WORKING PAPER East Gonja District

Service level and sustainability of water supply in East Gonja Northern Region, Ghana




Baseline report

Jeremiah A. Atengdem
Patricia Gyamfi
Bashiru Shahadu

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Front page photo
Jeremiah A. Atengdem

Triple-S

The Sustainable Services at Scale (Triple-S) is a six year (2009 – 2014) multi-country learning project to improve rural water by transforming the current piecemeal approach into the provision of planned and integrated water services. Triple-S is an initiative of IRC International Water and Sanitation Centre. Its aim is to move from project based, one-off construction of water supply systems to indefinitely sustainable rural water services delivered at scale. It seeks to tackle long-term challenges of sustainable water supply by contributing to a shift from an "infrastructure perspective" to a **service delivery approach** for **rural water** sector through action research, working with government and sector stakeholders, research, documentation and dissemination and international partnerships and advocacy.

Although there are clearly variations across countries and between regions in many aspects of the water sector, Triple-S believes that three major adaptations or strategy areas are needed to address sustainability challenge:

- **Adopting a Service Delivery Approach**. This approach promotes a shift from projects to services. This means taking the perspective of a service instead of projects (or groups of projects under programmes), in which policy, institutional, planning, financing and governance of the sector all support water services at scale for rural populations;
- **Supporting a strong learning and adaptive capacity for water service delivery.** This means a sector with the capacity to learn, innovate and adapt to changing circumstances and demands that are necessary to ensure that service delivery approaches continue to be maintained for rural populations;
- **Improving harmonisation and alignment for water service delivery.** This means greater harmonisation of donor efforts at both operational and national levels, as well as better coordination and alignment of these efforts behind government-led strategies for service delivery to rural populations.

In Ghana, the Triple-S initiative is hosted by the Community Water and Sanitation Agency (CWSA) and is currently being modelled in three 'pilot' districts (Akatsi, East Gonja and Sunyani West) in Volta, Northern and Brong Ahafo regions respectively.

Executive Summary

This report presents results of the baseline assessment of the status of service levels, service providers and support functions, in East Gonja district of the Northern Region. The main objective of this report is to identify strengths and gaps in the provision of sustainable water services at service provision and district level, particularly in terms of compliance of the Community Water and Sanitation Agency (CWSA) norms and standards for service levels, service provider and service authority functions.

A set of indicators was developed to assess and monitor sustainable service provision. These indicators were based on norms, standards and guidelines set by CWSA. This included indicators on:

- Point source and piped scheme functionality
- Service level provided by the facility (based on reliability, accessibility (in terms of crowding and distance between facility and users), water quality and water quantity)
- Community-based water service provider indicators, related to governance; operations and financial management
- Service authority indicators, related to support to community-based water service providers and other service authority functions (like planning, budgeting, coordination etc)

In the period October 2011 to January 2012, baseline data was collected in order to score and benchmark facilities, service providers and service authorities against these indictors. Data was collected by district level staff drawn from the Department of Community Development and Environmental Health and Sanitation Unit, using mobile phone technology, in East Gonja in Northern Region. Microsoft Excel was used for data cleaning and analysis including the generation of raw data reports, pivot tables and charts to give a good visual impression of results and findings of the study.

Key findings

- The study showed a high level of non-compliance with CWSA norms and standards, both at service provision level, water service provider (Water and Sanitation Management Teams) level and at service authority (district) level.
- Functionality of piped schemes is higher than that of point sources. About less than half of the point sources were not functioning well (either broken down or not passing the functionality test), while the majority of piped schemes in the district were functioning.
- The majority of water supply facilities do not provide basic services, as set in the standards for the community water supply sub-sector on reliability, maximum number of people per point source (crowding), maximum distance between facility and users and water quantity. More than two thirds of the facilities were found to be overcrowded with attendant frequent breakdowns.
- Many Water and Sanitation Management Teams (WSMTs) did not meet the service provider benchmarks. Their performance was low especially on the administrative and financial management, tariff setting and governance. Handpump boreholes managed by WSMTs for Small Communities did not necessarily provide higher levels of services than point sources not managed by WSMTs. However, handpump boreholes managed by WSMTs with adequate preventive maintenance, spare part supply and financial management, do provide more reliable services.
- The service authority in East Gonja was found to be performing very poorly not meeting any of the service authority bench marks. This means that the district is hardy complying with its mandate of providing support to the community-based service providers. More attention needs to be given to

the service authority functions. This support can lead to better performing community-based service providers, which can in turn lead to more reliable and hence higher levels of services.

Recommendations

Based on the baseline study findings, we make the following recommendations for improving functionality and sustainability of rural water service delivery in the East Gonja District in particular, and the country in general.

- The CWSA should strengthen the District Assembly as a service authority to ensure that all organisations providing water facilities in the district comply with the CWSA guidelines and standards for the rural and small town water sector.
- Both Governmental and Non-Governmental Organisations working in the rural water sector should as part of their provision of water infrastructure make adequate budgetary allocation for post construction support including monitoring of operations and maintenance to guarantee the sustainability of the facilities.
- To address the widespread overcrowding of facilities and its attendant problems observed by the study, it is recommended that the District Assembly provide more facilities in communities where overcrowding is being experienced to reduce the pressure on the existing facilities.
- In view of the lack of Life Cycle Approach to tariff determination by WSMTs, it is strongly suggested that a training workshop on Life Cycle Cost Approach be organised for all water service providers to enable them adopt it in the fixing of their tariffs.
- The study revealed weak capacity of water service providers particularly in the area of administrative and financial management and records keeping at the community level which impacts negatively on the functionality of water systems. As a matter of urgency, the District Assemblies in collaboration with CWSA and other like-minded organisations should organise refresher trainings for these service providers to bring them up to speed with their mandate of monitoring operations and maintenance of facilities in the communities. In addition, the District Assembly should provide adequate resources to the District Water and Sanitation Team (DWST) to enable them provide the necessary technical, administrative and financial backstopping to the service providers in the communities.
- Additionally, ground water is difficult to get in the district, and this calls for other options of sources of water to be explored including surface water as provided for in the CWSA guidelines. There may also be the need to consider the provision of new systems to augment the high populations of communities to reduce the pressure.

Acknowledgements

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Abbreviations

COM	Community Ownership and Management
DiMES	District Monitoring and Evaluation System
DLAP	District Learning Alliance Platform
DWSP	District Water and Sanitation Plan
DWST	District Water and Sanitation Team
FLOW	Field Level Operations Watch
GSB	Ghana Standards Board
MTDP	Medium Term Development Plan
NCWSP	National Community Water and Sanitation Programme
O & M	Operations and Maintenance
RLF	Regional Learning Facilitator
Triple-S	Sustainable Service at Scale
WASH	Water, Sanitation and Hygiene
WSMT	Water and Sanitation Management Team
WHO	World Health Organisation
WSMT (SC)	Water and Sanitation Management Team for Small Communities
WSMT (ST)	Water and Sanitation Management Team for Small Towns
UNICEF	United Nations Children Emergency Fund
EU	European Union
ADRA	Adventist Development and Relief Agency
NORRIP	Northern Regional Integrated Programme
VWR	Village Water Reservoir
DWD	District Works Department
MMDAs	Metropolitan, Municipal, District Assemblies
BHs	Boreholes
HWDs	Hand dug Wells

1 Introduction and background

Rural and Small Town water supply has been reported to cover 63% of the rural population of Ghana (CWSA Annual Report 2011), thereby being on track to achieving the MDG target for water. However, behind this apparent success are a complex set of challenges for turn newly provided water delivery infrastructure into sustainable services.

The sustainability of rural water supplies remains problematic in much of sub-Saharan Africa. Different studies estimate functionality of rural water supply schemes to be between 30 and 40% (Evans, 1992; Lockwood and Smits, 2011; RWSN, 2007). This level of failure represents a total investment of between $1.2 and $1.5 billion in the last 20 years. That equates to approximately $60 million wasted per year (RWSN, 2009). Understanding the degree of non-functionality and reasons for this is crucial to defining actions to improve them.

Also in Ghana, a substantial proportion of water supply infrastructure is believed to be either not-functioning or functioning sub-optimally at any time. Because of the lack of an effective monitoring system, data to back-up this claim is lacking in Ghana. The Community Water and Sanitation Agency has made progress with the establishment of such a monitoring system, with the development of an elaborate Microsoft Access-based District Monitoring and Evaluation System (DiMES), but has been struggling to operationalize this system and feeding it with (real-time) data. Furthermore, as in many other countries, focus has primarily been on coverage measured in terms of number of systems built and people served, not taking into account the fact that, without proper support for operations and planning for maintenance and replacement, systems break down and services deteriorate. 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.

Therefore, under the Triple-S initiative, the Community Water and Sanitation Agency (CWSA) and IRC are working together to improve monitoring of service provision in the country. This work has several components:

- Developing and testing a set of indicators which would allow a more comprehensive monitoring of sustainable service delivery, based on CWSA norms and standards;
- Assessing the current status of service delivery in terms of the level of compliance of service levels, performance of community-based service providers and support functions, with the CWSA norms, standards and guidelines, using the indicator set mentioned above;
- Assessing the potential to improve data collection using mobile phone technology through the application of a system called FLOW (Field Level Operation Watch).

Under this initiative, baseline data on water service provision was collected in three districts: Akatsi district in Volta Region, East Gonja in Northern Region and Sunyani West in Brong Ahafo Region. This report presents the results of the baseline assessment of the status of service levels, service providers and support functions, in East Gonja district.

The results of this assessment are primarily as an input into district level plans for addressing these gaps. Moreover, this assessment serves as a baseline for the work that Triple-S is carrying out in these districts to improve service delivery. Apart from the potential use of these data at district level, it was felt that the results have a wider use in the country for policy formulation, operational system definition, hence this synthesis report. The data were used to identify relations between service level, service provider and service authority functions, so as to inform broader policy discussions on strengthening the service delivery models in use in the country.

1.1 Outline of this document

Following this introduction chapter is description of the background of the conceptual framework and the research methodology in chapter two. Chapter 3 provides a brief background to the pilot district, East Gonja. The results from the survey of water facilities and level of services are presented in chapter four, while chapter five assesses community-based service providers (WSMTs for Small Communities managing Handpump boreholes (BH) and Handdug Wells (HDWs); and WSMTs for Small Towns, for managing the district's piped systems). Chapter six looks at the performance of service authorities (District Water and Sanitation Teams), providing support to service providers and chapter 7 discusses correlations between the functionality and reliability of water supply facilities, the level of service that they provide, the performance of the service providers and the support they receive from the service authorities. Conclusions and recommendations are finally presented in chapter eight.

2 Conceptual framework and methodology

This section presents the conceptual framework, including the indicators developed to assess and monitor water services and the conditions needed to ensure the sustainable provision of water services. First the concept of functionality is discussed, including how it is defined and used here. However, functionality is not synonymous with sustainability and does not say anything about the level of service that is provided. Therefore, service level indicators have been developed, as well as service provider and service authority indicators, in order to assess and monitor whether the conditions needed for sustainable water service provision are in place. The second part of this section describes the methodology of this study.

2.1 Functionality

Functionality of water supply infrastructure can be assessed to get a picture of the state of water infrastructure at a particular time. It is important to clearly define what is meant by 'functionality'.

For purposes of this study, the definition of functionality is based on parameters established by the CWSA Working Group on Functionality. Functionality of handpumps can be determined by doing a functionality test (see Box 1). Handpumps that pass this test are considered functional. Handpumps that do not pass the test can be considered non-functional. In cases where the test cannot be executed because of complete breakdown of the facility, the handpumps are classified as "broken down".

Functionality test:
For the stoke test, the number of hand pump strokes needed to fill a size 34 bucket (18 to 20 litres) is determined. In order for this test to be successful, the maximum number of strokes is 40 strokes within 1 minute for Afridev and Ghana Modified India Mark II and 30 strokes for Nira AF-85 hand pump

For the leakage test, pumping is resumed after 5 minutes rest following the stroke test. If water flows from the hand pump within 5 strokes, the pump has passed the leakage test.

Functionality of a piped system can be assessed at two levels:

- The functionality of the supply system, which includes the intake and treatment system. The supply system can be classified as fully functioning, partially functioning or non-functioning, based on whether or not the head works are fully, partially or non-functioning.
- The functionality of the distribution system, which includes the piped network, standpipes and household connections. This can be expressed in terms of percentage of functioning household connections and standpipes.

As functionality only gives an indication of whether or not water facilities are working, and not whether it is providing the water services that it should be providing, it is essential to look beyond functionality of facilities and assess water service provided by water facilities and the level of service that people are receiving in a certain geographical area. A facility that is functioning at a certain point in time, can be broken down the rest of the time. Furthermore a functioning facility can be providing water of an unacceptable quality or quantity, or can be difficult to access, for example because of the distance or because of the fact that too many people depend on the facility. In that case, the system may be functioning, but is not providing a high level of service. There is thus a need to assess functionality, but also to look at functionality over time (reliability) and other water service characteristics, like accessibility of the services and the quality and quantity of water provided and used. Furthermore, it is important to assess whether structures and service provision and support arrangements are in place to ensure that the facility is not only providing water services today, but will have a higher chance to do so for a long time to come.

2.2 Defining sustainable water services and indicators for measuring this

Water services can be defined as the supply of a certain quantity of water, with a certain quantity, accessibility and reliability. It should ideally be assessed and monitored from a user perspective: what is the level of services that people have access to (in terms of quantity, quality, reliability and accessibility of the service) and what is the level of service that they are actually using (in terms of amount and quality of water)? For this study however, focus is on the level of services provided by facilities in terms of the quantity and quality of water that it provides and the accessibility and reliability of the service provided by the facility, taking facilities as the starting point.

In order to assess and monitor the provision of services provided by facilities, **service level indicators** have been developed and benchmarks set against which to assess and monitor.

In the context of the rural water sector, sustainability is often defined as the maintenance of the perceived benefit (including convenience, time savings, livelihoods or health improvements) of investment projects, after the end of the active period of implementation. More simply, and less project focused, sustainability can be defined as: "whether or not something continues to work over time" (Lockwood and Smits, 2011; Abrams et al.1998); meaning, in this case, whether or not water continues to flow over time.

Sustainability of the service is affected by a range of factors. These factors include the technical or physical attributes of the system, the financial, organisational, institutional (support functions) and managerial capacities of the service provider, which indicate the likelihood of the service continuing to be provided over time. In fact, it is remarkable that no internationally agreed indicators for measuring "sustainability" or functionality of rural water supply systems exists (Lockwood and Smits, 2011; Lockwood et al. 2010). Even though, in practice, different countries use definitions and indicators for sustainability, for this study we understand sustainability to be the indefinite provision of a water service with certain agreed characteristics over time.

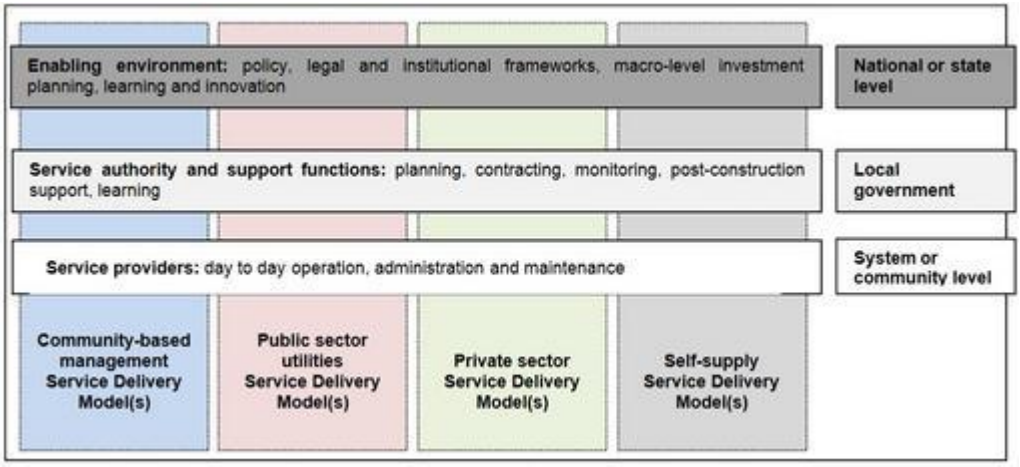
In addition to the service level indicators, it is thus important to assess and monitor the underlying factors that make the services sustainable, such as adequate management capacity, tariff recovery, and technical backstopping (Lockwood and Le Gouais, 2011). As such, it is essential to assess and monitor the performance of water service providers and the service authorities as well.

Lockwood and Smits (2011) define **service provision functions** as those functions related to the actual day-to-day provision of water services to users. These include tasks such as operation, maintenance and administration of the water scheme. **Service authority functions** include direct support, performance regulatory, planning and coordination at decentralised level. These functions are generally provided at the level between the community and the national level, which in Ghana is the district and the regional level. In order for the water service providers and service authorities to perform their tasks, an **enabling environment** is needed from higher, often national level, including the setting on targets, policy making and regulation and capacity support to the service authorities.

Service delivery models describe the 'how to' of applying the service delivery approach describes the policy, legal, institutional, financial, governance and normative frameworks that determine what services will be provided to consumers (of the service), and how this will be done. Service Delivery Models are country-specific and may include different management arrangements appropriate to the country or local conditions and desired service levels.. Indicators for assessing the level of services provided should be set at national level, irrespective of the model under which the services are provided. This will allow comparing service levels between different service delivery models. Indicators for assessing service authority functions have to be set irrespective of the service delivery models as well, as the service authority functions relate to multiple Service Delivery Models.

As different models will have different management requirements related to the service provider functions, a separate set of indicators to assess the performance of the water service provider will have to be set for the different water service providers under the different models. Below, the different indicators used for this study are introduced.

Figure 1: Functions, levels and service delivery models



2.2.1 Service level indicators

As mentioned above, service levels can be assessed in terms of the quantity and quality of provided water, the reliability of the services and the accessibility, in terms of distance and non-crowding.

In Ghana, it is the Community Water and Sanitation Agency, which is responsible for setting and regulating standards related to rural water service provision. In its Legislative Instrument (2011), it sets out the following standards:

- 'A person who designs a community water facility shall ensure that each person in a served community has access to not less than twenty litres of water per day;
- The walking distance to a water facility or delivery point in the case of a piped scheme does not exceed five hundred metres from the farthest house in the community or a section of the community;
- The facility provides safe water to the community throughout the year'.

For piped systems, it states that the delivery of water should be done in a virtually uninterrupted manner, at least ninety-five per cent of the time. When applying this criterion on an annual basis, this means that the facility should be providing services for at least 347 days in the year (with a maximum of 18 days downtime). Regarding water quality, the Legislative Instrument stimulates that the quality of the water provided should comply with the parameters for the physical and bacteriological monitoring, determined by the Ghana Standards Board GS 179-1:2009 3rd Edition Standards.

Furthermore, the CWSA design guidelines for small communities and small towns (forthcoming) stipulate that the maximum number of people per borehole or standpipe should not exceed 300 people. The maximum number of users for hand dug wells should be 150.

Table 1 gives an overview of these standards set by CWSA related to the main service level indicators.

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

Service level sub-indicators	Benchmark
Quantity	20 litres per capita per day
Quality	Ghana Standards Board water quality standards
Crowding: maximum number of people per facility	Point source / standpipe: 300 Hand -dug well: 150
Distance to water point	Maximum of 500 metres
Reliability	The facility is provides water for at least 95% of the year interpreted as at least 345 days of regular service without interruption.

A composite indicator for assessing and monitoring water service levels can be devised based on these sub-indicators, through the application of a scoring system, using a water ladder[1]. The concept of a 'service ladder' is useful in this case to better understand that when we refer to sustainability – or the lack of it – consumers can move up and down a continuum from 'no service' (which is effectively an insecure or unimproved source) to a high-service, where access is on demand at, or very close by, to the household. Applying these Ghana standards, the water service ladder can be constructed to define the overall level of service provided by a facility, as presented in Table 2.

Table 2: Ghana water service ladder

Service level	Score	Description of service level
High level service	100	The facility provides a minimum of 60 litres per capita per day (lpcd) of high quality water on demand.
Intermediate level service	75	The facility provides people with a minimum of 40 lpcd of reliable water services in line with the minimum criteria for water quantity, crowding and distance.
Basic level service (Benchmark)	50	The facility provides reliable water services (at least 345 days (95%) of the year) that are in line with the minimum criteria of providing 20 lpcd of acceptable quality water (GSB), at a distance no more than 500 m, with not more than 300 people using the hand pump, in the case of a bore hole, and 150 people, in the case of a hand dug well.
Sub-standard level service	25	The facility provides water services which are an improvement from not having water services at all, but fails to meet the basic standards on one or more criteria (quantity, quality, reliability, distance, crowding).
No service	0	The facility is broken down or not used

Source: adapted from Moriarty et al, 2010

Handdug Wells (HDWs) and Boreholes (BHs) in Ghana are supposed to at least provide water services at a basic service level. Limited mechanised boreholes and small community systems providing water services through standpipes should provide a similar level of service as HDWs and BHs. Small community and small town piped system often provide services through a mix of standpipes, providing a basic service level, and household connections, providing a higher service level. According to the CWSA design guidelines for small towns and small communities (forthcoming), the design of piped systems should cater for a design demand of 60 litres per capita per day for household connections. Based on the proportion of people served by standpipes and household connections, the service level score of a small town piped system can be determined, as indicated in Table 3.

[1] For more background on the development of service level indicators and water service ladders, see WASHCost Ghana Briefing Note 1, "Life-cycle costs in Ghana: background and methodology", and WASHCost Working Paper 2, "Ladders for assessing and costing water service delivery"

Table 3 Service level score of a small piped system

	Score	% of population served at service level				
		point source / small community piped system	Small town piped system, with a population of:			
			2000 - 5000	5000 - 15000	15000 - 30000	30000 - 50000
Percentage of people using household connections (High level service)	100		10%	15%	20%	25%
Percentage of people using standpipes (Basic service level)	50	100%	90%	85%	80%	75%
Service level score:		50	55	57.5	60	62.5

A similar method can be applied to determine an average service level score for an area. The service level score of an area can be determined based on the proportion of the population with access to different levels of services (and the score that comes with it).

2.2.2 Service provider and service authority indicators

Service provider and authority indicators are used to assess the degree to which *conditions* for sustainable service delivery have been put in place at district level.

CWSA guidelines and standards have been defined to guide service providers and District Assemblies. The service provision and authority indicators give an indication of the degree of compliance of these arrangements and structures as described in the CWSA standards and guidelines, including the model by-law for WSDB. S**ervice provider indicators** cover compliance by service providers, like WSMTs for SCs and STs, while service authority indicators are used to assess compliance by District Assemblies and agencies, which fulfil service authority functions, like the provision of direct support to the service providers and planning and coordination related to the development and provision of WASH services.

The service provider indicators are grouped into 3 sets of indicators:

- Governance indictors
- Operations indicators, and
- Financial management indicators.

Based on the performance on a number of sub-indicators, each indicator is scored on a scale from 0 to 100. Small narrative descriptions have been developed for each score. For each indicator, a benchmark of the minimum acceptable score on that indicator has been set. Table 4 gives an overview of the sustainability indicators. For a total overview of the indicators, sub-indicators, scoring tables and benchmarks, see CWSA and IRC, 2012[2].

[2] http://www.waterservicesthatlast.org/Countries/Ghana-Triple-S-initiative/News-events/CWSA-and-IRC-develop-indicators-to-evaluate-sustainable-rural-water-services-in-Ghana

Table 4: Overview of sustainability indicators

		WSMTs (SCs) managing HDWs and BHs	WSMTs (STs) managing a piped system
Service provider indicators	Governance	A well-qualified, trained and experienced gender balanced Team is in place	
		Technical, administrative and financial reports are kept and read out to the community at least once every six months	
		There is no political or chieftaincy influence in the composition of the Team	
	Operations	Spare parts are available to enable maintenance	The private sector provides the needed support to the Team
		Area mechanics are available to enable maintenance	
		Corrective maintenance is executed in an effective way	The Team prepares a work plan and budget for operations and maintenance (O&M) and executes maintenance accordingly
		Periodic maintenance is executed in an effective way	
		Water quality sampling and analysis (WQSA) services are performed on half yearly basis by recognised institutions	
	Financial management	Annual income from water sales exceeds total annual expenditure	
		There is sound financial management, accounting and auditing	
		Tariff setting is taking into account life-cycle costs, for example, minor O&M expenditures, capital maintenance expenditures for major rehabilitations, and cost of capital, e.g. interest on a loan.	
Service authority indicators		District Water and Sanitation Team (DWST) monitors O&M of water facilities in terms of financial, technical and administrative performance, including periodic audits, and provides support where needed	
		There is a well-resourced DWST, consisting of 3 well qualified and experienced staff members, receiving the needed support by CWSA and MMDA.	
		There are efficient monitoring and data flows	
		District Water and Sanitation Plan is incorporated into Medium Term Development Plans and budget of the assembly, which is used to guide implementation	
		Districts are able to allocate and utilise financial resources for water and sanitation services	
		By-laws for the WSMTs exist and are enforced effectively	
		NGOs and Civil Society Organisations (CSO) providing water facilities do so in coordination with the MMDA	

2.3 Methodology

This study has followed the action research methodology of working closely with key stakeholders at every step of the research process including the conceptualization, definition of indicators and methodology, and data collection and analysis. It followed short loop feedback cycles, sharing and discussing preliminary data

with key stakeholders at different steps of the research process (so not just at the end). It combined research (data collection and analysis to get a better understanding of water service provision) with action (development and testing of indicators and processes to improve monitoring). This section presents the process of indicator development, scope of the study, the data collection and analysis process and the limitations of the study.

2.3.1 Development of indicators

The indicators and scoring systems were developed based on the national guidelines, manuals and model by-laws by the CWSA Monitoring and Evaluation working group, Functionality Sub-Committee and the Technical Committee in close collaboration with Triple-S. Indicators and scoring tables were reviewed by CWSA's Technical Committee on Wednesday 10 November 2010 and by national level sector stakeholders during the National Level Learning Alliance Platform[3] meeting of Thursday 11 November 2010. Based on the received suggestion and comments, the indicators and scoring systems were refined. The resulting indicators and scoring systems were used as framework for analysis of a "looking back in order to inform the way forward" study in Volta region and Northern Region (forthcoming), which led to minor adjustments to the indicators.

Following the experience with these case studies, it was decided to develop standard 'assessment questions' in order to collect the required data to easily and unambiguously score the indicators on a larger scale. These questions were field tested in the second half of 2011. This led to a further refinement of some of the indicators, the questions and the scoring systems, which were used for the collection of baseline data in the 3 Triple-S focus districts from November 2011 till January 2012.

The findings of this baseline study forms an input to further refinement and finalisation of the indicators by the Monitoring and Evaluation Working Group.

2.3.2 Scope

Under this study in East Gonja, data on service levels and service providers has been collected for all existing rural and small town facilities and community-based service providers. The service providers included WSMTs (SCs) and (STs). Facilities were either BHs or HDWs with hand pumps or piped systems (community-managed systems with bulk water supply from CWSA, limited mechanized boreholes[4], small community systems[5] and small town systems[6]. Data were not collected from unprotected sources or household level facilities such as rainwater harvesting tanks.

2.3.3 Data collection

Data were collected using survey forms with mostly multiple choice questions. The surveys were tested in Akatsi district by the Triple-S team, in collaboration with regional CWSA and district staff responsible for

[3] The NLLAP is a WASH sector multi stakeholder platform with the overall goal of improving sector learning and dialogue. It is organised on a monthly basis by the Ghana WASH Resource Centre Network (RCN).

[4] Boreholes with an electrical, diesel or solar powered pump, supplying water to a small piped scheme, typically consisting of 1 or 2 public standpipes, serving up to 1200 people (CWSA, 2010a).

[5] Small piped scheme, typically with 3-4 standpipes, serving 1200 to 2000 people (CWSA, 2010a).

[6] Piped schemes with a mix of household connections and public standpipes, typically service 2000 to 50.000 people (CWSA, 2010b).

monitoring water services, using paper-based questionnaires. The feedback from these test runs were used to finalise the survey forms.

A web-based information and communication technology, called Filed Level operations Watch (FLOW), was used for monitoring and data collection. The dashboard was used to translate the paper-based surveys for the phone interface. These phone-based questionnaires were further tested in all three Triple-S pilot districts. The final survey was subsequently loaded on each of the phones.

Data collection was done using smart phones running on the Android operating system. Submitted surveys stored on the phones were transferred over the local mobile data network or WIFI into the online database.

In order to collect the data required for the scoring of the different indicators, the following methods were used:

- Review of project documents
- Field inspection and observations of facilities, including stroke and leakage test (in the case of hand pumps) and photography of each facility
- Focus group discussion / group interview with WSMTs for SCs and STs
- Inspection of financial and administrative records, where available
- Focus group discussions / group interview with the DWST

2.3.3.1 Constitution of data collection team

In constituting the team, the need to transfer knowledge and skills and build local capacity was taken into account hence the anchoring of the baseline exercise in the DWST/District Works Department (DWD). This was to ensure that after the completion of the exercise, the skills acquired would enable them improve on their routine monitoring of water services as well as data management in the district. Because of the exigency of the exercise, additional enumerators were drawn from the Department of Community Development and the Environmental Health and Sanitation Unit who form part of the DWST to speed up the process. Other considerations in the constitution of the teams were: availability of means of transport (motorbike), good knowledge of the district, and Information Communication Technology (ICT) knowledge and dexterity. In all, 3 teams consisting 2 each were constituted to carry out the exercise.

2.3.3.2 Training on functionality and sustainability indicators

To ensure data quality, a two-day training workshop was held for the constituted teams on the draft functionality and sustainability indicators to enable them deepen their understanding of the indicators to effectively carry out the baseline survey. Field testing of the tools was also undertaken in two communities to allow enumerators familiarize themselves with the process and also for the tools to be sharpened.

2.3.3.3 Training on Field Level Operations Watch (FLOW) technology

To familiarise enumerators with the data collection tool, a two day training workshop was organized on FLOW, its applicability and the use of smart phones based on Android operating system in the collection of the baseline data. The purpose of the training was to expose enumerators to the use of the technology and phones in data collection. The second day of the training focused on giving enumerators hands-on and practical experience in using the Android phones to administer questionnaires on the field. The exercise which took place in Kpalo and Adamupe, two communities in the district, also enabled the pretesting of the questionnaires loaded on the phones.

2.3.3.4 Data Collection

Data collection commenced on the 16th of November 2011 and ended on the 30th of December 2011. This involved visits by enumerators to water facilities (hand dug well with handpumps, boreholes, and piped systems) and interactions held with water management structures including WSMTs for SCs and STs to gather information. The enumerators worked in three teams and covered all Area Councils. This ensured that all facilities were covered under each of the Area Councils. Aside the gathering of data, enumerators also offered advice to WSMTs for (SCs) and (STs) on basic Operations and Maintenance (O&M) practices to improve the service levels of the water facilities. On average, the teams interviewed 2 WSMTs and 2 hand pumps in day. In some cases only data on hand pumps were taken on the first visit because of difficulties in organising WSMTs. In this regard, the enumerators made several visits to be able to meet the Committees which required extra effort and resources.

2.3.3.5 Monitoring of data collection

Monitoring of the data collection process was critical to the success of the exercise, particularly in quality assuring the data was collected. Again, the technology deployed on the field was new to the enumerators hence imperative for field support and backstopping to enumerators by the Regional Learning Facilitator.

At the outset of the exercise, the Northern Regional Learning Facilitator (RLF) joined each of the 3 teams at different times on the field for the data collection exercise. Indeed, this helped build confidence of the enumerators and provided an opportunity for their initial teething problems to be addressed. As the exercise progressed, similar visits were made to the district to support the enumerators and resolve challenges on the field. Additionally, regular contact was maintained through phone calls to get periodic updates and to respond to challenges experienced by field team.

2.3.4 Analysis process and report writing

Microsoft Excel was used for data analysis including the generation of raw data reports, pivot tables and charts to give a good visual impression of results and findings of the study. This was done together with the District Water and Sanitation Team and the District Planning and Coordinating Unit of the district to enable transfer of skills and knowledge. They also participated in the report writing process and made valuable inputs into the final report.

2.3.4.1 Data cleaning and analysis

A 5-day workshop in January 2012 was held together with the enumerators to clean the data and run preliminary analysis to establish trends and patterns of water service delivery in the district. This ensured that findings subsequently put out are accurate.

2.3.4.2 Training workshop on data analysis

On the 12th & 13th December 2011, a two day workshop on data analysis of the functionality and sustainability baseline data on water services was organised in the district. The purpose of the exercise was to agree with the district on the specific and relevant aspects of the analysis that would be useful for the planning and allocation of resources for the delivery of water services in the district. The workshop also provided the key staff such as the Planning Officer, the District Engineer (Water and Sanitation), and the DWST of the District Assembly an opportunity to have hands-on experience with various methodologies involved in data analysis with a view to building local capacity for data analysis to meet the district's specific needs. After the two days, participants were equipped with basic data analysis tools and feeling very confident of being able to analyse the functionality and sustainability data on water services collected.

2.3.5 Limitations

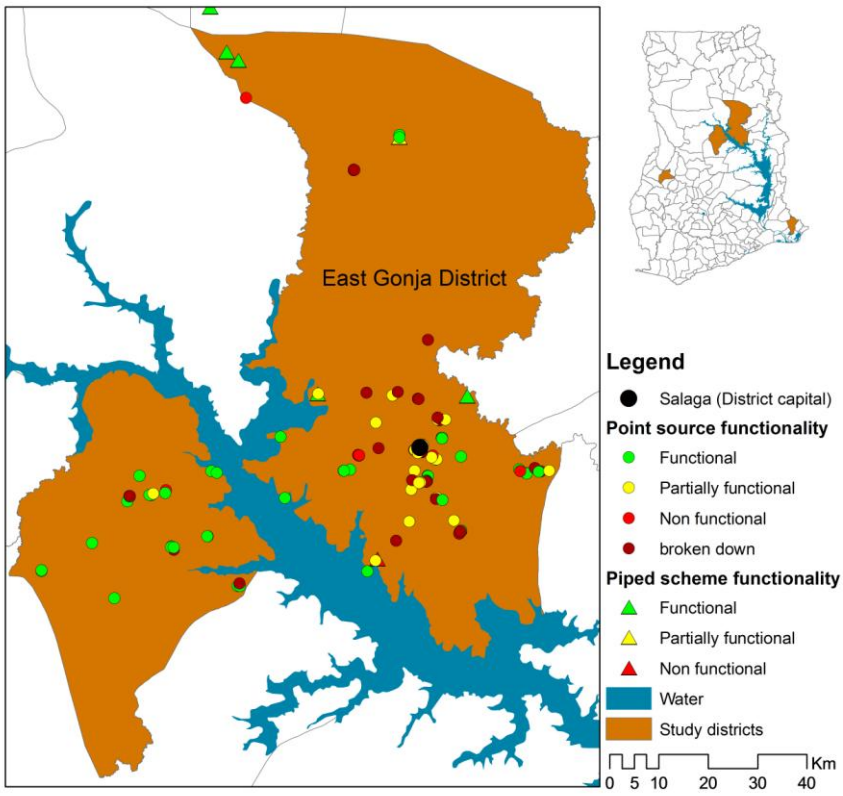
The study has the following limitations:

- Reliance on assessment of tastes and odours only instead of measuring physical, chemical or biological water quality data.
- Non-availability of financial data and water quantity data from the WSMTs (STs): Data on finances and quantity of water provided and sold from pipe systems was unavailable. WSMTs (STs) were unable to provide the data required to assess scoring on service level and service provider indicators.
- Absence of data from consumers: Because of time and resource constraints, this study has focused on collecting and analysing service level, service provider and service authority data and therefore did not conduct household surveys to get consumer perspectives of water services.
- Reliance on projected and estimated population data: Data on number of persons depending on a facility was obtained from respondents based on their estimation of the size of population. These figures were not based on head count or population census and therefore it is difficult to vouch or guarantee for accuracy of population data used in this study.

3 Introduction to the focus district

The East Gonja District is located in the South-Eastern section of the Northern Region of Ghana with its district capital in Salaga. The district lies within Lat. 8°N & 9.29°N and Long 0.29E & 1.26°W. It shares boundaries with Yendi district and Tamale Metropolitan to the North, Central Gonja District to the West, Nanumba-North, Nanumba-South and Kpandai Districts to the East, and the Volta and Brong Ahafo Regions to the South. The total land area of the district is 9,015 km^2, occupying about 15.3% of the landmass of the Northern Region. The district has six Area/Town Councils namely Salaga, Kpembe, Makango/Kafaba, Bunjai, Kpariba, and Kulaw.

Figure 2: Map showing the spatial distribution and functionality of water supply facilities in East Gonja



The population of East Gonja, which is predominantly rural, is estimated at 135,450 as at 2010, as in the 2010 national census (GSS, 2012). The main economic activity of the people is agriculture which employs over 80% of the population. Crops cultivated are mostly cereals and tubers. About 59,813 representing 47% of the total population have access to water in the district as at the end of 2011 (CWSA, 2011).

Currently, the district has one small town piped system, serving Salaga and its surroundings, 3 limited mechanised schemes, 4 systems connected to Ghana Water Company Limited, and 122 BHs and HDWs with hand pumps. The East Gonja district has the highest density of hand-dug wells in the country (about 5,856), majority of which are open and often dry-up in the dry season.(EGD MTDP, 2010) Furthermore, some 82 dams/dugouts are used for water supply, as well as the Volta Lake.

The district has a number of large water bodies that flow throughout the district. A number of streams, dugouts, valleys, hills and mountain are also found at various locations in the district, as part of the natural environment. The confluence of the Volta and some of its major tributaries including the White Volta and the Dakar River are found in the district. These are fairly large rivers, which are collected and stored in the Volta Lake. This provides the potentials for developing limited mechanised systems using surface water, to provide water to communities where ground water development is a challenge.

The East Gonja District has a District Water and Sanitation Plan (DWSP) in place spanning 2009 to 2012 with an overall goal of ensuring sustainable provision, access and management of adequate potable water and sanitation facilities and improvement in hygiene practices in the District.

The key expected results of the plan were:

- Increased potable water coverage from 29% to 85% by 2012.
- Increased sanitation coverage from 9% to 30% by 2012.
- Enhance capacity of the private investors in potable water provision in the District.
- Enhanced District Assembly capacity for coordinating and harmonizing activities of stakeholders in the water and sanitation sector.
- Increased and sustained involvement of women in the provision and management of potable water and sanitation facilities and the promotion of hygiene in all communities in the District.

The Water, Sanitation and Hygiene (WASH) sector in the district is characterized by many organisations with varied ways of monitoring and evaluating the functionality of water facilities. Many of these monitoring approaches are not structured, and often done on ad hoc basis. This often results in the generation of different data on the performance of the same facilities. In an attempt to address this challenge, the CWSA introduced DiMES in the district to harmonise data that is generated from the facilities by District Assemblies. However, the indicators for assessing the performance of water systems and management structures have been lacking as well as the funds required to enable the District Water and Sanitation Team (DWST) monitor operations and maintenance of these facilities.

4 Results: Facilities

This section presents an analysis and discussions of the findings of the study.

4.1 Introduction to the facilities in the district

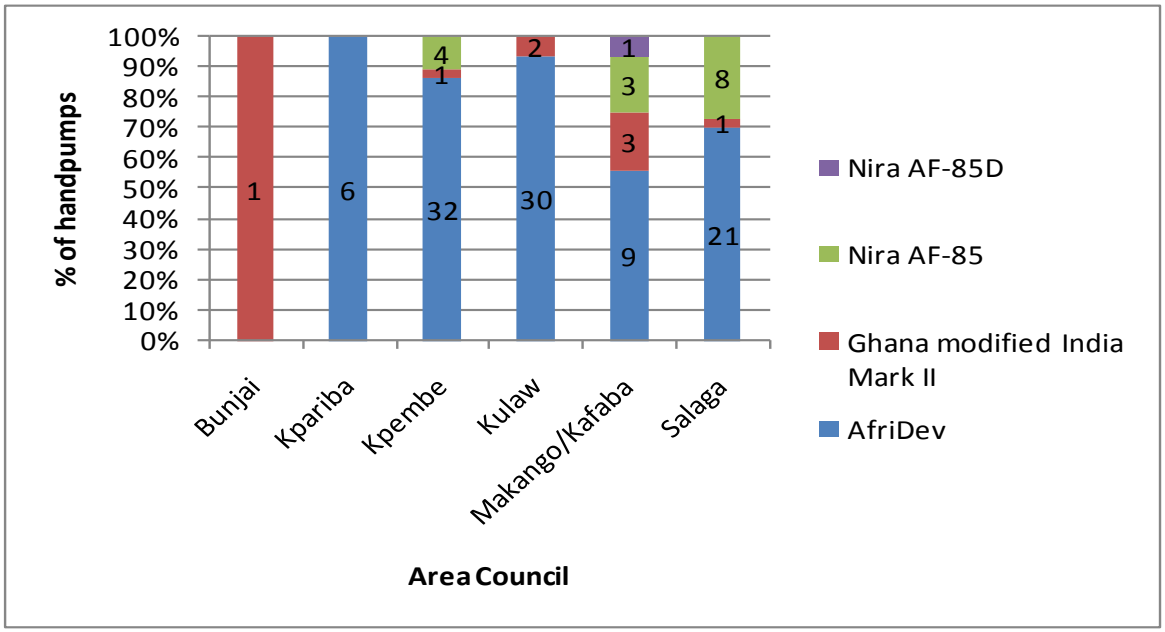
The district has many water supply facilities including boreholes, hand dug wells with handpumps, and piped systems that serve small towns and rural communities. There are 122 handpumps, 60 WSMTs (SCs), 8 WSMTs (STs), 8 piped schemes and 60 standpipes in the district (Table 5). The predominant type of water supply system is the borehole which serves nearly more than half of the population in the district. The Kulaw and Salaga Area Councils have the highest number of boreholes (32 and 30 respectively). Many piped schemes are also found in the Kpariba Area Council accounting for 5 out of the total 8 schemes in the district. The Bunjai Area Council has the least number of water facilities probably because of the unsuccessful attempts at drilling boreholes due to the difficult underground water situation. However, there is a dugout which has a potential for development to serve the people in the area.

Table 5: Overview of facilities in the district

Area council	Total number of Handpumps	Total number of WSMTs (SCs)	Total number of piped systems	Total number of Standpipes	Total number of WSMTs (STs)
Bujai	1	1	0	0	0
Kpariba	6	3	5	10	5
Kpembe	37	20	0	0	0
Kulaw	32	11	0	0	0
Makango/Kafaba	16	12	2	4	2
Salaga	30	13	1	41	1
Total	122	60	8	60	8

In line with CWSA Sector Guidelines -Small Communities O&M Guidelines (CWSA, 2010), the recommended standardized handpumps that should be operated and maintained are Nira AF-85 and Nira AF-85D for shallow wells and Ghana Modified India Mark II, Afridev and Vergnet for deep wells. As shown in Figure 2, the study observed that the hand pumps installed on boreholes and hand-dug wells in the district comply with this recommendation. Afridev hand pumps accounted for more than two thirds of all the handpumps in all Area Councils (except in Bunjai, where only one Ghana modified India Mark II was found).This gives strong indication that the water table of the district is low hence the need for handpumps suitable for deep wells. The least used type of handpump in the district is the Ghana Modified India Mark II accounting for less than one third of total hand pumps (Figure 3).

Figure 3: Type of Handpumps in the district

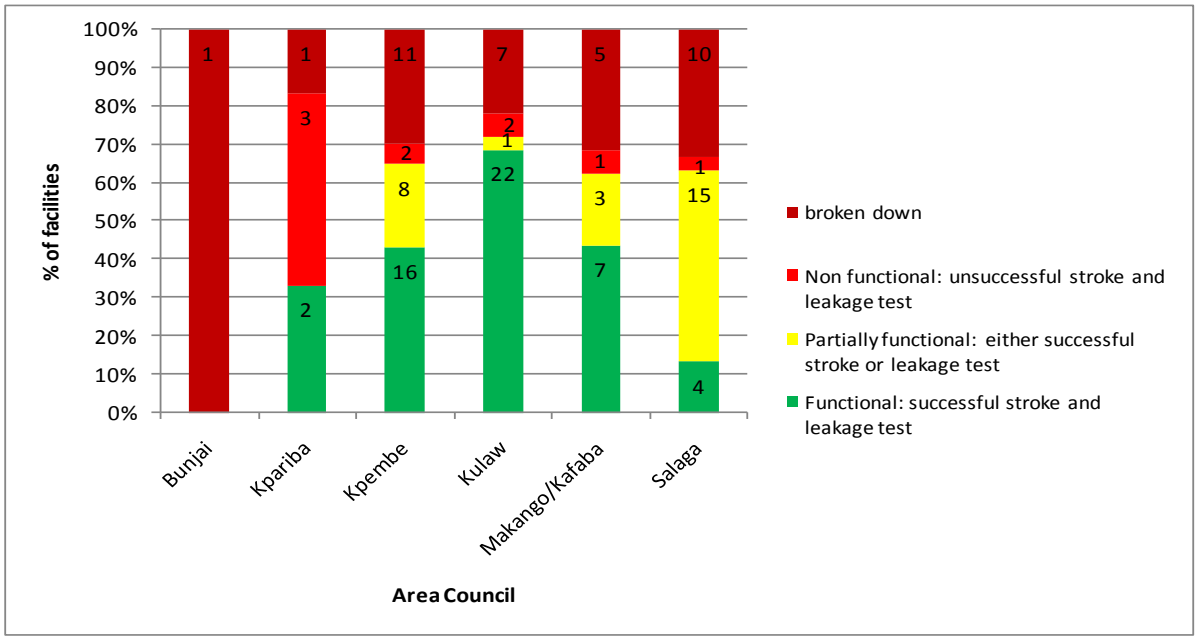


4.2 Functionality of handpumps

Functionality is defined by the systems successfully passing a functionality test as described in the Revised CWSA Sector Guidelines -Small Communities O&M Guidelines, November, 2010. The findings of the study noted the highest functionality in the district in the Kulaw Area Council accounting for more than half of total facilities in the Area Council. Functionality in the other Area Councils is less than half of the total facilities in the respective Area Councils (Figure 4).

While half of all systems in Salaga Area Council are partially functional, less than one-third in the rest of the Area Council are partially functional. The Kpariba Area Council recorded the highest percentage of non-functionality accounting for half of the total systems in the Area Council. Averagely, more than one- third of systems across all Area Councils have broken down, while in Bunjai, the only facility there is broken down (Figure 4).

Figure 4: Functionality of handpumps

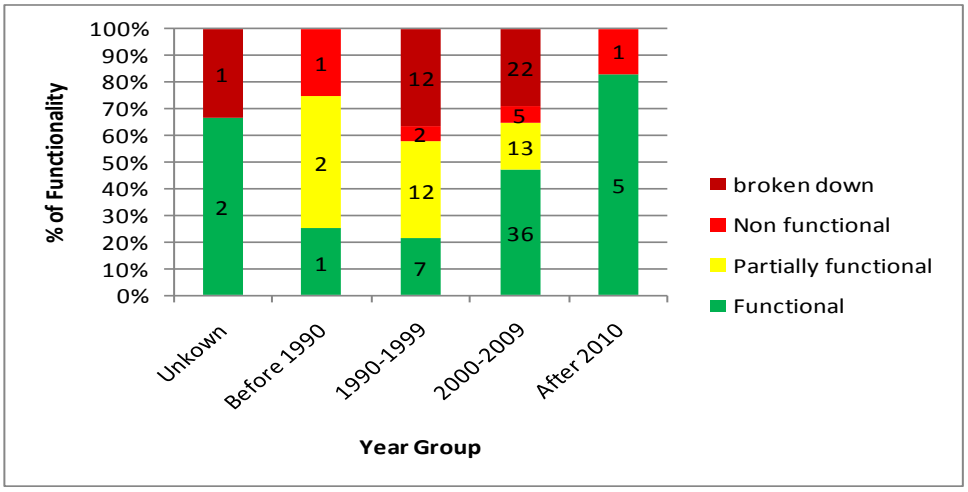


4.2.1 Age of handpumps and functionality

Water supply systems for small rural communities generally have a design life of about 10 years to deliver high quality and uninterrupted water.

The study revealed that about 5 out of 6 systems constructed after 2010 were functioning as compared to 36 out of 76 systems constructed between 2000 and 2009 as depicted in Figure 5. Functionality is even lower for systems implemented before 2000. It is clear from the findings that functionality is higher in newer systems than in older ones (Figure 5)

Figure 5: Age and Functionality of handpumps



4.2.2 Functionality of handpumps and the implementing agencies

Funding of water supply infrastructure to rural communities in the last two decades has largely been undertaken by Development Partners probably because of the substantial capital outlay required and the limited capacity available at the local level to implement such projects. The East Gonja District has had its fair share of these water system implementation projects, which have improved access to potable drinking water and accelerated the elimination of guinea worm.

As shown in Table 6, the majority of the water supply systems in the district have been provided by Development Partners, with United Nations International Children Emergency Fund (UNICEF) and European Union (EU) providing 46 out of the 122 systems surveyed in the district. Table 6 reveals that out of the 26 BHs provided by UNICEF, 15 are functional and 6 are broken down. A similar trend can also be established for those provided by EU and Government of Ghana. The only system provided by the District Assembly is broken down.

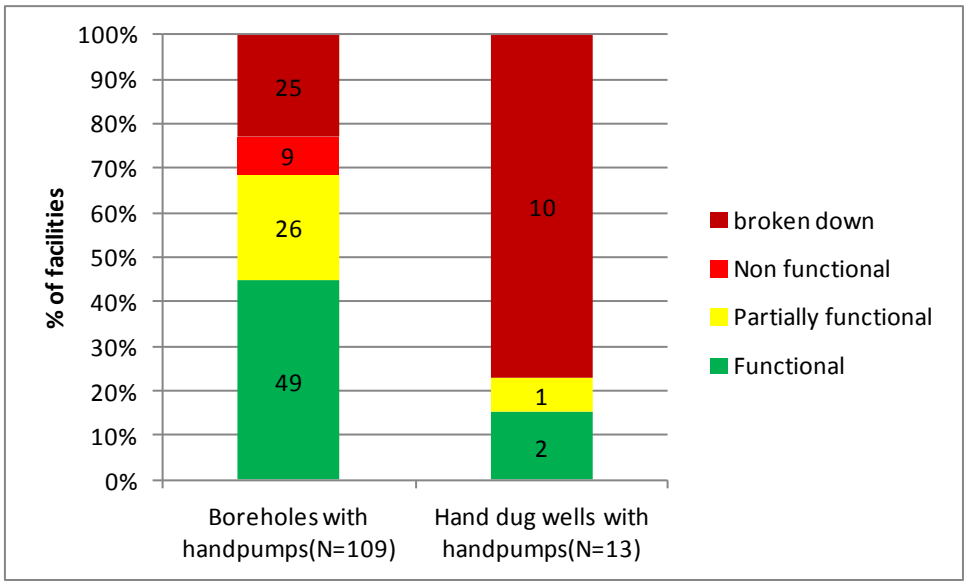
Table 6: Functionality of Donor/Implementing Agency Projects in the District

Financier or donor of implementation	Functionality				
	Broken Down	Functional	Non functional	Partially functional	Grand Total
Adventist Development and Relief Agency(ADRA)	3			1	4
'Agence Française de Dévelopement (AfD)	3	4		1	8
Assemblies of God		1			1
Catholic Church	1	1		2	4
Catholic Mission	1		1	4	6
Christian Church				2	2
Church of Christ	2				2
Canadian International Development Agency(CIDA)	1				1
Community				1	1
CWSA				1	1
District Assembly	1				1
Don't know	3	5	2	3	13
European Union(EU)	4	9	1	6	20
FAME Church		1			1
Government of Ghana	6	12	2		20
Juxtapose Integrated Development Association	2				2
Mahanat Enterprise	1				1
Northern Regional Integrated Programme (NORRIP)	1	3		2	6
United Nations International Children Emergency Fund(UNICEF)	6	15	3	2	26
Village Water Reservoir(VWR)				2	2
Grand Total	35	51	9	27	122

4.2.3 Functionality and type of facility

Boreholes and Hand dug wells fitted with pumps is the principal technological choice for the delivery of potable water to small communities as stipulated in the Revised CWSA Sector Guidelines - Small Communities Design Guidelines, 2010. The study noted that out of the 122 facilities surveyed in the district, 109 are boreholes with handpumps of which 49 are functional passing functionality test (Figure 5). About 26 and 9 boreholes are partially functional and non-functional respectively. Regrettably, 25 boreholes out of the 122 surveyed are completely broken down, shown in Figure 5. Out of the 13 hand dug wells with handpumps, 10 had broken down (Figure 6).

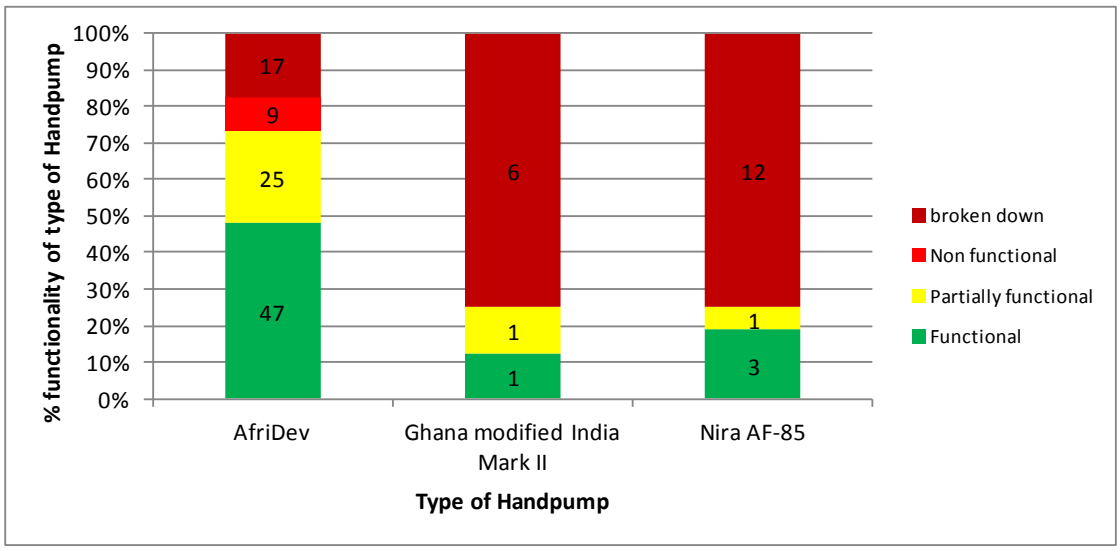
Figure 6: Functionality and type of facility



4.2.4 Functionality and type of handpump

As shown in Figure 6, almost half of all Afridev handpumps in the district are functional as compared to the others with less than one third functionality except the Nira AF-85 handpumps. However, Figure 7 shows that almost two-thirds of total Ghana India Modified Mark II and Nira AF-85 handpumps are broken down which gives cause for worry given the fact that the district has just come out of having guinea worm situation with the possibility of a recurrence.

Figure 7: Functionality of type of handpump



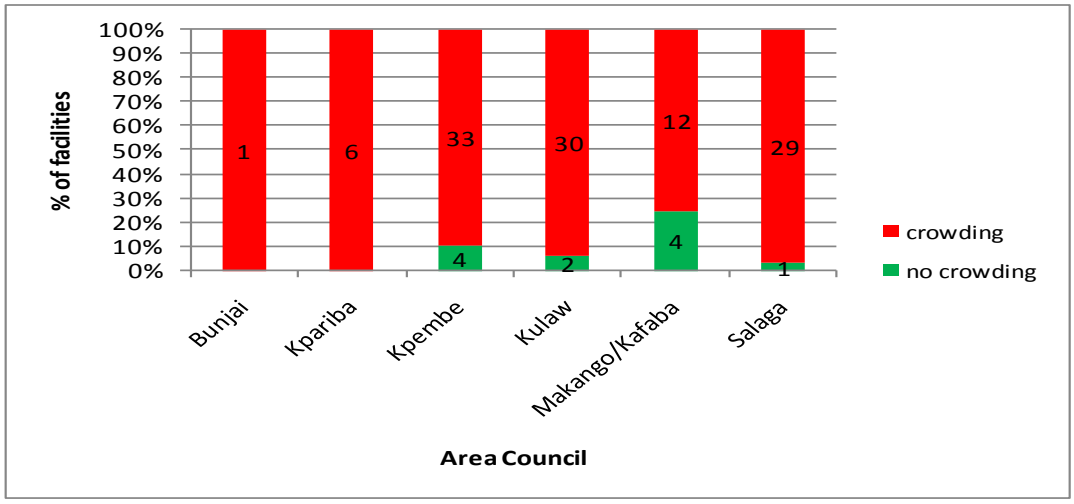
4.3 Service level indicators- Boreholes (BHs) and Handdug Wells (HDWs) with Handpumps

An acceptable service level is where potable water is delivered at GSB water quality standards to communities in a virtually uninterrupted manner, within an agreed distance and the right quantity, as per the standards outlined in chapter 2. The elements of a service included: quality, quantity, distance and reliability which are discussed below.

4.3.1 Accessibility (non-Crowding) of HDWs and BHs with handpumps

A borehole handpump should serve not more than 300 persons and a hand-dug well with handpump not more than 150 persons (CWSA Sector Guidelines -Small Communities Design Guidelines, 2010). The study however, observed an unacceptably high level of overcrowding, with more than two-thirds of systems in all the Area Councils in the district experiencing overcrowding shown in Figure 8. Nevertheless, all systems in Bunjai and Kpariba Area Council are experiencing overcrowding (Figure 8). This situation will inevitably, put a lot of stress on the facilities, and without corrective and preventive maintenance schedules carried out, many of the systems will break down.

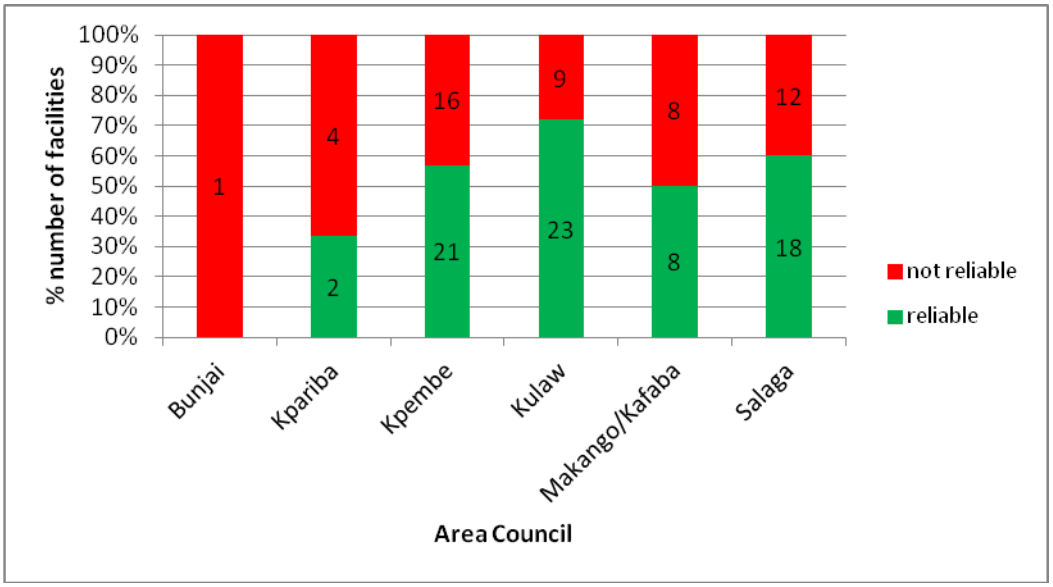
Figure 8: Crowding of handpumps



4.3.2 Reliability of handpumps

The Revised CWSA Sector Guidelines - Small Communities Design Guidelines (2010) states that systems should provide water all year round at least 95% of the time to the community. More than half of systems in Salaga, Kulaw, and Kpembe Area Councils were reliable as shown in Figure 9. Conversely, less than half of the Kpariba Area Council systems were reliable. On the other hand, more than one –third of the systems in all Area Councils are not reliable with Kpariba and Bunjai Area Councils registering the highest number of unreliable sytems in the District (Figure 9). This may be the result of a number of factors including inadequate routine and preventive maintenance of systems by WSMTs (SCs) and unavailability of Area Mechanics and spare parts.

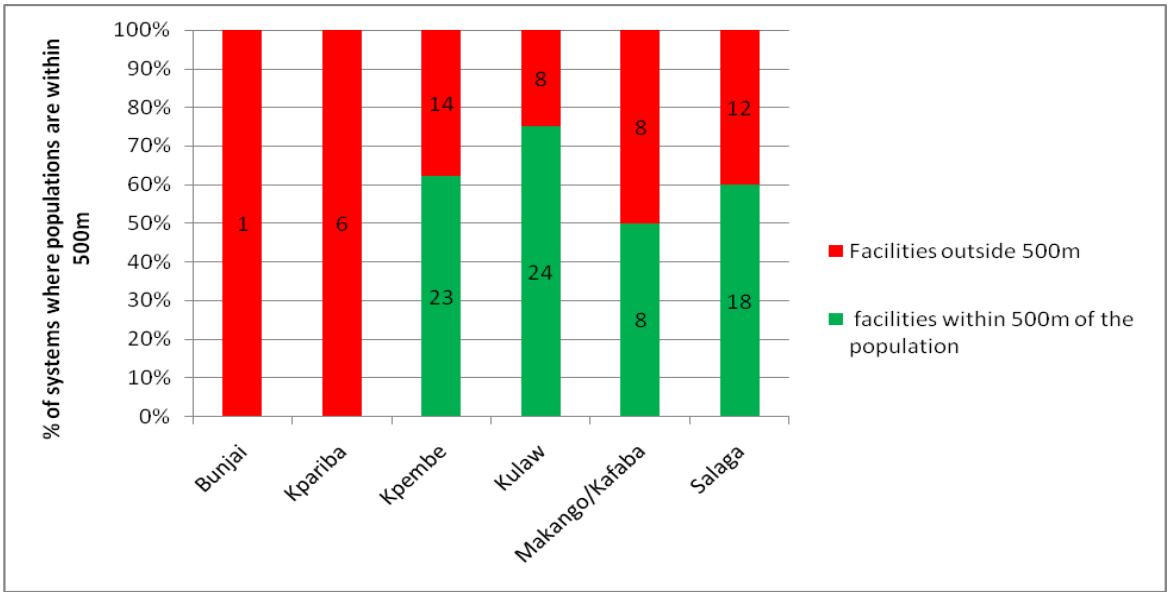
Figure 9: Reliability of handpumps



4.3.3 Distance to HDWs and BHs with handpumps

According to Revised CWSA Sector Guidelines Small Communities Design Guidelines, November, (2010), the walking distance to a water facility should not exceed 500 metres from the farthest house in the community. Generally, more than half of systems in the East Gonja District are within 500 metres of the user households, except Kpariba and Bunjai Area councils where the population walk for more than 500 metres to the water facilities as shown in the Figure 10. For the facilities that do not meet the 500 metres bench mark, especially in Bunjai and Kpariba Area Councils where the whole population walks for more 500 metres to fetch water, some additional facilities may be required in order to reduce the walking distance (Figure 10).

Figure 10: Distribution of systems within 500 metres of walking distance by the population

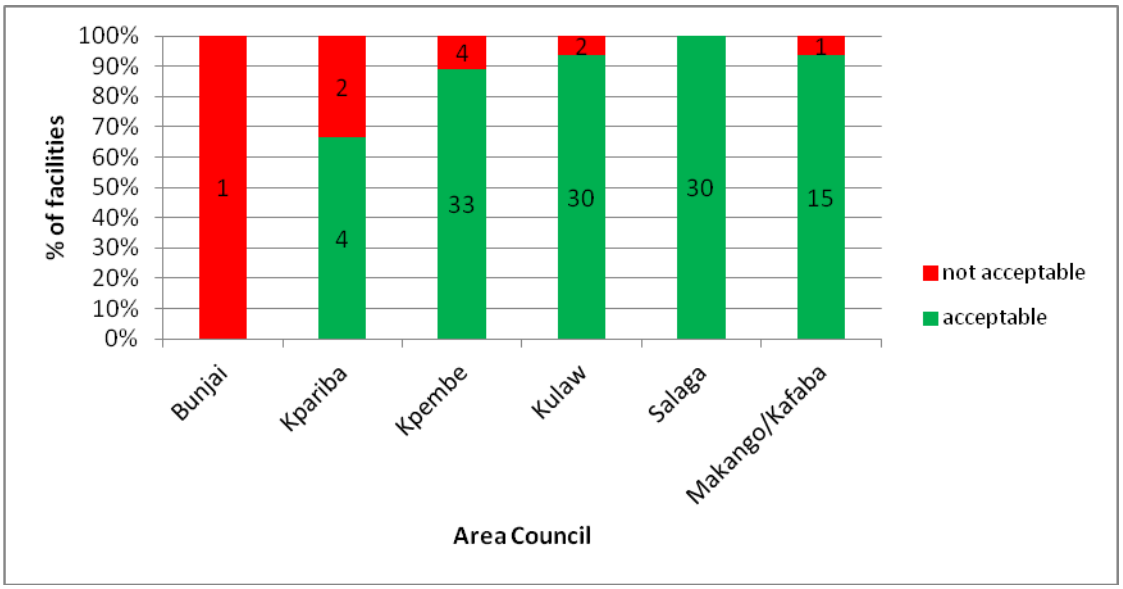


4.3.4 Water Quality of HDWs and BHs with handpumps

The monitoring of drinking water quality is a requirement to ensure its safety. The quality of water provided to communities shall meet the relevant Ghana Standard Authority (GSA) criteria and World Health

Organization (WHO) guidelines for drinking water (Revised CWSA Sector Guidelines Small Communities Design Guidelines, 2010). Where the water is found to be polluted and unsafe for drinking, treatment may be required.

Figure 11: Water quality of HWs and BH with handpumps



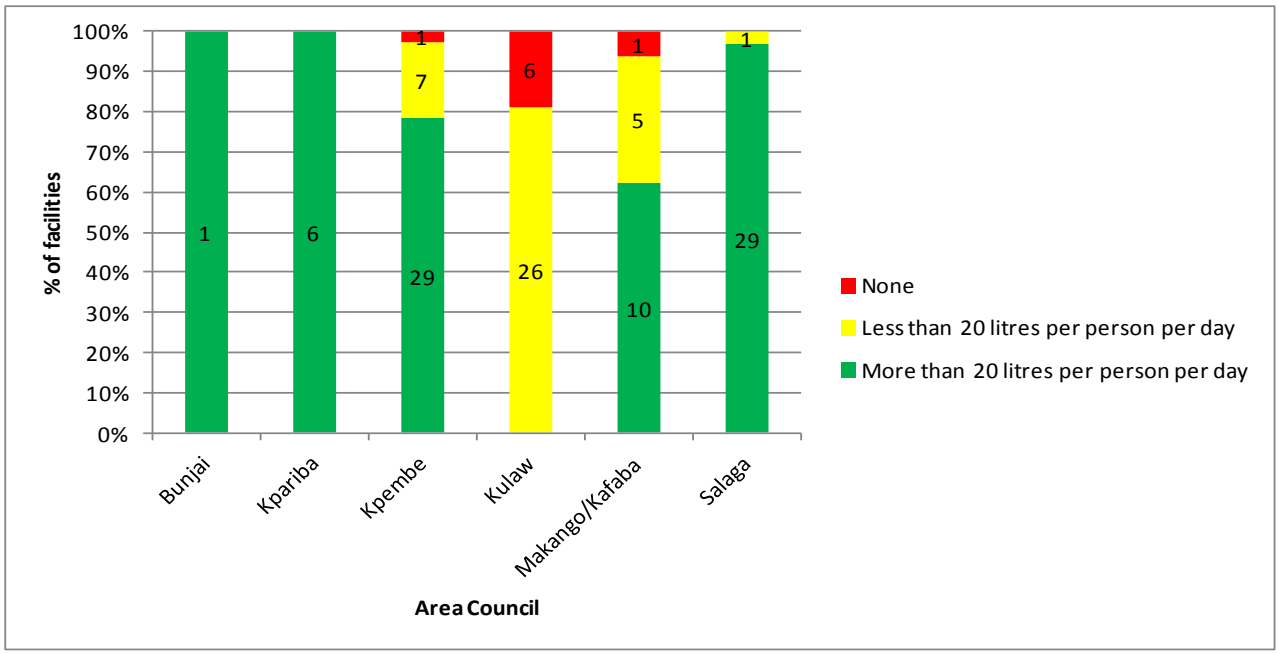
Admittedly, the study did not carry out full scale water quality test based on GSA criteria, but assessed tastes and odours only. Out of 122 systems surveyed in the study, 112 representing nearly 92% of the total systems have acceptable tastes and odours as shown in Figure 11.

4.3.5 Quantity of water consumed

The Revised CWSA Sector Guidelines -Small Communities O&M Guidelines, 2010 further recommends that each person in a served community with water shall have access to a minimum of 20 litres of water per capita per day. The study showed generally that people accessed more than 20 litres per capita per day for more than half of the point sources in the district as shown in Figure 12. This was evident in all Area Councils except for Kulaw where the people access less than 20 litres per capita per day from more than two thirds of the systems.

This was based on the estimates from the WSMT (SCs), rather than on household surveys or measurements and observations. It is likely that in reality, water use from point sources, and therefore the percentage of point sources meeting the benchmark on the quantity indicator, maybe even lower.

Figure 12: Estimated quantity of water consumed per person from handpumps

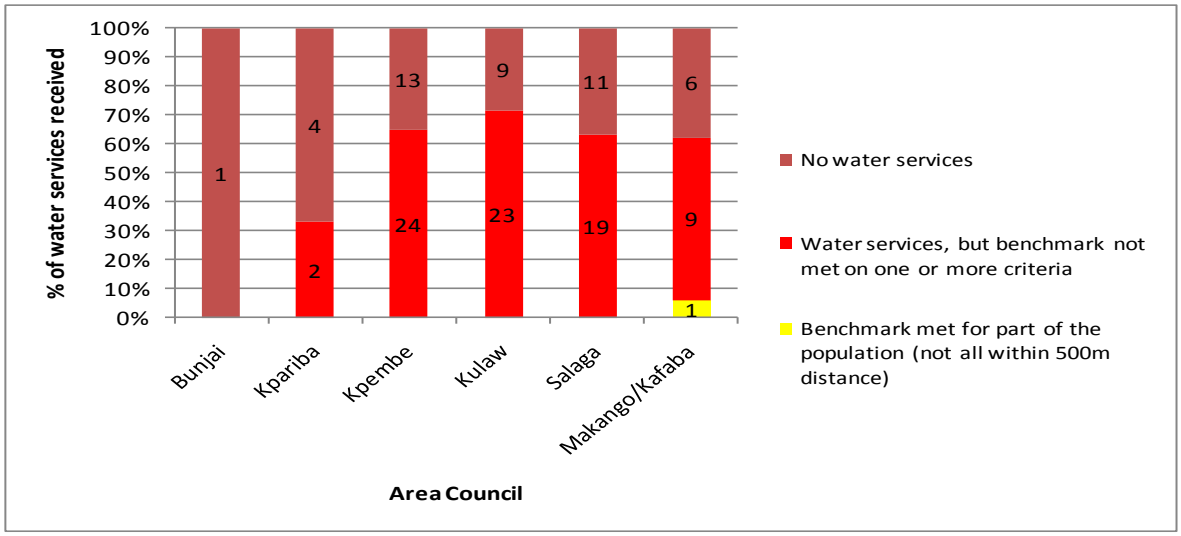


4.3.6 Service level score of BHs and HDWs with handpumps

Water service level is generally low in the district as revealed by the study. Out of the 122 systems surveyed in the district, only 1 system in the Makango/Kafaba Area Council was found to be providing water services that met the bench mark for half of the population depending on the system for water) as shown in Figure 13. Conversely, 77 out of 122 systems were providing water services, but do not meet all the bench marks on the indicators set for the provision of water services, with Kulaw, Kpembe, and Salaga Area Councils being the least areas where the population receives water services (Figure 13).

As shown in Figure 13, the study further noted that about 44 out of the 122 systems visited, were not providing any water services at all.

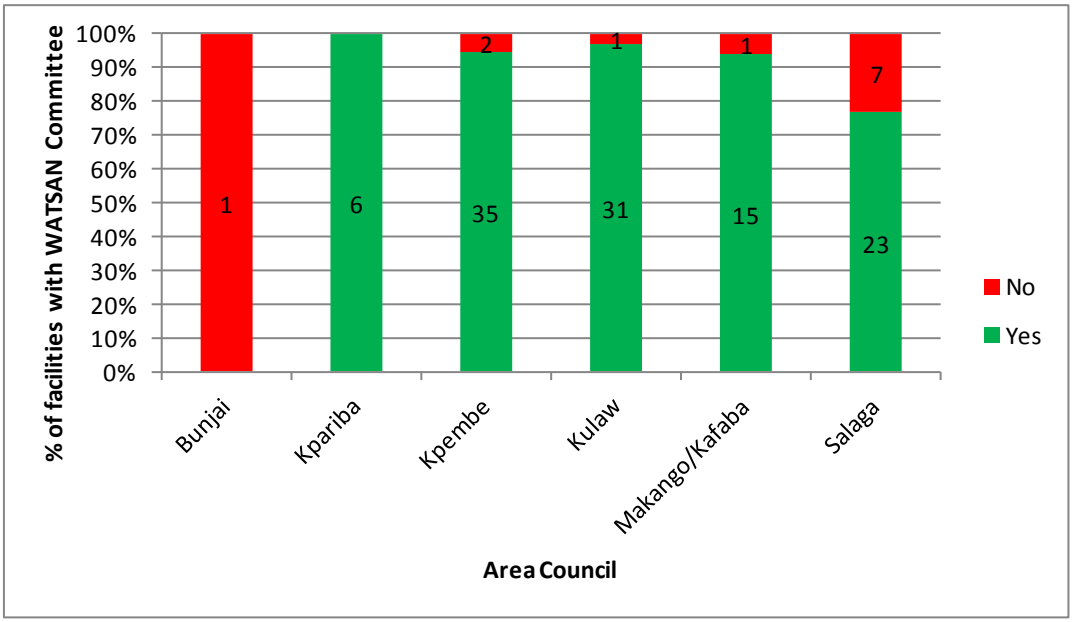
Figure 13: Level of water service received by population



4.3.7 Presence of WSMTs for Small Communities

According to the CWSA Sector Guidelines- Small Communities O&M Guidelines, November, (2010) every water facility provided shall have a WSMT (SC) in place to exercise overall management responsibility for the system. Generally, the study noted that out of 122 point sources surveyed, about 110 had WSMT in place which is pivotal to the sustainability of water systems as shown in Figure 14. However, only 12 facilities out of the 122 facilities, cutting across all Area Councils except Kpariba, were without WSMTs which clearly violates the CWSA Sector Guidelines- Small Communities O&M Guidelines), 2010 (Figure 14). Given the important role of WATSAN Committees in the operations and maintenance of water systems, communities without these structures are likely to have challenges managing their systems sustainably.

Figure 14: BHs and HDWs with handpumps with WSMT (SCs)



4.4 Overview of Piped Systems

Communities with populations between 2000 and 50,000 may be provided with simple piped schemes provided they are interested and committed to the operational management of the facility and also depending on the quantity of water being produced and socio-economic status of the community. The district is served by 1 small town piped system (serving the district capital- Salaga) and 3 limited mechanized systems and 4 systems connected to Ghana Water Company Limited network. The principal source of water for the piped systems in the district is surface water. As shown in Table 7 majority of the systems were constructed in 2011 and also financed by the I-WASH project. The Salaga small town system was originally constructed in 1967, with financial support from UNICEF/ World Bank and rehabilitated in 1997, with financial support from the World Bank. Apart from the Salaga, Kpalbe and Dabogshie systems where the current population depending on them for their main source of water far exceeds the design population, the rest of the systems are serving populations within their carrying capacities (Table 7). This section assesses the extent to which these systems are delivering water services to communities by the CWSA guidelines.

Table 7: Overview of piped systems

Type of system	System	Implementation project	Year of construction /completion	Design population	Population served	Number of household connections	Number of standpipes	Source of water
Connected to GWCL	Dabogshie	I-WASH	2011	1500	2200	0	3	GWCL
	Wulanyili	I-WASH	2011	2000	136	0	1	GWCL
	Dashie	I-WASH	2011	5000	887	0	3	GWCL
	Kpandu	I-WASH	2011	843	843	0	3	GWCL
Mechanized borehole	Bunkwa	I-WASH	2010		902	0	4	Ground water
	Kpalbe	Rotary Water Intervention Project	2007	1500	3000	0	1	Surface water
	New Makango	Water for Green Schools project	2011	700	700	0	1	Ground water
Small town system	Salaga	GAP Phase 2	1967	14000	26000	560	41	Surface water

4.5 Functionality of piped systems

Functionality of a piped system can be assessed at two levels:

- The functionality of the supply system, which includes the intake and treatment system. The supply system can be classified as fully functioning, partially functioning or non-functioning, based on whether or not the head works are fully, partially or non-functioning.
- The functionality of the distribution system, which includes the piped network, standpipes and household connections. This can be expressed in terms of percentage of functioning household connections and standpipes.

The study observed that out of the 8 piped systems in the district, 6 are functional, 1 partially functional and 1 non-functional as depicted in the Table 8. The only non-functional system was the New Makango limited mechanized borehole system in the Makango/Kafaba Area Council. The borehole which serves as the source of water for the system has a low yield; hence very little water can be pumped from it.

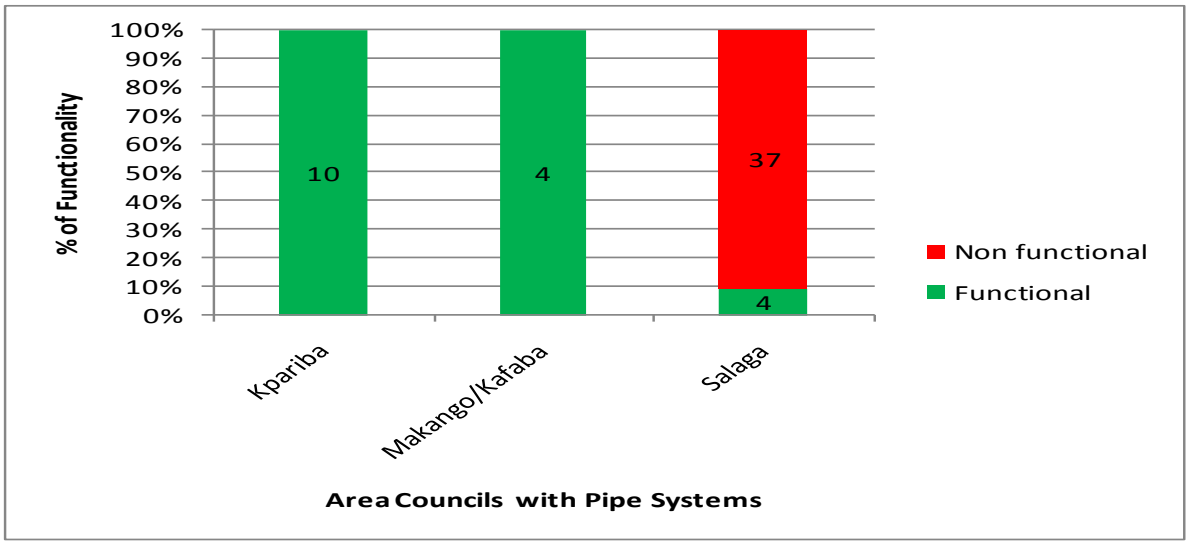
Table 8: Functionality of piped systems

Name of Piped system	Type of System	Functionality of Piped Systems		
		Functional	Partially Functional	Non-Functional
Kpalbe	Limited Mechanized		✓	
Dagboshie	Connected to GWCL	✓		
Dashie	Connected to GWCL	✓		
Salaga	Small Town System	✓		
Bunkwa	Limited Mechanized	✓		
Wulanyili	Connected to GWCL	✓		
Kpandu	Connected to GWCL	✓		
New Makango	Limited Mechanized	✓		✓

4.5.1 Functionality of standpipes and taps

As shown in Figure 15, out of 55 standpipes serviced by 8 piped systems in the district, only 18 are functioning and 37 are non functional. Salaga Area Council is characterized by the highest number of non-functional standpipes in the district with 4 working out of 41 surveyed in the Area Council (Figure 15). Observations of these standpipes revealed that a majority of them have been tampered with, rendering them non-functional.

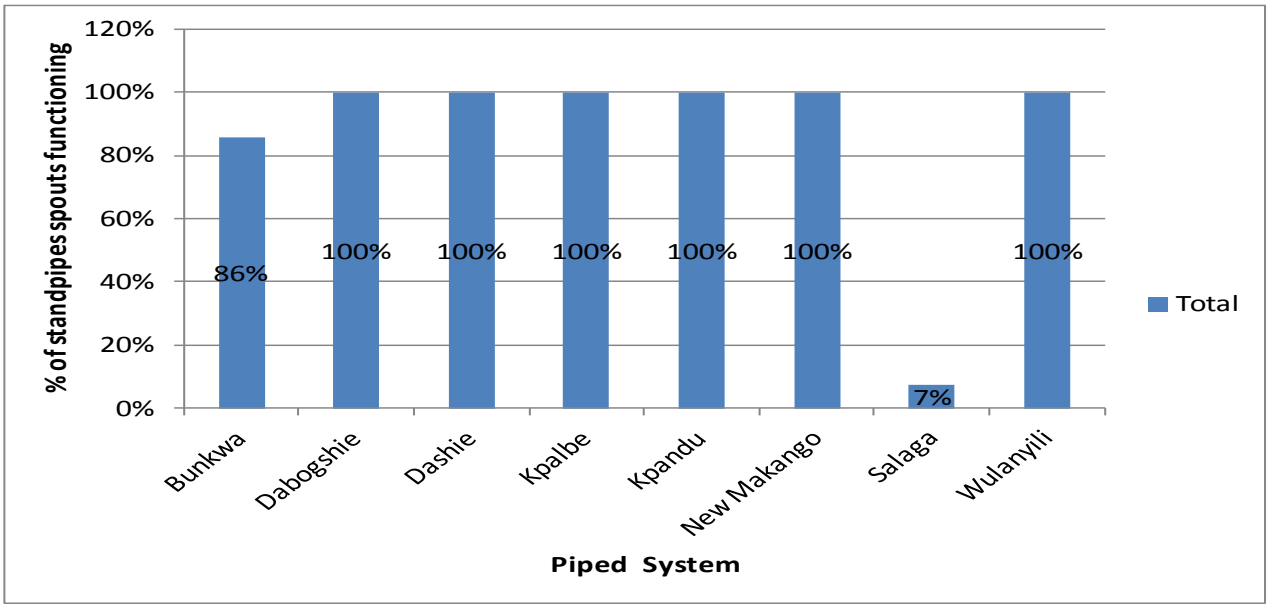
Figure 15: Functionality of standpipes



The study further observed a high rate of standpipe taps functionality in the Kpariba and Makango/Kafaba Area Councils. (Figure 16)

However, the Salaga Area council had a very low rate of about 7% standpipe tap functionality in the district (Figure 16). This may be due to lack of repair of standpipes which leaves people without household connections with limited access to potable water.

Figure 16: Functionality of standpipe spouts



4.6 Service Levels-Piped System

4.6.1 Reliability of piped systems

Piped schemes by their design should deliver water in an uninterrupted manner over their design period (CWSA Sector Guidelines - Small Towns Design Guidelines, 2010). The study revealed that the Wulanyili, New Makango and Bunkwa systems were the only reliable systems in the district, whiles the other 5 systems were unreliable as shown in Table 9.

Table 9: Overview of Service Level Indicators

Type of system	System	Reliable	Non-crowded	Acceptable distance for entire population	Acceptable quality	Quantity
Connected to GWCL	Dabogshie	0	0	0	1	no data
	Wulanyili	1	1	1	1	no data
	Dashie	0	1	1	1	no data
	Kpandu	0	1	0	1	no data
Mechanised borehole	Bunkwa	1	1	1	1	no data
	Kpalbe	0	0	0	1	no data
	New Makango	1	1	0	1	no data
Small town system	Salaga	0	1	1	1	no data

4.6.2 Perception of Water Quality of piped systems

The quality of water provided to communities shall meet the relevant Ghana Standard Authority (GSA) criteria and WHO guidelines for drinking water (CWSA Sector Guidelines -Small Towns Design Guidelines, 2010). Admittedly, the study did not carry out water quality test based on GSB criteria, but assessed the taste and odours alone.

It turned out from the WSMTs (STs) interviewed, that all the systems produce water of acceptable quality (Table 9).

4.6.3 Walking Distance of population to piped system

The study revealed that 5 out of the 8 pipe systems in the district have met the benchmark for the populations that travel within 500 metres to the farthest standpipe in the community as shown in Table 9. However, Dabogshie, Kpandu and New Makango systems have their populations walking more than 500 metres to access water from standpipes.

4.6.4 Crowding of Piped systems

Pipe systems in the district generally do not experience overcrowding. This notwithstanding, the Kpalbe and Dagboshie piped systems experienced overcrowding (Table 9).

4.6.5 Quantity of water consumed from Pipe systems

Data was generally not available from the WSMTs (STs) to establish how much water consumers were taking from the piped systems (Table 9).

5 Results: Performance of service provider

5.1 Service Providers-WSMTs for Small Communities

For effective operation and maintenance of water supply system-point sources in a community, WSMTs (SCs) are required to be established in every community with the overall responsibility for the operation and maintenance of handpumps by observing sound administrative, technical and financial management practices. The WSMTs (SCs) represents the District Assembly which is the service authority. Area Mechanics trained by CWSA should be contracted to carry periodic maintenance, and where necessary, repairs of the handpumps (CWSA Sector Guidelines-Small communities O&M Guidelines, 2010).

5.1.1 Overview

Table 10 provides data on 60 WSMT (SCs) in the East Gonja District and indicates those that meet the bench mark on the different indicators as contained in the guidelines for their establishment. The performance of these water management structures against the different indicators are discussed below.

Table 10: Overview of benchmarking of all indicators for WSMT (SCs); Number of service providers that meets benchmark on the different indicators

	n	1	3	20	11	12	13	60
Indicator group	**Indicator**	**Bunjai**	**Kpariba**	**Kpembe**	**Kulaw**	**Makango /Kafaba**	**Salaga**	**Grand Total**
Governance and management	A well-qualified, trained and experienced gender balanced WSMTs (SCs) is in place	1	0	2	1	1	3	8
	Technical, Administrative and financial Reports are kept and read out to the Community at least once every six months	1	0	7	9	7	3	27
	There is no political and chieftaincy influences in the composition of the WSMTs (SCs)	0	3	18	10	11	10	52
Operations	Spare parts are available to enable maintenance	0	1	8	4	6	5	24
	Area mechanics are available to enable maintenance	0	1	11	3	7	3	25
	Corrective maintenance is executed in an effective way	0	0	10	10	8	9	37
	Periodic maintenance is executed in an effective way	0	1	15	10	10	10	46
	Water Quality Sampling and Analysis services are performed on half yearly basis by recognized institutions	0	0	13	10	8	6	37
Financial management	Annual income from water sales exceeds total annual expenditure	0	1	7	10	9	5	32
	There is sound financial management, accounting and auditing	0	0	0	9	1	0	10
	Tariff setting is taking into account the lifecycle costs	0	0	0	8	5	0	13
Support	DWST monitors O&M of water facilities in terms of financial, technical and administrative performance, including periodic audits, and provides support where needed	0	1	7	0	3	3	14

5.1.2 Governance and management

Generally, many facilities in the district have Committees put in place as required by the (CWSA Sector Guidelines -Small Communities O&M Guidelines, 2010). However the capacity of these committees to deliver on their mandate is questionable. For instance, out of the 60 WSMTs (SCs) interviewed, only 8 are well-qualified, trained, experienced, and gender balanced. The well constituted WSMTs (SCs) were seen mostly in the Kpembe and Salaga Area Councils (Table 10).

As shown in Table 10 less than half of WSMTs (SCs) that responded to the study, kept technical, administrative and financial reports of their activities as well as sharing with the community. However, more than half of the Kulaw and Salaga/Kafaba Area Councils WSMTs (SCs) were found to be keeping records and preparing reports.

Political and chieftaincy influences in the composition of WSMTs (SCs) were low as reported by the Service Providers interviewed. As shown in Table 10, out of 60 service providers who responded to the study, only 8 observed the occurrence of political/chieftaincy interference in their composition.

5.1.3 Operations

One key function of water service providers of point sources is to monitor operations and maintenance of water systems and undertake remedial actions (CWSA Sector Guidelines -Small Communities O&M Guidelines, 2010). An important component of the performance of this function is the availability of spare parts. Out of the 60 water service providers interviewed, only 24 representing about one third indicated the availability of spare parts to enable maintenance of water systems (Table 10). This trend can be observed across all the Area Councils. The availability of only one spare parts outlet in Salaga, the district capital of East Gonja to serve the whole district, may have accounted for the difficulty of caretakers in procuring spare parts to carry out maintenance on their handpumps promptly. Apart from Salaga and Kpembe Area councils which are less than 5 kilometres from the spare part outlet, the rest of the Area Councils are more than 30 kilometres away which increases travel time.

Similarly, less than half of service providers noted the availability of area mechanics to carry out major repair works on broken down systems. However, more than half of WSMTs (SCs) in Makango/Kafaba and Kpembe Area Councils indicated the presence of an area mechanic they can rely on during major breakdowns of their systems (Table 10).

To ensure water systems do not breakdown often, corrective and preventative maintenance is recommended to prolong their lifespan. The study revealed that more than half of all service providers surveyed carry out preventative and corrective maintenance on their water systems. The service providers in Kulaw, Salaga and Makango/Kafaba Area Councils were particularly found to be doing well on these two indicators as compared to Bunjai, Kpariba, and Kpembe Area Councils (Table 10). Further investigation would be required to establish the reasons for this situation.

Water quality monitoring of community water systems is critical to ensuring water safety. According to the CWSA Sector Guidelines -Small Communities O&M Guidelines (2010) water quality sampling and analysis should be carried out at least twice in a year in accordance with GSA Standards and WHO guidelines. The study observed that more than half of WSMTs (SCs) interviewed, indicated that water quality analysis has been carried out. On the other hand, water quality test were not carried out in Bunjai and Kpariba Area Councils as shown in Table 10. However, it was noted that the results of these analysis undertaken largely by NGOs, have neither been shared with the communities nor the District Assembly.

5.1.4 Financial management

WSMTs (SCs) are to keep records on the operations and maintenance of the BHs and HDWs with handpumps for reporting and decision making (CWSA Sector Guidelines -Small Communities O&M Guidelines, 2010).

The study showed that more than half of all service providers interviewed have their total income exceeding expenditure. In the Kulaw and Makango/Kafaba Area Councils, the situation is commendable with more than two thirds of service providers posting higher incomes than expenditure (Table 10). However, records requested to confirm this fact were not made available.

The study further revealed that less than one-third of WSMT (SCs) observed sound financial management, accounting and auditing practices in the management of their water systems. This was predominant in the Kulaw and Makango/Kafaba Area Councils of the district (Table 10).

WSMTs (SCs) are responsible for the setting of tariffs in collaboration with the community which is subject to approval by the District Assembly. Tariff setting should take into consideration the full life cycle cost involved in delivery sustainable water services to communities. The study showed that most tariffs set for boreholes and handpumps are not based on the full Life Cycle Cost of delivering water to the users. While Kulaw and Makango/Kafaba Area Councils WSMT (SCs) set tariffs with recourse to Life Cycle Cost, the service providers in the rest of the Area Councils set their tariffs based on different considerations (Table 10).

5.1.5 Support from DWST

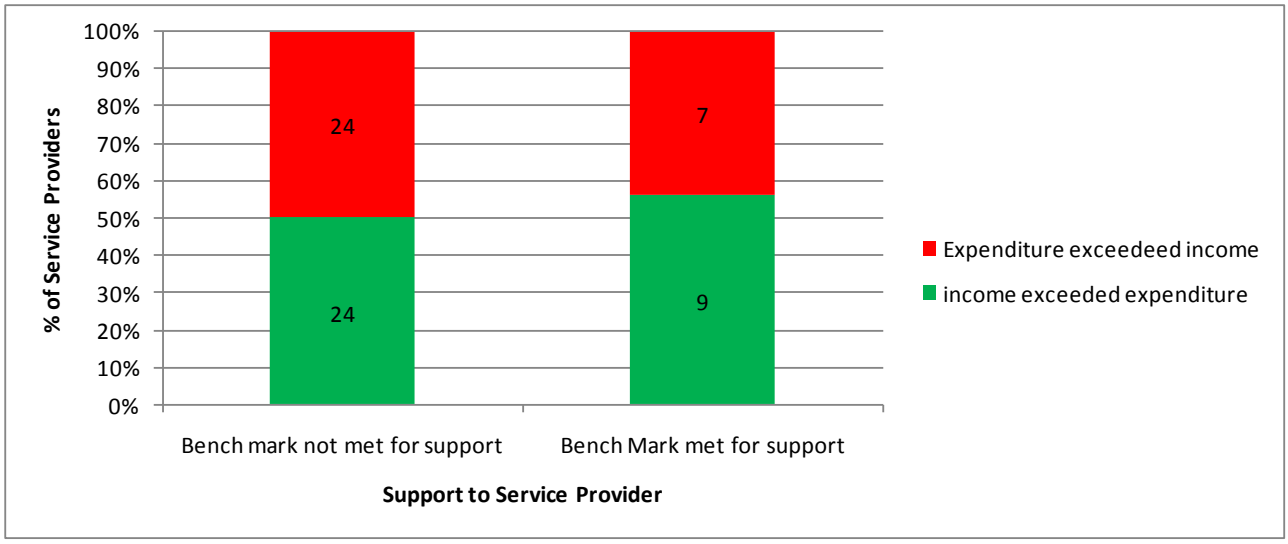
The DWST by their mandate are to monitor operations and maintenance of water facilities and provide technical, administrative and financial backstopping to WSMT (SCs) in the performance of their functions (CWSA Sector Guidelines -Small Communities O&M Guidelines, 2010). As shown in Table 10, the study noted that less than one- third of WSMT (SCs) have received support from the DWST. Only a few WSMTs (SCs) in the Kpariba, Kpembe Makango/Kafaba and Salaga Area Councils have benefited from this support that very much needed to improve their performance.

5.1.6 DWST Support and revenue mobilization of WSMT (SCs)

The study did not establish any strong correlation between DWST support to WSMTs (SCs) and sound financial management practices. As shown in Figure 17, out of 16 WSMT (SCs) that received support from the DWST, 9 had their incomes exceeding expenditure, whiles 7 had expenditure exceeding income. This raises questions about the kind of support that DWSTs provide to the extent that it does not seems to have contributed significantly to the revenue mobilization drive of the service providers.

On the other hand, out of the 48 WSMTs (SCs) that did not receive support from the DWST, 24 had their income exceeding expenditure (Figure 17). It thus appears that even without DWST support to service providers; about half of them have managed to make incomes far in excess of their expenditure. Further investigation would be required to establish the reasons for this.

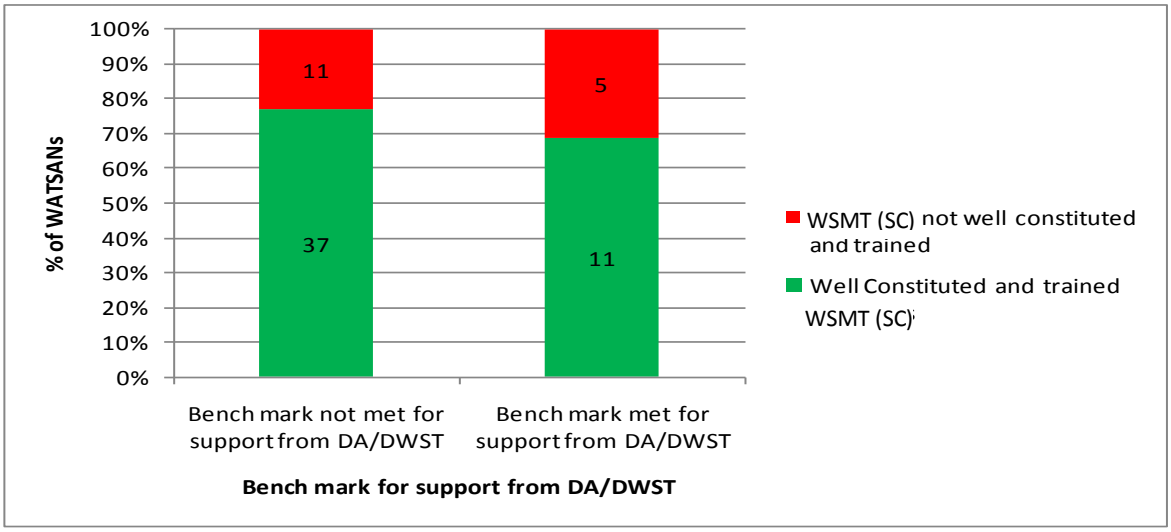
Figure 17: DWST support and revenue mobilization by WSMT (SCs)



5.1.7 DWST support and governance of WSMTs for small communities

The study revealed that more than half of WSMT (SCs) that met the bench mark for support received from the DWST were well constituted, trained and gender balanced in line with the CWSA guidelines governing their establishment as shown in Figure 18. The study further showed that even when the bench mark for support from DWST was not met, nearly two-thirds of the WSMT (SCs) were observed to be well constituted, trained and gender balanced.

Figure 18: DWST support and governance of WSMT (SCs)

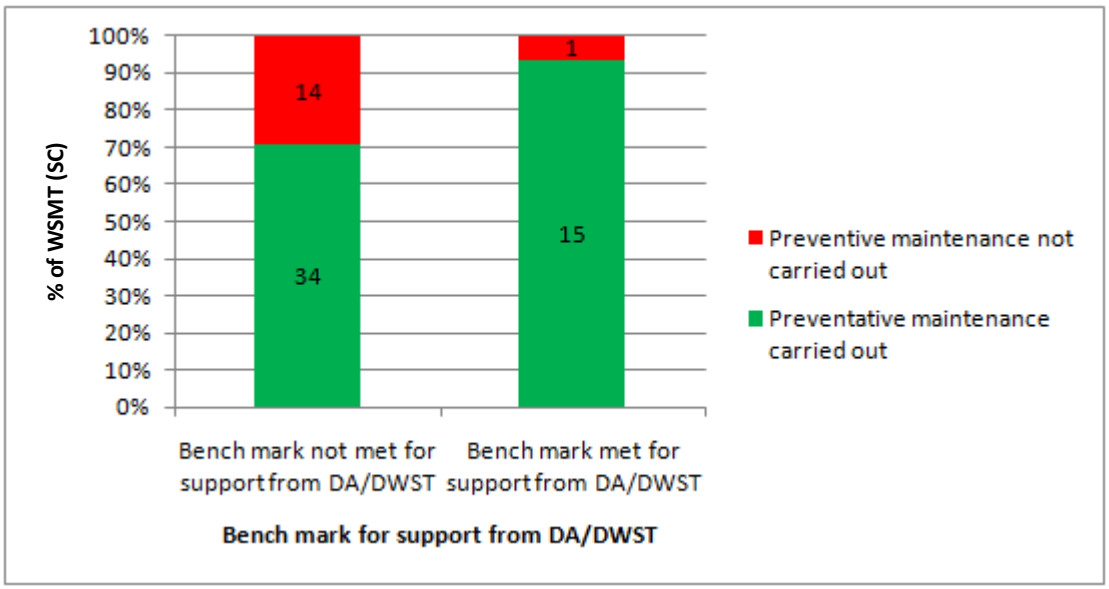


The question to ask is, despite the lack of support from DWST, how have WSMTs (SCs) formed several years ago with no retraining, still managed to be well organized? Answers from these could serve as useful lessons for sharing with other WSMTs (SCs) that are weak because of lack of support from the DWST.

5.1.8 DWST support and maintenance practice of WSMTs (SCs)

The study asserted that there is a significant correlation between DWST support and regular maintenance of point systems by WSMTs (SCs). As shown in Figure 19, of the 16 WATSAN Committees that claimed that they have received support from the DWST, more than two-thirds were found to have carried out preventative maintenance on their water systems.

Figure 19: DWST support and maintenance practice of WSMT (SCs)



However, out of the 48 WSMT (SCs) that did not receive any support from the DWST, nearly 30 percent did not carry out preventative maintenance (Figure 19). This suggests that if service providers receive regular support from DWST, they are more likely to carry out preventative maintenance on their systems which inevitably would ensure reliability and shorter downtimes.

5.2 Service Providers- Piped Systems

The CWSA Sector Guidelines -Small Towns O&M Guidelines (2010) requires the establishment of a WSMTs (STs) in each town for the overall technical, administrative, and financial management of water supply and sanitation facilities in a sustainable manner.

Table 11: Overview of benchmarking of all indicators for WSMTs (STs); Service providers that meets the benchmark on the different indicators

Indicator group	Indicator	Bunkwa	Dabogshie	Dashie	Kplabe	Kpandu	Salaga	Wulanyili	New Mankango
Governance and management	A well-qualified, experienced and trained team								
	Technical, Administrative and financial Reports are kept and read out to the Community at least once every six months								
	There is no political and chieftaincy influences in the composition of the WSMTs (STs)	✓	✓	✓	✓	✓		✓	
	WSDB meetings organised and minutes kept						✓		
Operations	Private sector provides the needed support to WSMTs (STs)							✓	
	Preparation of work plan and budget for O & M								
	Water Quality Sampling and Analysis services are performed on half yearly basis by recognised institutions and paid for through tariff				✓		✓		
Financial management	Annual income from water sales exceeds total annual expenditure	✓	✓	✓	✓	✓		✓	
	There is sound financial management, accounting and auditing								
	Tariff setting is taking into account the lifecycle costs								
	Interference of MMDAs in tariff setting does not affect revenues								
Support	DWST monitors O&M of water facilities in terms of financial, technical and administrative performance, including periodic audits, and provides support where needed								

The water supply systems can be operated either directly by the community or through contractual arrangement with private companies. This section discusses the extent to which WSMTs (STs) in the district have met the bench mark on the different indicators as provided for in the management guidelines for their operations.

5.2.1 Governance and Management

All WSMTs (STs) are enjoined by the CWSA Sector Guidelines -Small Towns O&M Guidelines (2010) to observe sound administrative, technical and financial management practices to prolong the lifespan of the systems they manage.

The study showed widespread non-compliance with CWSA Sector Guidelines -Small Towns O&M Guidelines (2010) by WSMTs (STs) interviewed as shown in Table 11.

It is commendable to note that political or chieftaincy influences in the composition of WSMT (STs) is low and was only evident in the Salaga and Wulanyili WSMTs (STs) (Table 11).

The WSMTs (STs) interviewed pointed to the fact that they seldom organize Board meetings nor take minutes of such meetings. Apart from the Salaga WSMTs (STs), no other Board has organized a meeting to discuss important issues relating to the operations and management of water systems (Table 11).

5.2.2 Operations

Table 11 shows that with the exception of the Wulanyili WSMT, none of the WSMTs (STs) in the district have received the needed support from the private sector to aid their operations. This perhaps, points to weak collaboration between the WSMTs (STs) and the private sector which would need to be strengthened.

All the WSMTs (STs) interviewed indicated that they do not prepare work plans and budgets on operations and maintenance of water facilities as shown in Table 11.

The study revealed that only Salaga and Kpalbe WSMTs (STs) have carried out water quality sampling and analysis of water facilities out of the 8 WSMTs (STs) interviewed (Table 11).

5.2.3 Financial Management

All WSMTs (STs) are required by the CWSA Sector Guidelines -Small Towns O&M Guidelines (2010) to observe sound administrative, technical and financial management practices to prolong the lifespan of the system.

Apart from the Salaga WSMT, all the other 7 WSMTs indicated that their income for 2010 exceeded expenditure as shown in Table 11. However, when records to ascertain this fact were requested, they were not made available. This may be the case because of poor record keeping practices of WSMT (STs)

The study further revealed that none of the WSMT (STs) in the district observed sound financial management, accounting and auditing practices as required by Byelaws that established them (Table 11). This may have serious implications on the sustainable management of small town systems and the delivery of good quality water services in the district.

WSMTs (STs) have the responsibility for setting tariffs in consultation with the community which is subject to approval by the District Assembly. Tariff setting should take into consideration the full Life Cycle Cost involved in delivery of sustainable water services to communities to enable the WSMT (STs) arrive at a realistic tariff to guarantee the sustainable operation of the system. However, the survey revealed that none of the WSMT (STs) adopted the life cycle cost approach in setting tariffs (Table 11). It is therefore significant to know what goes into the current tariff regime practiced by WSMT (STs). Widespread interferences from MMDAs were observed by WSMT (STs) interviewed in tariff setting, and this also tend to affect their revenue base and consequently their operations.

5.2.4 Support

One key function of the DWST of the District Assembly is to monitor the operations and maintenance of water facilities. On the contrary, the service providers noted the absence of this support from the DWST which they very much need to improve their performance (Table 11).

6 Results: performance of service authority

Metropolitan/Municipal/District Assemblies (MMDAs) are the focal point for delivery of water and sanitation facilities but with support from CWSA as facilitators and regulators, providing guidelines and setting standards, and providing back-up professional support. In Ghana, the service authority function lies with the MMDAs who perform functions including planning, coordination and oversight in a geographical area of jurisdiction. Direct support functions, like monitoring and technical support to community-based service providers are also part of the service authority.

The study revealed that the service authority in East Gonja was performing poorly, not meeting any of the service authority benchmarks of 50 as shown in Table 12.

Table 12: Scores of service authority indicators

Indicator	Score Bench mark -50
Presence of the DWST	25
Monitoring and data flows	25
District level budget allocation and utilisation	0
Facility management plans and by-laws	0
Coordination of NGOs	0

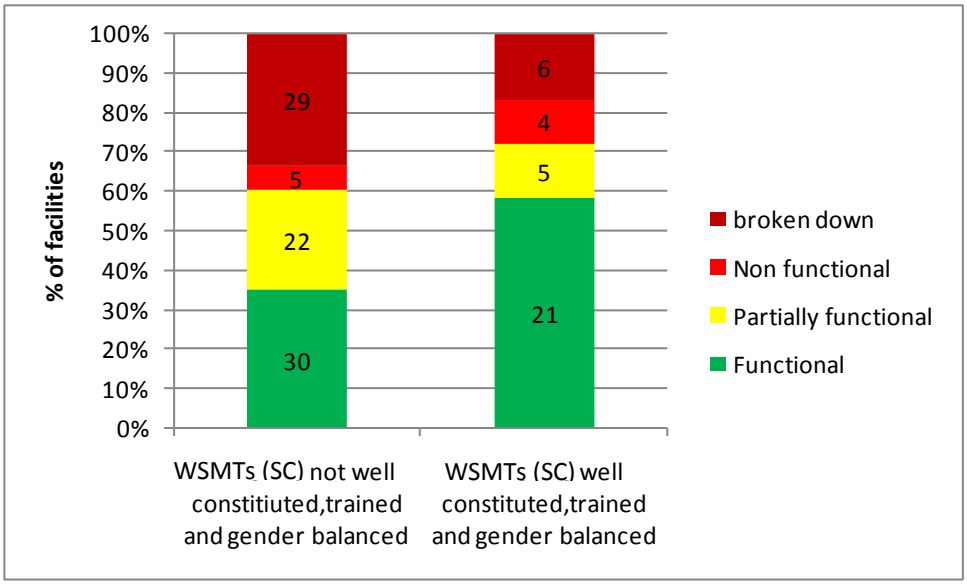
Direct support from the service authority to community-based water service providers takes mostly place through regular monitoring of the WSMTs for (STs) and (SCs) by the District Water and Sanitation Teams. The study showed that less than one third of WSMTs (SCs) and none of the WSMTs (STs) have received monitoring support from the District Water and Sanitation Team (See Table 10 and 11 respectively). As shown in Table 12 monitoring data was not transferred from district to regional level on quarterly basis, as required by CWSA.The three-member District water and Sanitation Team was found to be insufficiently resourced to do its job. The district did allocate a budget for operational costs, but not for investment costs. No facility management plans had been developed, spelling out the roles of WSMTs, nor bye-laws to legalize them. Most NGOs were reported not to provide facility data on new facilities to the DWST. (See Table 12)

7 Results: how do support, service provider and service level indicators relate to each other?

7.1 Well constituted WSMTs (SCs) and functionality of point sources

There is a direct correlation between well capacitated water management structures and low breakdown of water systems. This is confirmed by the study as in communities where WSMTs (SCs) were well constituted, trained and gender balanced, breakdown of facilities was low as shown in the Figure 20. In communities where the WSMTs (SCs) were not well trained and constituted, as high as about 29 facilities were broken down as shown in the Figure 20.

Figure 20: Governance of WSMT**s (SCs)** and functionality of handpumps



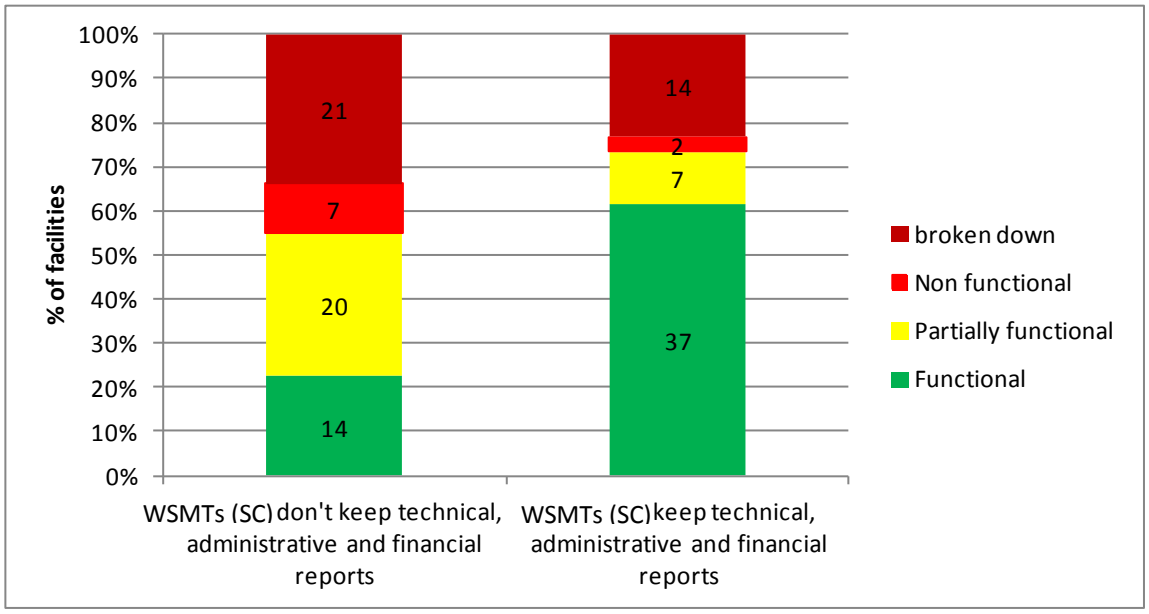
It is therefore clear from the Figure 20, that continuous functionality of water systems is very much dependent on a well constituted and capacitated service provider that is well positioned to discharge its mandate.

7.2 WSMTs (SCs) reporting and functionality of handpumps

WSMTs (SCs) are required by the CWSA guidelines to keep records of their operations to guide them in making decisions regarding the maintenance of the facilities to ensure their sustainability. The study noted that more than half of facilities that were managed by WSMTs (SCs) that keep reports of their operations were functional while only less than one-third were broken down as shown in the Figure 21.

On the other hand, facilities managed by WSMTs (SCs) with poor record keeping regimes had less than one-third and less than half of their facilities functioning and broken down respectively (Figure 21).

Figure 21: **WSMTs (SCs)** reporting and functionality of handpumps

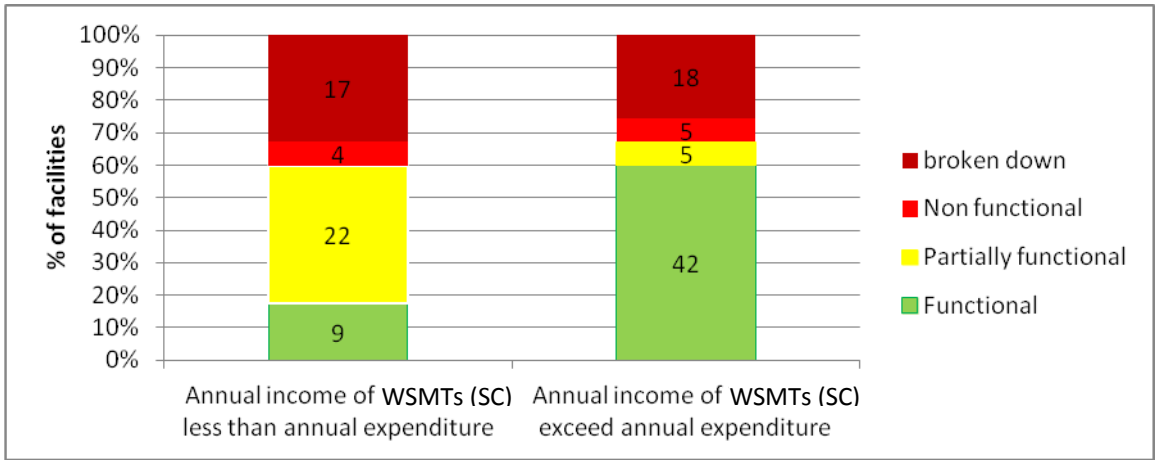


This finding underscores the importance of records keeping to the sustainable management of water systems in rural communities.

7.3 Funds management by WSMTs (SCs) and Functionality of handpumps

WSMT (SCs) require funds to procure spare parts to enable them carry out corrective maintenance on water facilities periodically. The availability of these funds at all times to enable maintenance is crucial to ensuring that facilities are functioning all the time.

Figure 22: Fund management by WSMT (SCs) and functionality of handpumps

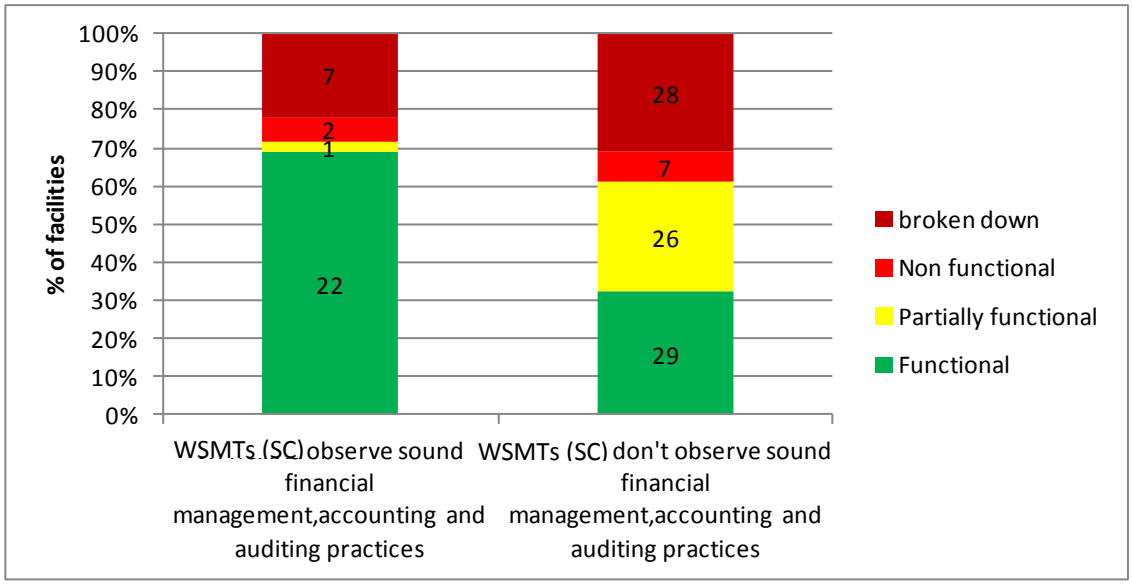


As shown in Figure 22, more than half of facilities managed by WSMTs (SCs) that had funds available for maintenance were functioning, while those that did not have funds had nearly less than one-third of their facilities functioning. This implies that fund mobilization for operations and maintenance of water facilities should be taken seriously by WSMTs (SCs) to guarantee the continuous functioning of their facilities.

7.4 Financial management and functionality of handpumps

Sound financial management practices observed by WSMTs (SCs) contribute largely to better management and improved operations of water systems, hence a higher functionality. It came out from the study that almost two-thirds of water facilities managed by WSMTs (SCs) that observe sound financial management practices are functional, whiles those with poor financial management practices have a lower functionality of less than half as shown in the Figure 23.

Figure 23: Financial Management by WATSANs and functionality of handpumps



It therefore suffices to say that the DWST should support WSMTs (SCs) with poor financial management practice to enable them better manage their facilities.

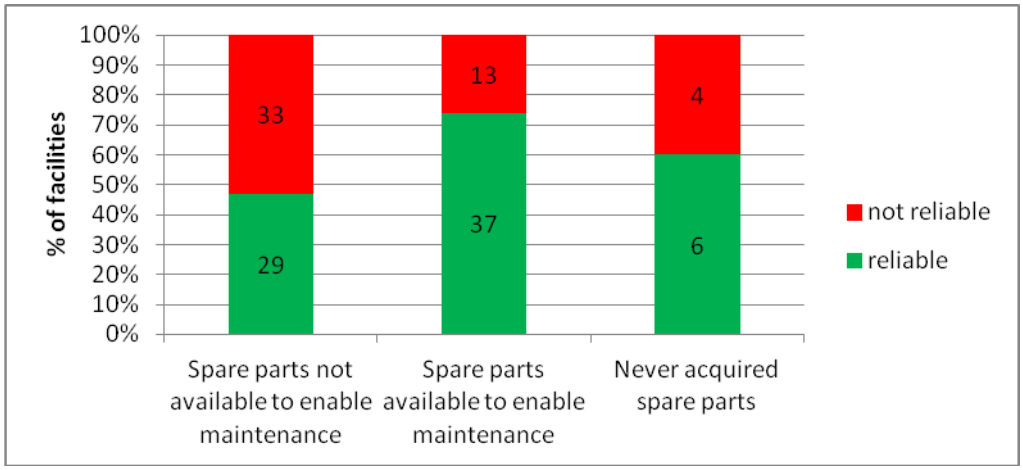
7.5 Availability of spare parts and functionality of handpumps

The national hand pump spare parts distribution network with outlets at the regional and district level is supposed to enable the availability of spare parts at all times for hand pump maintenance and repairs in communities. In the absence of these spare parts particularly the fast wearing ones, hand pumps functionality and reliability may be in jeopardy.

The study has observed a strong correlation between spare parts availability and functionality of handpumps. Figure 24 shows clearly that they where spare parts were available, nearly two-thirds of facilities were functioning; whiles broken down pumps were less than one-third. On the other hand, where spare parts were unavailable, nearly two-thirds of handpumps were broken down, whiles less than half were functioning (Figure 24).

With low functionality and a high number of broken down hand pumps being attributable to the unavailability of spare parts as noted by the study, there may be the need to further decentralize the spare parts distribution outlets from the district level to the Area Council level to enable caretakers have access to them at all times.

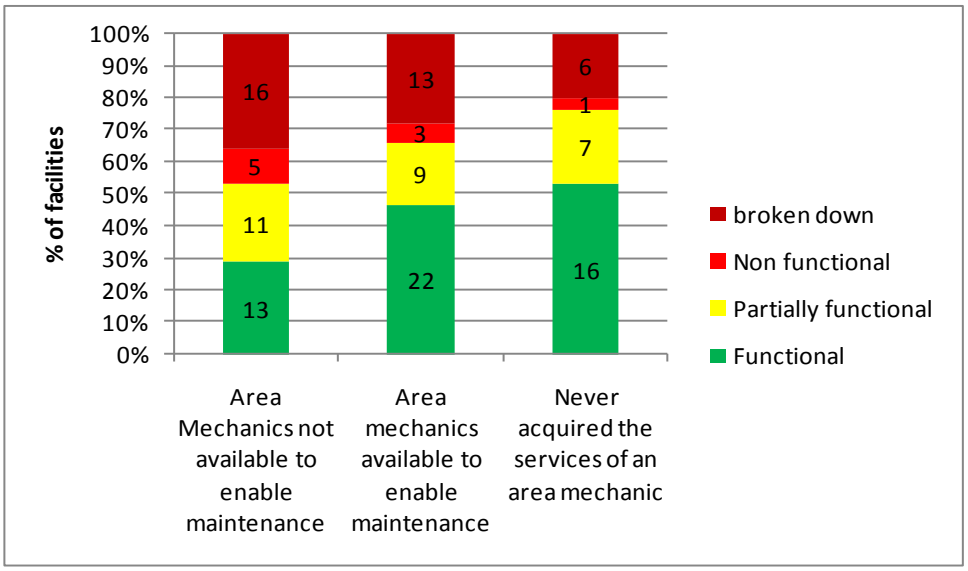
Figure 24: Availability of spare parts and functionality of handpumps



7.6 Availability of Area Mechanics and functionality of handpumps

The CWSA Sector Guidelines –Small Communities O&M Guidelines, 2010 require that Area Mechanics shall be available in every district to undertake major pump maintenance and repairs. However, the study did not show overwhelmingly that, where area mechanics were available, functionality of handpumps was high. About less than half of both facilities with and without area mechanics were functioning. As shown in Figure 25, where area mechanic service were never acquired, more than half of handpumps were functioning and less than one-third were broken down. This raises a number of questions. First of all, how are the service providers of these handpumps posting high numbers of functioning handpumps without the services of area mechanics? Is it the case that the caretakers have acquired a lot of experience overtime so that they are now able to carry out major repairs and maintenance on the handpumps? Further research will be required to establish why the availability of area mechanics has not translated into high functionality of handpumps.

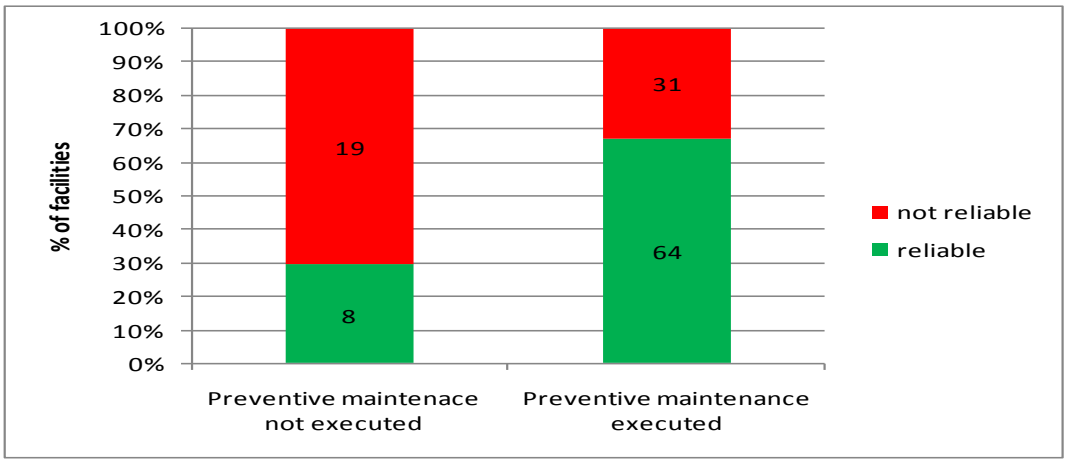
Figure 25: Availability of Area mechanics and functionality of handpumps



7.7 Effective preventive maintenance and functionality of handpumps

Preventative maintenance including general inspection, replacement of fast wearing parts and minor repairs carried out at least twice a year is key to ensuring that handpumps deliver water in a reliable manner. The findings showed that out of the 94 handpumps that had preventative maintenance carried out on them, 64 were found to be reliable, while only 8 out of 27 handpumps were reliable where preventative maintenance was not carried out. (Figure 26)

Figure 26: **Preventative maintenance by WSMT (SCs) and functionality of handpumps**



8 Conclusions and recommendations

The Community Water and Sanitation Programme(NCWSP) anchored on the Community Ownership and Management Model (COM) sets out clear guidelines and standards for ensuring sustainable delivery of water services to rural communities by ensuring that water systems are functional all the time.

The study however, reveals non-adherence to these guidelines and standards in the provision of water facilities in the district surveyed. Consequently, the level of service that communities are receiving from their water service providers is low.

WATSAN Committees and WSDBs were found in the study not to be performing well as per the CWSA Sector Guidelines –Small Communities O&M Guidelines; 2010.This may be in part, as a result of limited support received from the DWST towards operations and maintenance of water facilities as indicated by the study.

The study also reports low investments in the monitoring of operations and maintenance of water facilities right from the District Assembly level to the service provider level in beneficiary communites, contributing to the situation where less than half of total handpumps in the district functioning.

Notwithstanding, NCWSP offers opportunities for achieving sustainable water service delivery, provided all stakeholders in the water sectors implement their interventions with recourse to the guidelines and standards stipulated in the NCWSP, and invest more in the monitoring of operations and maintenance of facilities.

8.1 Recommendations

Based on the baseline study findings, we make the following recommendations for improving functionality and sustainability of rural water service delivery in the East Gonja District in particular, and the country in general.

- The CWSA should strengthen the capacity of the District Assemblies as a service authority to ensure that all organisations providing water facilities in the district comply with the CWSA guidelines and standards for the rural water sector.
- Both Governmental and Non-Governmental Organisations working in the rural water sector should as part of their provision of water infrastructure, ensure adequate budgetary provision for post construction support including monitoring of operations and maintenance to guarantee the sustainability of the facilities.
- To address the widespread overcrowding of facilities and its attendant problems observed by the study, it is recommended that the District Assembly provide more facilities in communities where overcrowding is being experienced to reduce the pressure on the existing facilities.
- In view of the lack of Life Cycle Approach to tariff determination by WSMTs (SCs)and (STs), it Life Cycle Cost and tariff setting generally should be carried out in accordance with CWSA guidelines for water rural water sector practitioners.
- The study revealed weak capacity of water service providers particularly in the area of administrative and financial management and records keeping at the community level which impacts negatively on the functionality of water systems. As a matter of urgency, the District Assemblies in collaboration with CWSA and other like-minded organisations should organise refresher trainings for these service providers to bring them up to speed with their mandate of

monitoring operations and maintenance of facilities in the communities. In addition, the District Assembly should provide adequate resources to the DWST to enable them provide the necessary technical, administrative and financial backstopping to the service providers in the communities.

- To reduce facility downtime, the District Assembly and its partners in the water sector should consider identifying and training area mechanics for each area council in the district to ensure that communities are able to access their services in real time.
- There is need for the national spare parts distribution network to further decentralize the spare parts distribution outlets beyond the district level to the Area Council level to enable caretakers have access to spare parts particularly the fast wearing ones at all times.
- Additionally, ground water is difficult to get in the district, and this calls for other options of sources of water to be explored including surface water as provided for in the CWSA guidelines. There may also be the need to consider the provision of new systems to augment the high populations of communities to reduce the pressure.

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IRC International Water and Sanitation Centre, P.O. Box 82327, 2508 EH The Hague, The Netherlands, triple-s@irc.nl
www.waterservicesthatlast.org