

INNOVATIVE FINANCING FOR CAPITAL MAINTENANCE EXPENDITURE IN SMALL TOWNS WATER SYSTEMS IN THREE DISTRICTS IN GHANA

AKATSI SOUTH, EAST GONJA AND KINTAMPO SOUTH DISTRICTS



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EXECUTIVE SUMMARY

Rural water coverage in Ghana is on the increase but many users receive services below the CWSA prescribed basic service (20L/c/d, within 500m, 95% available). One of the reasons for the low service level is inadequate CapManEx and lack of proper Asset Management results in high cost way of providing poor services. One of the main problem adversely affecting small-town water service delivery is the lack of systematic maintenance as a result of inadequate funding for CapManEx and unreliable cash flow for CapManEx.

The objective of this study is to identify solutions including innovative financing mechanisms to address CapManEx for improved water services (affordable, reliable and sustainable) in small towns. The study was conducted in three districts (Akatsi South, East Gonja and Kintampo South) using focus group discussions, key informant interviews and review of existing management and operations data. The study adopted a purposive sampling technique to select respondents for the interviews and the primary and secondary quantitative data obtained were analyzed using Microsoft Excel while qualitative data analysis involved identification, examination and interpretation of patterns and themes.

The study revealed that the mechanism inherent in the NCWSS for addressing CapManEx works for the systems that have been following it. The water systems with inadequate mechanisms to address CapManEx are characterized by limited capacity (e.g. tariff settings) and weak management (record keeping, financial management etc.). There was limited awareness and application of water sector guidelines for the management of the piped schemes by the WSMTs and the DA. Tariff settings was done arbitrarily by almost all the WSMTs; tariffs used by WSMTs were not submitted to the DA for approval. Most of the water systems were not following the NCWSS procedures of having three separate accounts with one dedicated for CapManEx.

The study did not find any innovative mechanisms of financing capital maintenance expenditure for piped schemes in the three districts. The main sources of finance are tariffs, contribution from District Assemblies and in a few instance grants from donors. In addition, none of the water systems had ever approached a bank for loan to address CapManEx. However, the financial institutions in the study districts are willing to provide loans to the piped schemes if WSMTs meet their conditions.

The concept of pool funding received mixed reactions from the DAs and the WSMTs. The majority were in support of the pooled funding concept on condition that the modalities for its implementation were clearly spelt out from the on-set. Opinions however differed regarding insuring components of the piped schemes.

The study concludes that innovative mechanisms for the financing of capital maintenance of piped systems in Ghana may not necessarily fix the problems of poor service delivery (including unreliable service). What is critical to effectively address CapManEx relates to governance, management and financial management regimes of the WSMTs to bring about the necessary change in the WSMTs in Ghana.

The following recommendations are made to improve small towns water service delivery:

- CWSA should sensitise the DAs/WSMTs on the NCWSS especially on the mechanism to address CapManEx and small towns water system governance in general as most of the DAs and WSMTs were not following the NCWSS. In addition, CWSA should monitor the operations of all WSMTs and this may require additional budgetary allocation at all regional and head office.
- The District Assemblies should intensify their monitoring and support roles including budgeting and tariff setting to the WSMTs to ensure efficient fund mobilisation and management.
- All WSMTs should be supported to maintain the requisite record books and operate the mandatory bank accounts to facilitate their access to financial support from the banks when the need arises.
- Regular refresher trainings of WSMTs in operation and management will ensure that they are always up to their responsibilities.
- The pool funding concept is considered by most of the respondents in the study as promising. Stakeholders want the pool funding to be guided by transparency and accountability if it is to be implemented. Content or district specific requirements should not be overlooked in the roll-out of the concept. Deeper consultation, deeper community engagement processes should be critically considered prior to implementation.
- For the current regime of funds mobilization and management by the WSMTs to be effective, there will be a need for constant monitoring, support, capacity building and technical backstopping to the various WSMTs by the District Assembly and CWSA Regional Offices. Regular monitoring and periodic audit of operation and maintenance as well as the financial audit of the systems need to be enforced by the DA.

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ABBREVIATIONS

ADB	Agricultural Development Bank
CapManEx	Capital Maintenance Expenditure
CIDA	Canadian International Development Agency
CWSA	Community Water and Sanitation Agency
DA	District Assembly
DOM	District Operational Manual
DWSP	District Water and Sanitation Plan
FGD	Focused group discussion
GWCL	Ghana Water Company Limited
KSDA	Kintampo South District Assembly
LCCA	Life Cycle Cost Approach
MMDAs	Metropolitan, Municipal and District Assemblies
MP	Member of Parliament
NCWSP	National Community Water and Sanitation Programme
NCWSS	National Community Water and Sanitation Strategy
WSMT	Water and Sanitation Management Team

INTRODUCTION

Rural water coverage has been increasing across Ghana with current coverage estimated at 62.03% at the end of 2016 (CWSA, 2017). However, the actual level of service (measured by the water quantity, quality, accessibility and reliability of water supply) received by users in many communities is low, below the basic level prescribed by CWSA. The reason contributing to the poor water service levels are inadequate asset maintenance and repair at community level. Indeed, in many cases, formal rural water points are only repaired through ad hoc processes of maintenance, rehabilitation, or replacement by international donors or government agencies. Thus, there is no structured asset management in place resulting in a high cost way of providing rural communities with poor services (Burr and Fonseca, 2012; Pezon and Franceys, 2010). Therefore, with growing stock of fixed asset for rural water supply, it is important for actors in the development sector to think systematically about ways in which expensive water supply assets can be maintained and managed in a more cost-effective manner, whilst safeguarding continuity in service delivery (Burr et al., 2013).

Studies conducted as part of WASHCost research project identified little structural investments in Capital Maintenance Expenditure (CapManEx), because of a bias towards Capital Expenditure (CapEx) as one of the factors contributing to poor water service levels. It observed that annual recurrent costs are US\$4 per capita per year for water point sources and US\$10 to US\$14 per capita per year for small towns water systems was sufficient to keep existing services (Nyarko et al., 2010). Small town's water systems with prolonged breakdowns have capital maintenance expenditure six times more than systems with consistent maintenance (Nyarko et al., 2010).

CapManEx is defined in the CWSA District Operational Manual (DOM), (2014) as the cost for occasional asset renewal, replacement and rehabilitation of WASH facilities. CapManEx costs may be covered by tariffs, user fees or through the local government budget. CapManEx deals with major maintenance whereas OpEx (operation and minor maintenance) deals with minor maintenance.

Minor maintenance: is defined as repair that is within the financial capability of the users of the facility, and can be covered by their user fees. Major maintenance: is defined as repair that is beyond the financial capability of users, and cannot be fully covered by user fees, therefore requiring external support from the DA, central government or other sources. Major maintenance is interchangeable with capital maintenance expenditure. Activities constituting major and minor maintenance are shown in Table 1.

Table 1: Minor and major maintenance of a small town system

Item	Minor Maintenance	Major Maintenance
Borehole	Redevelopment	Replacement of borehole
Pump House	Repair of cracks in roof and building, reconstruction of building	Nil
Submersible Pump	Replacement of parts, Replacement of pump	Nil
Transmission line	Replacement of sections of pipes, repair of leakages, repair of meters, valves, gauges	Replacement of all pipes, re-alignment of whole line
Electromechanical equipment	Repair or replacement of switches, meters, fuses	Replacement of control panel, replacement of transformer
Storage Tank	Repair of leakages, painting (steel tanks)	Replacement of tank
Distribution network	Repair of leakages, replacement of sections of pipes	Re-alignment of network
Standpipes	Repair or replacement of taps, meters, repair of cracks, reconstruction of platform	NIL
Surface water intake	Repair of cracks , repair of low-lift pump(s)	Re-construction of intake, replacement of low-lift pump(s)
Treatment plant (eg Slow Sand Filter, SSF)	Washing of filter media, cleaning of filter chambers, topping –up of filter media,, repair of high-lift pump(s)	Replacement of high-lift pump(s), re-construction of filter chambers

Source: adapted from DOM 2014

Problem statement

The lack of financial mechanism to address CapManEx is one of the problems affecting the small towns water systems. The lack of the finance result in inadequate expenditure on CapManEx and ultimately on lack of systematic major maintenance. A study by Adank et al. (2013) revealed that 33% of water points were non-functional and a further 30%-40% of the water points delivering services below the basic acceptable levels (partially functioning with down time more than 18 days a year). The poor functionality of the rural water points demonstrates poor asset management (Burr et al., 2013). Other factors contributing to the poor services are the lack of sound financial management, accounting and auditing practices

and the lack of preventive maintenance by the WSMTs. The baseline study in Akatsi revealed that none of the WSMTs for small towns exhibited sound financial management, accounting and auditing practices and none of them undertook scheduled preventive maintenance. Furthermore, none of the WSMTs had a facility management plan contrary to CWSA guidelines confirming that routine maintenance was not systematically planned or executed.

Small town water systems are confronted with inadequate funding for CapManEx from WSMTs and District Water and Sanitation Teams (DWSTs)/District Works Department (DWD) and unreliable cash flow for CapManEx. When sufficient funds are not set aside by WSMTs for CapManEx, small towns water systems would have to rely on donors or district assemblies. However, funding from donors and district assemblies are often unreliable and often leads to extended periods of service downtime or sub-optimal performance. A study of CapManEx by small town water teams, Asante (2012) noted that none of the WSMTs sampled had received monies from the district assemblies into their capital accounts. Small town water schemes that are doing well have been able to fund their capital maintenance from their capital accounts. Schemes that have not been able to finance their capital maintenance needs from their capital funds suffer unexpected and long breakdowns. The reasons why some schemes are not able to fund capital maintenance themselves are insufficient revenue, poorly managed systems and high capital maintenance needs, often where surface water is the only water resource (Fonseca et al., 2013).

Main objective of the study

The main objective of this study is to identify potential innovative financing mechanisms to address CapManEx for improved water services (affordable, reliable and sustainable) in small towns.

The study seeks to address the broad objectives with the following specific goals:

- Identify and describe the various small towns water management models prevailing in the field
- Assess the existing maintenance regime for small towns
- Assess the effectiveness of their financial management system
- Examine the alternative funding mechanism practices for capital maintenance in the sector within and outside Ghana, and
- Make proposals on how to improve the mechanisms for capital maintenance financing

Research questions

1. What is the nature of breakdowns in small town's water systems?
2. What are the underlying causes of the breakdown or sub-optimally functioning of small town systems?
3. What kind of management model is in operation and their effectiveness?
4. What kind of funds mobilization strategy exists for addressing CapManEx?
5. How functional/effective is the funds mobilisation strategy?
6. What challenges exist with funds mobilisation?
7. What is the financial management system¹ of the management teams?
8. What are the current costs of major components² of the system?
9. What are the current and future capital maintenance needs of the small towns?
10. How is capital maintenance expenditure of the systems financed?
11. What is working and not working with the capital maintenance financing mechanism in place?
12. What potential sustainable financial schemes exist to address CapManEx?

Scope of study

This study focused on all the small town systems in East Gonja, Kintampo South and Akatsi South to answer all the research questions aforementioned. Kintampo South has new water systems provided by World Vision Ghana.

¹ (Manages three bank accounts, account books are kept, financial statements are prepared, auditing is carried out once every year)

² Replacement of the borehole, large portions of transmission lines, control panel and transformer, tank, low and high lift pumps

METHODOLOGY

Study area

Akatsi³ South District is located in southeastern part of Volta region in eastern Ghana. It is located between latitudes 6°S 7°N and longitudes 0°W 1°E. It shares boundaries with Keta Municipal Assembly to the South, Ketu North to the East, to the West by South and Central Tongu Districts and to the North by Akatsi North and Agortime-Ziope Districts. The district has an estimated population of 98,684 with a growth rate of 2.4%. The female population is made up of 53.9% as compared to the male population of 46.1% (Akatsi South DWSP 2017-2020, GSS, 2010).

At the end of 2015, the average water coverage for Akatsi South District was 60.03%. Akatsi South District is endowed with One Hundred and Ninety-seven (197) boreholes fitted with handpumps, 4 Small Town/Communities Pipe Systems and One (1) Limited Mechanized System. (CWSA Service Monitoring data, 2015). The district receives an average of 1,084 mm of rainfall per year spread between a wet season (May – October) and dry season (December – March) of about equal lengths.

East Gonja district is located at the Southeastern section of the Northern Region of Ghana. The district lies within Latitude 8 degrees North and 9.29 degrees North and, Longitude 0.290E & 1.260W. It shares boundaries with the Mion District and the Tamale Metropolitan Assembly to the North, Central Gonja District to the West, Nanumba North, Nanumba-South and Kpandai Districts to the East, and the Brong-Ahafo Region to the South. The total land area of the district is 8,340.10 square kilometers, occupying about 11.95 percent of the landmass of the Northern Region, making it the largest district in the country (GSS, 2010). According to 2010 Population and Housing Census, the district has a total population size of 135,450. This gives a population density of about 16 persons per square km. The total number of males (69,721) is higher than the females (65,729). The population of the district is predominantly rural constituting of 81.3 percent of the total population of the district (GSS, 2010). The population demand for water in the district is very high. East Gonja has one major rainfall season between April and September; however, the rains can often be irregular with total annual rainfall ranging between 1000 – 1500mm.

According to CWSA baseline data collected in 2014, the East Gonja District has 130 boreholes fitted with hand pumps and 10 piped systems. Functionality of these boreholes fitted with

³ In 2012, Akatsi district assembly was split into Akatsi North (maintaining Akatsi town as the district capital) and Akatsi South (with Ave Dakpa as the district capital). The original baseline study by Triple-S was undertaken when Akatsi was a single district.

handpumps stood at 57% with non-functional handpumps estimated at 40%. Fifty Water and Sanitation Management Teams were constituted to manage the handpumps. There are 10-piped systems being managed by eight Water and Sanitation Management Teams. East Gonja District is characterized by low coverage of 30.45% (CWSA Service monitoring data, 2015).

Table 2 Core district characteristics

Characteristic	Akatsi South District	East Gonja District	Kintampo South District
Population	98,684	135,450	93,600
Area/km ²	1,774.85	10,787	1,774.85
Population density (persons per km/sq)	119	13	53
Average annual rainfall	1084 mm	1050 mm	1600mm
Number of piped systems	4	7	5
Number of house/private connections	625	Not available	72
Number of public standpipes	77	Not available	50
Number of functional public standpipes	72	77	46
Functional piped schemes	4	6	5
Number of Non-functional piped standpipes	5	Not available	4
Total population served	46,899	44,667	29,851
Formal water coverage rates	60%	30%	72%

Source: CWSA Service monitoring data 2015 and field data collected in 2016

Kintampo South District⁴ is one of the twenty seven districts within the Brong Ahafo Region of Ghana and one of the six newly created in the Region. The District was created by the Legislative Instrument (LI) 1781 and duly inaugurated on 24th August 2004.

⁴ Source of district information from http://kintamposouth.ghanadistricts.gov.gh/?arrow=atd&_45&sa=5550

It lies within longitudes 10 20' West and 20 10' East and latitude 8 15' North and 7 45' South. The District shares boundaries with Kintampo North district to the North, to the South by Nkoranza and Techiman districts, to the East by Atebubu and Pru Districts and to the West by Wenchi Municipal. The district covers an area of about 1,774.85 km² and comprises about 122 settlements (GSS, 2010).

The population of Kintampo South district, according to the 2010 Population and Housing Census, is 81,000 with more males (52.0%) than females (48.0%). The household population in rural areas (91.2%) is higher than that of the urban (8.8%). The average household size in the district is 5.2. Four-fifth (80.9%) of the population aged 15 years and older are economically active (GSS, 2010).

The district has 267 boreholes fitted with handpumps (out of which 33 were broken down), 4 limited mechanised systems and 3 piped schemes. With these facilities, the District's water coverage stood at 72.0% in 2016. Performance of WSMTs and the district's Service Authority functions were identified as poor, and would be given the required attention in the 2017-2020 Water and Sanitation Plan (KSDA DWSP, 2017-2020).

The Kintampo South district experiences a modified tropical continental climate or modified Wet Semi-equatorial climate. The mean annual rainfall is between 1400mm-1800mm. The Wet season shows double maxima rainfall pattern (i.e. major and minor). The mean monthly temperature in the district is between 24°C in August and 30°C in March. These conditions create sunny conditions for most part of the year (KSDA, 2016).

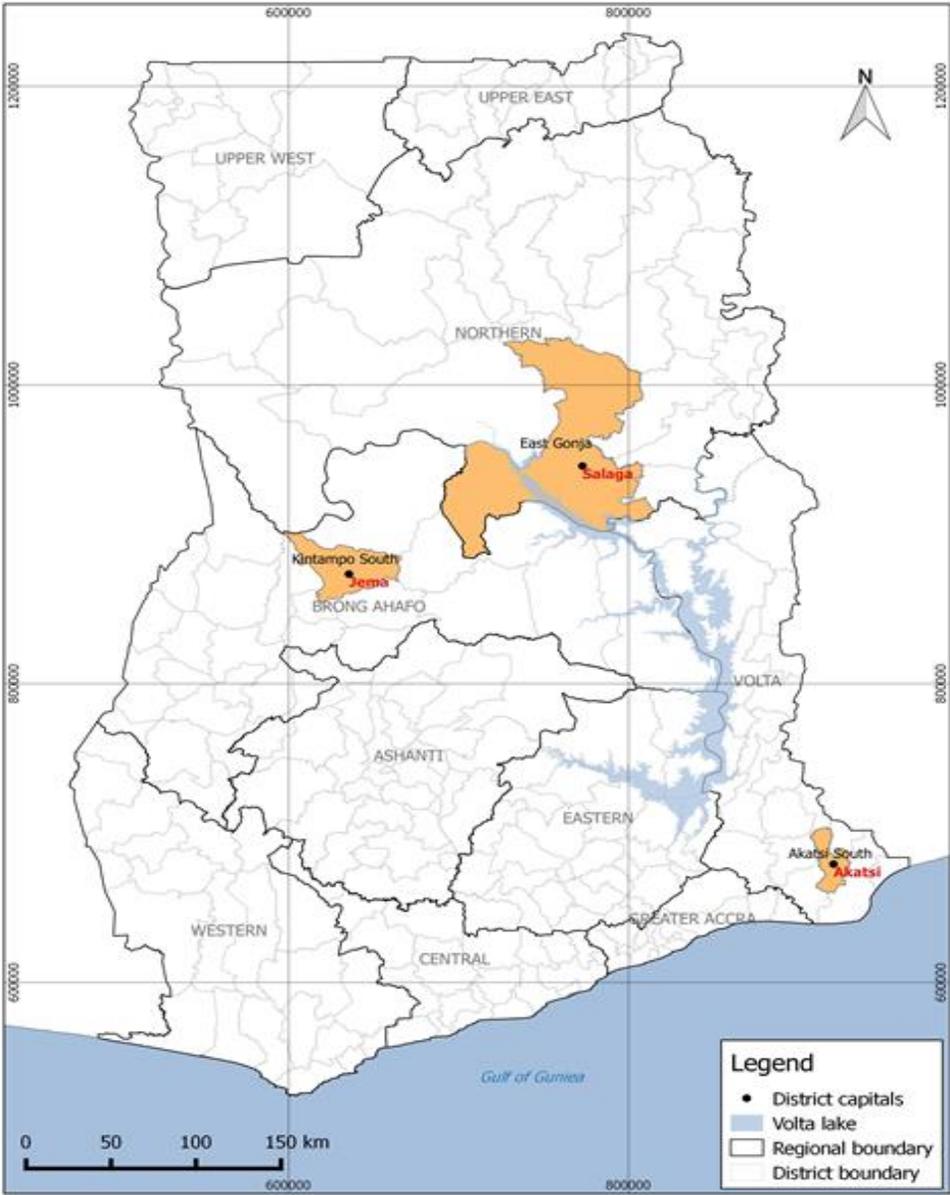


Figure 1: Map showing the study districts in Ghana

Sampling

A purposive sampling technique was used to select respondents for the interviews. This non-probability, and non-representative sampling technique was adopted because, it allowed the interviewers to focus on particular characteristics of the study population to meet the research objectives. Data was collected on all sixteen (16) water and sanitation management teams managing piped systems serving more than 2000 users on how they carry out major and minor maintenance, and how the District Assembly’s support these WSMTs.

Key informant interviews were also conducted with eleven financial institutions in both the district and the region.

Data collection

Both quantitative and qualitative data was collected from the piped schemes (16 No). Quantitative data was obtained from the operational records on system components and capacities, expenditure disaggregated into operations, maintenance, water revenue, tariff structures and service levels for the small towns in the study districts. Quantitative data was collected with the use of android phones, and the qualitative data was collected through focused-group discussions and key informant interviews. The CWSA regional staff collected both qualitative and quantitative data. The data collection processes entailed the training of the facilitators, rapporteurs and translators on conducting focused group discussions and key informant interviews. The data collection process was supported and supervised by staff from the CWSA Head office. Primary data was collected between April and June 2016. The questionnaires used for the data collection were pre-tested in March 2016, at the Unity Bank in Ho and Hlefi, a community in Ho West district of the Volta Region. A two-man team from regional Community Water and Sanitation Agency carried out data collection in the field. One person administered the questionnaires to the respondents and the other recorded the proceedings. Focused group discussions (FGD) were used to collect data from the District Assembly and the WSMTs. Key informant interviews were conducted with the financial institutions.

The rules of engagement were clearly spelt out and a consent form duly signed by the various groups prior to each FGD session. Both participants and facilitators introduced themselves prior to the commencement of each focused group session. Again, before the administration of the questionnaire, participants were given unique numeric identification codes to ensure their anonymity but at the same time keep track of their trend of contribution. Where it was observed that some of the respondents could not understand the English language, the questionnaire was administered in the local language and translated. The facilitators posed the questions to the group and where necessary, responses were probed for further clarity on certain issues. Observations such as body language, tone and differences in opinion were taken note of in each question. The discussions were tape recorded for transcription.

Data analysis

Primary and secondary quantitative data was analyzed using Microsoft Excel while qualitative data analysis involved identification, examination and interpretation of patterns and themes in the textual data from the focused group discussion and determination of how

these patterns and themes responded to the guiding questions using content analysis. The qualitative data was used to triangulate the quantitative data.

Challenges/limitation of the study

The challenges and limitation of the study are as follows:

- Poor record keeping on the dates of repairs and cost of repairs by WSMTs: Most of the systems did not have the required operational and financial records due to improper record keeping and frequent 'change-overs' of management in which the transitions were not properly handled in terms of proper handing over. Data on finances and quantity of water provided and sold from piped systems in most cases was usually unavailable. There was unavailability of system historical records on the systems such as design capacity, age, type and pump capacity were not available for the older systems.
- Lack of capital maintenance expenditure data from new-piped systems: Some of the systems were relatively new, and therefore had not experienced major breakdowns. As such, data on major maintenance were not available.
- Most of the WSMTs interviewed were without the required number of members as per the CWSA Guidelines.
- None of the financial institutions interviewed had ever granted loans to WMSTs, and therefore were unable to share practical experience in financing major maintenance in piped schemes.
- The data collection exercise coincided with the major farming season and this affected the availability of some members of the WSMTs for the focused group interviews, and the amount of time they were willing to spend.

RESULTS

The results are presented and discussed under five thematic areas of the guiding questions and juxtaposed with the results of the quantitative data. The chapter begins with a section on the description of rural water service delivery in Ghana and highlights the delivery of water services vis á vis what the situation is on the ground.

Description of Rural Water Services Delivery in Ghana

The national commitment to ensure sustainability of water and sanitation facilities provided to rural communities and small towns, under the National Community Water and Sanitation Programme (NCWSP), is based on the Community Ownership and Management (COM) strategy. Legal ownership of water supply systems is vested in District Assemblies, who hold this in trust for the communities. Communities, through their respective Water and Sanitation Management Teams have responsibility for the day-to-day management of these systems in line with the principles of community management (NCWSS, 2014).

District Assemblies are the focal point for delivery of water and sanitation facilities. The DAs are mandated to plan, budget and implement their own water and sanitation programmes. They are also responsible for the approval of tariffs, the appointment of water service providers and oversight of community management to ensure compliance. WASH services should also be guided by the principles of good governance and transparency (NCWSS, 2014). The private sector has the responsibility to deliver the needed goods, works and services through contractual arrangements.

There are two main types of water service providers within the Community Water and Sanitation sub sector. These are Type 1: Water and Sanitation Management Team (WSMT) and Type 2: Private operator (NCWSS, 2014).

The WSMTs are established in each small town and rural community for the overall management of Water Supply and Sanitation Facilities. The formation and operation of the WSMT is guided by the national model by-laws. The WSMTs are responsible for setting tariff, and exercise this responsibility in consultation with the community. The MMDAs approve all tariffs. The components of the tariff should include the following:-

- 1) All water production expenses
- 2) All distribution expenses
- 3) Routine maintenance and other contracts
- 4) Repair work (by staff and private maintenance contracts).
- 5) Water quality monitoring at facility level
- 6) Tariff collection expenses (vendors) (up to 20% of total tariff)
- 7) Replacement cost (20% of 1-6)

- 8) Rehabilitation and Expansion (5% of 1-6)total)
- 9) Sanitation Fund (8% of 1-6)
- 10)Contingency (2% of total (1) – (6)).

The portion of the tariff for major rehabilitation, expansion and replacement are to be invested to add value and safeguard against depreciation (CWSA Small Town Sector Guidelines, 2010)

According to the national model by-law (2010):

- Tariffs are to ensure sustainable finances for operation and maintenance of the system
- The WMSTs are to recommend water tariffs, service fees and penalties to the Assembly for consideration and approval. In calculating tariffs for recommendation to the Assembly, the WSMTs are guided by the Community Water and Sanitation Agency Tariff Setting Guidelines.
- The WMSTs are to inform the Town/Area Council of all proposed tariffs, service fees and penalties prior to submitting these to the Assembly for approval.
- The WSMTs shall review at least annually all water tariffs, service fees and penalties.
- For managing its finances, the WSMTs are to establish at least three accounts, designated as “Operational Account”, “Capital Account” and “Sanitation Account”.
- The WSMTs are to make payments of all revenue accrued from water sales and other receipts to the Operational Account and are to pay from the said account all the regular operation and maintenance costs, including the cost of water quality monitoring as may be agreed with DWST/DWD.
- The Capital Account are to be used for major repairs, extensions and replacement of the water system but not for routine operation and maintenance. The WSMT shall make a monthly payment to the Capital Account at a figure to be determined by the WSMTs provided that the figure shall not be less than 20% of the net monthly revenue accrued to the WSMT after all regular operation and maintenance costs have been paid. The Assembly may allocate funds annually through its regular budgetary allocation to the Capital Fund.
- The Chairperson, the Secretary and the Treasurer of the WSMT are to be signatories to the accounts. The signature of the Chairperson and any one of the remaining two signatories are sufficient to validate any cheque. Any cheque drawn on the Capital Account must also be co-signed by the District Coordinating Director.
- Each year the WSMTs are to prepare a work plan and budget for the operation and maintenance of the water system. It shall provide a copy of this annual work plan and budget to the Town/Area Council and to the Assembly.

- The DWST/DWD are to provide the WSMTs with technical assistance in the preparation of its annual work plan and budget.
- The WSMTs may pay quarterly sitting allowances for its members, if these allowances are reviewed and approved by the Assembly.
- The WSMTs shall establish a bookkeeping system appropriate for the management of funds relating to the nature of its business.
- The books and accounts of the WSMTs are to be audited annually by auditors approved by the Assembly within three months of the end of the immediately preceding financial year.
- The Assembly are to approve the audit report. A summary of the audit report shall be posted on the community notice board.
- The financial year of the WSMTs are to be the same as the financial year of the Assembly.
- The WSMTs are to produce monthly and annual financial statements, which it shall provide to the community, Town/Area Council, and Assembly.

The private sector has a role to play in terms of: providing technical and management support through consultancy services (design, construction supervision, hydro geological services, training, mobilisation, hygiene promotion, etc.); constructing water and sanitation facilities and supplying equipment, spare parts, etc.; developing, funding and implementing community water and sanitation schemes in partnership with DAs and/or WSMTs

The community as citizens and customers have a key role to play in ensuring sustainable service delivery. This role includes expressing demand for services and indicating their preference in terms of levels and quality of service and affordability; Making payments for services provided; registering complaints where services are not according to set standards; demand accountability from service providers (Figure 2, NCWSS, 2014).

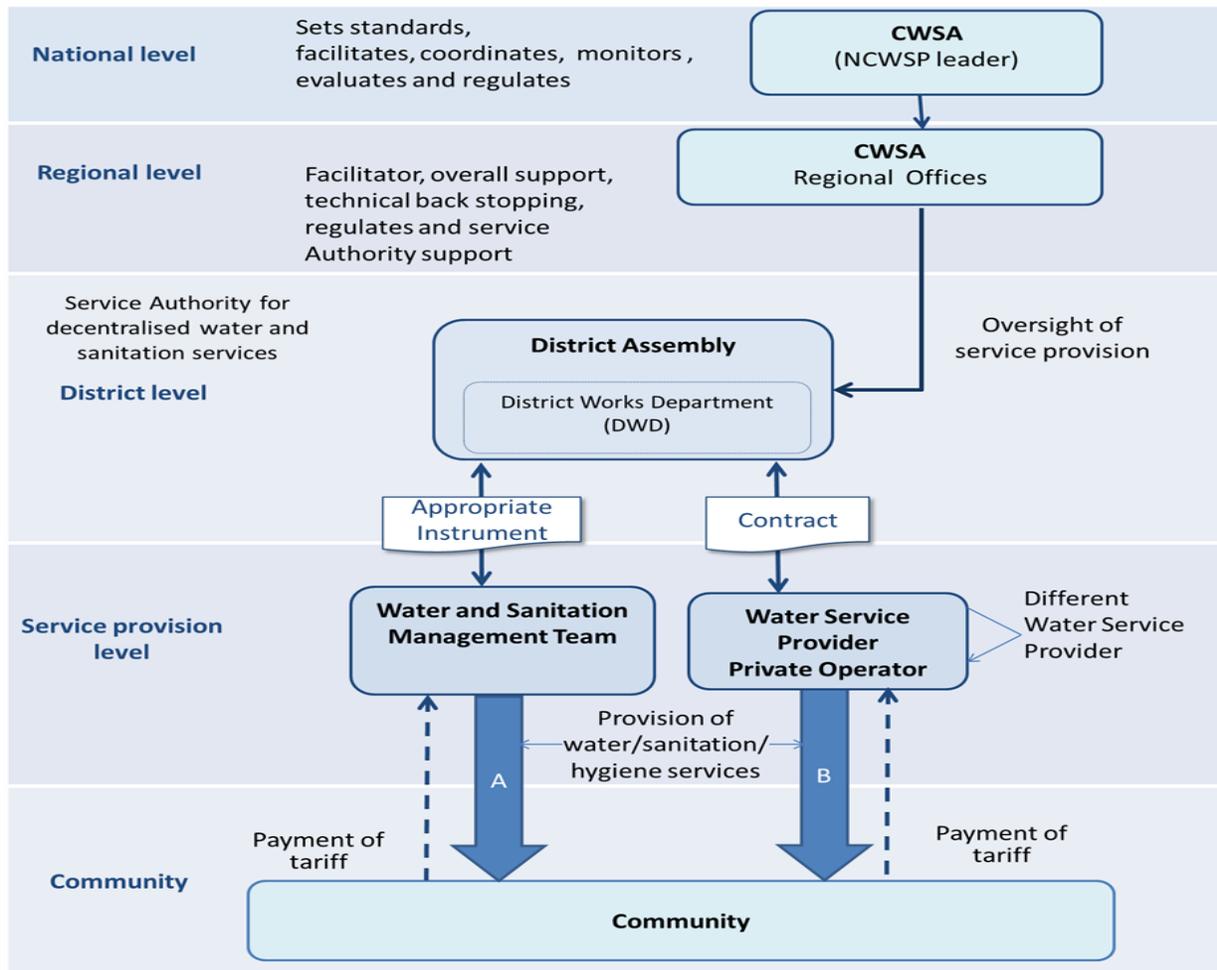


Figure 2: Institutional relationships within the Community Water and Sanitation sub-sector

Management structures/models for piped schemes

The study identified three management models. These are direct management models, partial management models and private operators. Out of the total of sixteen (16) STWSs, ten (10) were directly managed by the WSMTs, four (4) were partially managed by the WSMTs and two (2) managed by private operators

Majority of the WSMTs (7 out of 16 WSMTs) have very good/cordial relationship with the DAs. According to these WSMTs, the DAs are responsive to the challenges that are reported to them. Others had cordial relationship with the DAs (5 out of 16) but it was revealed that the DAs were not responsive to the challenges that were reported to them. While there was no relationship between some of the WSMTs and the DAs (3 out of 16), others (1 out of 16) also had a bad relationship with the DAs.

Majority of the STWSs which the management had good relationship with the DAs were either directly managed by the WSMTs or partially managed by the WSMTs. The STWSs which management had no relationship with the DAs were mostly managed by private operators.

The Akatsi piped scheme employs six staff who assist the WSMT in the operations and management of the scheme. In Akatsi South, all the WSMTs indicated that the management models practiced are effective. They attributed their ability to provide reliable, sufficient quantity and safe water supply services to their clients and the support received from the DA. Although there exist a good relationship between the DA and the WSMTs, according to the WSMTs, frequent visits will strengthen the existing relationship.

Table 3: Piped scheme, management model and relationships with the district

District	Piped Scheme	Management model	Relationship between the WSMTs and the district
Akatsi South	Akasti	Partial management model	Cordial
	Lume Avete	Direct management model	Cordial
	Avenorpedo	Direct management model	Cordial
	Dabgamete	Direct management model	Cordial
East Gonja	Salaga	Partial management model	Cordial
	Dashie	Direct management model	Cordial but non-responsive
	Kpalbe	Direct management model	Mixed (Cordial and non-responsive)
	Talkpa-Abromasi	Direct management model	Bad
	Daboashie	Direct management model	Not cordial and DA non-responsive
	Kpembe	Private operator	No relationship
	Makango	Private operator	No relationship
Kintampo South	Jema	Partial	Cordial
	Anyima	Partial	Cordial
	Amoma	Direct	Cordial but non-responsive
	Krabonso	Direct	Cordial but non-responsive
	Nante	Direct	No relationship

In East Gonja, the WSMT members of the water system had divided opinion concerning the effectiveness of the existing management model. One group believes that giving the management of the system to a private operator could be a better means to sustain the

system as the appointment of WSMTs is politicized.

In East Gonja, the Salaga system WSMT members were split between the effectiveness of the current model and the fact that a private management would do better. The first school of thought believes that there is so much politics in the appointment of the WSMT members and that the system would see the much-needed expansion to match the growing population if its management is handed over to a private person. It was evident from the interaction that; the current members of the team are affiliates of a certain political party. However, after further explanation by the researchers on provisions of a private management, they unanimously agreed that, privatizing the system would ensure sustainability. The DA's support to the Salaga management of the system has been phenomenal over the years. Its support cuts across both minor and major maintenance works as evidenced in the repair works at the system site, purchase of new pumps among others (Table 3).

Dashie system WSMT believes that if one person is put in charge, the system would perform much better and minor repairs such as replacement of faulty tanks would have been taken care of. The WSMT thinks that even though the DA plays a general supervisory role over the community, its relationship with the water management team and issues relating to water supply are not given the needed attention (Table 3).

The Kpalbe system WSMT were of the view that the model was effective because they coach and inform water users of the benefits of drinking potable water, which resulted in increased patronage of the system. The relationship between the WSMT and the District Assembly was split between two views; whereas one school of thought was of the view the DA responds to their needs, the other described is as *"affectionate and highly associative"*. However, majority argued that the relationship has not been cordial, as several complaints sent out to the District Assembly have not yielded positive outcomes (Table 3).

The Talkpa-Abromasi system is managed by a WSMT, which is not properly constituted. According to them, the former WSMT was not effective and had to be reconstituted. A new WSMT had been formed about 3 months ago but without the requisite membership. The team could only confirm the presence of a secretary and a chairman. According to the WSMT, the relationship between them and the DA is not good. Apart from the Environmental Health Officer who visits the area occasionally, they scarcely interact with DA (Table 3).

The Daboashie WSMT seems to have given up wishing that a private person took over the running of the system. They complain that they are always in debt to Ghana Water Company Limited (GWCL) since money from the sales of the water is never meeting the bills that Ghana Water brings to them, two (2) of their overhead poly tanks have burst and the third one leaks. The WSMT believes that they have no cordial relationship with the DA since they only listen to their problems without offering solutions (Table 3).

Kpembe and Makango systems are privately owned and managed by Water Health. The private operator prefers managing the Kpembe system over to a WSMT. A WSMT has been constituted alongside the private operator after persistent plea from the community to be involved in the management of the system. Though the WSMT has been constituted they feel sidelined in the management. As their views are never considered on issues pertaining to the day-to-day running of the system. Although it is not the standard practice to have a WSMT for private facilities. The financier of the system- Water Health adopts the market based approach which seeks to recoup the investment. The Makango system has been down for the past 12 months due to low water level in the Volta Lake and a broken down pump. The private owner is reluctant to restore it. The WSMT wished the system was handed over to them to manage. The Kpembe and Makango management and private operator hardly has anything to do with the DA (Table 3).

In Kintampo South with the exception of Nante and Amoma where the current group of WSMTs begun their work in 2011 and 2014 respectively, the remaining three WSMTs started managing their respective piped schemes at different times in the year 2015: Anyima, September 2015; Jema, April 2015; Krabonso, January 2015. All the WSMTs rated themselves as 'performing well' to the best of their capabilities because they were able to keep their respective water systems running. They also undertook maintenance activities as required. The WSMTs at Amoma and Krabonso however mentioned that, their work could be enhanced if they are given the necessary support from the District Assembly, in the form of refresher training and the requisite record books. With exception of the WSMT at Nante, all the others indicated that there were some form of interaction between them and the District Assembly. Interactions between the WSMTs and the District Assembly staff occurred through audit meetings and visits on demand (for example to the Anyima system for recruiting operational staff). The WSMTs however indicated that these forms of interactions did not occur on regular basis (Table 3).

Functionality of the piped systems

The study revealed 15 out of 16 piped schemes were functional. The age of the systems ranged between 12years to 20years. The Akatsi system in the last one year was shut down for seven days. This was because of dispute between the WSMT and the owners of the lands on which the boreholes were drilled. The landowners prevented the WSMT from having access to the boreholes to pump water. This was however partially resolved when the DA intervened by requesting the WSMT to advance an amount of GH¢4,000.00 to the landowners pending the final determination of the worth of their royalty claim. The study further observed that distribution bulk meter for the Akatsi Piped scheme was not working.

Table 4: Overview of piped water systems in Akatsi South, East Gonja and Kintampo South districts

Piped system	Year of construction	Status	Water Source	Description							
				Design Plant capacity m ³ /h	Type of storage facility	Type of pump	Age of pump	Pump capacity (Q = M3/h)	Pump capacityH (m)	Condition of pump	Construction Cost (GHC)
Akatsi	2004	functional	Borehole (4)	71.95	Elevated Concrete Tank (380m3)	Grunfos	Average age of 4 years	Not available	Not available	All in good working condition	819,266 (Euros)
Avenorpedo	1996	functional	Boreholes (1)	Not Available	Elevated Concrete Tank (80m3)	Pedrolo	1 years	Not available	Not available	Good	Not available
Dabgame te	1998	functional	Borehole (1)	Not Available	Elevated Concrete Tank (60m3)	Grunfos	1 years	Not available	Not available	Good	Not available
Lume Avete	1998	functional	Borehole (1)	Not Available	Elevated Concrete Tank (60m3)	Grunfos	18years	Not available	Not available	Good	Not available
Salaga	1965	functional	Daka river	Not Available	Steel tanks	Centrifugal	Not available	102	Not available	Not available	Not available
Kpembe	2011	functional	Dam	Not Available	Polytanks	Pedrolo	Not available	270	Not available	Not available	Not available
Makango	2011	Partially functional	White Volta	Not Available	Polytanks	Pedrolo	Not available	Not available	Not available	Not available	Not available
Kpalbe	2006	Non functional	Dam	Not Available	Polytanks	Pedrolo	Not available	Not available	Not available	Not available	Not available
Daboashi e	2011	functional	GWCL(Dalun)	Not Available	Polytanks	GWCL fed	Not available	Not available	Not available	Not available	Not available
Dashei	2011	functional	GWCL(Dalun)	Not Available	Polytanks	GWCL fed	Not available	Not available	Not available	Not available	Not available
Talkpa	2012	functional	Borehole	Not Available	Polytank	Centrifugal	Not available	Not available	Not available	Not available	Not available
Jema	2015	functional	Borehole	Not Available	2Concrete tanks	Pump A: Grunfus Pump B: Pedrolo	Not available	Grunfus:14m ³ /hr Grunfus:7m ³ /hr	Not available	Not available	Not available
Anyima	2015	functional	Borehole	Not Available	1Concrete tank	Pedrollo	Not available	Pedrollo:7m ³ /hr	Not available	Not available	Not available
Amoma	2014	functional	Borehole	Not Available	4 polytanks	Lorentz PS 4000	Not available	80m ³ /hr	Not available	Not available	Not available
Krabonso	2014	functional	Borehole	Not Available	4 polytanks	Lorentz PS 4000	Not available	45m ³ /hr	Not available	Not available	Not available
Nante	1999	functional	River Nante	Not Available	1Concrete tank	Not available	Not available	Not available	Not available	Not available	Not available

The WSMT reported that farming activities involving the use of tractors and the activities of road contractors caused damage to some pipelines. It cost the WSMT an amount of GH¢3,000.00 to repair the damaged pipelines. The WSMT also reported that within the past 12 months it had replaced two pumps at the cost of GH¢15,900.00.

The WSMT further explained that with exception of the float-valve, all components of the Lume Avete piped scheme were working well. The piped scheme did not experience any major breakdown in the past 12 months. According to the Avenorpedo WSMT, the piped scheme suffered a major break down for three days in the past 12 months due to damage to the control panel and pump. The Dagbamete piped scheme suffered pump break down twice in the past 12 months but service was restored on all occasions in less than 3 days according to the WSMT.

The Salaga system is a complex surface water treatment plant that draws and treats water from the Daka River for consumption. The system is huge and old (50 - 60 years) and almost all its components have either been replaced or repaired, including changing of pumps, extension of pipes and some portions of the transmission lines, and maintenance work at the pump house (Table 4). The population of the township has outgrown the designed capacity of the system, resulting in zoning and rationing of water. Funds were not readily available for all the major maintenance works that needed to be carried out so external support came from CIDA and the DA, taking more than one (1) month to fix the problem.

Kpembe system is a sand and carbon filter system, which treats water from a dam for consumption and is privately owned by Water Health. The system often experience frequent pipe burst and leakage in storage tank. Experts from Kumasi often fix the problems within a week and repair works are solely financed from water sales. The system source has not been functioning for the past 5 weeks due to de-silting of the dam. It was anticipated to be completed within two weeks from the period of data collection. The system has since been functioning as at the time of writing this report

Makango system is also based on a sand and carbon filter system that treats water from the Volta Lake for consumption and is also privately owned by Water Health. The system has stopped functioning for the past 1 year due to drop in water level in the lake and the breakdown of the pump as a result of pumping mud instead of water (Table 4). The WSMT has complained of frequently having to shift the position of the pump anytime the water level recedes. The system is only 3 years old and 3 pumps have been replaced already due to breakdown as a result of pumping mud. From the study it appears there is no immediate sign of the private owner revamping the system.

Kpalbe system is a solar powered slow sand filtration system - water from the dam is pumped through a sand filtration media that treats the water for consumption.

The system was provided by the Guinea Worm Eradication Project and has broken down for the last 7 to 8 years. The system is not functioning because of pipe burst, pollution of source by animals and malfunctioning of media. The community had difficulty mobilizing funds to fix the problems and have thus abandoned the system.

Daboashie system depends on bulk water supply from GWCL, which is stored in three overhead poly tanks. The bulk water supply is erratic and sometimes takes 2-3 months for the WSMT to be served. In the last year, two of the poly tanks have burst and the third one leaks. Furthermore, the meter at the vending site has stopped working. The only repair work that was ever carried out was worth GHS20.00 in 2016. This was for repair works on one of the standpipes.

Dashie system is a mechanised system with bulk water supply from GWCL with two overhead poly tanks and characterized by erratic water supply. This downtime translates to 2-3 months in a year. The system has never broken down, however, one of the overhead poly tanks was leaking. The management team was of the view that the tank leakage was due to its exposure to extreme sun rays but have not been able to fix it due to lack of funds.

Talkpa-Abromasi system is a five-year's old mechanised borehole powered by solar. The water is pumped and stored in an overhead poly tank. In the last 12 months, a minor problem occurred with the pump but the community organized communal labour, raised money and fixed the problem in one week.

In Kintampo South district, the five small town piped schemes, were made up of two solar mechanized systems with only public standpipes, available at Amoma and Krabonso. There was also a surface in-take, piped system with household connections at Nante. The two remaining piped schemes depended on mechanised boreholes with power from the national electricity grid and these were located at Anyima and Jema. The system at Jema is a multi-village scheme, serving three communities: Jema, Jema-Nkwanta and Ampoma, and it has household connections and standpipes. The Anyima system supplies water to the community through public standpipes only. At Amoma, there were five additional hand pumps, which augment water from the public standpipes, and were considered as part of the piped scheme, under a common management structure (Table 4).

As indicated in Table 4, apart from the Nante piped scheme, which was constructed in 1999, the remaining four systems were new. At the time of the study, all the sources for the five-piped schemes were reported as working and could therefore be described as functional.

A complete shut-down was reported for only the Jema piped scheme in the 12 months preceding the survey. This breakdown lasted for about a month, and was caused by a fault on the drop out fuse and lightning arrestors. Complete shutdown was also reported for the piped scheme at Krabonso when it was being test-run, and was under the management of World Vision Ghana. The breakdown was caused by defects on the submersible pump, and the pump was replaced as part of the project's cost, under defect liability period.

Funds mobilization and management for capital maintenance of piped systems by management structures

Akatsi South district

All the WSMTs interviewed in Akatsi South district were practicing *pay-as-you-fetch*. Akatsi WSMT a tariff of 10 pesewas per 18-litre bucket whilst the other WSMTs charged a lower tariff of 2.5 pesewas per 18-litre bucket.

All the four WSMTs interviewed were aware of CWSA guidelines for setting water tariffs. However, only the Akatsi WSMT used the CWSA tariff guidelines. The rest indicated that they were not using the tariff guidelines because of their limited capacity and resort to community consensus.

Akatsi WSMT submitted their last tariff to the District Assembly in December 2015 for approval before its implementation in January 2016. The WSMT has submitted a revised tariff of 10p–15p per 18-litre bucket due to high electricity bills to the DA for approval subsequently.

The Akatsi piped scheme has a number of Government institutions such as hospital, clinics, the police and schools as their customers. These institutions are highly indebted to the Akatsi WSMT because they have not been paying their bills regularly. In a bid to address some of these challenges, the Akatsi WSMT has instituted legal action against some of these defaulters to retrieve monies owed the system.

All the WSMTs rely on revenue generated from the sale of water for carrying out major repairs. A WSMT member summarized the situation with the quote:

“As long as the system continues to be managed effectively and professionally without any undue interference from any quarters, the WSMT is not likely to have any difficulties with mobilizing funds for repair works.” (Source: FGD Akatsi WSMT, April, 2016).

All the WSMTs stated that in case they are unable to meet the cost of any repairs or replacement they intend to increase tariff, organize fund raising in the community, and as a last resort go for bank loan. The Avenorpedo WSMT mentioned that they would consider increasing their water tariff due to the high operation and maintenance costs.

The District Assembly confirmed that all the WSMTs operate bank accounts. Akatsi WSMT operates all the three required accounts while Avenorpedo WSMT operates two accounts (operational and capital). Lume-Avete and Dagbamete operate one account each. All the WSMTs admitted publicly rendering accounts to the community once a year during Christmas, at community durbar. The Akatsi WSMT in addition reported that they submit quarterly returns on their transactions to the District Assembly for scrutiny.

The Akatsi South district Assembly has sufficient knowledge of a budget-based tariff, which is derived from all the cost elements of operating and maintaining a water system. They are also aware that the WSMTs have to present a proposed tariff to the DA for approval before implementation. According to the DA, it was only Akatsi WSMT that use the guidelines for tariff setting. The other WSMTs in the district have not submitted their proposed tariff for approval even though they were aware of the procedures according to the DA. The DA revealed that the prevailing tariff of 2.5 pesewas per 18-litre bucket at Lume-Avete, Avenorpedo and Dagbamete was low as most of the WSMTs could not generate sufficient funds to meet their operational cost. Avenorpedo was indebted to Electricity Company of Ghana (ECG) to the tune of GH¢ 4,000.00 as at February 2016.

East Gonja district

In Kpalbe, the tariff was 5 pesewas per 36-40 litres, which the WSMT admits is not realistic and could not sustain the system. They claim that since the project was targeted at eradicating guinea worm, they needed to motivate people to patronize the treated water and stop them from fetching water from the dam. They agreed it was difficult to set tariff based on the guidelines. The system was not connected to any institution namely school, clinic or police barracks in the area. The only source of fund mobilization for major repairs were through the meagre tariff and individual donations. The system eventually broke down and for the past 7-8 years, the WSMT has not been able to mobilize funds to undertake the repairs.

The situation was completely different in Talkpa-Abromasi as the WSMT did not set tariff. They practice a levy system where every woman pays 50 pesewas on Fridays irrespective of the quantity of water she draws for the whole week. The WSMT in some time past attempted implementing a 20 pesewas per basin tariff but the people kicked against it.

There are no institutional connections. The WSMT counts on the high communal spirit of the people who attend communal labour in their numbers to mobilize funds to undertake minor repairs whenever the need arises. However, the system is barely 5 years old and had not encountered any major maintenance problems. As to whether this high communal spirit would sustain the system without implementing realistic tariff, only time will tell. The WSMT through meetings with sectional leaders and community fora disseminate information on the account of the system. They also liaise with the Assembly member to brief the DA when he goes for Assembly Meetings.

Daboashie WSMT did not set tariff based on the guidelines as in the case of Kpalbe. A 10 pesewas per basin of water tariff was implemented for some time but that was not able to meet the bills Ghana Water Company Limited charged for water it pumps to their storage tanks. The tariff was then reviewed upwards to 20 pesewas per basin, which is being implemented currently. There are no connections to institutions. The people have not explored other means of mobilizing funds to take care of any repair work. At the time of collecting data and writing the report two (2) of their poly tanks have burst and the third one is leaking. The WSMT is not able to account to the people because whenever meetings are called the people do not attend. Majority of the people have returned to fetching water from the dam.

Kpembe and Makango system are privately owned so the private owner determines the tariff, which is not in line with the tariff guideline. Tariff rates ranges between 10 pesewas, 15 pesewas and 20 pesewas depending on the size of the container. The Kpembe system supplies water to the Nursing Training College. Payment for water appears not to be a problem with the system. The Makango system is connected to the house of a private person who deals in sachet water. There were also plans to connect the water to the Health Centre before the system broke down. The private operator would not disclose whether there were challenges with payment from the sachet water dealer. Funds mobilization for addressing major repairs was not disclosed. The private owner does not account to the people or the DA.

The Salaga system operates both tariff and levy system. However, the tariff is arbitrary, not taking into consideration all that is spelt out in the guidelines. Households connected to the system pays GHC 5.00 per day for the number of hours that water is rationed whereas those who fetch from the public standpipes pay 20 pesewas for 54-60 litres and 20 pesewas for 3 basins. However, the WSMT asserts that realistically, a bucket (18 litres) of water should cost 60 pesewas. The system is connected to institutions such as prisons, police, secondary schools and the hospital. There has always been severe challenges with payment of bills from these institutions. Some of these institutions owe as far back as 3 years.

The main source of funding major repairs is from revenue generated from the sale of water. Some external support especially from the DA occasionally comes to support some major maintenances. The WSMT mostly resort to the FM Radio Stations to account to the people on the running of the system.

The Dashie WSMT did not set any tariff and for that, reason had no knowledge of the CWSA tariff guidelines. They allow the community members to fetch the water free but levy each household to raise money any time GWCL bring a bill. The system has no institutional connection. The WSMT apparently has no plan in place for addressing major maintenance should the system suffer one. The WSMT calls for community meetings to disseminate information on the running of the system.

The East Gonja District Assembly admitted they were aware of the guidelines for setting tariffs. However when probed on the content of the guidelines, there was a gross deviation. The district however conceded that the DA in recent times has not approved any tariff and no WSMT is practicing realistic tariff - setting in the district. They also indicated that the WSMTs do operate capital and sanitation accounts but keep only one account (preferably operational account) as against the three recommended.

It was revealed that the WSMTs do not prepare annual budget and financial statements because of the low educational level of its members in most cases. The district confirmed that it carries out internal technical and financial audit of each system half-yearly, and stated that CWSA sometimes carry out external technical and financial auditing of the systems. However, further probes showed that this was not the case. In instances where external auditors have requested for the books of the Salaga system, the system managers never honored the request .

Kintampo South district

All the WSMTs in Kinatampo South adopted pay-as-you-fetch as the principal means of funds mobilization. A tariff regime of 10 pesewas per 34-size bucket (18 litres) was charged in almost all the piped scheme communities except at Amoma where the WSMT charged 10 pesewas per basin (54 litres). Four out of the five WSMTs surveyed were not aware of the existence of a guideline for setting water tariffs, and therefore did not use it in determining the rates being charged for water sold. Similarly, only one out of the eight staff of the District Assembly who were engaged during the Focused Group Discussion session had knowledge about the existence of guidelines for setting tariffs. The WSMTs, which did not use the tariff guidelines, indicated that, they pegged their rates at the prevailing tariffs of nearby communities, which also operated piped systems, and considered people's willingness and ability to pay in agreeing to the 10 pesewas per 34-size bucket.

'We considered the fact that some community members were depending on private wells while others fetched water from nearby rivers/streams. Therefore, if we set the tariff too high, there would be resistance from the community and most people would not pay.' [Krabonso WSMT member, May, 2016].

Three of the WSMTs interviewed mentioned that they would consider increasing their water tariffs, in consultation with their respective communities because of the prevailing operations and maintenance costs, which was reported as becoming progressively expensive. Increment of tariff was contemplated by some WSMTs who wanted to generate enough money while the systems were still new, to be able to finance capital maintenance expenditure in the future.

The district was aware that all the piped schemes practiced 'pay-as-you-fetch' for revenue mobilization at the public standpipes. They however added that none of the WSMTs had referred their tariffs to the District Assembly for review and approval in consultation with CWSA Regional Office, as required by water sector guidelines (see for example CWSA Regulations 2011, L.I. 2007).

At Anyima, the Technical Operator) collected revenue from water vendors twice a week. At Amoma and Krabonso, the Treasurer did revenue collection twice a week. At Nante, sales revenue from public standpipes were collected every two weeks by the Chairperson and the Secretary, and the same team was responsible for collecting monthly bills from private connections. At Jema, a dedicated revenue collector collected sales from vendors at the public standpipes three times in a week. For the same scheme, the Technical Operators after which the Systems Manager generated monthly bills did meter reading for private connection. Those with private/house connections paid their monthly bills at the WSMT office at Jema.

The piped systems at Amoma and Krabonso did not have meters at the public standpipes, making it difficult to track the quantity of water vended and the total revenue that ought to be generated from the sale of water. Controlling of private connections was reported as a major problem at Nante. Only 12 out of the 41 private connections in the community were done with the involvement of the WSMT, and most of these private connections were not paying their monthly bills. An individual without recourse to the WSMT did the other private connections to the WSMT.

All the WSMTs noted that revenue from the sale of water were being saved with banks/financial institutions in the district, in what could be described as 'Operational Accounts'. This allowed the WSMTs to draw money for the day-to-day running of their water systems (operations and maintenance as well as administrative expenditure).

None of the WSMTs interviewed operated the other two mandatory accounts for piped schemes, namely the Sanitation and Capital Accounts. Various reasons were given for this: three WSMTs (Nante, Krabonso and Amoma) were not aware of the need to operate three Bank Accounts for small town piped systems. The other two WSMTs (Anyima and Jema) mentioned that, they were aware that they had to operate three Bank Accounts. The WSMT at Anyima did not have three Bank Accounts because they wanted to save money in their Operational Account before opening the other two accounts. The WSMT at Jema indicated that *'we do not have a lot of money to share in the three Bank Accounts.'* The WSMT blamed this on the peculiar problem of frequent pipe bursts, which had not allowed them to operate consistently even up to one calendar month.

Financial institutions

In the Akatsi South District Data was collected from three financial institutions namely, the Avenor Rural Bank, Akatsi Branch, GCB Bank, Akatsi Branch, and Unity Rural Bank Ave-Dakpa (Akatsi North). Of the three banks surveyed, Avenor Rural Bank confirmed holding the accounts of more than twenty (20) WSMTs in the Akatsi district. All the four WSMTs covered by this study operate their accounts with the Avenor Rural Bank. The Akatsi WSMT for instance operates daily lodging (brings deposit on daily basis) to the bank. The WSMT noted that this leads to efficiency in funds mobilization and management. Based on the rapport established with the bank, the WSMTs were reminded of their daily deposits.

The three banks admitted that they had not granted loan to any WSMT simply because they never received loan application from any of them. They however showed their readiness to grant loan facilities to the WSMTs provided loan application requirements are met. The conditions for accessing credit facility from the three banks vary. The requirements ranged from operating accounts with the bank, active funds flow among others. The appraisal requirements for accessing loan from the Avenor Rural Bank and the Unity Rural Bank are as follows:

- The WSMT must be a customer of the bank for at least one year
- The WSMT must submit a loan application form to the banks. When the application is evaluated and it meets the standards the bank will then ask for a collateral in the form of landed property, which is properly valued and documented.
- The interest rate was 33% on commercial loans. Payment is by calculated in monthly instalment.

With the GCB the requirements for loan application are:

- One must be a customer of the bank for at least two years
- The WSMT must make a loan request to the bank
- Application will be evaluated
- Audited financial statement of the WSMT

- Bank official(s) will make an enquiry visit to the WSMTs to evaluate their loan request

In East Gonja District, the study identified four banking institutions. Two each in the district and the region. At the regional level, Bonzali rural bank and ADB Ltd were surveyed while GN bank and GCB were surveyed at the district level.

None of the financial institutions surveyed in the study had granted loans to any water and sanitation management team or private operator. However, they expressed their readiness to deal with the WMST in their operations just like any other entity or customer. The appraisal and loan application requirements were almost the same across all these institutions except for GN Bank, which had an extra requirement in the applicants having a guarantor who is a customer of the bank. The requirements ranged from operating an active account with the bank for a minimum of six months, must have a constitution guiding the operations and activities of the team, and must have kept sound financial records per the bank's standard and a good debit and credit turnover. All the banks confirmed the use of the active account and the inflows and outflows as well as the collateral should the loan be granted. When probed on whether the banks could use the assets of the water schemes as a collateral for granting loans, all the four banks surveyed showed no interest as they rejected this proposition. The GCB Bank Limited in Salaga alluded to the bank's core mandate as business. They further explained that should the water schemes assets be considered before granting loans, in the event of default the bank would have to invest on experts and staff to manage the systems for them to recoup their investment. This they argued was not a position the bank would want to find itself in.

The interest rates given by these banks was 33% per annum. When probed whether there would be some consideration for the WSMTs in terms of reducing the interest rates, the banks argued that, WSMTs would be considered just like any other business entity thus the commercial rates as indicated will apply. Loans would normally be granted on short-term basis (6 months to 1 year) initially and would graduate through medium to long term. This is however dependent on good faith of the customer i.e. efforts put into repaying previous loans. The banks expressed willingness to transact business with these WSMTs when approached. It was however evident that, none of these WSMTs surveyed were dealing with any of these banks at least from the perspectives of the banks.

In Kintampo South, interviews were organised with four financial institutions for their perspective on how capital maintenance activities would be financed in small town piped systems. All the banks/financial institutions indicated the possibility of providing financial assistance to the piped systems/WSMTs on demand. The banks added that, demands for

financial assistance would be evaluated on the following criteria:

- The income generation capacity of the various piped systems to determine the amount of loan to grant and the WSMTs ability to pay back the loans;
- Guarantee letters from Municipal/District Assemblies;
- WSMTs must have Accounts with the banks.

The financial institutions indicated that, loans to WSMTs would be treated as commercial, with varying interest rates per annum: 19.5% for BACSSOD, 32-37% for ADB, 32% for Kintampo Rural Bank and 35% for Sahel Sahara Bank.

Mechanisms for financing major repairs

The study revealed that three out of the four-piped schemes in Akatsi South district experienced major breakdowns over the past 12 months. The Akatsi WSMT reported that they have replaced two pumps at a cost of GH¢ 15,900.00. The funding was from the replacement account of the WSMT. In the case of Dagbamete, the WSMT reported they replaced a pump. An amount of GH¢ 3,000 was reportedly received from the Apetorku shrine⁵ as top-up to purchase the pump. The breakdown experienced at Avenorpedo had to do with burnt pump. The system was fixed with funding from their water revenue. However the study could not independently verify the cost involved.

The DA admitted that provision was made for WSMTs in financing major maintenance expenditure. For example in 2015 the DA set aside GH¢ 54,000.00 (1.93% of the DA common fund). The DA admitted that the GH¢54,000.00 allocated was not adequate. The DA however revealed that there was no request from the piped scheme WSMTs for financial support.

On the issue of what could be the future major maintenance needs of the WSMTs, the Akatsi WSMT revealed plans of shifting from the national grid to the use of solar power due to high electricity bill. They reported that efforts are underway to mobilize funds for the procurement of solar panels. A new supplementary borehole for the current scheme was identified by the Dagbamete WSMT, as a future major expenditure need. The increase in population of Avenorpedo according to the WSMT has created a need for an additional water storage tank. All the WSMTs identified pump replacement as a necessity. The four WSMTs identified revenue from the sale of water and fund raising durbars as the major sources of funding for the anticipated capital expenditure needs. In addition to these, Avenorpedo WSMT indicated that they would seek support from the District Assembly, while the

⁵ The Apetorku Shrine is the heart of Dagbamete where members go for spiritual and physical healing and to receive protection from evil influences. It has a very active program of Sunday worship, daily pledges and vows, and it celebrates two major festivals at Easter and at the end of October. Adherents worship Apetorku, a god belonging to the Vodou African traditional religion. Vodou is an often misunderstood but profound religion that teaches self-discipline, unity and peace. The shrine is also the impetus behind community development projects such as electrification and water, and in this way it serves an important social role.

Dagbamete WSMT consider the shrine as a potential source of support.

Table 5: WSMTs in Akatsi South income and expenditure from 2012-2015

Description			Akatsi WSMT				Avenorpedo WSMT				Dagbamete WSMT				Lume WSMT				
			Year				Year				Year				Year				
			2012	2013	2014	2015	2012	2013	2014	2015	2012	2013	2014	2015	2012	2013	2014	2015	
Income	Income	Water Income	100,298	129,288	155,663	178,456	1,049	5,925	13,321	9,934	7,452	8,790	9,560	10,927	2,131	2,156	2,346	2,302	
		Other income.	10,096	4,856	13,195	35,685	3270	1050	150	500				18,856	0	0	0	0	
Expenditure	Opex	Salaries	9,999	17,229	21,059	31,129	-	-	-	-	-	-	-	-	0	0	0	0	
		Utilities	16,303	21,549	22,340	45,500	3,645	3,642	2,570	4,727	1,336	1,535	1,600	1,890	0	0	0	0	
		Administration - newspaper, bank charges, meeting cost, cleaning,	2,531	3,475	3,961	5,053	658	510	420	382	211	244	315	296	0	0	0	0	
		minor repairs - source, pipes, pumps, storage etc	5,090	3,637	4,457	1,733	209	530	454	677	614	1,095	1,130	1,340	506	682	979	640	
		WSMT allowance	2,412	5,694	7,215	6,850	2,910	3,660	3,660	3,660	-	-	-	-	120	120	120	120	
		transportation - T&T, fuel etc	5,135	5,701	9,076	6,499	300	210	120	290	-	-	-	-	50	60	60	50	
		others....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Rehabilitation of water system	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	CapManEx	major repairs	0	0	0	15,985	2,230	1,450	3,635	1,500	0	0	0	0	0	0	0	0	0
		asset replacement	12,108	6,175	6,490	15,985	0	0	0	0	6,000	0	0	7,000	0	0	0	0	
other state...														0	0	0	0		

All the WSMTs interviewed were of the view that if they can increase their revenue collection efficiency and exercise proper financial management practices coupled with financial transparency and accountability their systems can generate sufficient revenue to meet all operation and maintenance needs.

The Kpalbe WSMT in East Gonja apparently have no major maintenance financing strategy in place. Their only hope is the DA Common Fund, which is also not forthcoming. The Talkpa WSMT counts on the DA, MP and the high communal spirit of the people as major maintenance financing strategy that is working for them now and hope to work for them in the future. The Daboashie system has not suffered any major breakdown apart from the irregular water supply from Ghana Water Company and bursting of two polytanks with the third one leaking. The WSMT has no major maintenance financing strategy in place. Their only hope is the DA Common Fund, which is also not working for them. The Kpembe system has not suffered any major breakdown. The only challenge in the past was that the system used to run on generator until it was connected to the national grid. Moreover, the system, at the time of this survey was not functional for about 5 weeks due to a desilting operation going on at the source (dam).

The Makango system suffered a major breakdown because of drop in water level at the source (Volta Lake) and subsequently the pump broke down after sucking in mud. The system has been down for the past 12 months and still not restored. The WSMT anticipates that the source (Volta Lake) as well as its subsequent effect on the pump would continue to be their major capital maintenance needs since drop in the water level is perennial and wished that the source could be changed from surface water to borehole. The WSMT could not tell what the private owner's major maintenance financing strategy was.

The Salaga system has been in existence for over 50 years and has encountered a number of breakdowns; breakdown of pumps, damage to transmission lines, leakage of high level tanks, etc. Most of these breakdowns were fixed within 2 weeks but repairs requiring external support, are handled within 1 month. The WSMT anticipates that the transmission lines, high-level tanks, pumps, power, etc. could give rise to major capital maintenance need in the future. The WSMT counts on revenue generated from sales of the water, in addition to support from the DA as its major maintenance financing strategy that is working now and in the future.

The Dashie system has not suffered any major breakdown apart from erratic water supply from Ghana Water Company and leakage in one of the overhead poly tanks. The WSMT has no major maintenance financing strategy in place. Currently, households are levied to pay GWCL water bills, which is working, but one cannot tell whether the levy system can be effective in financing major maintenance should the system suffer one.

The East Gonja Assembly believes support to WSMTs with funds for major maintenance is phenomenal but limited to the Salaga system, which happens to be the biggest system. They explained that the smaller systems do not run into major maintenance problems due to less pressure on them. The WASH unit of the DWD however noted that the DA's support has never been adequate in any circumstance. The DA could not provide information on the cost of major components of all piped scheme because the officer in charge of such records was not available at the time of the study.

The only system in which major maintenance expenditure was incurred was the Jema piped system in Kintampo South district. The WSMT at Jema reported that they had two control panels replaced, but the cost was borne by the Peri-urban, Rural and Small Town Water and Sanitation Project (under the project's defect liability period). Given that the other three piped systems (except the one at Nante) were fairly new, the WSMTs indicated that they had not incurred any major maintenance expenditures. As could be inferred from Table 6 on WSMTs annual income and expenditure for 2015, available figures confirmed that no major expenditure on capital maintenance had been incurred by any WSMT.

The WSMTs however anticipated the following as some major maintenance expenditure:

- replacement of solar panels (Krabonso and Amoma);
- construction and mechanisation of a borehole to augment surface water intake (Nante);
- construction of additional storage tank and procurement of a new treatment plant (Nante); and
- replacement of all transmission and distribution lines to curb frequent pipe bursts (Jema).

All the WSMTs interviewed mentioned some replacement/repair works were undertaken on components of their water facilities, but this could not be classified as major maintenance. The commonly cited maintenance activities include:

- replacement of taps,
- mending of burst and leaking pipes (transmission and distribution),
- replacement of meters,
- repair of gate valves,
- sealing of leakage on storage tanks, and
- repair of electric transformer.

Table 6 provides a summary of the expenditure of the various WSMTS. With exception of Jema WSMT (which had support from the District Assembly), all the other four WSMTs depended solely on revenue from sale of water to finance their repairs.

Table 6: WSMT in Kintampo South district Annual Income and Expenditure for 2015

Description		Cost in GHC				
		Amoma	Nante	Anyima	Krabonso	Jema
Income	Water income	4,640	18,059	15,237	2,406.5	59,946
	Other income	0	0	1,363.07	None	2,380
Operational Expenditure	Salaries	2,160	2,520	5,100	784.2	5,250
	Utilities	0	3,595	6,035	0	29,370
	Administration - newspaper, bank charges, meeting cost, cleaning,	1,355	Not available	2,902.10	53.2	1,435.6
	minor repairs - source, pipes, pumps, storage etc	260.0	3,400	2,122	369	14,534.5
	WSMT allowance	540.0	1,440	993.54	112.96	800
	Transportation - T&T, fuel etc	215.0	455	167	146	2,057
	Others	0	0	0	0	0
	Capital maintenance expenditure	Rehabilitation of water system	0	0	0	0
	major repairs	0	0	0	0	0
	Asset replacement	0	0	0	0	0
	Others	0	0	0	0	0
Bank balance	Balance as at December 31, 2015	2,422.81	8,113	3,811.7	1,696.4	2,370

'The only strategy we have in place for financing our maintenance activities has been reliance on revenue from the sale of water. This strategy has been working very well because whenever people fetch water, they pay and we account to the community. We have been able to save enough money to even finance other developmental activities such as construction of a public toilet, and installed street lights in the community.' [Nante WSMT member, June, 2016].

Aside the revenue generated by the various WSMTs which was identified as a key source of funding major repairs, the Kintampo District Assembly indicated that it has set aside two percent of its total budget (an equivalent of GHC 58,576.70) to support WASH activities in the 2016 Composite Budget (KSDA, 2015). The District noted that this budget would be drawn from the District Assemblies Common Fund allocations. This budget line was considered by the District as adequate to support the small town piped schemes because schemes were not likely to experience breakdown at the same time. Therefore, the current budget allocations would be enough to assist the various WSMTs to finance their repair works if required.

According to the DA, financial support to WSMTs to meet the cost of repair/maintenance

needs is strictly demand driven. WSMTs need to make a formal request to the District Assembly for assistance after which designated officers are assigned to examine the problem. Based on the magnitude of the problem (whether it is a major or minor maintenance need) and the available savings of the WSMTs, support is provided. The district indicated that, unless otherwise stated, financial support to WSMTs (both handpump and piped schemes) are not expected to be paid back because the water facilities are assets of the district.

Sustainable, innovative and promising strategies for addressing major repairs of piped schemes

Apart from the known orthodox strategies such as revenue from sale of water and community fund raising, the WSMTs of the four-piped schemes in Akatsi South could not mention any innovative way of addressing major maintenance issues. All, the WSMTs admitted they had never heard of 'pool funding', but after explanation from the interviewers the concept was understood. There were mixed reactions from the various WSMTs about the concept. The Akatsi WSMT was of the view that, getting funds from the pool when it is needed most will be difficult because the money may have been spent on a different system. Others indicated that the decision to join might not be dependent on them alone. They may have to consult the district Assembly for approval.

With regard to bank loan, no WSMTs in Akatsi South showed any appreciable enthusiasm in the option probably due to what they perceive to be the '*high interest*' on the bank loan. With the exception of Lume-Avete WSMT, all the other three had mixed feelings about insurance as a feasible funding strategy. The WSMTs of Akatsi, Avenorpedo and Dagbemetete argued that if within the insured period there were no breakdown of their piped schemes, their premium would be lost. This is how one of the most resourceful interviewees summarized the discussions on the various funding arrangements:

"Bank loan will attract interest, it will not help. Insurance is 'dead money', forget it. Pool funding is better, but the question is, how will the fund be managed? However, to me, the best is revenue from the sale of water." (Dagbemetete WSMT member, May, 2016).

The Akatsi South DA expressed the view that the Akatsi WSMT is capable of self-financing. This is because the system is able to generate enough revenue, which could finance major maintenance expenditure. They were also of the conviction that though Dagbemetete piped scheme appears to be performing poorly in terms of standard management and financial practices, the homogeneous nature and religious set-up of the community provides a strong

financial backbone to the operation of the WSMT. The reason being that the community was able to generate revenues from the religious activities part of which was used to support the operations of the WSMTs.

The DA further indicated that they have no arrangements in place to support the WSMTs to take loans for major repairs. Moreover, no WSMT had approached the district for loan guarantee. Notwithstanding this, the DA may consider supporting a genuine request from WSMT to take loans for major repairs and replacement provided they meet the conditions of the banks. The DA added that it would be easier providing such guarantees to the WSMTs, which are of good financial standing.

The Akatsi South DA opined that there has not been any innovation beyond the status quo. They further stressed the importance of generating revenue to fund operation and management of the water systems. The DA indicated that bank loans may also help but should be the last resort because of the high interest rate. Another reason against bank loan is the ceiling on the amount the banks can give to the WSMTs.

About pool funding, some of the DA staff indicated that they had knowledge about the concept. Different opinions were however expressed about its implementation. Some consider the pool funding idea good but it can be very challenging looking at the different levels of endowment in terms of financial strength and management capabilities of the various WSMTs in the district. Other schools of thought is that the pooled funding concept can be implemented but, procedures and modalities should be clearly spelt out.

"...for me, there is no better promising innovative financing mechanism than for the water systems to generate their own revenue and be self-sustaining that is why the DA must monitor, supervise and give technical support to the WSMT." (WASH Engineer Akatsi South, June, 2016).

The Kpalbe WSMT has never heard about the pooled funding. After explaining the concept, they lauded the idea and pledged to join such a scheme if it becomes operational. The WSMT is well aware of insurance schemes but have never applied for their services. When asked whether they would like to insure some components of the new Sustainable Rural Water Supply and Sanitation Project Small Town system that is about to be commissioned in the town, the team agreed it was a good idea to consider. The WSMT is however not enthused with the idea of taking bank loans for the fear that they may not be able to generate enough revenue from the sale of water to redeem the loan.

The Talkpa-Abromasi WSMT believes that setting realistic tariff and implementing it is the surest innovative and promising way to address major repairs. The pooled funding concept has never been heard of but was warmly welcomed by the WSMT with a promise to join one if it starts working. The WSMT also agreed to discuss the idea of insuring the system with

their people before they can take a final decision. The idea of contracting a loan should the need arise for major repairs or replacement of assets was however not acceptable to the WSMT with the reason that considering the current levy of 50 pesewas per every woman for the whole week, they may not generate enough revenue to pay back the loan.

Daboashie WSMT has never heard of pooled funding but think it is a good concept worthy of joining. The WSMT is aware of insurance schemes but think that they would not be able to afford the premium, since they are indebted to GWCL and not able to meet their bills. The WSMT would not take the risk to contract loan either.

The private operator at Kpembe has never heard of pooled funding but think is a good concept. The operator could not tell whether the private owner (Water Health) has subscribed to any of the insurance schemes or would go in for a loan if the need arises.

Makango WSMT has never heard of pooled funding concept but think that it is a laudable idea to enroll. The WSMT also think that it is a good idea to insure the system but would not be able to take that decision since the system is privately owned by Water Health.

The Salaga WSMT knows little about the pooled funding concept but think it is a good idea to implement a scheme of that nature. The only concern is that the bigger systems like the Salaga system stands the chance of contributing more and benefiting more since the smaller systems rarely run into major maintenance problems due to less pressure on them. The WSMT lauded the idea of insuring the system but conceded that they had not signed unto such services. The idea of contracting loans was split between two views; whilst some think it is a good idea to expand the system, others think otherwise.

Dashie WSMT has never heard of pooled funding but think it is a good concept worthy of exploring. The WSMT is aware of insurance schemes but think that they would not be able to afford it. The WSMT laments that they do not consider any bank granting them a loan facility since they do not operate an account.

The WASH unit of the DWD of East Gonja believes that the Salaga piped system and Water Health systems at Kpembe and Makango are capable of self-financing capital maintenance expenditure. The DA explained that the Water Health systems are privately owned and effectively mobilising funds from water sales. The Salaga system is a huge system and can generate enough funds from water sales when all the necessary structures (metering, re-composition of WSMTs, hiring of a private operator) are put in place. According to the DA, the Salaga system can take loans to finance major repairs. This is possible because the system's account is active with the GCB bank in Salaga, which is one of the major requirements for accessing a credit facility from the bank.

The DA unfortunately has no arrangement in place to support WSMTs to take loans. The

WASH unit of the DWD mentioned that they once suggested to the Salaga system management to go for a loan facility to expand the system but the latter declined on grounds that they might default in paying the loan. The DWD believes that metering the Salaga system and accessing loan facility from the bank are some of the potential, promising, innovative financing mechanisms that can be implemented for addressing major maintenance. Metering of the system according to the DA was one sure way of reducing wastage.

In Kintampo South, all the WSMTs interviewed identified revenue from water sales as the major means for financing major repairs. The district staff shared this position. According to them, the Anyima scheme could self-finance its major repair needs in the future, if the right management practices are put in place. This is because the Anyima piped scheme was relatively new, and had experienced only minor repair works since it started operations. The District Assembly also noted that with the appropriate form of support to Amoma and Krabonso, those systems could also be self-financing. The reason being that, they incurred relatively lower overheads because of the fact that the systems were solar-powered.

In addition to the sales revenue, the WSMTs identified the following as potential sources of funds for major repairs:

- Bank loans (Krabonso, Nante, Amoma and Jema WSMTs);
- Community contributions/levy (Krabonso and Anyima WSMTs);
- Community fund raising durbars (Krabonso WSMT);
- Support from the District Assembly (Jema, Anyima and Amoma WSMT); and
- Support from NGOs/Development Partners such as World Vision Ghana (Anyima and Amoma WSMT)

What was remarkable from the WSMTs' response was that, all the other sources of funding which were identified above are to complement the existing systems of generating money directly from the sale of water, and managing it prudently. In the words of one of the WSMT members,

'Sustainable financing would depend on the effective management of the piped system. We are able to generate some money through sales revenue. If every member of the WSMT continue to play their roles well and the piped system functions sustainably, we can generate a lot of money to finance future maintenance needs.' [Amoma WSMT member, May, 2016].

While some district staff were aware of the concept of pooled funding, none of the WSMTs interviewed had ever heard about it prior to the survey. The District Assembly mentioned that the idea of pooled funding was laudable, and further noted that the various WSMTs would not have a choice in rejecting it if the directive comes from the District Assembly for

its implementation. This is because; all the small town piped systems legally belong to the District Assembly. All the WSMTs also indicated their willingness to sign on if it becomes operational, but based on certain conditions:

'The concept could be used to finance major repairs but the formula for contributing to the scheme would have to be well-explained, and the benefits must be pro-rated on the quantum of money contributed by each WSMT. If such a policy is implemented, it will help us because we may not be financially sound at the time when a major maintenance financing will be required on the system.' [Jema WSMT member, May, 2017].

The idea of insuring components of the piped system was also discussed with the WSMTs and the District Assembly. Four out of the five WSMTs interviewed indicated that they would consider adopting insurance policies for some components of their piped systems. The components to insure would be those, which would require huge amount of money for replacement/repair. The Kintampo South District Assembly supported this position. The WSMT at Nante, which was not in favour of buying insurance policies for their water systems, cited potential difficulties/delays in the payment of claims by the insurance companies as a reason for their decision.

CONCLUSION AND RECOMMENDATIONS FROM THE STUDY

Key findings from the study

The concept of community ownership and management model is a good one. However, local level capacity (eg tariff setting) and leadership (responsibility and transparency) are required for success. Furthermore, beneficiary communities will need some form of external assistance in terms of technical backstopping, monitoring and supervision from the DA and CWSA to be able to manage their water supply systems sustainably.

The key findings from the study are as follows:

- a. The various piped schemes could be self-financing if realistic tariffs are charged and the sales revenue properly managed.
- b. The financial institutions in the study district are willing to provide loans to the piped schemes if WSMTs meet their conditions.
- c. There was limited awareness and application of water sector guidelines for the management of the piped schemes by the WSMTs and the DA.
- d. Financial management of all the WSMTs was weak. For example, with the exception of Akatsi WSMT none of the WSMTs had a Capital Account with savings to finance only major maintenance activities in the future. There was no control over the disbursement of funds generated by the various WSMTS, and this could lead to funds mismanagement and inappropriate expenditure. This situation could be aggravated by the poor culture of accountability by the WSMTs to their respective communities.
- e. Tariff settings was done arbitrarily by almost all the WSMTs; tariffs being used by WSMTs were not submitted to the DA for approval.
- f. The DA and the WSMT were in support of pooled funding concept on condition that the modalities for its implementation were clearly spelt out from the on-set. Opinions however differed regarding insuring components of the piped schemes.

Recommendations

- Given that the WSMTs/DAs are not managing the small towns in line with the principles of the NCWSS, CWSA should sensitive the DAs/WSMTS on the NCWSS especially on the mechanism to address CapManEx and small town's water system governance in general. In addition, CWSA should monitor the operations of all WSMTs and this may require additional budgetary allocation at all regional and head office. This will of course require making a strong case to the Ministry of Sanitation and Water Resources for such an allocation, and strongly lobbying at Ministry of Finance level.
- The District Assemblies should intensify their monitoring and support roles including budgeting and tariff setting to the WSMTs, technical and financial audit of the

systems. Regular, consistent monitoring visits and technical support to the WSMTs will help ensure efficient fund mobilisation and management. The mandatory monitoring activities may require increase in its budgetary allocation to the Water Unit of District Works Department to enable the unit to monitor regularly.

- All WSMTs should be supported to maintain the requisite record books and operate the mandatory bank accounts to facilitate their access to financial support from the Banks when the need arises.
- Formation and one time training of WSMTs is not enough. Regular refresher trainings in operation and management will ensure that they are always up to their responsibilities. The various management structures and their functions would have to be professionalized (proper reconstitution with educated members, gazette constitutions, binding contracts, proper financial management etc.) to be able to benefit from the services of financial institutions. This calls for greater collaboration from all stakeholders.
- The pooled funding concept is considered by most of the respondents in the study as promising. Stakeholders want pooled funding to be guided by transparency and accountability if it is to be implemented. Content or district specific requirements should not be overlooked in the roll-out of the concept. Deeper consultation, deeper community engagement processes should be critically considered prior to implementation.
- The communities must consider instituting incentive packages for the WSMT members as a token of appreciation for their stewardship. The issue of volunteerism is demotivating.

Conclusion

The stakeholders in the sector are aware of existing strategies to help communities mobilize resources for capital maintenance of water supply infrastructure. However, most of the water systems were not following the NCWSS procedures of having 3 separate accounts with one dedicated for CapManEx. Akatsi South was observed to be practicing three accounts which should be exemplary for the others.

The main sources of finance are tariffs, contribution from District Assemblies and in a few instance grants from donors. In addition, none of the water systems had never approached a bank for loan to address CapManEx. The study did not find any innovative mechanisms of financing capital maintenance expenditure for piped schemes in the three districts. It however identified that all the piped schemes could be self-financing if realistic tariffs are charged and the sales revenue are properly managed by the various WSMTs. The study therefore conclude that innovative mechanisms for the financing of capital maintenance of piped systems in Ghana may not necessarily fix the problems of poor service delivery (including unreliable service). What is critical to effectively address CapManEx relates to governance, management and financial management regimes of the WSMTs to bring about

the necessary change in the WSMTs in Ghana.

In the three districts studied, the WSMTs simply flouted the operational, governance, management roles and responsibilities. The communities are practicing some form of cost recovery mechanisms (i.e. collect tariffs for operation, maintenance, and repairs) but are not able to plan and mobilize enough funds for capital maintenance. The reasons are due to poor management, low and unrealistic tariff and poor revenue collection efficiency. For WMSTs to effectively manage the funds generated the WSMTs require support and routine monitoring to ensure they are doing the right thing.

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APPENDIX

Focus Group Participant Demographics

FOCUS GROUP PARTICIPANT DEMOGRAPHICS		
<i>Date:</i>	<i>Time:</i>	<i>Place</i>
<i>What is your academic background?</i> <i>O Engineering</i> <i>O Banking/finance</i> <i>O Planning</i> <i>O Administration</i> <i>O Social scientist</i> <i>O Others</i> <i>O illiterate</i>	<i>What is your position?</i>	<i>How long have you held this position</i> <i>O Less than 5 years</i> <i>O 6 to 10 years</i> <i>O More than 10 years</i>
<i>Your age:</i> <i>O 20-30 years</i> <i>O 30-40 years</i> <i>O 40-50 years</i> <i>O 50-60 years</i> <i>O More than 60 years</i>		<i>Your gender</i> <i>O Female</i> <i>O Male</i>

Focus group guiding questions

Water and Sanitation Management Teams

Theme 1: Overview and functionality of systems

1. Can you tell us about the piped system and how it has been working? Are all the components working as designed –source, tanks, standpipes etc? Source functional?
2. Has the systems stopped functioning within the last 12 months? (If yes probe on what is the nature of the breakdown of the system?, Probe if there is a recurring breakdown of the system e.g fluctuation of the power, burning of transmission lines, frequent pipe burst etc)
3. Are there any underlying causes of the breakdown of the system and what are they?
4. Has there been the need for replacement or rehabilitation of the assets? (Probe on if yes how much did it cost you to undertake this? And were funds readily available for this) Have you had difficulties of financing the cost of repair? How long did it take you to mobilize the funds and fix it in days? (If so what was the reason?)

Theme 2: Management structures/models for piped systems

5. In your opinion would you say the management model in operation is effective? Why
6. What is the relationship between the WSMT and the district?

Theme 3: Funds mobilization and management for capital maintenance of piped systems by management structures

7. *Are tariffs set based on guidelines? Based on the guidelines for setting tariffs, how much should a bucket of water cost? In reality how much are you charging for a bucket of water??* (should be probes)
8. What are the challenges with payment from institution? How can it be addressed
9. How are funds mobilised for addressing major repairs? What are the challenges of funds mobilization?
10. What mechanisms are in place to ensure accountability to the community and the DAs (*annual financial statements to community notice board, district assemble, and meetings with the community*) probe

Theme 4: Mechanisms for financing major repairs Ex probes for FGDs

11. Can you share your experience with us on the major breakdown you suffered and how it was managed? When did that happen, duration of down time, cost of repairs etc.
12. What do you anticipate will be your capital/major maintenance needs in the future? Do you have funds to meet your anticipated needs?
13. What major maintenance financing strategy do you have in place? Is this strategy working, if no why? And if yes, how?

Theme 5: Sustainable, innovative and promising strategies for addressing major repairs of piped schemes

14. Can you think of any innovative and promising ways of addressing major repairs? (refer to table on major and minor maintenance)

NB all below should be probes to the above question

- Have you heard of pooled funding? Do you think it can be used to improve financing of major repairs? Will you be willing to join a scheme such as this?
- Does the WSMT insure its assets such as motor bike, vehicle etc? Has the WSMT district insurance of components of the water systems? Will the WSMT consider insurance if it can improve the service?
- Can the WSMTs take loans to finance the major repairs or replacement of assets? What kinds of arrangements are in place to support the WSMTs to take loans? Can you share experiences of WSMTs taking loans to improve water service delivery?
- In your opinion what can be done to ensure sustainable financing of the systems? (Probe on the operational and capital cost). What are the potential promising innovative financing mechanisms that can be implemented for addressing major repairs?

Financial Institutions (Banks, Microcredits, Insurance, rural banks)

1. Do you operate accounts belonging to WSMTs or private operators of a water system?
2. What are the appraisal requirements for loan application
3. What are the requirements for assessing long term credit
4. What is the interest rate?
5. Have you ever granted a loan facility to a WSMT
6. If Yes:
 - a. What was the interest rate?
 - b. What is the mechanism for paying back the credits?
 - c. What was the payback period?
 - d. Where they able to pay back the facility? What is the rate of default?
 - e. What is the ceiling of funds they can assess?
7. If no:
 - a) Why?
 - b) What loan facility would be available to WSMTs or private operators of a water system?
 - c) Are you willing to grant a loan facility to a WSMT or private operators of a water system?
 - d) Under what terms - i) short term needs ii) long term needs
8. What is the type/nature of insurance?

District - Focused Group Discussion

Theme 1: Funds mobilization and management for capital maintenance of piped systems by management structures

1. Are you aware of the guidelines for setting tariffs? Briefly explain
2. In setting tariffs, do the management structures/WSMTs use the guidelines? (Refer to document - framework), Give reasons, If no, what informs the tariff setting?
3. When was the last tariff set and how much is the tariff for each management structure/WSMTs? (Probe how realistic⁶ are these tariffs)
4. Where does each of the management structures/WSMTs keep their revenue?
5. What type of accounts are the management structures/WSMTs maintaining? (Verify: operational, sanitation and capital/replacement/investment account)? Give reasons
6. Does the DA support the management structures/WSMTs with funds for major maintenance? (Refer to the concept note/DOM), Give reasons
7. In your opinion are the DA funds adequate⁷ to finance major maintenance ⁸for each of the systems? Probe on the cost of major parts/components of the system.
8. Do the management structures/ WSMTs for each system prepare annual budgets?
 - If yes, how often?
 - If no, give reasons
9. Do the management structures/WSMTs for each system prepare financial statements?
 - If yes, how often?
 - If no, give reasons
10. Do you undertake internal technical and financial audit of each system? (internal by the district and CWSA for the technical audit)
 - If yes, how often?
 - If no, give reasons.

Theme 2: Sustainable, innovative and promising strategies for addressing major repairs of piped schemes

11. Which of the systems are capable of self-financing? Give reasons (How are they making it work? What are the modalities?)
12. Can each of the management structures take loans to finance the major repairs or replacement of assets? Give reasons
13. What kinds of arrangements are in placed to support each of the management structures to take loans? Can you share experiences of management structures taking loans to improve water service delivery?

⁶ The tariff should make provision for the operation and maintenance of the system

⁷ Revenue exceeds expenditure and can meet the cost of major components

⁸ refer to DOM/Concept Note

14. What are the potential promising innovative financing mechanisms that can be implemented for addressing major maintenance?
15. Have you heard of pooled funding? Do you think it can be used to improve financing of major maintenance?
16. In your opinion what can be done to ensure sustainable financing of the systems? (Probe on the operational and capital cost).

Innovative financing study – tool for WSMTS

REGION DATE

COMMUNITY DISTRICT

A. General Information

s/n	Description	Response
1	Water Source	
2	Design Plant capacity m3/h	
3	Year of construction	
4	Construction Cost (GHC)	
5	Total Population served	
6	Number of house/private connections	
7	Number of Public standpipes	Functional..... Non functional.....

B. Water Transport and Distribution

Parameter	Value
Population for design	
Length of distribution pipe (m)	
Diameter of distribution pipe (mm)	
Pipe material	

Pumps

No	Type of Pump	Capacity		Location	Condition	Age
		Q (m3/h)	H (m)			
1						
2						
3						
4						

Storage facilities

No	Type of storage	Size	Material	Age	Condition
1					
2					
3					

	Description	Year				
		2012	2013	2014	2015	
Income	Water Income					
	Other income.					
Expense						
	Salaries					
	Utilities					
	Administration - newspaper, bank charges, meeting cost, cleaning,					
	minor repairs - source, pipes, pumps, storage etc					
	WSMT allowance					
	transportation - T&T, fuel etc					
	others....					
	CapManEx	Rehabilitation of water system				
		major repairs				
asset replacement						
other state....						

