weaknesses or challenges*. Water For People's leadership has prioritized learning and similar institutional support should allow others to prioritize or implement a similar process.
- *Prioritization of new infrastructure*. If the sector is to come close to meeting the MDGs, all of the existing systems need to be functional. Monitoring is Water For People's contribution to understanding sustainability of existing systems.

Monitoring does not tell everything about a project's potential impact on a community

Although the monitoring programme does not tell everything about a project's potential impact on a community, it does provide quantitative data on the functionality and use of water and sanitation infrastructure long after inauguration celebrations have ended and beneficiaries have been counted. If pumps and toilets are functioning and people are using them, the conditions needed for health, time-savings, and improved attendance are there. Perhaps an equally important impact – the impact of *not* having to go back to that disease-infested river to drink because your community water point still works – will rally more in the sector to invest in monitoring.

The Water For People monitoring system is not perfect, but the point is not to design a perfect system. Water For People could have spent years developing a lengthy, statistically rigorous, deep monitoring protocol, falling prey to the action-atrophy predicament. What the organization needed was rapid results, methodologies that could be used by a range of skill-sets, and a catalyst to debate in the sector around the need for monitoring.

The benefits of monitoring to the organization are several:

- Years of data on water and sanitation sustainability have provided quantitative measures of success, weakness and trends that can inform future programming.
- Programmatic successes have been identified and replicated and programmatic weaknesses have been addressed.
- Metrics of success have been strategically re-focused, from beneficiaries of projects to sustainable services.

The sector considers success in terms of new beneficiaries. Monitoring has pushed Water For People away from that measurement and

The sector considers success in terms of new beneficiaries

towards an alternative: '3-6-10'. The numbers refer to specific benchmarks following a project's completion. The key indicators used during these analyses will be honed down from the general monitoring and include quantity, quality, access, distance, financial management, sanitation hygiene and handwashing knowledge. What will change over time is the financial management indicator:

- *3*. After three years, communities should have an established tariff system in place.
- *6*. After six years, there should be enough local finance (refers to both community and local government finance) available to repair/replace the most expensive part of a system.
- *10*. After 10 years, there should be enough local finance available to repair/replace the entire system.

The sector lacks hard evidence of sustainability, but implementing the 3-6-10 monitoring programme will allow Water For People to provide just that, while learning from its programmes, adjusting programming where needed, and contributing to the growing body of knowledge on sustainability challenges.

This paper has demonstrated how monitoring data is used at a general, global level so that Water For People staff, supporters and others have a sense of how the organization's work holds up over time. Performance on specific indicators, such as financial management, highlights where countries are succeeding and identifies areas where improvement is needed. At the country level, the cases of Honduras and Malawi show how real, programmatic improvements have been made based on weaknesses uncovered by the annual monitoring exercise. The methodology for monitoring developed by Water For People was designed with replicability in mind, so that it may be applied to a range of contexts – from rainwater catchment tanks in Guatemala to piped systems at Indian high schools. Peer organizations have expressed interest in the monitoring system and gone on to apply it in the field. A greater win, however, would be to see *all* groups working in water and sanitation start to monitor, document and learn from past work, no matter the format.

Programmatic improvements have been made based on weaknesses uncovered by the annual monitoring exercise

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