



COMMUNITY WATER AND SANITATION AGENCY

HOW-TO-DO GUIDE for functionality and service monitoring





REPUBLIC OF GHANA

**MINISTRY OF WATER RESOURCES,
WORKS AND HOUSING**



**Community Water and
Sanitation Agency (CWSA)**

NATIONAL COMMUNITY WATER
AND SANITATION PROGRAMME (NCWSP)

How-To-Do Guide

For Functionality And Service Monitoring

March 2014

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Abbreviations and Acronyms

CDU	Community Development Unit
CSO	Civil Society Organisations
CWSA	Community Water and Sanitation Agency
DAs	District Assemblies
DiMES	District Monitoring and Evaluation System
DOM	District Operational Manual
DPs	Development Partners
DSA	Daily Subsistence Allowance
DWD	District Works Department
DWST	District Water and Sanitation Team
EHAs	Environmental Health Assistants
EHSU	Environmental Health and Sanitation Unit
FAQs	Frequently Asked Questions
FGDs	Focus Group Discussions
FLOW	Field Level Operations Watch
Ghc	Ghana cedi
GPS	Global Positioning System
GWCL	Ghana Water Company Limited
HP	Hand pump
ID	Identification
IMEI	International Mobile Station Equipment Identity
ITS	Information Technology Specialist
KMZ	Keyhole Markup language Zipped
MMDAs	Metropolitan, Municipal and District Assemblies
NCWSP	National Community Water and Sanitation Programme
NGOs	Non-Governmental Organisations
O&M	Operations and Maintenance
PS	Pipe Scheme
SD	Secure Digital
SIM	Subscriber Identity Module
SP	Standpipes
ToT	Training of Trainers
Triple-S	Sustainable Services at Scale
WASH	Water, Sanitation and Hygiene
WSMTs (SCs),	Water and Sanitation Management Team for small communities
WSMTs (STs)	Water and Sanitation Management Team for small towns
QIS	Qualitative Information System



Introduction

With a steady growth in water coverage levels in Ghana over the last 20 years, emphasis is slowly moving from improving coverage by construction of more facilities, to ensuring sustainable delivery of water services in rural areas and small towns. An important element of ensuring the provision of sustainable water services is having a robust and comprehensive monitoring system that provides continuous reliable data required for remedial and corrective action and strategic planning. However so far, existing monitoring systems have focused on water coverage with less attention on functionality, actual services delivered and performance of service providers and service authorities.

Under the Community Water and Sanitation Agency (CWSA), norms and standards have been set related to the level of water services that should be provided under community management models in Ghana. Guidelines, Manuals and Model Bye-laws describe the organisational, financial and institutional arrangements that should be in place in order to ensure sustainable water service delivery. CWSA, in collaboration with IRC International Water and Sanitation Centre, under the Sustainable Services at Scale (Triple-S) initiative, have developed a Framework for assessing and monitoring rural and small town water supply services in Ghana in line with the set norms and standards.

This 'How-To-Do' Guide on monitoring Rural and Small Town Water Services in Ghana is based on lessons and experiences acquired in the testing and implementation of the Service Monitoring Framework. Testing and implementation of the Service Monitoring Framework was conducted between 2011 and 2013 with two rounds of data collected in 3 pilot districts; namely East Gonja (Northern Region), Akatsi (Volta Region) and Sunyani West (Brong-Ahafo). This Guide has been developed through wide-spread consultations with field enumerators, service providers and key officials involved in the testing and implementation of the service monitoring framework in the three Districts Assemblies (DAs) and the CWSA Technical Committee. This Guide is meant to be used together with the service monitoring framework

Objective of this Guide

This Guide has been developed to assist WASH sector stakeholders in Ghana to undertake water service monitoring in the community water sub-sector. It details the various steps and activities involved in carrying out water service monitoring geared at providing real time information required for planning, budgeting, resource allocation and remedial action. The target audience include:

- ❖ The Community Water and Sanitation Agency (CWSA)
- ❖ Water and Sanitation Units of the Works Department's of the various Metropolitan, Municipal and District Assemblies (MMDAs)
- ❖ Non-Governmental Organisations (NGOs)
- ❖ Water and Sanitation Management Teams (WSMTs)

Overview of this Guide

The first section of this guide describes the water service monitoring approach. It discusses the 'why', 'what' and 'how' of water service monitoring. The following sections in this guide discuss the subsequent stages of water service monitoring:

- ❖ Phase 1: Starting-up
- ❖ Phase 2: Data collection
- ❖ Phase 3: Data cleaning
- ❖ Phase 4: Data analysis, reporting and presentation

The costs related to and the business case for service monitoring is presented in the final section of this guide.



THE WATER SERVICE MONITORING APPROACH

This section describes the water service monitoring approach. It takes a closer look at the 'why' of water service monitoring, for what can it be used and which aspects of water services need to be monitored.

Why Water Service Monitoring?

Water service monitoring is used to inform decision-making and strategic planning at all levels (district, regional and national).

What can Water Service Monitoring be used for?

Water service monitoring can serve different purposes at different levels:

Local level: Service monitoring provides beneficiaries of water services (users and service providers) with an opportunity to see how they are doing compared to other users and service providers in a district, region or country. This can stimulate users in demanding better services and service providers taking steps in providing these services.

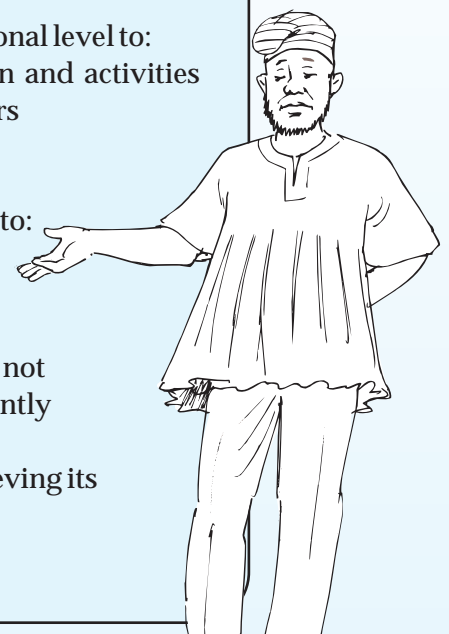
District level: Water service monitoring presents service authorities with information on the current state of water service provision in a certain area. It can be used to inform immediate corrective action.

Regional level (CWSA): Service monitoring data can be used at regional level to:

- ❖ Inform regional level strategic planning on implementation and activities related to supporting service authorities and service providers
- ❖ Inform corrective action

National level: Service monitoring data can be used at national level to:

- ❖ Inform national level strategic planning on implementation and activities related to supporting regional level CWSA and service authorities
- ❖ Research to create more insight in what works and what does not
- ❖ Inform discussions on how to do things better and/ or differently
- ❖ Feed into a Sector Information System (SIS)
- ❖ Have an overview of progress in the sub-sector towards achieving its set goals and targets



What needs to be Monitored?

In addition to the number of facilities, the types of facilities and their location, there is a need to monitor the performance of water facilities and service providers.

Water Facilities

The functionality of a hand pump is assessed based on the following indicators:

- ❖ *Functioning*: water flows out of the spout within 5 strokes
- ❖ *Partially functioning*: water flows out of the spout after more than 5 strokes
- ❖ *Non functioning*: no water flows out of the spout or cannot pump at all (i.e. broken down)

Water Service Levels

When a facility is functional it does not necessarily mean that it provides water service in line with the norms and standards set for rural and small town water provision. Therefore, there is a need to monitor water service levels in terms of water quality, quantity, reliability, and accessibility (coverage and distance). For each of these water service level indicators, benchmarks have been set based on national norms and standards, as shown in table 1.

Table 1: Service level sub-indicators and standards, as set by CWSA

Service Level sub Indicators	Benchmark
Quantity	Hand pump / standpipe: 20 litres per capita per day House connection: 60 litres per capita per day
Quality	Ghana Standards Authority water quality standards for drinking water
Coverage	Hand dug well: maximum 150 people per facility Hand pump / 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.

Whether or not a facility meets the benchmark on the different service level sub-indicators, determines the level of service provided by the facility. See table 2 and 3.

Table 2: Water service Levels for Hand pumps

Service Level	Description of Service Level
III	The hand pump provides water services and satisfies all sub-indicators
II	The hand pump provides water services but fails to meet one or more of the sub-indicators.
I	The hand pump is not functioning

Table 3: Water service levels for piped schemes

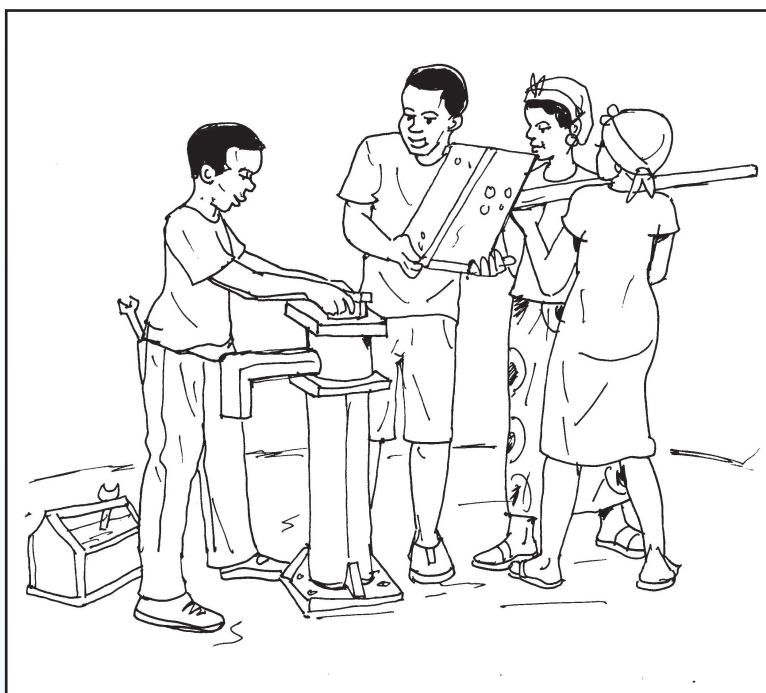
Service Level	Description of Service Level
IV	The piped scheme provides service as per design standards for population category and meets all sub-indicators
III	The piped scheme provides service as per design standards for population category but does not meet one of the sub-indicators
II	The piped scheme 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 Providers

An important assumption of the sustainability of water service provision is that they are provided by well-trained Service Providers. These Service Providers should be properly constituted in line with the guidelines¹, accountable to users and should not suffer from political interference. They should have access to spare parts and technical services and should execute maintenance and water quality testing on a regular basis in accordance with the guidelines. They should set a realistic tariff in line with the guidelines, collect and manage funds efficiently and effectively.

To monitor the performance of Service Providers, indicators (see table 4) have been developed and tested based on national norms, guidelines and model bye-laws. In order to quantify qualitative information on Service Provider's performance, Qualitative Information System

(QIS)² scoring tables have been developed for each indicator. These tables go from a minimum score of 0 (the worst situation) to 100 (the ideal situation). For each indicator, a benchmark has been established representing the minimum acceptable score on this indicator. This is set at the half-way point (at the 50-score).



¹ District Assemblies model Bye law-Establishment and operations of water and sanitation teams/committees

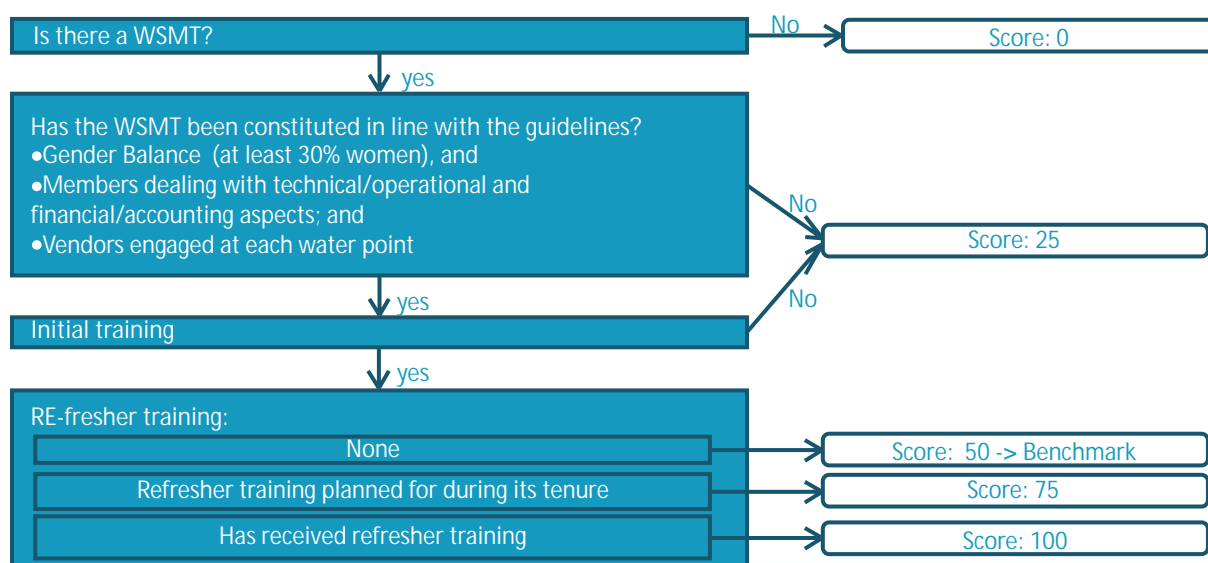
² The scoring tables for each indicator using QIS can be found in the framework for assessing and monitoring rural and small town water supply services in Ghana'

Table 4: Indicators and benchmarks for monitoring performance of water service providers

Indicator	Hand pump water service provider benchmark	Piped scheme water service provider benchmark
Management and Governance indicators:		
Composition of WSMT	There is a WSMT, which has been composed in line with the CWSA guidelines, and has received initial training	
and Operating staff	(Not applicable)	At least half of the following required positions have been filled by adequately qualified staff
Record keeping and accountability	All records are kept and are up-to-date, but have not been presented to the community	
No political and chieftaincy interference	Changes in the WSMT membership were not due to political or chieftaincy interferences	
Operational Indicators:		
Spare parts supply and technical services	It takes between 1 to 3 days to acquire spare part(s)	There are spare parts and well-equipped private sector, but it takes between 1 to 3 days to carry out maintenance or repairs
	It takes between 1 to 3 days to acquire the services of an Area Mechanic	
Corrective maintenance and Routine maintenance	Breakdown repair is carried out between 1 to 3 days	Routine maintenance is executed according to the maintenance schedule but relevant staff have not been trained in the use of the O&M manuals
	Routine maintenance is carried out but less often than twice a year	
Water quality testing	Water Quality Sampling and Analysis done by certified institutions but not on yearly basis	Water quality testing and analysis is done by certified laboratories but only once a year and paid for by the community through tariffs
Financial management indicators:		
Revenue / expenditure balance	Annual revenues were higher than annual expenditure	
Financial management	There is a bank account, cash book, but no rendering of accounts to community	All three bank accounts have been opened and proper accounts are kept, but amounts deposited less than thresholds but financial statement not prepared and not audited
Tariff setting	There is a sort of financial arrangement in place but not based on all the indicative cost items	

Scoring and benchmarking of Service Providers on these indicators can be done based on monitoring data and applying the scoring logic. An example of such scoring logic is presented in Figure 2.

Figure 2: Example of scoring logic for indicator - Composition of WSMT (small community)



Service Authorities

Service Providers need to be supervised and supported by Service Authorities (e.g. the District Assembly and CWSA). Service Authorities are responsible for overall planning and coordination of water service provision.

Based on the District Operational Manual (DOM, 2014, page 11), the regional office of CWSA plays the lead role in providing technical support to the Metropolitan, Municipal and District Assemblies (MMDAs) and building the capacities of regional and district stakeholders for the effective implementation of Water, Sanitation and Hygiene (WASH) activities in the region. The MMDA is responsible for all developments including WASH services delivery within its area of jurisdiction. Accordingly as a Service Authority, the MMDA has a leading role as implementer of water and sanitation projects and programmes under the National Community Water and Sanitation Programme (NCWSP).

Scoring tables and logics for the Service Authority's indicators have been devised in a similar way as for the Service Provider performance. See table 5 for an overview of the Service Authority and support indicators and benchmarks.

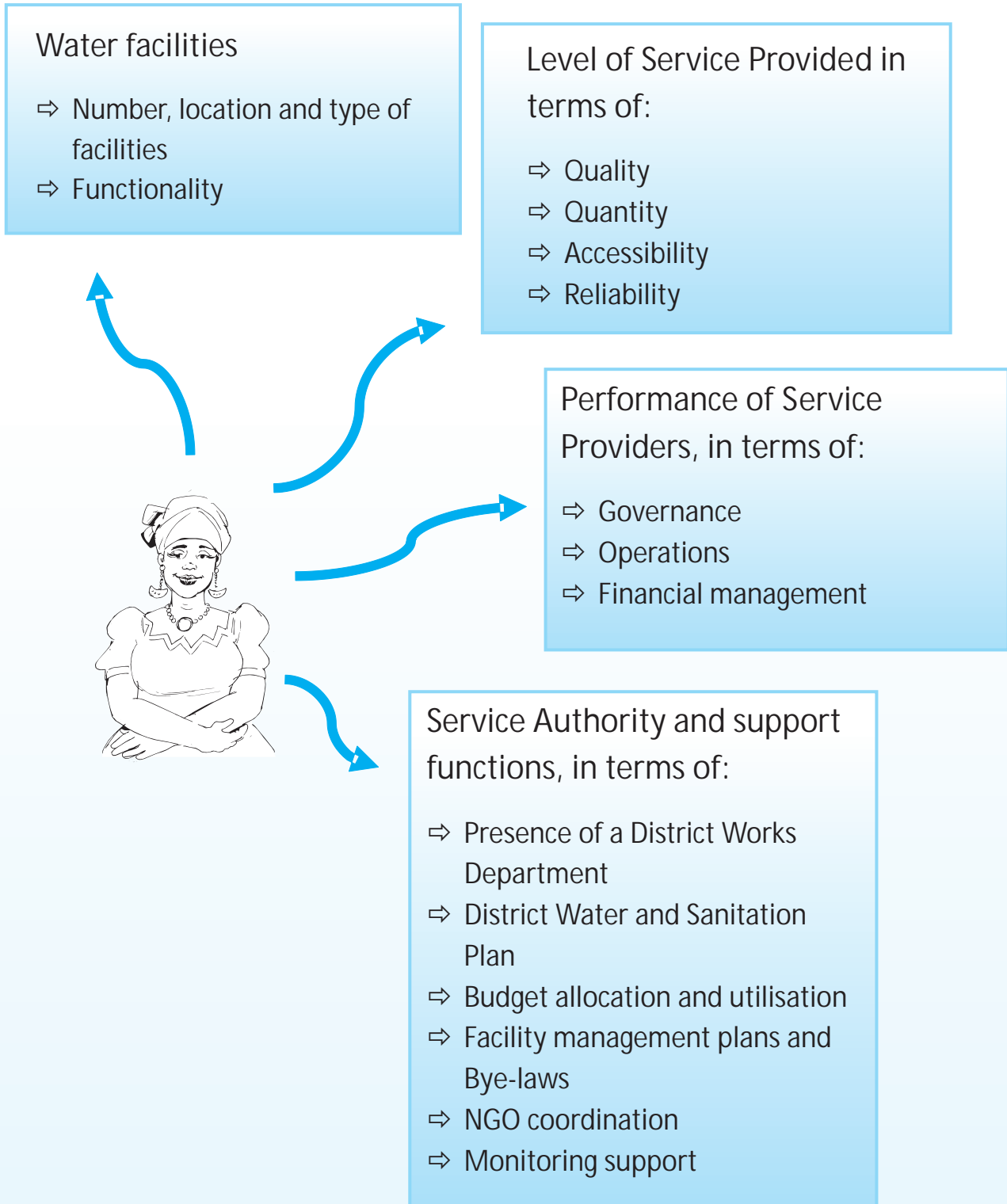
Table 5: Indicators and benchmarks monitoring performance of water Service Authorities

Indicator	Benchmark
Presence of a District Works Department	There is a full unit for WASH activities, and coordination and collaboration for WASH activities is good but not well resourced
District Water and Sanitation Plan	There is a District Water and Sanitation Plan, which has been developed with active participation of relevant departments, but this has not been included in the MTDP
Budget allocation and utilisation	There is a budget allocation for WASH activities but less than 50% of the budget has been disbursed
Facility management plans and by-laws	There are Bye-laws for WSMTs which are published and gazetted
NGO coordination	At least 50% of NGOs inform the MMDA about implementation of their activities and align their implementation to the DWSP
Monitoring support	The MMDA monitors O&M of water facilities in terms of financial, technical and administrative performance on a regular basis (but less than quarterly) and provides the direct support when needed but no auditing of WSMT accounts
Data transfer from district to regional level	DWD submits MOM reports to the regional CWSA office but not on quarterly basis.
Support in case of major breakdown	MMDA has provided some support to the community when they needed support with replacement of hand pumps or redevelopment of boreholes

Table 6: Indicators and benchmarks for monitoring CWSA regional office technical support

Score	Narrative Description
100	CWSA regional office has provided technical support to the MMDA at least twice a year
50	CWSA regional office has provided technical support to the MMDA at least once last year
0	CWSA regional office has not provided technical support to each MMDA over the last year

In Summary, there is the need to Monitor:

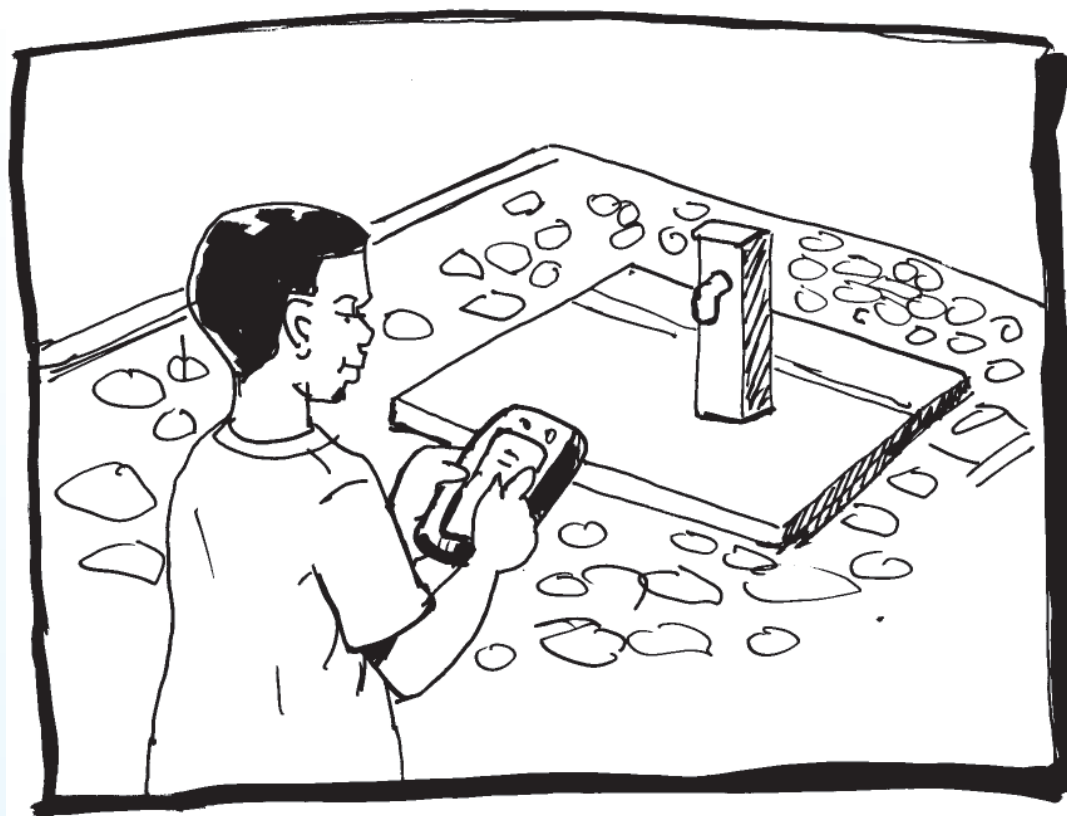


How do you undertake Water Service Monitoring?

Water service monitoring should be a structured, planned activity which is conducted on a quarterly basis. It involves four phases:

1. Starting up
2. Data collection
3. Data cleaning
4. Analysis, reporting and presentation

Each phase is explained in detail in the following sections of the Guide.



Phase 1 - Starting-up

Organising the Service Monitoring Team

Water service monitoring data should ideally be collected quarterly to enable corrective actions to be taken on a timely basis and strategic planning done at various levels. Data should be collected by relevant staff of the Metropolitan, Municipal and District Assemblies (MMDAs) responsible for monitoring.

Based on experience from the pilot, a Data Collection Team of at least six (6) full time dedicated staff has to be established to ensure that data on all facilities in a district is collected within a reasonable timeframe (e.g. within one calendar month). It is recommended that the team at the start of data collection works in pairs for the first few days.

The data collection team needs to be supported and the data coming in must be monitored, especially at the start of the exercise. This task should be taken up by the Information Technology Specialist (ITS) of the regional CWSA office. In the start-up phase there is need for the following activities:

- ❖ Introduce stakeholders to the approach
- ❖ Clarify roles and responsibilities of different stakeholders
- ❖ Train stakeholders on the approach

If the approach has been followed in the area before:

- ❖ Confirm the roles and responsibilities of stakeholders
- ❖ Re-train key stakeholders involved



Tip: Make sure that...

- ⇒ The Data Collection Team is anchored in the District Works Department (DWD) and other related departments such as the Environmental Health and Sanitation Unit (EHSU), Community Development Unit (CDU) etc.
- ⇒ Data collectors need to have a good understanding of the district (i.e. location of communities, water facilities and WSMTs)
- ⇒ Data collectors should have access to means of transport (i.e. motorbike, pick-up).
- ⇒ In case of mobile phone data collection, data collectors should have the ability to use a mobile/smart phone effectively, type and send messages or are willing to learn. Each data collector needs an individual smart phone loaded with the necessary applications for data collection.

- ⇒ Minimum of 6 data collectors per MMDA are required.
- ⇒ Data collection should not last more than a month (based on experience from the pilot).
- ⇒ On average, data collectors are able to complete and submit 3-5 communities per day.

Training of Data Collection Team

The training for the Data Collection Team involves three main sessions³ spread over a maximum of three days training. The main sessions are:

Session 1: What data are we collecting?

This session presents an overview of different indicators and scoring logics for assessing and monitoring:

- ❖ Functionality
- ❖ Service levels
- ❖ Service Provider performance
- ❖ Service Authority performance

Session 2: How are we collecting the data?

This session takes data collectors through:

- ❖ How to use the data collection tools (questionnaires, Focus Group Discussion etc.)
- ❖ Hands on practise - Using smart phones for data collection
- ❖ Hands on practise - Using GPS for data collection

Session 3: Field testing

This session consists of a field visit. A community is selected and data collectors are guided to administer the data collection tools. After the field exercise there is a feedback session so data collectors can share and discuss their experiences.

³ Training materials will be made available by CWSA to the relevant stakeholders.



Tip:

- ⇒ In order to get a good overview of water services provided in a certain area, monitoring data has to be obtained from hand pumps and piped schemes (including the standpipes).
- ⇒ Make sure sufficient time is made available for training data collectors on collecting data on piped schemes, as this tends to be more complicated and requires more guidance than data collection on hand pumps.
- ⇒ The training of the data collectors should be done by the people responsible for supporting the data collectors in the field. The training process should therefore start with a Training of Trainers (ToT) of the people responsible for supporting data collectors so they can train the data collectors

Phase 2 - Data collection

Coding

In order to ensure that data from water facilities and Service Providers can be analysed, it is important to use unique identity codes for each water facility and Service Provider. Unique codes need to be generated and managed from a central point (e.g. CWSA). The same unique codes for a water facility and Service Provider should be used in all future monitoring data collection exercises.

In the absence of comprehensive national coding system that will generate unique codes which are used by all stakeholders in the sub-sector, temporal unique codes should be set during the baseline assessment. Subsequent data collection rounds will then always have to refer to the temporal unique codes from the baseline assessment for each specific facility or Service Provider. As soon as a national coding system is fully implemented, these temporary codes can be replaced by the official codes.

Baseline and repeat data collection

In an area where service monitoring data has not been collected before, there is a need to collect all static and dynamic data for all facilities in order to establish a baseline. Static data is data that (generally) does not change over time. This includes the geo location (Global Positioning System coordinates), the year of implementation, the type of facility, the financier of the facility etc. Static data needs to be collected for all new water facilities. During subsequent monitoring rounds, static data of facilities identified and assessed in the baseline, will not have to be collected again.

Tip:

When collecting Global Positioning System (GPS) data, make sure your GPS device or phone has been in a stable position for some time before taking the GPS coordinate. Else the coordinate could be incorrect.



Dynamic data is data that can change over time, and thus needs to be updated at a regular interval. This includes data on functionality, the level of service provided by the facility (in terms of accessibility, water quality, quantity and reliability) and the use of the facility. Dynamic data needs to be collected on all facilities. After a baseline database has been established, dynamic data on existing facilities needs to be updated at least annually. The static data will remain the same, unless the facility is rehabilitated or extended.



Tip:

In order to ensure static and dynamic data for the same facility can be linked, the same identity code needs to be used. To enable data collectors to identify the right unique facility code, they have to be provided with a list and/or preferably a digital map with the points of previous entries, their locations and their codes.

Collecting data from water facilities

In order to monitor the functionality and level of service provided in a district, data needs to be collected from:

- ❖ All hand pumps (hand dug wells and boreholes)
- ❖ All public standpipes connected to piped schemes, including the ones connected to Ghana Water Company Limited (GWCL) systems
- ❖ All piped schemes, including limited mechanised boreholes, small community schemes, small town schemes⁴ and connections to GWCL systems
- ❖ All piped scheme sources

The data needs to be collected through observations and interviews with the Water Service Provider. The data collection forms can be found in the annex of the Framework for Assessing and Monitoring rural and small town water supply services in Ghana document.

Frequently Asked Questions of data collectors:

Where can I get data on year of construction, financier of the facility, design population etc.?

- ⇒ Do not only rely on information from the WSMT for the static data, but review projects reports and as built drawings of the water facility.

How can I determine the number of people using a hand pump or standpipe?

- ⇒ Note that this is not the number of people actively going to the facility to collect water, but the total number of people depending on water from the facility. For example, in a household of 5 people there may only be 1 person actively going to the facility to collect water, but the number of people depending on the facility in that household is 5 (i.e. the total number of household members).
- ⇒ In order to determine the number of people depending on the facility, use the census data were available to assess the number of people in the community.

⁴ A glossary of technology options is available in the monitoring indicator framework.

⇒ If multiple water sources are available in the community, use the ratio of people per water facility type to calculate the number of people per facility

How can I get a reliable estimation of the amount of water used per person per day from a hand pump?

⇒ This is indeed a challenge. If sales records are kept which mention the quantity sold these can be reviewed and compared with your own assessment of how many buckets are sold on a daily basis. Then compare this with the number of people using the facility. If the number of buckets sold is more than the number of people depending on the facility, then people are using on average more than 20 litres per person per day (lcpd).

How can I measure the discharge (or flow rate) of a standpipe?

⇒ Measure the amount of time it takes to fill a container with a known quantity.

⇒ The discharge (l/s) = volume of the container (in litres) / time it took to fill (in seconds)

Tip: Turn on the tap before putting the container under it to be filled.

Collecting data from water Service Providers

Hand pumps in rural areas should ideally be managed by Small Community Water and Sanitation Management teams (WSMT-SC), while piped schemes in small towns should be managed by Small Town Water and Sanitation Management Teams (WSMT-ST). However in addition, other service providers can often be found including:

- ❖ Assembly man managing a (number of) hand pump(s)
- ❖ Private person managing a hand pump
- ❖ Private person managing a limited mechanised borehole

In order to monitor the performance of Water Service Providers, data needs to be collected on their governance, operations and financial management. This data will be used to score the performance of the Service Providers⁵.

Data can be collected by having an interview or Focus Group Discussion (FGD) with the Service Provider. It is useful to organise a FGD followed by interviews with key members (chairman, treasurer and secretary) to get more detailed information. Data also needs to be collected by reviewing records, including administrative, financial and technical records.

⁵ Some of this information can be difficult to collect when the facility is owned by a private person.



Tips for collecting data from water Service Providers:

- ⇒ Inform the service provider in advance and book an appointment
- ⇒ Make sure that relevant WSMT members (chairman, treasurer and secretary) are available for the interview/focus group.
- ⇒ Give a clear introduction on the objective of the data collection exercise and check whether this is understood correctly.
- ⇒ In case the service provider is a WSMT consisting of a number of members, make sure that all members participate in the Focus Group Discussion.
- ⇒ Encourage other community members to participate and validate responses given by Service Provider.
- ⇒ Make the interview a conversation with the group.
- ⇒ Try to keep the meeting under 45 minutes.
- ⇒ When working in pairs, have one data collector ask the questions and lead the conversation, while the other records the data.
- ⇒ Where possible, advise the Service Provider on issues related to basic O&M and administrative practices, or provide technical assistance in other ways during the visit.
- ⇒ Request for all the records from all the systems.
- ⇒ Plan a return visit to the Service Provider if you fail to gather all information on the first visit.

Collecting data from Service Authorities

Service Authorities supervise water Service Providers in a certain geographical area. Furthermore, Service Authorities plan and coordinate efforts to sustain and improve water services. In Ghana, the MMDA is responsible for ensuring sustainable water service provision in their area of jurisdiction. The MMDA is supported in this function by CWSA. In order to assess the performance of Service Authorities, data needs to be collected from the MMDA and its DWD and the CWSA. This data can be collected by organising a FGD or interviews with the Service Authorities to gather information on their performance. Furthermore review of documents, including budgets and expenditure overviews, can help obtain the required information



Tip for collecting data from MMDA/DWD and CWSA:

- ⇒ Follow protocol. Make an appointment with the MMDA Chief Executive and/or the District Coordinating Director, Planners, Water Engineers, DWD/DWSTs, EHAs and explain the objective of the data collection exercise.

Monitoring of data collection

To ensure the quality of the data, there is a need to monitor submitted surveys from the field to check for wrong data entries, inconsistencies and other errors. As mentioned previously in the starting up phase, this task can be undertaken by CWSA regional Information Technology Specialist (ITS).

Where errors are minor, a simple call to the data collector involved could be used to rectify the anomaly. Where errors are grave, the Information Technology Specialist should visit the data collector concerned and provide direct support.

Common data collection mistakes include:

Facilities assigned the same GPS coordinates because:

- ⇒ Facilities are too close to register separate coordinates or
- ⇒ Data collectors forgot to take new coordinates as they moved to new locations or facilities.

Corrective action: This can be checked by sorting on geo-location.

Amount of water used per person per day

- ⇒ Explanation of the indicator: This should be the amount of water from that specific facility used per person per day.
- ⇒ *How to spot mistakes?* Check the number of people using the facility. If this number is higher than 600, the use of 20 lpcd would mean that the pump would have to be in use non-stop for more than 10 hours each day (assuming it only takes 1 minute to fill a bucket), which does not seem realistic. So if you spot that the number of users is higher than 500, and a use of "More than 20 lpcd", check with the data collector if this is the real situation.

Corrective action: Check with data collector. Adjust number of people or use per day accordingly.

Number of people within 500 meters of the facility

- ⇒ Explanation of the indicator: This should be an estimate of the number of people who are located within 500 metres of the facility.

How to spot mistakes? Save the data in your Excel file as a KMZ⁶ file. Open the KMZ file in Google Earth and check whether the facility is indeed within 500 meter of a collection of houses.

⁶ KMZ is a file extension for a placemark file used by Google Earth. KMZ stands for Keyhole Markup language Zipped. It is a compressed version of a KML (Keyhole Markup Language) file. KMZ files can contain placemarks featuring a custom name; the latitudinal and longitudinal coordinates for the location, and 3D model data.

(Estimated) number of people depending on the facilities as their main source of water supply

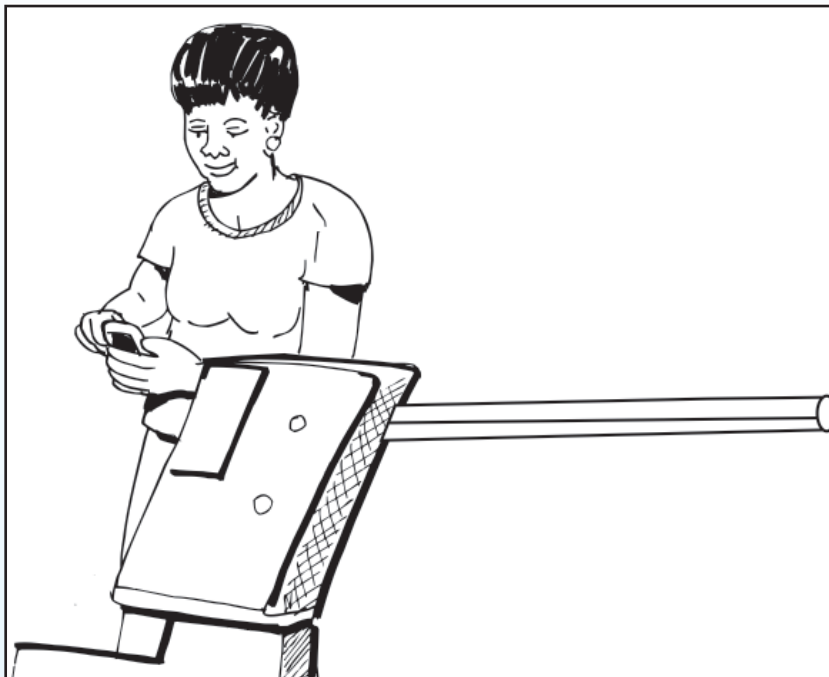
- ⇒ Explanation of the indicator: If one community is served by a number of functional boreholes, who all make use of the facility, then the estimated number of people depending on the specific facility will be the total population divided by the number of functional facilities.
- ⇒ *How to spot mistakes?* Check for repeated high population sizes. Check whether this concerns the same community.

Corrective action: If so, check with the data collector whether this is the total population, or really the number of people depending on that specific facility.

In the service provider survey: How much is the tariff?

- ⇒ Explanation of the indicator: This should be filled in Ghana pesewas (Ghp).
- ⇒ *How to spot mistakes?* The tariff per bucket is likely to be between 1 and 10 Ghana Pesewas. The tariff per m3 is likely to be between 50 and 200 Ghana pesewas.

Corrective action: Check whether the submitted tariff is within the margin mentioned above. If not, check with the data collector and correct accordingly.



Phase 3 - Data Cleaning

Data that has been collected and submitted needs to be cleaned before it can be used for analysis and reporting. It is useful to do this in a working group, involving data collectors and other relevant MMDA and CWSA staff.

Organising a working group is not only helpful in data cleaning, but can simultaneously be used for data validation and combined with data analysis (see Phase 4).



Tips: How to spot and correct common data collection or entry mistakes?

- ⇒ Inconsistency in spelling of names (especially of communities and area councils). This can be checked by sorting on community or area council name and checking consistency.
- ⇒ Double counting. Data on the same facility or service provider may be submitted more than once. This can be checked by sorting the entries on location or on community name and comparing entries.
- ⇒ Facilities assigned same GPS coordinates (because facilities are too close to register separate coordinates or enumerators forgot to take coordinates as they moved to new locations or facilities). This can be checked by sorting on geo-location.

Phase 4 - Data analysis, Reporting and Presentation

Data analysis is done by the MMDAs with support from the CWSA. Data analysis consists of scoring and benchmarking of:

- ❖ Water facilities, in terms of:
 - ♦ Functionality
 - ♦ Provided service level

- ❖ Service Providers, in terms of performance in the area of:
 - ♦ Governance
 - ♦ Operations
 - ♦ Financial Management

- ❖ Service Authorities, in terms of in the area of:
 - ♦ Establishment of a District Works Department
 - ♦ Availability of a District Water and Sanitation Plan
 - ♦ Budget allocation and utilisation
 - ♦ Facility Management Plans and Bye-laws
 - ♦ NGO coordination
 - ♦ Monitoring support
 - ♦ Data transfer from district to regional level
 - ♦ Support in case of major breakdown)

Data analysis can be done by using the collected monitoring data and applying the scoring tables presented in the Framework for assessing and monitoring rural and small town water supply services in Ghana⁷

In order to ensure consistency in data analysis, it is advisable to use logical formula in excel to process the monitoring data. Stakeholders at different levels will need access to the monitoring results in different ways and with different levels of detail and aggregation. The results of water service monitoring needs to be presented at various sector platforms for reflection, discussion and action by stakeholders (e.g. district, regional and national). The findings can empower affected groups with adequate information to hold their duty bearers accountable and demand for improvements in water service delivery in their communities. For example:

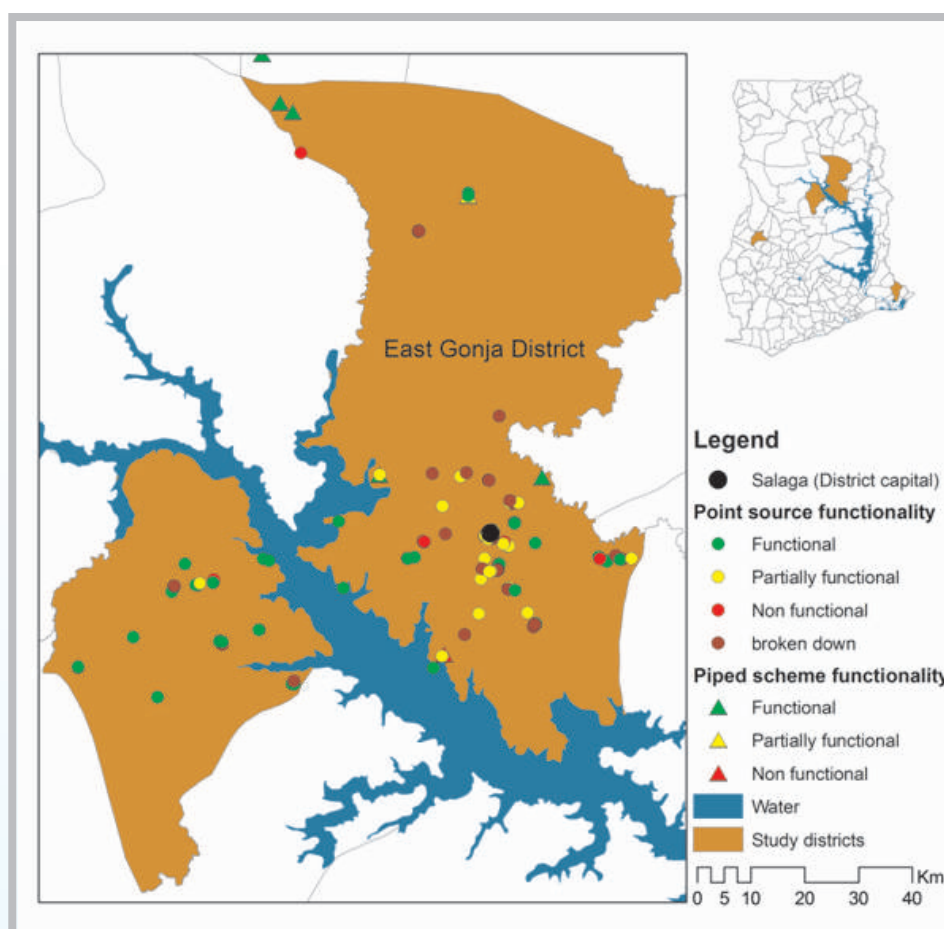
- ❖ Users may be interested in the level of service that they receive and the performance of their Water Service Provider, as compared to other Service Providers in the area. They can use this information to hold the Service Provider accountable.

⁷CWSA 2014, Framework for Assessing and Monitoring Rural and Small Town Water Supply Services in Ghana, Accra

- ❖ Service Providers may be interested in the level of service that they provide and their performance, as compared to other Service Providers in the area. Furthermore they may be able to use the data on Service Authority performance, to hold Service Authorities accountable.

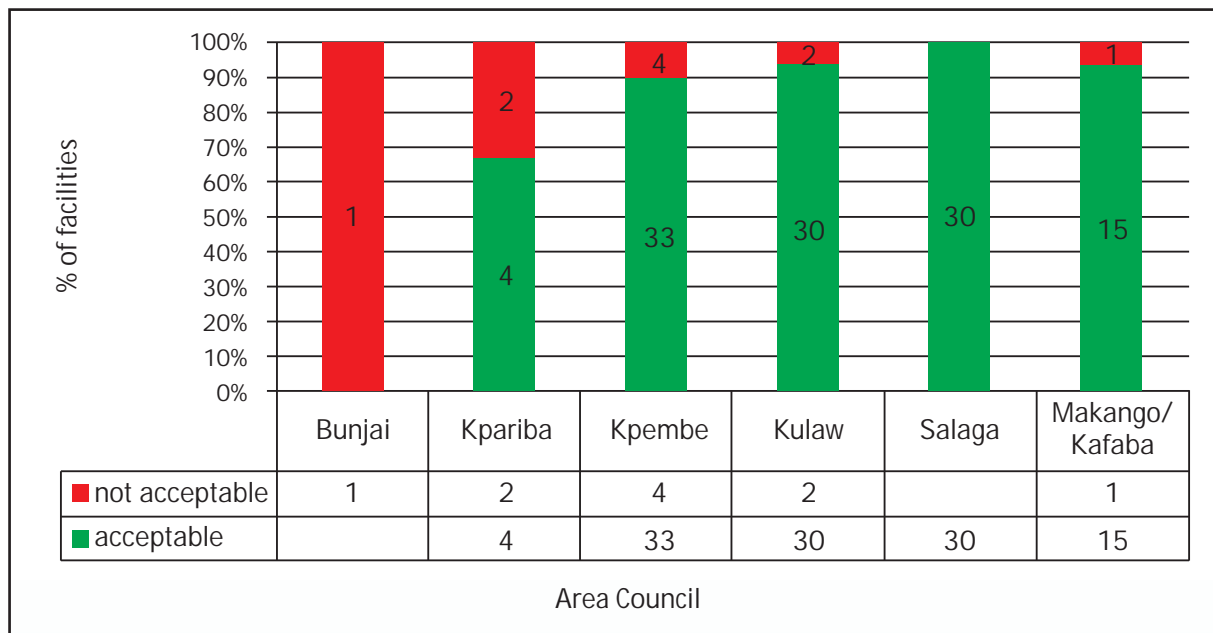
The data can be presented per facility or service provider, for example in maps (see figure 3). This map shows a spatial distribution of water points in the East Gonja District.

Figure 3: Example of map of water point distribution in East Gonja district



At district level, maps and figures (see below) can be useful for strategic planning, allocation of resources and taking remedial actions. At this level, aggregated data per area council can be useful as well. This can be presented in tables or graphs (see figure 4) which shows the user perception of water quality in the East Gonja District.

Figure 4: Example of bar chart showing percentage (%) of user perception of water quality in East Gonja district



After the presentation of the monitoring findings, stakeholders should be encouraged to discuss gaps identified and develop an action plan on how to address the issues. The plan can also be used to leverage additional external resources from development partners, individuals, and foundations to implement the plan.

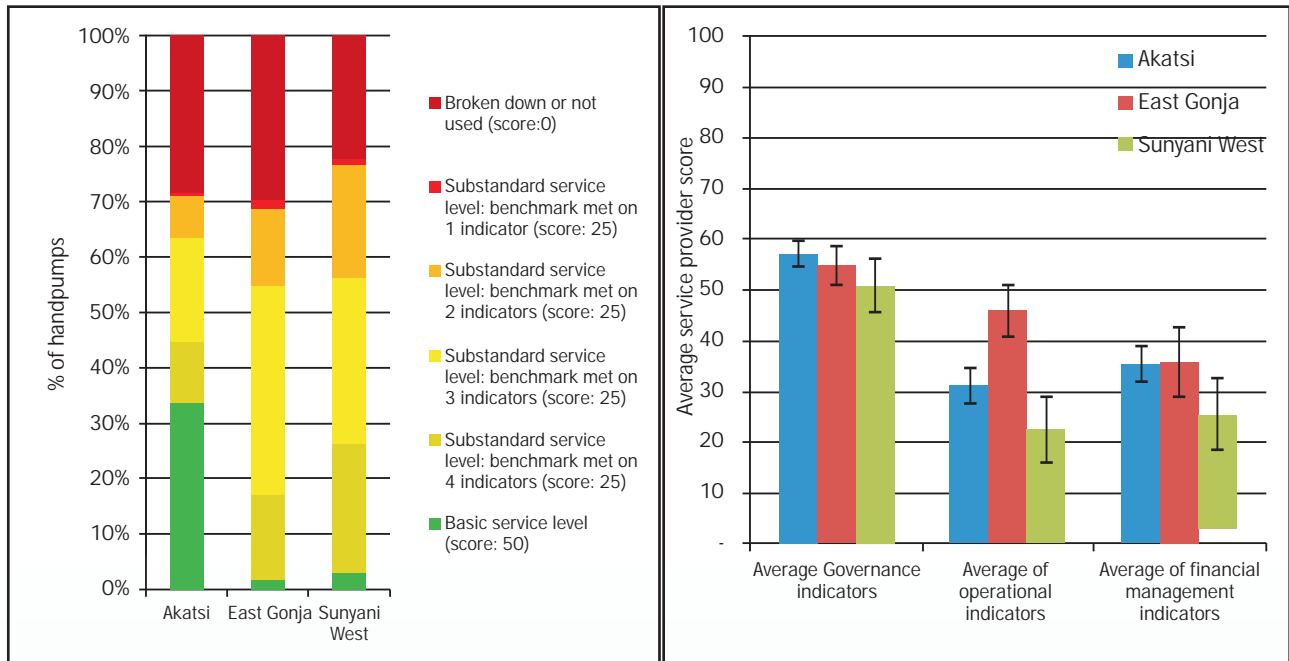
Tip

Actively involving core Metropolitan, Municipal and District Assembly (MMDA) staff and Environmental Health Assistants (EHA) in the data analysis and visualisation of the findings can help facilitate acceptance and ownership of the results.



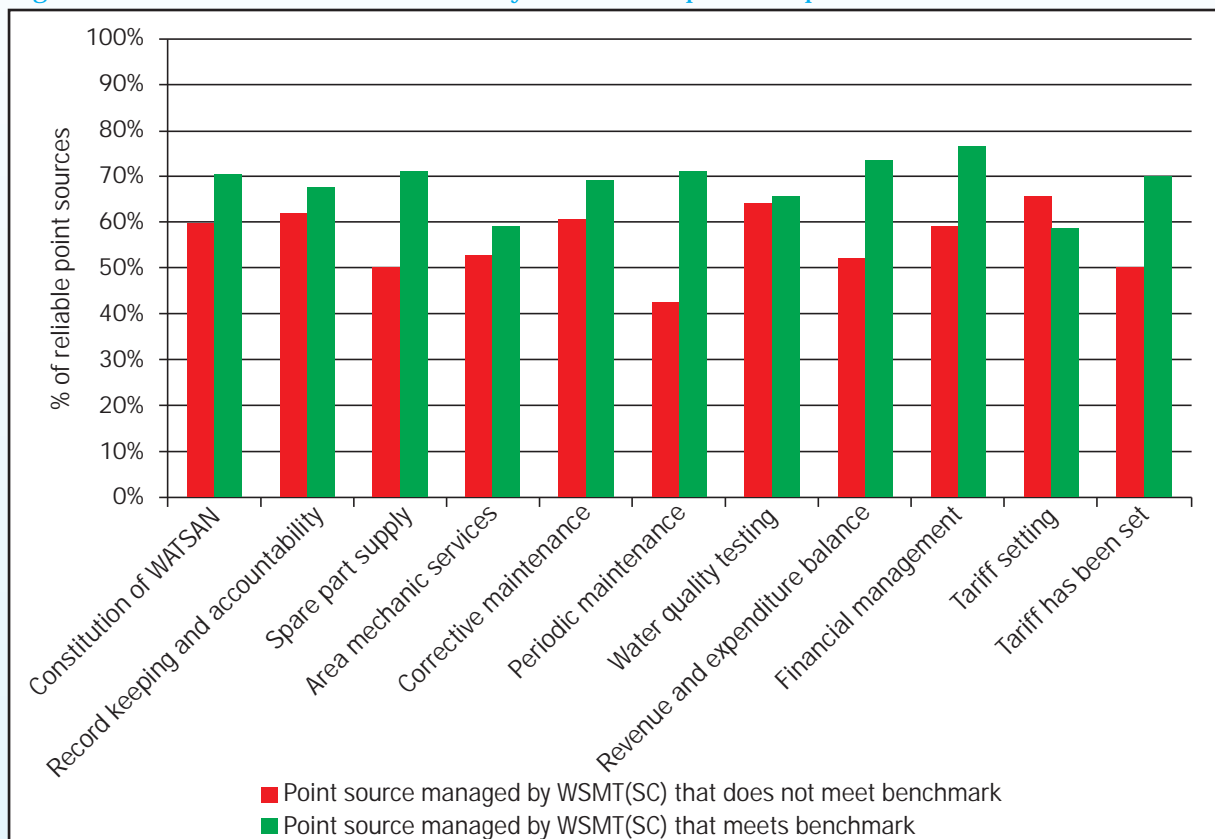
At national level, there is interest in aggregated data per district or region, in order to inform strategic planning. This can involve data on service levels, but also on Service Provider or Authority performance. For examples, figure 5 (below) shows the proportion of hand pumps providing a certain level of service and average service provider scores in 3 districts.

Figure 5: Proportion of hand pumps providing a certain level of service (left) and average service provider scores in 3 districts (right)



At national level, there is also an interest in cross-analysis between the different indicator groups, in order to stimulate and guide sector debate. For example, which elements of water service performance have the strongest correlation with service reliability (see figure 6)?

Figure 6: Correlation between reliability and service provider performance



In addition to generating individual maps, graphs and tables, monitoring results can be presented in the form of:

❖ Factsheets - see for example:

[http://www.waterservicesthatlast.org/countries/ghana triple s initiative/news events/triple s ghana produces fact sheets on water service delivery in three districts\)](http://www.waterservicesthatlast.org/countries/ghana%20triple%20s%20initiative/news%20events/triple%20s%20ghana%20produces%20fact%20sheets%20on%20water%20service%20delivery%20in%20three%20districts)

❖ Research reports - see for example:

[http://www.waterservicesthatlast.org/media/files/the status of rural water supply services in ghana](http://www.waterservicesthatlast.org/media/files/the%20status%20of%20rural%20water%20supply%20services%20in%20ghana)

❖ Blogs - see for example:

<http://waterservicesthatlast.wordpress.com/2013/10/18/tracking-change-and-sharpening-indicators/>

These kinds of materials can stimulate sector-wide discussion and debate on what is going well, what is not going well, and on how things could be improved or done differently.



The costs of Monitoring services

As shown in the previous chapters of this “How-to” Guide, regular monitoring of water services has many advantages and can be used for a variety of purposes. But monitoring also comes with certain costs. The details of the costs which have to be budgeted for when undertaking monitoring of rural and small town water services in Ghana as described in this document and based on the Triples S/CWSA service monitoring are described in this chapter.

The following cost elements need to be considered:

- ❖ Costs of maintaining a monitoring platform i.e. the FLOW instance: development and running costs of the platform, including staff time
- ❖ Cost of internet connectivity
- ❖ Costs of data collection medium: paper or mobile phones and their running costs
- ❖ Training of Trainers and training of data collectors
- ❖ Data collectors: staff time and allowances for data gathering, including cost of fuel, lunch and, if needed, accommodation
- ❖ Key MMDA staff: staff time and allowances for data cleaning and analysis (a minimum of five days per year).
- ❖ Regional CWSA staff: staff time and allowances to guide and support water service monitoring
- ❖ Costs of publication of monitoring results (e.g. factsheets, reports etc)

The costs to conduct a baseline study including training, data collection, cleaning and analysis are about Ghc 16,650 per district (see table 7 below)⁸. The second round costs on average Ghc 12,560 per district (see table 8 below). The difference is due to the fact that the duration for training for data collection, monitoring and supervision, data cleaning and analysis is reduced in the second round. In addition, seven (7) phones (one phone for each enumerators and the supervisor) at the cost of Ghc 350 per phone would be ideally included in the budget.

Table 7: Cost of the first round of service monitoring

Cost components		Cost of service monitoring in Ghana cedis (Ghc)			
		East Gonja	Akatsi	Sunyani West	Average
1	Training of enumerators	760	2,960	630	1450
2	Data collection	7,500	9,040	10,500	9013
3	Monitoring and supervision	3,554	3,830	1,176	2853
4	Data cleaning and analysis	5,110	2,960	1,927	3332
Total		16,924	18,790	14,233	16,649

⁸ All costs mentioned in this chapter are in Ghana cedi (Ghc) 2012 and when used in planning and budgeting need to be brought to the year under consideration.

Table Cost of the Second round of service monitoring

Cost components		Cost of service monitoring in Ghana cedis (Ghc)			
		East Gonja	Akatsi	Sunyani West	Average
1	Training of enumerators	755	2,161	1,725	827
2	Data collection	7,500	6,250	7,500	7,083
3	Monitoring and supervision	2,400	1,650	1,232	1,761
4	Data cleaning and analysis	1,960	2,820	1,716	2,165
Total		12,615	12,881	12,173	12,556

The costs detailed in the tables above exclude the time input (salaries and benefits) of the following personnel that were actively involved:

- ❖ District Assembly staff
- ❖ CWSA staff
- ❖ Triple S project staff

Cost breakdown

Procurement of the mobile phones

Each Municipal or District Assembly would require at least seven Android phones. The Samsung Galaxy Ace, which sells for approximately Ghc 350, was used for the monitoring exercise. The phone is user friendly and very efficient.

Training of Data Collectors on FLOW, use of phone and indicators

A two day workshop for 6-10 district staff on the use of mobile phones for data collection, service monitoring indicators and the specific questions for the monitoring will be required as described in phase 1⁹. The average cost of training is Ghc 1450. The training cost includes the cost of training venue, stationary, snack, water, lunch and transport allowance

Data Collection

Data collection can be carried out by six (6) enumerators for a period of 25 days covering water supply facilities (hand pumps, mechanised systems, standpipes) and the water management organisations (WSMTs for small communities and towns). Initially the staff will work in pairs and later on work individually after mastering the use of the mobile phones for the survey.

Monitoring and Supervision of the field work

The Triples S project staff and one CWSA staff spent four days in the field to supervise and monitor the data collection exercise. The expenditure for these activities covers fuel, Daily

⁹See page 15 of this document

Subsistence Allowance (DSA), accommodation, lunch and phone credit for internet. For the baseline four days of supervision and monitoring by Triple-S staff and CWSA staff experience in the use of the mobile phones for monitoring was sufficient. Subsequent monitoring required less time since the team had acquired experience from the baseline survey.

Data Cleaning and Analysis

The team needs two (2) days with the enumerators to clean the data, to fill in incomplete information, correct inconsistencies and delete duplications from the data. Data cleaning is useful to correct all wrongly spelt community names, wrongly placed Area Councils, duplicate submissions etc.

Two (2) day data analysis training was organised for CWSA and District Assembly staff to guide the participants to identify their data needs well and provide them with the requisite skill to be able to perform basic data analysis and provide information for management decisions using pivot tables in Microsoft Excel.

In total seven (7) days will be required for data cleaning and analysis for the first round (baseline) service monitoring. In subsequent service monitoring rounds the duration can be reduced from seven (7) days to four (4) days.

To sum, the cost of monitoring rural and small towns water services is made up of the following:

- ❖ Initial set up cost and the cost of the mobile phones
- ❖ Recurrent cost of service monitoring covering:
 - ◆ Training of the enumerator
 - ◆ Data collection
 - ◆ Monitoring and supervision of the field work
 - ◆ Data cleaning and analysis

NATIONAL ADDRESS & LOCATION OF CWSA HEAD OFFICE

THE CHIEF EXECUTIVE
COMMUNITY WATER AND SANITATION AGENCY
PRIVATE MAIL BAG
KOTOKA INTERNATIONAL AIRPORT
ACCRA

TEL: 0302 - 518401/518404/983104
FAX : 0302 - 518402/518405
E-MAIL: info@cwsagh.org
WEBSITE : www.cwsagh.org

LOCATION : off the Legon-Tetteh Quarshie Road
About 1km drive along the Standards
Board-Gulf House Road Adjacent to the
Dept. of Rural Housing, Okponglo.

ADDRESSES & LOCATION OF CWSA REGIONAL OFFICES

ASHANTI REGION

THE REGIONAL DIRECTOR
COMMUNITY WATER AND SANITATION AGENCY
P. O. BOX KS 9167
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TEL: 03220-27244/21424
FAX: 03220-27245
E-MAIL: cwsa_ash@cwsagh.org/cwsaksi@4u.com.gh

LOCATION: BEHIND GWCL REGIONAL OFFICE, KUMASI

BRONG AHAFO REGION

THE REGIONAL DIRECTOR
COMMUNITY WATER AND SANITATION AGENCY
P. O. BOX 1431
SUNYANI - BAR
TEL: 03520 - 27342/26462
FAX: 03520 -23539
E-MAIL: cwsabar@cwsagh.org

LOCATION: BEHIND TYCO OIL STATION

UPPER EAST REGION

THE REGIONAL DIRECTOR
COMMUNITY WATER AND SANITATION AGENCY
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TEL: 03820 - 22261/23161/22146/22712
FAX: 03820 - 22261
E-MAIL: cwsabolga@cwsagh.org/cwsaue@4u.com.gh

LOCATION: WITHIN GWCL REGIONAL YARD, BOLGA

NORTHERN REGION

THE REGIONAL DIRECTOR
COMMUNITY WATER AND SANITATION AGENCY
P. O. BOX 810
TAMALE - N/R
TEL: 03720 -22767 / 22677
FAX: 03720 - 22677
E-MAIL: cwsanr@yahoo.com./cwsanr@cwsagh.org
LOCATION: OFF BOLGA. ROAD IN MINISTRY OF
AGRIC AREA, TAMALE

CENTRAL REGION

THE REGIONAL DIRECTOR
COMMUNITY WATER AND SANITATION AGENCY
P. O. BOX 1315
CAPE COAST -C/R
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FAX: 03321 - 33134
E-MAIL: crcwsa@yahoo.com/ cwsacr@cwsagh.org

LOCATION: NEAR NATIONAL COLLEGE, CAPE COAST

EASTERN REGION

THE REGIONAL DIRECTOR
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LOCATION: ON THE KOFORIDUA-SUHUN ROAD

UPPER WEST REGION

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VOLTA REGION

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vrcwsa@cwsagh.org

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GREATER ACCRA REGION

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YARD, TAKORADI

