37th WEDC International Conference, Hanoi, Vietnam, 2014

SUSTAINABLE WATER AND SANITATION SERVICES
FOR ALL IN A FAST CHANGING WORLD

Monitoring water services in Ghana: the why, the what, the how and the cost

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BRIEFING PAPER 1965

This document presents the framework for monitoring rural and small town water in Ghana It documents the processes involved in the development, testing and refinement of indicators. These indicators are based on the norms, standards and guidelines set by the Community Water and Sanitation Agency (CWSA) and were developed by its Monitoring and Evaluation Working group, with support of IRC/Triple-S staff, and in consultation with officials from different other levels. They were tested in two rounds of monitoring. In addition, the framework for moniotoring defines the different uses to which these indicators can be put and the procedure through which data are collected, processed and analysed. Also actual costs of monitoring were collected and these currently stand at $4,931 to $6,936 per district Based on these field experiences, we consider that the current framework for monitoring will be feasible for annual data collection.

Introduction

Ghana's Community Water and Sanitation Agency (CWSA) has set norms and standards related to the level of water services that should be provided under its community management models. Furthermore, guidelines, manuals and a model by-law describe the operational, financial and institutional arrangements that should be in place at community, district and regional level, in order to ensure sustainable service delivery.

Some years ago, a comprehensive Microsoft Access-based District Monitoring and Evaluation System (DiMES) was developed. However, CWSA has been struggling to operationalize this system nation-wide and to regularly update the data. Also DiMES was not intended as a tool for monitoring compliance of water services delivered and performance of (community-based) service providers and district and regional levels) with CWSA norms, standards and guidelines.

Therefore, as part of the Triple-S project, CWSA and IRC have been (further) developing a system for comprehensive monitoring of rural water services, building on DiMES. The service monitoring system consists of 1) several sets of indicators and underlying scoring algorithms for monitoring functionality, service levels, performance of service providers and support functions, as per the CWSA norms, standards and guidelines, 2) tools for the collection, processing and storing of data, 3) a procedure for the various steps in monitoring and 4) an indication of the resource requirements for monitoring. This paper describes the framework, as it now stands after two rounds of testing in three districts: Akatsi, East Gonja and Sunyani West. Findings from the monitoring data collected so far are presented in the accompanying paper by Adank et al (2014).

Why water service monitoring?

Monitoring of rural water supply so far has been limited to only part of the CWSA guidelines, i.e. tracking the number of facilities providing water services and to some degree, their functionality**.** However the provision of sustainable water *services* goes beyond functionality. A facility can be functioning at a given

point in time, but can be broken down half of the time, can be providing water of a quality that is unacceptable, can be providing only a small quantity of water, or it can take people hours to fetch water from it, either because of the distance or because of the fact that too many people depend on the facility, or both. In that case, the system may be functioning, but is not providing an acceptable level of service. There is thus a need to assess functionality, but also to look beyond it and look at other water service characteristics, like quality, quantity, accessibility and reliability. Furthermore, it is important to assess whether structures and arrangements are in place to ensure that the facility is not only providing water services today, but will be able to do so for a long time to come. Monitoring to be able to track the level of service over time and the performance of key technical, financial and management functions is crucial to allow problems to be anticipated and addressed.

Water service monitoring can serve different purposes at different levels. At local level, water service monitoring provides users and service providers with an opportunity to see how their service is doing in relation to the standards set. This can stimulate users in demanding better services and service providers taking steps in providing these services.

At district level it presents service authorities with information on the current state of water service provision in a certain area. It can be used to inform immediate corrective action. Access to monitoring data in Akatsi district has for example prompted the political leadership of the district to take the initiative to allocate funds to rehabilitate a number of boreholes and to establish and train WSMTs where these were found to be not in place. Seeing the added value, the district provided funds to support the second round of service monitoring.

At regional level, service monitoring data can be used to inform regional strategic planning, while at national level it can be used to:

- Inform national level strategic planning
- Create better insight in what works and what does not and inform discussions on how to do things better and/ or differently
- Provide an overview of progress in the sub-sector towards achieving its set goals and targets
- Feed into a Sector Information System (SIS)

Monitoring what?

Development of the indicators, scoring systems and guidings questions

The monitoring framework centres around a set of indicators and scoring system based on the national guidelines, manuals and model by-laws. A first draft was reviewed by the CWSA Technical Committee and was further informed by stakeholders' consultations. Based on the suggestions and comments received, the indicators and scoring systems were refined. The resulting indicators and scoring systems were used as framework for analysis of rural water supply in the Volta and Northern region study in Volta region and Northern Region, which led to minor adjustments to the indicators.

The indicator set was accompanied by a number of standards 'assessment questions' in order to collect the required data to easily and unambiguously score the indicators. These questions were field tested in the second half of 2011 with support from the regional level CWSA and the District Assemblies 3 districts: Akatsi, East Gonja and Sunyabi West. This led to a further refinement of some of the indicators, the questions and the scoring systems.

A first full round of monitoring, covering all water points and piped systems in the three districts was undertaken from November 2011 till January 2012. Based on the reflection and feedback from the three districts and the regional level CWSA, the indicators and scoring system were further adjusted and have since then been approved by CWSA Technical Committee (Adank et al. 2013). The water service monitoring framework has recently been published by CWSA. This means that this will be the set of indicators the country will follow in future for rural water supply monitoring.

Functionality

The functionality of a water facility is determined by an on-site assessment of the status of the facility. For handpumps this is done through the '5-stroke test, whereby a handump is fully functioning when water flows out of the spout within 5 strokes. It is considered partially functioning, when water flows out of the spout after more than 5 strokes and non-functioning when no water flows out of the spout or cannot pump at all (i.e. broken down) (CWSA, 2014b).

The functionality of a standpipe connected to a piped scheme is classified as functioning when water flows at least 85% of the designed rate when the tap is opened and as partially functioning when water flows at a rate of less than 85% of the designed rate when the tap is opened. When there is no water flows when the tap is opened, the standpipe is considered non-functioning (CWSA, 2014b).

Service level indicators

The service level is defined in terms of the quantity and quality of water provided and the ease of accessibility of the service, in terms of distance[1] and maximum number of people per facility, here referred to as 'coverage', and its reliability (Kayser et al. 2013). Table 1 shows the standards set by CWSA (CWSA, 2014b).

Table 2. Service level sub-indicators and standards as set by CWSA

Service level sub-indicators	Standard
Quantity	Handpump / standpipe: 20 litres per capita per day House connection: 60 litres per capita per day
Quality	Meets all Ghana Standards Authority standards for water quality of drinking water
Coverage	Hand dug well: maximum 150 people per facility Handpump / standpipe: maximum 300 people per facility
Distance to water point	Up to 500 metres
Reliability	The facility is providing water for at least 95% of the year, interpreted as at least 345 days of regular service, without interruption.

Recognizing that a water facility may meet only some of the standards, an overall service level is obtained based on the number of sub -indicators are met. Table 2 below describes the level of service for handpumps and piped schemes.

Table 3. Service levels for handpumps and piped schemes

Handpump service level	Description of handpump service level
III	The handpump provides water services and satisfies all the sub-indicators
II	The handpump provides water services but fails to meet one or more of the sub- indicators
I	The handpump is not functioning
Piped scheme service Level	**Description of piped scheme service level**
IV	The piped scheme provides service as per design standards for population category and meets all the sub-indicators
III	The piped scheme provides service as per design standards for population category but does not meet one of the sub-indicators
II	The piped scheme provides service below design standards per population category and fails to meet one or more of the sub-indicators
I	Facility is non-functioning

Service provider and service authority indicators

Service provider and authority indicators are ones that describe the extent to which these oragnisations are fulfilling their roles and responsaibilities as per the CWSA guidelines and standards, including the model by-law for Water and Sanitation Management Teams (WSMTs). It is considered that when the service

providers and authorities comply with all these standards, they are in a good position to provide a service that lasts.

Service provider indicators cover compliance by WSMTs, while service authority indicators are used to assess compliance by district assemblies and agencies, which provide direct support to the service providers, planning and coordination related to the development and provision of Water, Sanitation and Hygiene (WASH) services. The service provider indicators are grouped into 3 sets of indicators, as shown in Table 2. Table 2 also presents the service authority indicators.

In order to quantify the qualitative data , for each indicator we use the scoring system, going from 0 (worst case) to 100 (best case) and a standard has been set, indicating the minimum acceptable level. Each indicator is scored based on a number of sub-indicators. These sub-indicators are processed towards a score, using a logic decision-tree. An example of the scoring logic of an indicator can be found in the Figure 1.

Table 3. Service provider and service authority indicators

Service provider indicators			Service authority indicators
Management and governance indictors	**Operations indicators**	**Financial management indicators**	
• Presence and composition of a Water and Sanitation Management Team (WSMT) • Record keeping and accountability • Non-interference in the composition of the WSMT	• Spare parts supply and technical services • Maintenance • Water quality testing	• Revenue and expenditure balance • Financial management • Tariff setting	• Presence of a District Works Department • District Water and Sanitation Plan • Budget allocation and utilization • Facility management plans and by-laws • NGO coordination • Monitoring support to service providers • Data transfer from district to regional level

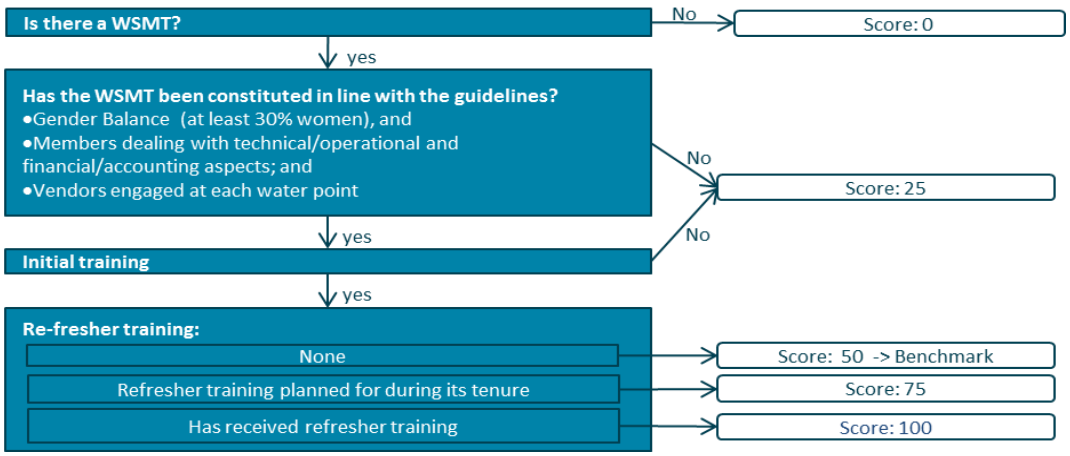

Figure 1. Scoring logic of the 'presence and composition of a WSMT' indicator

Source: Authors

How to do water service monitoring? The monitoring process and tools used

The monitoring process consists of a number of steps (see Figure 2). For each of the steps we briefly describe who does what, and which tools are used.The first involves clearly defining the aim of the monitoring data followed by the development and testing of the framework and training of district staff for data collection. Data collection is the third step and done through the following methods:

- Review of project documents
- Field inspection and observations of facilities, including stroke and leakage test (in the case of handpumps), taking GPS coordinates and photography of each facility
- Focus group discussion / group interview with WSMTs
- Inspection of financial and administrative records, where available
- Focus group discussions / group interview with DWST (Adank et al. 2013).

The data that are obtained in the field are filled out on the smart phone application of AKVO-FLOW, a web-based information and communication technology (AKVO, 2014) and a commonly used data tool in the WASH sector. Submitted surveys stored on the phones are transferred over the local mobile data network or WIFI into the online database (Adank et al. 2013) (Figure 2).

In parallel to data collection, its quality assurance and cleaning is done. This task, which was during the pilots being taken up by the Regional Learning Facilitators (CWSA hosted Triple-S staff) and the regional CWSA monitoring staff, is now taken up by the Information Technology Specialist (ITS) of the regional CWSA office. This is done using a web-based dashboard through which there was near real time access to data from the field to monitoring incoming data and for quality assurance (Figure 2).

Data that has been collected and submitted needs to be cleaned before it can be used for analysis and reporting. It was found to be useful to do this in a working group, involving data collectors and other relevant Metropolitan, Municipal and District Assemblies (MMDAs) and CWSA staff. This served simultaneously as way for data validation and analysis. Scoring of the indicators and further data analysis is currently done by district, CWSA and Triple-S staff, using standard excel formulas and pivot tables, allowing for some level of automation of the data processing and reporting. In the future, the data analysis and reporting process will be automated further. Data analysis and learning involved a series of witting weeks and the presentation of results at district, regional and national level for corrective action (Figure 2).

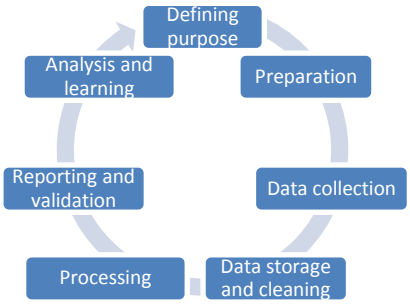

Figure 2. Steps in monitoring

Source: Smits et al. 2013

Cost of service monitoring

The costs of service monitoring during the first round of monitoring was on average $6,936 per district and the second round it was $4,931 and between $0.04-0.10$ per capita in the districts. The difference is due to the fact the duration for training for data collection, monitoring and supervision, data cleaning and analysis was reduced in the second round. These amounts are broken down as presented in Table 4. (CWSA, 2014b). As can be seen, the data collection is the phase which carries the highest costs, as expected, as that involves lots of travel expenditure. In all phases of monitoring, the costs have gone down between the first and the second round.

These costs exclude the time input (salaries and benefits) of the following personnel that was actively involved for each round: 6 District Assembly staff for a total of 25 person-days, 1-2 CWSA regional staff for a total of 3-6 man days and 1 Triple S project staff for a total of 10 person days per district. Based on experience from the districts where service monitoring has been taking place over the last 3 years, in order to collect data on all facilities in a district within a reasonable timeframe (not more than one month), there is the need for a data collection team of at least six full time dedicated staff, working in pairs.

Table 4. Cost of the service monitoring (in 2012 US$)

Cost components	First round (baseline)				Second round			
	East Gonja	Akatsi	Sunyani West	Average	East Gonja	Akatsi	Sunyani West	Average
Training of enumerators	380	1,480	315	725	378	1,081	863	414
Data collection	3,750	4,520	5,250	4,507	3,750	3,125	3,750	3,542
Monitoring and supervision	1,777	1,915	588	1,427	2,400	825	616	881
Data cleaning and analysis	2,555	1,480	964	1,666	980	1,410	858	1,083
Total	**8,462**	**9,395**	**7,117**	**8,324**	**6,308**	**5,361**	**6,087**	**5,918**

Drawing on expert opinions from across CWSA and DAs, the estimated expenditure of a typical district on all its support functioning, including periodic monitoring visits to small communities, service monitoring, annual financial audits of piped schemes and the logistical and administrative support that would enable the district water and sanitation team to undertake the work, as estimated at around $22,373 (Burr et al.2013). This amount includes all cash expenditure but not the costs of salaries of district staff.

Water service monitoring should ideally be done quarterly to take corrective actions, but that would mean that about the entire district's WASH budget would be spent on monitoring. Therefore, we rather consider monitoring at least annually, to inform strategic planning at various levels.

Lessons learnt

Comprehensive monitoring is recommended by CWSA. However this framework might not be feasible taking into consideration the extensive set of indicators. This will require more resources to undertake on a more frequently basis. From a district perspective, such a routine data collection poses a challenge to their limited subvention from central government. Realistically, districts should have two set of monitoring indicators; the lighter and heavier version for quarterly and annual data collection respectively. Taking into consideration that the level of service and sustainability indicators do not necessarily change suddenly in less than a year, it will therefore be financially prudent for districts to collect functionality data on a routine basis such as monthly or quarterly and undertake comprehensive data collection annually. Also depending on the use of the monitoring data districts can sample for an overview of the facilities and performance of service providers and authority. However if data is required for corrective action and population of the asset register, then sampling will not be ideal. Self reporting using SMS functionality tracking could provide a cheaper means of having monthly data on the status of facilities.

Acknowledgements

The authors would like to extend thanks to CWSA in providing leadership in the development of the framework for assessing and monitoring rural and small town water supply in Ghana with the support of IRC, pilot districts and the WASH sector whose support and feedback have been invaluable.

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Note

[1] CWSA standards refer to distance, rather than time from the facility. This has been a point of discussion in the sector in Ghana (WSMP, 2010).

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