

# Measuring More than Pipes and Pumps: The Evolution towards Levels of Service and Sustainability Monitoring at Water For People

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## Abstract

The water sector celebrated earlier this year when JMP estimates suggested that the MDG goal for water had been met a few years before the 2015 deadline. In order to determine that achievement, the JMP used infrastructure access as a proxy indicator for household water provision. Data from around the world continues to suggest that measuring access to infrastructure may not be painting a complete picture of the level of service and sustainability of water or sanitation infrastructure

This paper will share the process from monitoring infrastructure to levels of service and sustainability at Water For People. Technology, including the Akvo FLOW system, has contributed to the improvements in monitoring processes, not only at Water For People, but other institutions, too. At approximately \$1.50 per survey to implement, greater understanding of how much monitoring costs has been identified as an area for further investigation. The bulk of the paper provides examples on how measuring service and sustainability levels contributes to the following organisational and sectorial challenges:

- **Accountability:** One of the reasons for investing in a post-construction monitoring system is that we are accountable to donors, not just for what their money purchases, but the impact of that money over time. Governments are also accountable to their citizens and for their investments and Akvo FLOW may be an option for improving their accountability as well, although tensions do exist between local and national government data needs.
- **Service delivery focus:** A second reason is that the shift from “adopt-a-project” approaches to service delivery requires an information system. By publishing service and sustainability data, in addition to or in place of “new” beneficiaries, we hope to contribute to the sectorial debates on measuring success and promote a service delivery approach over solely an access to infrastructure approach.
- **Documenting sustainability challenges:** The third reason for monitoring is to learn, both what is working and what is not, following the completion of construction to decide upon an appropriate response if necessary.

Setting an example for others to adopt: One of the comparative advantages of NGO-initiated monitoring is that they can try different approaches and demonstrate a system

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that can inspire others. In the case of Water For People, the development of its post-construction monitoring system has spread far beyond the use of just the NGO using it to monitor its own projects. By transferring the technology to Akvo, they have been able to support 14 organisations in over 20 countries around the world, from very small scale to national level efforts at systemic monitoring.

### **Keywords**

Akvo FLOW, monitoring, service delivery, sustainability, water.

### **Introduction**

The water sector celebrated earlier this year when estimates by the Joint Monitoring Programme (JMP) suggested that the Millennium Development Goal (MDG) for water had been met before the 2015 deadline. In order to determine that achievement, the JMP used infrastructure as a proxy for household access. Data from around the world continues to suggest that measuring static access to infrastructure does not give a complete picture of the ongoing level of service and sustainability of water systems. Some examples of failure statistics that are becoming as oft-cited as the numbers of global un-served are forcing the sector to re-evaluate how programmes are implemented and success measured:

- Approximately 50,000 rural water points in Sub-Saharan Africa are broken and US\$215-360 million of investment wasted (Skinner, 2009).
- The average rate of non-functionality in 21 Sub-Saharan African countries is 36% (IRC, 2009).
- Over half the world's population - 4 billion people - do not have a reliable source of safe water (Payen 2011).

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 prioritised by international development organisations (Global Water Supply and Sanitation Assessment, 2000; UNESCO, 2006; Hunter et al., 2009; Winpenny, 2009). Moreover, the absence of national WASH monitoring systems in many countries further complicates systemic data collection, contributing to underperforming systems the world over.

At the global level, the JMP is currently in a process of defining its post-2015 indicators to include a more nuanced view of water and sanitation than just access. Water For People is at a similar juncture in deepening and honing its measurements of post-construction sustainability and levels of service as it strives to facilitate permanent universal services in its regions of operation. This paper will share the process from project/infrastructure monitoring to levels of service and sustainability monitoring.

## From Projects to Services

For the first fifteen years of its existence (1991-2006), Water For People's data collection was limited to inputs and outputs: how much money was being spent and how many water systems were built. A large excel spreadsheet was used to track funds "needing adoption" as the organisation's fundraising strategy during the early years was primarily one of "adopt-a-project," which Table 1 demonstrates.

Table 1: Excerpt from Twinning Tracking System.

Project Number	Project Name	Project Category	Total Cost	Donor Name/Org	Number of Beneficiaries	Funds Needing Adoption	Received	Applied	MOA Received
BOL 9074	Liollata Water Project	W	\$ 4,320	Pennsylvania	225	\$4,320.00	\$ 3,563.00	7/6/00	11/19/99

Source: Water For People, 2000.

During the first decade, money was sent to non-governmental organisations in over forty countries with minimal staff oversight. By the late 1990s, however, leadership recognised that globally-dispersed water projects were not the most effective way to contribute to ending the water crisis. The excel tracking format could show how much money had been spent on how many water systems in which countries, but said nothing about what happened to those systems over time. Throughout the years, lots of anecdotal, qualitative information had been collected about the impact of its work, but the organisation, like many in the sector, could not speak to the sustainability of past investments with quantitative confidence or learn from past mistakes.

Any organisation supporting a service delivery approach intrinsically needs to understand the status of those services on a much more real-time basis than a final report when construction is finished. Over the last five years, although we were not explicitly calling our approach a service delivery approach, it became evident that many of the characteristics of a service delivery approach were becoming key aspects of programmes, including: targeted scale at district level with local governments involved in planning, financing, implementing, and monitoring; addressing post-construction support; explicit sustainability targets; and monitoring service and sustainability levels (Lockwood and Smits, 2012). In this context, during 2006, Water For People began to test a post-construction sustainability monitoring process, which has continued to evolve to its present day form of level of service and level of sustainability monitoring.

Water For People is currently using six indicators to assess the level of service across countries: technology, number of users, access, reliability, down time, and quantity<sup>2</sup>.

<sup>2</sup> Missing is quality, and the organisation is testing different methods for integrating water quality testing into this analysis, but the current data do not include it. Data on distance is collected but due to

Points are given and a scale from 0-6 to determine the level of service. A separate composite indicator has also been developed to measure the level of sustainability. Nine indicators regarding technology, availability, tariff payment, financial management, access to spare parts, management, current problems, and expansion, provide a basis for understanding the potential for permanent services. A deeper discussion of these indicators is provided later in the paper.

## Methodology

The methodology has been modified over the years, although the general information collected has not changed. Table 2 compares some of the key differences as the process has evolved and continues to evolve towards a country-led process.

*Table 2: Evolution of Monitoring Processes at Water For People.*

	<b>Pre-2006</b>	<b>2006-2010</b>	<b>2010-current</b>
Data collection tools	None	Paper surveys, cameras, GPS units	Akvo FLOW
Enumerators	None	Teams of foreign volunteers, local partners	In-country staff, partners, locally hired enumerators
Metrics	Completion of construction	Coverage, functionality, use, access, financial management	Levels of service and levels of sustainability

*Source: Water For People, 2013.*

Advancements in technology have allowed Water For People to move from cumbersome paper-based formats and manual data entry to the Akvo FLOW system, which uses Android mobile phones and cloud-based storage facilities to collect survey data, photos, and GPS locations. Moreover, the data is now uploaded over cellular networks, internet connections, or through a transfer from phones to computers, greatly reducing the time for data entry and the possibility of errors. Multi-lingual and customisable, the tool is making the collection and analysis of data much easier than in the past.

Institutional metrics and sector evolution have also shaped the refinement and prioritisation of what actually gets measured. The sector standard for many years was - and some would argue, still is - access and new beneficiaries reached especially as efforts to meet the MDG targets intensified. Some of the most fundamental changes have been the shift from data collected only on money invested, new beneficiaries, and projects constructed towards an emphasis on levels of service and levels of sustainability.

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technical issues with its calculation, the current data also do not include distance. Akvo FLOW version 2.0 is expected to resolve the distance calculation issue.

Field reflections contributed to Water For People’s evolution towards service delivery approaches. During the first few years of field-testing Akvo FLOW, it became clear to staff and partners that although many water systems still provided water, they were operating at sub-optimal levels. This led to the reflection that monitoring what type of system was installed was not going to be sufficient to understand what was happening after the initial celebrations. A mapping exercise in 2007 in Bolivia illustrates just this point: of over 100 communities visited in the rural district of Tiraque, less than 10 had no water system, 17 were functioning per Bolivia government norms, and close to 70% technically were improved systems, but were providing sub-par services.

One of the weaknesses identified has been that Water For People has not prioritised understanding how much all of this has cost. Part of the rationale of using volunteers in the early days was to keep some of the costs down while the system was being tested and developed. It is perhaps important to mention that the development of the monitoring system was funded through the organisation’s unrestricted funding as it was deemed critical to the organisation’s operations. That said, because it was funded from restricted funding, we were not as diligent as we could have been about understanding all of the costs going into development and annual monitoring.

We estimate that we have spent close to \$500,000 on Akvo FLOW development, which includes developers’ fees, software, and ANDROID phones over the last seven years. A comparison of some cost data from 2012 in Table 3 can be analysed to understand what it is costing Water For People to collect data annually in contexts as different as peri-urban India to rural Malawi to the highlands of Guatemala:

Table 3: 2012 Survey Costs.

	Type of Survey			Totals	Cost	Cost/Survey
	Water point	Household	Public Institution			
Malawi	2289	5162	267	7718	\$ 13,319.00	\$ 1.73
India	6414		1071	7485	\$ 12,611.00	\$ 1.68
Guatemala	186	1165	220	1571	\$ 2,240.00	\$ 1.43

Source: Water For People, 2013.

Although the contexts are very different, the cost per annual survey comes out to between \$1.43 and \$1.73. Since the current monitoring process includes three separate surveys: a water system survey, household surveys, and public institution surveys, we are not able to determine the cost per community since financial data was not recorded per community. The survey process is designed to be representative of the entire geographical areas; so alternatively, we can estimate the cost of data collection per capita:

Table 4: 2012 Per Capita Costs.

Country	Totals	Cost	Population	Per capita cost
Malawi	7,718	\$ 13,319.00	484,000	\$0.03
India	7,485	\$ 12,611.00	1,321,600	\$0.01
Guatemala	1,571	\$ 2,240.00	152,215	\$0.01

Source: Water For People, 2013.

Table 4 shows that although the population sizes vary greatly, the per capita costs of data collection range between \$0.01-\$0.03 US. Being more rigorous about measuring costs is an area of weakness and one that we must improve as documenting and sharing cost information will allow others to make informed decisions about adopting Akvo FLOW or other alternatives.

## Discussion

A results-based monitoring system contributes to solving several organisational and sectorial challenges:

- Accountability and transparency
- Promotion of a service delivery approach
- Documenting and understanding sustainability challenges
- Setting an example for others to adopt and improve

### Accountability and Transparency

For many years Water For People measured and reported its success in terms of new beneficiaries, as the example from the 2005 annual report shows: *“With your help, Water For People achieved its programme objectives in 2005 by funding 78 projects and helping nearly 80,000 people around the world develop safe drinking water sources and build improved sanitation systems”*. Interesting to know the scale of the organisation’s operations and to justify the funding being spent, but nothing was ever collected or reported on if water continued to flow for those 80,000 people at an acceptable level of service.

Reporting on dollars spent and activities completed tends to fulfill being accountable to one group of people involved: NGO donors. Reporting back on how money was spent is inevitable and not going to go away. That said, reporting should be seen as an opportunity for learning, both for the NGO and the donors supporting the work. From an institutional perspective, Water For People uses the annual data on levels of service and sustainability to inform its supporters, partners, and the general public on changes over time. Under development right now is a new reporting platform which will combine financial data, including co-finance, programmatic outcomes (levels of service



and sustainability at district level), customer feedback, and narrative from staff, partners, and consumers. Figure 1 shows a prototype of the web tool that will use the level of service and level of sustainability data to continue to shift the sector from one that focuses on projects to services.

Figure 1. Prototype for Annual Web Reporting.



Source: Water For People, 2013.

But local governments around the world often invest much more than Water For People, and are also accountable not only for their investments, but in ensuring that their citizens actually have water services. Demand for dashboards hosted in local government offices has come from blocks in India to cells in Rwanda and municipalities in Guatemala, which will allow both the institutionalisation of the monitoring process in government authorities and improve access to the information. This is an on-going process and part of larger discussions around at which levels of government does the responsibility for monitoring lay, and in some cases, even which institute of government should be responsible. Water For People’s role in this process has been to focus our data collection support to our local government partners as they are responsible for water services, but data is then shared in a range of forums from Association of Municipality meetings to state and national-level coordination meetings.

Right now, the monitoring process occurs on an annual basis, with data collection occurring in each community in a municipality, whether or not Water For People has intervened or not. This has been a key step in the process of supporting local institutions to monitor, as it 1) involves local government staff in the data collection process so they are confident of the results; 2) provides annual data that helps with budget allocations; 3) provides comprehensive data that is not limited to where one NGO has intervened. One of the barriers to this process moving quicker has been the

upgrading to Akvo FLOW version 1.5 that is much easier for the user to use and for Akvo to support. On the flipside, one of the facilitating factors in many of the Latin American countries in which Water For People is working is the existence of technicians in the local government offices whose job it is to support community water boards and who are actively involved in the collection and analysis of the data.

In the majority of the countries where Water For People works, there are no national level monitoring systems<sup>3</sup>. Where they do exist - even if it is simply census data on access - we have experienced tension not only between NGOs and governments, but between both local and national government data needs. From the frequency of data collection - local governments are allocating funds on an annual basis and prefer annual data; to the level of detail needed - local government often wants more detail than state or national entities; to the accuracy of the data collected, intra-government tensions and differing needs exist and must be taken into consideration.

### **Promotion of a Service Delivery Approach**

Water For People has ambitious goals - that water flows for everyone, forever; meaning that universal coverage is achieved and high levels of services are sustained permanently. Governments also have high universal coverage goals, such as Rwanda's Vision 2020 plans or Bolivia's aspirations for water for all by 2025. However, by focusing intervention efforts at municipal level, where responsibility for water lies, Water For People and local government partners can demonstrate a tangible way of not just providing universal access, but sustaining it. And the only way to know if one is sustaining a service is to measure it.

Permanent implies that the NGO no longer plays any role in that service, which implies that government institutions must be monitoring services. Based on government standards when available and suggesting others in the absence of government standards, Water For People aspires to influence governments to adopt service delivery approaches by supporting the collection of indicators related to service delivery.

Water For People has committed to ensuring that post-construction monitoring happens for at least 10 years following construction, either through Akvo FLOW or through government monitoring systems if they exist. During those 10 years, however, staff are working with institutions to support the institutionalisation of country-led monitoring, whether at local, state, or national level.

As previously mentioned, one of the key components of a service delivery approach is a monitoring system that can provide regular updates on levels of that service. As part of the shift from supporting infrastructure to services, starting in 2006, annual data was collected on many more indicators than just money spent and projects completed, including water availability, use, management structure, financial management,

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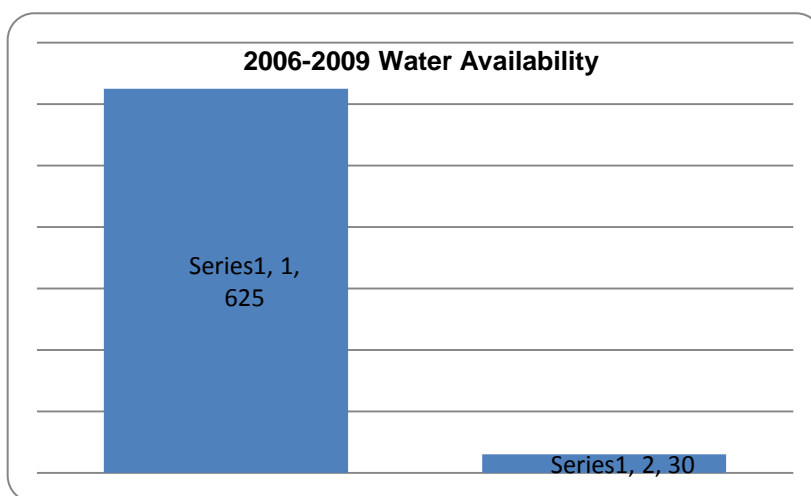
<sup>3</sup> Uganda and India are the exceptions with current national-level systems, although Honduras and Nicaragua are in the process of implementing a regional system-SIASAR. Honduras previously had a system but once USAID funding withdrew, it was not updated regularly and systematically.



operations and maintenance, user satisfaction, access standards, distance standards, water quantity and water quality.

Each indicator was scored and country programmes and partners could reflect on what was going well and what was not. However, no composite indicator was available to summarise the level of service or potential for sustainability. In the absence of such an indicator, Water For People used water availability as a proxy for functionality to generally understand whether water continued to flow over time. Using four years of data in five countries from one of the most illuminating indicators - water availability - Figure 1 shows that 30 water systems were broken, stolen, or had dried up. Water flowed from 625 taps and pumps – or over 95% - in Africa, India and Latin America.

Figure 2: Water Availability on Day of Visit.



Source: Water For People, 2010.

While it was a positive moment to learn that so many systems were still providing water, availability of water by no means gives an accurate understanding of the quantity, quality, or reliability of that system. As Water For People was already collecting data on those indicators, the shift from monitoring infrastructure and water availability to services and sustainability meant that the process did not change dramatically, but the scoring and sharing of that data did change with the move to level of service and level of sustainability.

As Table 5 below describes, Water For People is currently using six indicators to assess the level of service: technology, number of users, access, reliability, down time, and quantity. Points are given on a scale from 0-6 to determine the level of service. When indicators were being developed, an assessment of any monitoring systems being used in the countries of operation was undertaken, such as the SANAA rating system in Honduras, as well as a general literature review of sustainability indicators. It can be difficult to come to consensus on what to measure, as evidenced by the interesting discussions occurring on post-2015 indicators, but rather than suffer from paralysis by analysis, Water For People prefers to learn by doing, and adjust accordingly from

experience. Working in ten countries around the world, with varying technologies and government standards, the process is one that is flexible enough to account for local standards while still being comparable across countries.

Table 5: Level of Service Metrics and Scoring.

Level of Service Scoring Key			Level of Service Metrics	Points Possible
Scores	Colour	Label		
0	Black	No Improved System	Has Improved Water Point # of Users Meets Standards	1 1
1	Red	Inadequate Level of Service	Majority of Community Members Have Access to the Improved System	1
2-3	Orange	Basic Level of Service	There Is Enough Drinking Water Every Day Of The Year	1
4-5	Yellow	Intermediate Level of Service*	The System Was Down For 1 Day or Less In The Last 30 Days	1
6	Green	High Level of Service	Quantity Of Water Available Meets Standards	1
			<b>Total</b>	<b>6</b>

Source: Water For People, 2012.

Similarly for level of sustainability, the organisational metrics are described in Table 6 below.

Table 6: Level of Sustainability Metric and Scoring.

Level of Sustainability Scoring Key			Level of Sustainability Metrics	Points Possible
Scores	Colour	Label		
0	Black	No Improved System	Has Improved Water Point Water Was Available On The Day Of The Visit	1 1
1-3	Red	Unlikely to be Sustainable	A Tariff Or User Fee Is Collected For Water	1
4-5	Orange	Somewhat Likely to be Sustainable	Water Point Financial Records Were Reviewed By Monitors	1
6-7	Yellow	Likely to be Sustainable	There Is A Positive Balance Listed In The Financial Records	1
8-9	Green	Highly Likely to be Sustainable	Spare Parts are Available In or Near the Community	1
			There Is Someone Responsible For Water Point Management, Operations And Maintenance	1
			There Are No Current	1

	Problems With The Water Point	
	The System Has Been Expanded To Incorporate New Users	1
	<b>Total</b>	<b>9</b>

Source: Water For People, 2012.

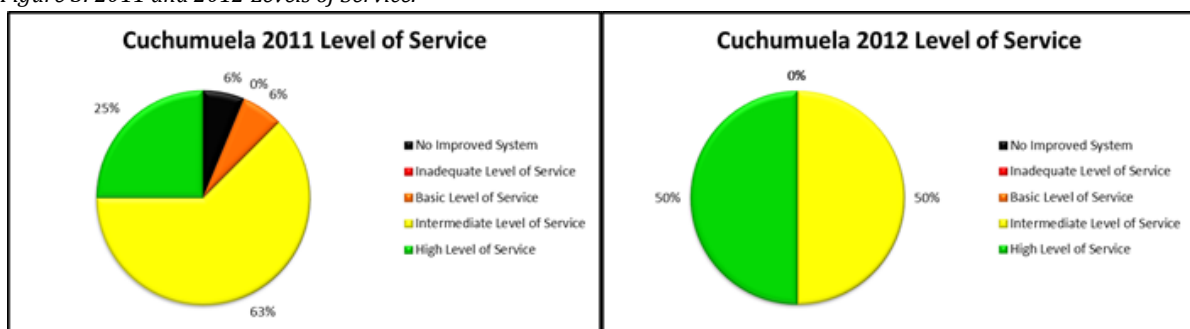
The nine point scale is also divided into categories: no improved system, unlikely to be sustainable, somewhat likely to be sustainable, likely to be sustainable, and highly likely to be sustainable. Based on the nine indicators above which measure technology, availability, tariff payment, financial management, access to spare parts, management, current problems, and expansion, we can try to understand the potential for permanent services.

### Documenting Service and Sustainability Challenges

The example of the rural municipality of Cuchumuela, Bolivia, home to approximately 2,000 people, can be used to understand how the data is being used to measure changes in service levels and sustainability over time, and how programming has responded to data collected through monitoring.

In 2012 every community in Cuchumuela reached a level of either intermediate or high level of service. This was represented by a 12% increase over 2011. In this case one community in the region went from having no improved water system to having an intermediate level of service and one community went from having a basic level of service to a high level of service. The most significant metrics that contributed to these changes were that in 2012 the number of households with access to improved systems increased, and the amount of downtime per system decreased. A directed investment at self-supply and multi-family solutions was a programming response that resulted from the 2011 data and allowed Cuchumuela to reach universal coverage.

Figure 3: 2011 and 2012 Levels of Service.

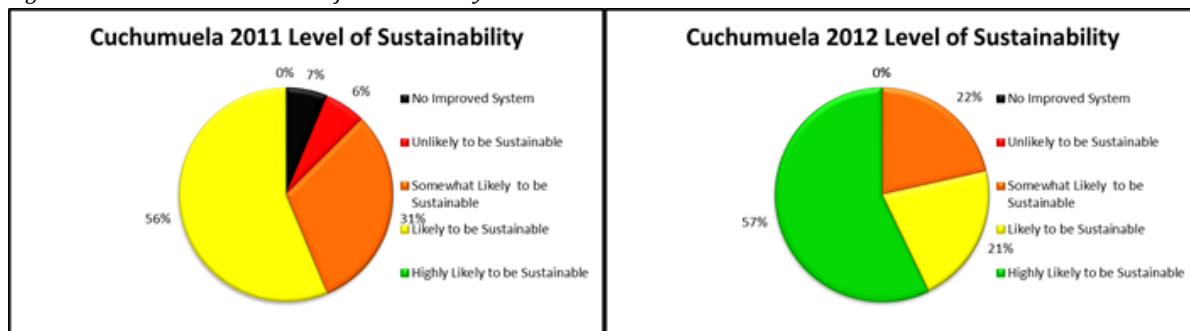


Source: Water For People, 2012.

In 2012 there was significant change to the Level of Sustainability across the board in Cuchumuela. The percentage of communities with no improved system or that were Unlikely to be Sustainable went from a combined 13% in 2011 to 0% in 2012. Conversely, the percentage of communities enjoying a high Level of Sustainability

increased from 0% in 2011 to 57% in 2012 and the percentage of communities that had water systems that were only somewhat likely to be sustainable decreased by 9% 2012. The main reasons for the dramatic increase in the level of sustainability of water systems in the region is that there was a drop in the number of significant problems reported with the water systems, spare parts were more readily available and financial records were both reviewed and they more frequently indicated that there was a positive balance available.

Figure 4: 2011 and 2012 Levels of Sustainability.



Source: Water For People, 2012.

The most interesting data is yet to come in the years that follow reaching universal access - will service and sustainability levels remain high or follow the unfortunate vicious cycle that many systems around the world succumb to?

### Testing to Inspire Others

One of the comparative advantages of NGO-initiated monitoring is that they are able to try out different approaches and demonstrate a monitoring system that can inspire or motivate others, be they external development partners, local, or national government. In the case of Water For People, the development of its post-construction monitoring system has spread far beyond the use of just the NGO using it to monitor its own projects. One of the earliest modifications was to monitor all systems in a given district, whether or not Water For People had supported software or hardware interventions in a community, as the district-wide data is useful to local government and others as part of the shift towards service delivery.

In Peru, the pre-existing national level system collected data on national-level programmes, not all water systems in the country. The continuing decentralisation trends in Peru have led to the development of two donor-financed monitoring systems in two states, both of which have unfortunately not been updated since the donor funding ended. However, after hearing about the possibilities with Akvo FLOW, state government of La Libertad is in the process of analysing and adopting it for its monitoring needs. A thorough diagnosis of why other state systems have failed will be critical in supporting a similar effort with Akvo FLOW.

In the case of Bolivia, the Ministry of Water, through its Vice Ministry of Water and Sanitation, also does not have a consistently updated monitoring system. Data is collected through the 10 year censuses; and requested as desired from local governments

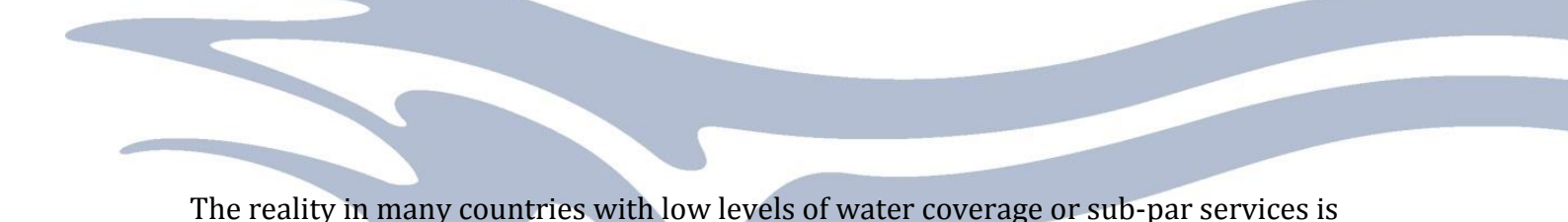
or external development partners, but is not consistently collected or systematised at all. Complicating the efforts at national level in Bolivia is the high turnover in the political positions of Minister of Water and Environment and Vice Ministry of Basis Services; there have been 5 Ministers in the last 5 years and 4 Vice Ministers. Because of these structural challenges, our efforts have been focused at local level. One of the tangible outputs from the data collection and review has been increased investment by several municipalities in their own technical staff and budget assignments for direct support to community service providers, as it became very evident that government investments made in infrastructure needed complementary on-going software support, as well, to maintain sustainable services. An interesting development has been the request of additional municipalities where we do not currently work to implement Akvo FLOW. As mentioned earlier, the limitation of supporting this has been primarily a technical one and with the improvements in Avko FLOW versions 1.5 and 2, we expect to see more local governments implementing the system.

While the initial development of the process and the technology was in part to serve the organisation's own accountability and learning agendas, it was always with a vision of influencing and inspiring other development partners and governments to adopt or improve their monitoring, whether it was through Akvo FLOW or another platform. Recognising that the demand for the product and service were far beyond the capacity of the NGO to provide, we transferred the product to Akvo, a Dutch non-profit organisation focused on development of open source and mobile software for international development, which are much better placed to improve and expand the product. Since doing that, they have been able to support 14 organisations in over 20 countries around the world, from very small scale to national government-led monitoring.

## **Conclusions**

Times have changed since Water For People began to develop a results-based monitoring system, and the incentives for similar NGOs to begin to adopt a similar approach will only become stronger. Major donors are increasingly focused on the outcomes in addition to outputs, pushing aid recipients to be accountable for long-lasting results. The philanthropic sector is shifting how it ranks charitable organisations, moving from a dry analysis of overhead percentages to measuring how effective the organisation actually is at delivering whatever service it provides. Sector metrics for success are moving beyond static beneficiary numbers or number of projects to service and sustainability levels. Technological advancements and investments made by organisations such as Water For People in open sourced software will make it more affordable and accessible for others to adopt Akvo FLOW. The post-MDG indicator discussion, although still underway, will surely include more than proxy indicators of access, resulting in monitoring that encompasses more than technology.





The reality in many countries with low levels of water coverage or sub-par services is that national sector monitoring mechanisms are also weak or non-existent. The role of any development partner monitoring system should never be to displace national, state, or local efforts to develop monitoring systems and NGO-led systems should complement or strengthen local systems whenever possible. Tensions are bound to arise when trying to meet multiple expectations, but these obstacles are not insurmountable. The Akvo FLOW experience has shown that technology can play a huge role in creating customisable platforms that allow for both development partner and government processes to complement each other and ultimately, lead to higher levels of sustainable water service for all.

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