REVIEW OF SUSTAINABILITY OF SMALL TOWNS PIPED WATER SERVICES IN GHANA

BY

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Abbreviations and Acronyms

AMCOW	African Ministers' Conference on Water
CEO	Chief Executive Officer
CR	Central Region
CWSA	Community Water and Sanitation Agency
GLAAS	UN-Water Global Analysis and Assessment of Sanitation and Drinking Water
GWCL	Ghana Water Company Limited
HLT	High-Level Tank
IDWSSD	International Drinking Water and Sanitation Decade
IT	Information Technology
IMC	Interim Management Committee
JMP	WHO/UNICEF Joint Monitoring Programme
KEEA	Komenda Edina Eguafo Abirem
M&E	Monitoring and Evaluation
M/DWSTs	Municipal/District Water and Sanitation Teams
MDG	Millennium Development Goals
MIS	Management Information System
MMDA	Metropolitan, Municipal and District Assemblies
MOM	Management of Operation and Maintenance
MoWE	Ministry of Water and Environment
NRW	Non-Revenue Water
NWSC	National Water and Sewerage Corporation of Uganda
O&M	Operation and Maintenance
PO	Private Operator
POM	Private Operator Management Model
PPP	Public private Partnership
PSP	Private Sector Participation
RWST	Regional Water and Sanitation Team
UN	United Nations
UNICEF	United Nations Children's Fund
VLOM	Village Level Operations and Maintenance
WASH	Water, Sanitation and Hygiene
WHO	World Health Organisation
WSDB	Water and Sanitation Development Board
WSMT	Water and Sanitation Management Team
WSP	Water and Sanitation Programme of the World Bank
WSSB	Water Supply and Sewerage/Sanitation Board

Abstract

The sustainability of small towns water services in Ghana and Africa is a matter of great concern. Service levels of older water systems have declined due to increased demand from growing populations. There have been serious challenges with respect to technical, financial, management, socio-political, institutional/legal/governance and capacity issues.

Low financial sustainability, community interference with O&M funds, weak O&M systems, inadequate technical and financial support from Local Government and the weaknesses of the community management model were identified as factors responsible for the unsustainable water services in small towns.

Improving the sustainability of small towns water services therefore require clear leadership for a comprehensive, harmonised and coordinated approach, which addresses all the facets of sustainability within the contexts of institutional reforms and private sector participation.

It is imperative to define and target small towns as a unique segment of society in Africa, which needs specialised approaches for sustainable water services delivery.

Key words: partnership, community management, private sector participation, institutional reforms, service levels.

Executive summary

Background

The World Bank in March, 2000 facilitated a global e-conference, which came up with a definition for small towns as *"settlements that are sufficiently large and dense to benefit from the economies of scale offered by piped water supply systems but too small and dispersed to be efficiently managed by a conventional urban water utility" (World Bank, 2003:1). They require* ***formal management arrangements****;* ***a legal basis for ownership and management****; and the* ***ability to expand services to meet the growing demand for water*** *(ibid). The conference also added that small towns usually have populations between* ***5,000 and 50,000*** *inhabitants but can be larger or smaller (ibid).* Again, the Town Water Supply and Sanitation Report from another e-conference organised by WEDC on behalf of the World Bank's Town Water Supply and Sanitation Initiative from 22nd November to 17th December, 2004 suggests a population of between 2000 to 20,000 as small towns (distinguishing between medium-size towns: 20,000 to 50,000 and large towns: 50,000 to 200,000) (Sansom and Fisher, 2005:13). Adank, (2013: 11 and 12) cited the following two observations to support the importance of small towns in contemporary times:

- A new and significant category of human settlement is emerging, being the "small town" (Cranfield University; Aguaconsult and IRC, 2006).
- It is generally believed that in the future, small towns will grow in number, population and importance (Collington, 2002; UN-HABITAT, 2006; Cranfield University; Aguaconsult and IRC, 2006; WSP, 2010; Caplan & Harvey, 2012).

The above observations are early warnings for the challenges ahead and the need to reform and adapt at both the institutional and operational levels in order not to be overtaken by events. Pilgrim et al., (2007:6) identified small towns as a grey segment, which falls between the rural and urban classifications but outside the well-established community management and urban utility management approaches respectively and thus constitute a "management gap".

From the early 1990s to the end of December, 2013, **465** piped schemes have been constructed for small towns and some small communities in Ghana serving over five million people (CWSA, 2013a). It has been acknowledged that small towns still present a bright spot on Ghana's water supply service delivery landscape (IRC and Agua consult, 2011:24).

Objectives of the research

The aim of the research was to review and analyse the situation, effectiveness and prospects of small towns piped water services sustainability in the Central Region (CR) of Ghana with

respect to such factors as finance, functionality, operational and technical issues as well as management/institutional capacity issues and their interrelationships.

More specifically, the research sought to

1) assess the achievement and prospects for sustainable piped water service delivery in small towns
2) identify gaps, weaknesses, and strengths of institutional structures and systems for small towns piped water services.
3) identify other sustainability related needs of small towns water services including the support mechanisms from government, local government and the private sector and
4) make recommendations for improvement of the sustainability of small towns piped water services.

Methods used

The case study approach was used for the research because of its strength in doing in-depth investigation into one or a few instances of a phenomenon (Descombe, 2010:52). Yin (2009:11) in justifying the superior value of case study over history, mentioned one of its (case study's) distinguishing characteristics, which is its reliance on two additional evidence sources namely: direct observations of events being studied and interviews of the persons involved in the events. The communities selected in conjunction with CR, CWSA and the MMDAs have been operating piped water services over periods ranging from 5 to 22 years.

Documents review, including grey literature, key informant interviews, and direct observations were the main methods used in collecting the data. A comprehensive questionnaire (with mainly open-ended questions) was also used to maximise data capture.

The analysis was mainly qualitative describing the situations based on the evidence obtained and offering recommendations for improvement.

Key findings

Overall, the sustainability of small towns piped water services in Ghana is a matter of concern for various reasons. The challenges of the community management model, lack of oversight and technical support for community management structures, low prioritisation of rural WASH by the MMDAs resulting in weak M/DWSTs and their inability to undertake community outreach, inadequate governance and accountability systems, vulnerability of WSMTs to dissolutions and pressures for money otherwise meant for major O&M activities, as well as inadequate service levels due to increased demand arising from rapidly growing populations of

the small towns account for the poor sustainability status of the small towns piped water services in Ghana.

Similar to findings from other studies (see for example Sansom, 2004:1.9, 5.3 and 5.4) the research identified that non-use of water meters makes it difficult if not impossible to estimate and monitor non-revenue water (NRW) in order to introduce appropriate and timely measures to prevent further loss of revenue and reduce water wastage. The weak financial status of the WSMTs means that they will not be able to resolve any major breakdown, which may occur.

There have been misapplication of funds as some community leaders and Assembly members/Unit Committees are using the WSMTs as their most reliable source of funds for community development projects. House connections have been unwilling to pay their water bills resulting in huge accumulated debts since these customers continue to receive services thus hurting the financial health of the water services. The water supply infrastructure in the four towns shows visible signs of inadequacy, old age and weakness. They experience frequent breakdowns. The iron removal plants installed on three of the four water systems have broken down. The bulk meters installed in three of the four small towns were not working and taps in some of the communities are not functioning well. Severe erosion has affected some concrete structures, for example the standpost platforms. There were major cracks on some drains also whilst soakway pits are not functioning well. There is reduced capacity of the water supply services relative to demand. Out of the four small towns studied, only one has a functioning office for its WSMT. Unreliable power supply, rising cost of electricity, and power fluctuations have been another set of problems affecting the operation of the small towns water services. Furthermore, water quality monitoring is not carried out by the WSMTs mainly because of low awareness about its necessity and inadequate information available to the WSMTs on it. The legal mandate of CWSA, which made it a facilitator with the assumption that MMDAs will be effective in supporting the planning, financing, and implementation of rural WASH as well as supporting community management through monitoring and provision of technical assistance to the communities/WSMTs, was identified as a serious weakness.

On a more positive note, however, all four communities have effective demand for potable water supply. The WSMTs have been committed to making sure that the services are running for the population to have reliable access to water. Even with inadequate institutional support from the MMDAs, the WSMTs have been positive and enthusiastic about their work, linking up quite well with the private sector for specific maintenance and supply services. Some measure of regulation is however, needed in areas of service charges, prices, quality of work, and warranties from the private firms. They have all kept their water systems functioning throughout the design life of 10 years and even beyond. Three of the WSMTs have actually

kept the systems functioning for 16years, 18 years and 21 years at Assin Bereku, Aburansa, and Twifo Mampong respectively in the face growing demand,

Key conclusions and recommendations

Although various definitions of water systems sustainability made mention of "the service producing benefits for a long or prolonged period of time", no reference is made to a specific timeline. The author, however, observed that, the real test for sustainability comes after the design life of the piped water service. In the author's view, the piped water supply system is expected to perform optimally during its design life anyway (i.e. if properly designed). Operation and maintenance management of the water system during its design life could make the services sustainable in the longer term. The capacity of the water systems to respond to the challenges of major repairs/replacements, rehabilitations, extensions and expansion should be indicative of their ability to meet the test of sustainability. This could be measured in terms of how much savings the managers of the systems are able to accumulate or how much investments have been entered into over the years. It has been noted that once a water facility is installed, its sustainability depends to a large extent on the institutional arrangements and management systems put in place (Asimah, 2009:30). Even more important is how well these institutional arrangements/management systems are functioning.

The O&M trainings conducted for WSMTs during project implementations have been useful as the WSMTs applied such knowledge and skills to manage the piped water services in some cases throughout the design life. However, the training packages need updating to respond to emerging O&M needs of the piped water services. The update of the O&M training curriculum for managers of small towns/peri-urban piped water services will include procurement and management of contract; negotiating for services; water quality issues and monitoring; effective use of water meters as a management tool; water tariff settings based on life-cycle cost estimation; business plan preparation, and plumbing skills training (for operators). Furthermore, the absence of functioning WSMT offices in most small towns results in the loss of important documents, records and assets of the WSMTs. This affects the credibility of the WSMTs especially in relation to being able to access private financing from the Banks for capital expenditure.

It may be required to review the design parameters of piped systems including storage tanks, which currently provides 40% daily storage for communities. In view of the rapid population increases in most of these small towns, it is proposed to increase the capacity of these High Level Storage Tanks and also increase the size of the distribution pipes in anticipation of future extensions and expansion and increased demand for private connections in calculating the demand. The inclusion of a stand-by diesel-powered generator and power stabiliser in the

design of small towns has become a matter of urgent necessity. Regular water quality testing is necessary and will need to be prioritised by the managers of the water supply services. However, information on why, how, where it will be done, and the cost of doing the water quality tests/monitoring need to be provided to the managers of the small towns water services by CWSA.

A review of the existing legal framework, in which the MMDAs would delegate the implementation mandate for small towns water services to CWSA is required (see Delbos, 2006:20 citing Sansom and Fisher, 2005:5). This way, CWSA will be empowered to promote and facilitate a nationally harmonised and coordinated process of private sector participation in the management of small towns water services (see Triche, Requena and Kariuki, 2006,:1; Sansom et al., (eds) (2003):19 - 75). The experience of Uganda in the use of private sector participation as the official management model for small towns piped water services since the beginning of their water sector reforms in the early 1990s offers useful lessons for Ghana (see section 4.3.7 of this report).

Sansom, et al., (Eds) (2003) observed that, apart from the specific contracts that are contracted out, key responsibilities remain with the public sector under the service and management contracts types of PPP. With this in mind, it will be more beneficial to leverage the strengths and capacity of a more professionally-oriented and water supply-focused public sector institution (like the CWSA in Ghana) rather than a multi-purpose, fragmented local government institution (like the 216 MMDAs in Ghana). This is important in view of the significant role the public sector will need to play in facilitating the contracting out of small towns piped water services to the private sector, harmonising approaches, coordinating, regulating, monitoring & evaluation, and reporting. Triche, Requena and Kariuki, (2006:1) however, admitted that developing effective partnerships between government institutions (typically at local level) and local private operators of water supply has its own challenges with respect to: contract design; selection criteria and procedure; financing arrangements; risk mitigation instruments; performance improvement measures to develop technical skills; and regulatory and monitoring framework.

The challenges affecting the sustainability of small towns water services are multi-dimensional and complex thus requiring bold and futuristic institutional and policy reforms which can place small towns piped drinking-water service on a new priority level. The renewed commitment of government to operationalise the Public-Private Partnership Policy, which was approved by parliament in 2011, offers a timely window of opportunity for the proposed small towns water services reforms in Ghana.

CHAPTER ONE

1. Introduction

1.1 Background

The UN-Water Global Analysis and Assessment of Sanitation and Drinking Water (GLAAS) in its 2012 report re-echoed the universal view that, sanitation and drinking water are essential for human life, dignity and human development (WHO, 2012:6). In spite of this, it has been estimated that one-sixth of the world's population lack access to safe water (Swedish Water House, 2007: 5). Though sanitation and drinking-water did not get the needed political attention and commitment in the past, the Millennium Development Goal (MDG) 7, which seeks to halve the proportion of the population without sustainable access to safe drinking water and basic sanitation by 2015 (from 1990 levels) has mobilised global and national commitment and prioritisation for drinking water supply and sanitation coverage. The accelerated investments in new water supply infrastructure and the rehabilitation of existing ones by governments, development partners and local communities reflect this shift and have resulted in progress towards the MDG target for water, even though regional and rural-urban disparities still exist. The Joint Monitoring Programme (JMP) in its 2013 update on progress in sanitation and drinking water revealed drinking-water coverage of 89% in 2011, which was 1% above the MDG target for 2011 (WHO and UNICEF 2013:1). This, notwithstanding, 768 million people across the world relied on unimproved sources for drinking water, with 83% of the population without access to potable water living in rural areas (ibid).The WHO and UNICEF (2013) also noted that the urban drinking water coverage has remained high over the past two decades, and further asserted that 70% of the global progress made in achieving this feat came from both piped drinking-water on premises and public taps. However, there are concerns about service quality in terms of intermittent supply and its attendant increased exposure to the risk of contamination (ibid). It will, however, be useful if the JMP can include small towns category in its analysis and reports using the World Bank definitions.

Also, whilst Africa witnessed an increase in drinking water coverage from 56% in 1990 to 66% in 2010, the population relying on unimproved drinking water sources increased from 279 million in 1990 to 344 million in 2010 (AMCOW, 2012: 3). This is partly due to the loss of access through complete breakdown of water systems, resulting from weak operation and maintenance regimes.

The Community Water and Sanitation Agency (CWSA) estimated that there were 134 small piped schemes, 331 small towns piped schemes and 525 transferred systems from the urban water utility systems which served some 5,509,273 people as of the year 2013 (CWSA, 2013a). It should also be mentioned that, a year after the Act establishing CWSA was passed,

the urban water utility company (the then Ghana Water Company Limited) transferred 120 small towns water systems, which hitherto had been under its jurisdiction to the MMDAs for community management (Delbos, 2006:68). The transferred systems were being managed by full time technical professionals employed by the urban water utility company, and were also highly subsidised. An evaluation of the state of these transferred GWCL systems will be helpful, having kept these systems under community management for about 14 years. The lessons and recommendations from this study has provided the way forward and justify why and how a more professional managerial oversight probably from CWSA for these systems would be ideal.

1.2 Context of the research

Small towns within the rural water sub-sector of Ghana were used for the case study. Even though the research was undertaken on small towns' piped systems in Ghana, its findings and recommendations could be relevant for small towns' piped water systems elsewhere, particularly in other developing countries.

1.3 What is sustainability?

Sustainability defies a 'strait-jacket' definition but manifests in a number of expected conditions relative to the phenomenon in question as in small towns piped drinking-water services.

The following three definitions draw on the work of Harvey and Reed (2004:6-8):

a) The Cambridge Dictionary (2003) defines sustainable as 'able to continue over a period of time'; or causing little or no damage to the environment and therefore able to continue for a long time.

b) Parry Jones et al (2001a) identified the most frequently recurring core issues in sustainability definitions as:

1) Minimal external assistance in the long term
2) Financing of regular operation and maintenance costs by users, and
3) Continued flow of benefits over a long period.

c) Davis and Brikke (1995) on the other hand defined drinking-water supply as sustainable if:

1) The water consumed is not over-exploited but naturally replenished
2) Facilities are maintained in condition which ensures a reliable and adequate water supply; and
3) The benefits of the supply continue to be realised over a prolonged period of time.

One of the most elaborate definitions has been formulated by Francois Brikke (cited in WHO, 2000). According to him (WHO, 2000:41) a service is sustainable *when: it functions and it is being used; it is able to deliver an appropriate level of benefits (quality, quantity, convenience, continuity, affordability, efficiency, equity, reliability and health); it continues over a prolonged period of time (which goes beyond the life cycle of the equipment); its management is institutionalised (community management, gender perspective, partnership with local authorities, and involvement of formal and informal private sector); its operation, maintenance, administrative, and replacement costs are covered at local level (through user fees, or alternative financial mechanisms); it can be operated and maintained at local level with limited but feasible external support (technical assistance, training and monitoring); and when it does not affect the environment negatively.*

All the above definitions highlight the concept of time. However, what is not known is, 'how long' a facility ought to deliver adequate and reliable services to be deemed sustainable? This will vary depending on the phenomenon in question. It will however be helpful to define it for drinking-water supply services especially for small town water services.

The definition provided by WHO (2000:41) attempted to clarify the time concept of sustainability by referring to "continuous performance or functionality of the service beyond the life cycle of the equipment". The particular equipment being referred to in the definition, is however, not clear. Nonetheless, linking sustainability to the life cycle of the motorised pump for instance will be problematic as some of them have even shorter life span than the design life of the water system.

The tendency has been for some countries to directly link the design life of water supply systems to sustainability of the service. *For instance, the CWSA in Ghana considers a small water system sustainable if it provides reliable and good quality water in sufficient quantity over the design period of the system (which in the case of small towns piped schemes in Ghana is 10 years)* (CWSA, 2005:11).

It is the view of the author that the time concept for the design of potable water supply infrastructure might not be the same as that of its sustainability. The operation and maintenance measures are expected to continue supporting the provision of the service beyond the design life of the water system or adapt to meet increasing demands. The time horizon is important because the operation and maintenance (O&M) requirements, including tariffs and funds utilisation/management will be different if a drinking-water supply service is only expected to work for the duration of the design life as against the goal of providing

benefits to the population beyond the design life. This requires further investigation even though the research tried to gain some insights into it.

Over the past decades, the pre-occupation of national governments, multi-lateral organisations and External Support Agencies has been to increase coverage levels and targets through significant financing of new infrastructure, given the large number of people who need to gain access in order to meet the MDG target (WHO, 2012:59). It must be appreciated, however that, sustaining services to existing users will become increasingly important as country coverage levels increase and targets are attained since waiting too long will mean part of the investment made will go waste (ibid).

The WASH Sustainability Charter (2012:1-2) is an international collaborative effort, which seeks to align WASH stakeholders around collaboratively developed sustainability principles and catalogue adoption of these principles around the world. The charter, which is an aspirational document and not a governing one, has the following guiding principles:

1) Strategy and Planning
2) Governance and Accountability
3) Service Delivery Support
4) Financial Management and
5) Reporting and Knowledge Sharing

Adopting the above principles for the water supply sub-sector will contribute to sustainable water service delivery as illustrated by Figure 1.2 below.

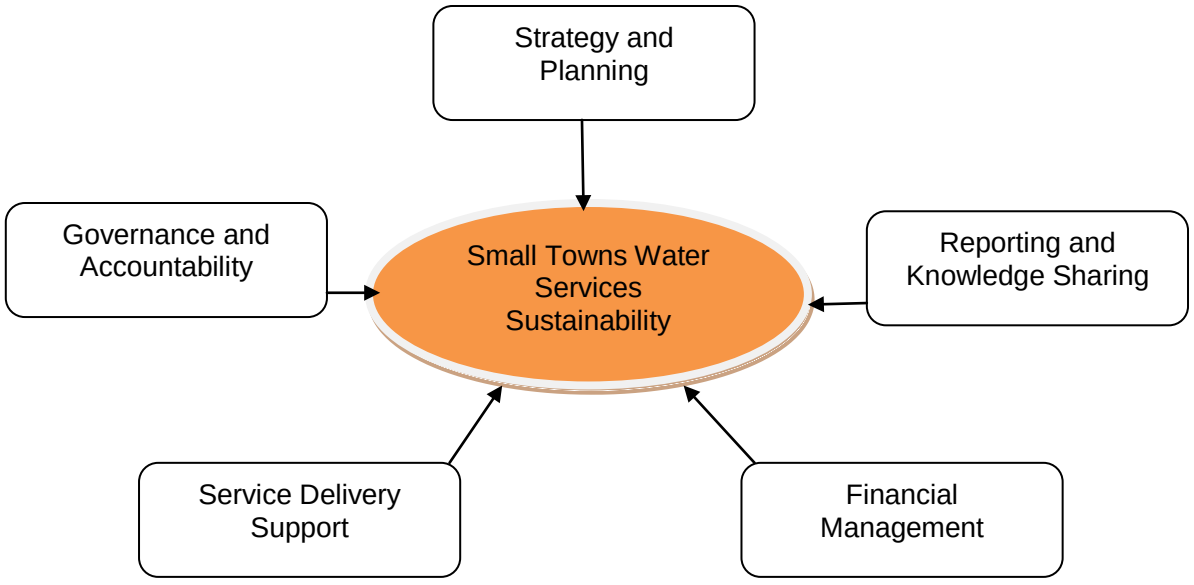


Fig 1.1 Sustainability Framework adapted from the Principles of the Sustainability Charter (2012)

The above framework encapsulates all the critical pre-conditions for sustainability, which should be adapted from the onset of water supply projects and programmes. Arguably, these principles are broad and will need to be carefully unpacked and fully implemented for maximum results.

1.4 Research objectives

a) Research aim

The research sought to review and analyse the situation, effectiveness and prospects of small towns piped water services sustainability with respect to such factors as finance, functionality, operation, technical, management/governance and institutional capacity and interrelationships.

b) Research objectives

The author hopes to achieve the following objectives through the research:

1. Assess the status, effectiveness and prospects of the various aspects of sustainability and their potential impacts on small towns piped water services in Ghana.
2. Assess the effectiveness and outcomes of sustainability structures, systems, procedures, and principles implemented in small towns water supply projects in Ghana with respect to the performance of communities (WSMTs) and the private sector organisations they use.
3. Identify gaps, weaknesses and strengths of existing institutional/governance structures and systems for small towns piped water supply
4. Assess the support systems available for community management with respect to the role of Local Government (District Water and Sanitation Teams (DWSTs), Community Water and Sanitation Agency (CWSA) and the Private sector service providers and suppliers.
5. Assess/identify the critical success factors under each of the sustainability themes (financial, functionality, operational, maintenance, management, and institutional sustainability).
6. Identify other sustainability-related needs of the communities (Water and Sanitation Management Teams).
7. Make recommendations for improvement of small towns' water supply service.

c) Research questions

1.1 What is the state of the small towns piped water services as well as options available for improvement?

2.1 How strong/effective are WSMTs and their governance systems

3.1 What are the strengths, weaknesses, opportunities and threats of key institutions connected to small towns piped water services?
3.2 What lessons can be learnt from existing literature on experiences of water supply sustainability?
4.1 Do the community management structures receive technical and financial support from the Local Government Authorities (MMDAs) and CWSA after projects have ended?
4.2 Who regulates the relationship and transactions between the communities (WSMTs) and the private sector service providers and how well do they perform this role?
4.3 Are maintenance services from the private sector easily accessible?
4.4 Are there guarantees or warranties for defect liability in respect of services provided by the private sector and how effective are these warranties?
5.1 What are the critical success factors for financial, institutional, operational, technical, and functionality aspects of sustainability in small towns?
6.1 What are the needs of the community/WSMT in terms of sustainability?
7.1 What actions are required to improve upon the sustainability of small towns piped water services?

1.5 Outline of the methodology

The case study approach was used to explore and get deeper insight and in-depth knowledge about the sustainability measures, processes and activities implemented by small towns' water supply programmes and assess their outcomes in a manner that will establish lessons, best practices and approaches that could be replicated and scaled up. The author took a flexible and comprehensive approach by using multiple and appropriate methods and techniques with the needed triangulation to validate the responses obtained from the field.

1.6 The scope and structure of the report

The report is structured into six main chapters. Chapter one covers the introduction including the background, aim and objectives. Chapter two reviewed existing literature whilst chapter three outlined the research methodology. Chapter four presents key findings, analysis and discussions, whilst the conclusions have been organised under chapter five. Chapter six, presents and discusses key recommendations.

CHAPTER TWO

2. Literature review

This chapter responds to objective objectives one to six of the research project in terms of exploring existing relevant knowledge from previous works done. It specifically addresses research question 3.1 and examines the issue of small towns piped water services sustainability from the point of view of different authors establishing similarities, differences, gaps, strengths and opportunities, and also helped to refine the research questions.

2.1 The defining characteristics of small towns

Small towns, within the context of water supply are usually defined and characterised in different ways typically on the basis of population, service level and management type. The unpublished report of the World Bank (2000 cited in Triche, Requena and Kariuki, 2006:1) asserted that there is no universally acceptable definition of terms such as "small town" or medium-size town, nor is there a clear distinction between town and city".

The World Bank (2003: 1) through a global e-conference on small towns water supply in March 2000 defined small towns as *"settlements that are sufficiently large and dense to benefit from the economies of scale offered by piped water supply systems but too small and dispersed to be efficiently managed by a conventional urban water utility".* They require **formal management arrangements**; **a legal basis for ownership and management**; and the **ability to expand services to meet the growing demand for water** (ibid).

The Town Water Supply and Sanitation Report from the e-conference organised by WEDC on behalf of the World Bank's Town Water Supply and Sanitation Initiative from 22nd November to 17th December, 2004 suggests a population of between 2000 to 20,000 as small towns (distinguishing between medium-size towns: 20,000 to 50,000 and large towns: 50,000 to 200,000) (Sansom and Fisher, 2005:13).

Adank (2013) also in differentiating between the different sizes of small towns cited UN-HABITAT (2006) and Pilgrim, et al., (2007) as follows:

1) Small towns: settlements with population between 2000 and 20,000
2) Medium size towns: settlements with population between 20,000 and 50,000
3) Large towns: settlements with population between 50,000 and 200,000.

Different countries use different population thresholds to define small towns for purposes of planning and implementing water supply services as illustrated by the table below adapted from Caplan and Harvey, (2010: 10).

Table 2.1 Small towns classifications in seven developing countries

No.	Country	Existing classification of small town	Population Range
1	Bangladesh	Range of different classifications - more based on administrative determinations than local populations or other characteristics	5,000 - 50,000
2	Madagascar	Different classifications are observed. The National Institute of Statistics (INSTAT) considers an urban centre as any commune in which the population exceeds 5,000. The law of urbanisation requires all communes with minimum population of 10,000 to develop a strategic document for managing their district	District capitals and urban communes are those of between 10,000 and 80,000
3	Nepal	Government administrative classification	5,000 - 40,000
4	Nigeria	May not be enshrined in policy	Widely defined as 5,000 - 20,000
5	Tanzania	Defined by Local Government Act of 1982 based on population size	5,000 - 50,000
6	Uganda	Based on population size. , water supply technology and management model	5,000 - 50,000 Small towns are settlements outside the jurisdiction of NWSC[1] (the urban water utility). The population of small towns ranges from 5000 to 15,000. Rural growth centres, which have populations in the range of 2000 and 5000 inhabitants are also served with piped water systems (Hirn, 2013)
7	Ghana	Community Water and Sanitation Agency – Small Towns Water Policy (Design Guidelines) of 2003	2000 - 50,000
		National Water Policy of the Ministry of Water Resources Works and Housing (2007)	2,000 - 30,000

Adapted from Caplan and Harvey (2010:10)

Underscoring the increasing need to direct attention to small towns in planning, development decision making, and resource allocation, Adank (2013:11 and 12) cited the following two observations:

- *A new and significant category of human settlement is emerging, being the "small town" (Cranfield University; Aguaconsult and IRC, 2006).*
- *It is generally believed that in the future, small towns will grow in number, population and importance (Collington, 2002; UN-HABITAT, 2006; Cranfield University; Aguaconsult and IRC, 2006; WSP, 2010; Forster, 2012).*

[1] NWSC: National Water and Sewerage Corporation (the Urban Water Utility of Uganda)

Small towns as the grey segment of towns, which fall between the rural and urban classifications but outside the well-established community management and urban utility management approaches respectively, face special challenges in the provision of their water and sanitation services and also constitute a "**management gap**" (Pilgrim et al., 2007:1).

2.1 Growth of small towns within the rural-urban continuum

Characterised by unregulated growth and highly heterogeneous groups with widening poverty gaps (Swedish Water House, 2007: 8; Butterworth *et.al.,* 2007: 11; Allen, Davilla and Hofman, 2006: 13), the rapid urban growth has been of concern to policy makers considering that, at the beginning of the 1990s, not more than 40% of the world's population lived in cities – or urban areas (WHO, 2014: 1). It has been estimated that, by the year 2030, 6 out of every 10 people will live in urban areas, and by 2050, this proportion will rise to 7 out of 10 people (WHO, 2014: 1). Pilgrim *et al.,* (2007: 6) noted that for every large town or urban area, there are an estimated ten small towns – and these towns are expected to double within 15 years and double again in 30 years. Triche, Requena, and Kariuki (2006:1) observed that rapid urban growth in developing countries has fuelled the rise in the number and importance of small and medium size towns noting that such towns currently account for 20 to 40% of the urban population and are the fastest growing urban settlements. Migration from rural to urban areas and the transformation of rural settlements into urban places are important determinants of the high urban population growth anticipated in the less developed regions (ibid). The presence of schools, health and administrative centres in small towns may further attract in-migration (Mugabi, 2006:188 cited in Caplan and Harvey, 2010:9).

Caplan and Harvey. (2010:7) noted that, in a rapidly urbanising world, where small town growth in both size and number rapidly outstrips that of larger urban centres, there is an urgent need to find new approaches to ensure the provision of basic services. It is a fact that small towns have been neglected over the years by mainstream government policies and development assistance in favour of urban areas or rural settlements (Caplan and Harvey, 2010: 11). However, it cannot be the case anymore that small towns will be neglected in the face of their peculiar requirements or confused with either the rural or urban segments of society.

2.2 Clarity of institutional mandates and leadership in Ghana

The role of institutions in policy formulation, planning, capacity building, provision of technical support, monitoring and evaluation and financial support are key to ensuring sustainability in any development. Conditions such as legal mandates and leadership responsibility are, however, needed for institutions to function effectively.

WHO (2012: 5) observed a number of evidence-based issues requiring urgent attention, which includes: the need for national governments and WASH stakeholders to **continue to improve the clarity of leadership for WASH**.

Allen, Davilla and Hofman (2006: 22) opined that, small towns are usually characterised by the convergence of sectoral and overlapping institutions with different spatial and physical remits. Thus, in these areas, institutional arrangements are sometimes too small or too large or are too urban or too rural in their orientation to effectively address development challenges, and hence the need for particular attention to be paid to them (ibid: 22).

A Ghana Country Study conducted by IRC and Aguaconsult (2011: VI) aptly summarised the institutional challenge facing the WASH sector in Ghana as follows:

"The multiplicity of service providers, their overlapping mandates, and the lack of provision for oversight and regulation leads to problems in terms of coordination and control". Progress in achieving improved sustainability can be made only if there is greater clarity in terms of roles and responsibilities for the entire service delivery cycle[2]

The report further noted that, confusion of mandates for small towns is not the only area of lack of clarity in terms of institutional responsibilities – the definition of peri-urban areas also falls between the urban-rural definitions, thus creating a challenge for the sector, where many of these areas are similar to small towns but are not formally defined as such (IRC and Agua Consult, 2011:8).

2.3 Institutional support for small towns

Institutional support is a necessary pre-condition for effective and efficient community management. This support usually comes from the formal sector for both community management organiations and private sector service providers (in terms of capacity building and the creation of enabling environment). Harvey and Reed (2004:51, citing Davis & Brikke, 1995) stated that **stronger institutions than at present are needed to promote and support community management, and adequate funding is still required for agencies to be able to perform their essential supportive roles**. They (Harvey and Reed, 2004:51) put forward the following key elements, as constituting institutional support:

1) Monitoring and Evaluation

[2] The service delivery cycle as defined by IRC and Agua Consult (2011) covers Planning (design and tender); Implementation (construction); Operation and maintenance; Major maintenance; and Rehabilitation and replacements.

2) Participatory Planning
3) Capacity Building and
4) Specialist technical assistance (including financial support where required)

Lane (2004:21) observed that community management principles have been important in Ghana and that it was crucial to the sustainability of water and sanitation services but was quick to add that **communities cannot manage their water and sanitation services in a vacuum**; **rather they need long-term technical and professional support from intermediary organisations**. These intermediary organisations in the case of Ghana are the MMDAs and CWSA.

In the light of the above, therefore, it may inaccurate to write off the community management model as a failure without alluding to the failure of formal intermediary agencies or organisations to fully assume and consistently discharge their supportive roles and responsibilities, including professional guidance and motivation.

2.4 Existing frameworks/tools for sustainability

This section draws on the mapping and review of sustainability assessment tools for water and sanitation service delivery conducted by Boulenouar, Schweitzer and Lockwood (2013). In justifying the need for such assessments, they stated that only by accumulating data and analysing data can we really learn about trends and factors over time (Boulenouar, Schweitzer and Lockwood, 2013:18). However, the gap in such assessments and M&E in general has been the lack of opportunity to take the monitoring and evaluation/assessment process beyond the level of learning, documentation and sharing to the stage of actual implementation of key recommendations in order to practically address the identified problems/gaps and improve the situation. Usually, reports of assessments contain detailed analysis and specific recommendations for relevant agencies and stakeholders to implement. The five sustainability assessment tools reviewed and mapped by Boulenouar, Schweitzer and Lockwood (2013) are presented in table 2.2 below.

Table 2.2 Sustainability assessment tools

No.	Organisation	Tool
1	AGUASAN (network)	Sustainability Assessment Tool
2	Dutch Water Alliance (consortium of NGOs)	Sustainability Monitoring Framework
3	UNICEF Mozambique	Sustainability Check
4	USAID - Rotary International (collaboration)	Sustainability Index Tool
5	Water and Sanitation for Africa (NGO)	Tool for Planning, Predicting, and Evaluating Sustainability

Source: Boulenouar, Schweitzer and Lockwood (2013)

The review by Boulenouar, Schweitzer and Lockwood (2013:6) found the following:

1) All the five tools share a number of characteristics in common as they all considered financial, institutional, environmental, technical and social factors of sustainability even though some considered additional factors like service delivery, management, knowledge and capacity. They also adopted similar research methodologies and sampling approaches, generally presenting either overall sustainability score per factor assessed.
2) The tools to a large extent reflect the way the programmes have been designed, thus they focus largely on the **provision level**, with less attention devoted to **broader policy and governance issues** or to the **role of capacity and practices of local government**. To buttress this point, they stated that, out of the combined total of 800 indicators of all five tools covered by the mapping, two-thirds are focused on the provision level.
3) The relevance and impact of the tools could not be assessed because the stage of application differs from one tool to the other and ranges from pilot testing (e.g. the Tool for Planning, Predicting and Evaluating Sustainability- TOPPES) to full application in multiple geographic areas (e.g. the Sustainability Index Tool and the Sustainability Check).
4) Even though costs are difficult to compare as they relate to interventions or program, on average, these tools cost US$35,000 per application.

See appendix 1 for details of the mapping/review of the sustainability assessment tools.

Since the questions for sustainability assessments for water supply are very similar and target almost the same respondents from officialdom and communities, it is important to follow-up these assessments with concrete participatory interventions to be implemented with the support and guidance of those who carried out the assessment in order to be able to determine the actual improvements or outcomes in the end. Anything short of this will lead to a situation of inertia and/or monotony if the same questions have to be answered by communities, local governments and central government agencies for different individuals and teams at different times without noticeable improvement in the situation. In other words, water supply sustainability will be caught in the vicious cycle of assessments and recommendations without any real breakthrough whilst the situation of water services remains unchanged or deteriorates.

2.5 Management models for small towns drinking-water supply systems

According to Sansom (2004: 1.23) many countries are going through a process of devolving service management, including water services to town municipal councils, but cautioned that municipal management does not generally provide the necessary commercial approaches. Uganda for instance addressed this problem by directing the Municipal Councils to contract out the management of the piped water services to local operators and this is said to be yielding results (ibid). They identified a wide variety of management options being used around the world for small towns water services as outlined below (ibid):

1) Regional utilities
2) Municipal government
3) Community management
4) Cooperatives and
5) The local private sector.

The two management models discussed as part of the literature review are presented below.

2.5.1 The community management model

The community management model has been the official management system adopted for the rural water sub-sector in most developing countries including Ghana. It is considered the most appropriate alternative to the utility management model, which was becoming ineffective and stretched at the turn of the International Drinking Water Supply and Sanitation Decade (IDWSSD). The wave of water sector reforms, which followed the IDWSSD, gave impetus to the accelerated development of the rural water sub-sector albeit without specific consideration to small towns.

According to Harvey and Reed (2004:50), the community management model remains by far the most widespread for rural water supply in Sub-Saharan Africa, and yet has failed to deliver the levels of sustainability that were initially anticipated. Acheampong (2009:25 citing Nyarko, 2007) observed that estimated 98% of rural communities and small towns water services in Ghana are managed by communities.

This is further supported by the insight provided by Harvey and Reed (2004:50 citing Ockelford, 2002) that government authorities and support agencies do not fully understand the need for appropriate support systems probably because the development of the Village Level Operation and Maintenance (VLOM) concept might have created complacency. Again, whilst community sensitisation or mobilisation is designed to instil a sense of ownership and responsibility, it does not automatically lead to a willingness to manage or finance a water supply service over a prolonged period of time (Harvey and Reed, 2004:50). The assumption

that, supporting community-based O&M (such as VLOM) is a less onerous task than running a centralised maintenance system has not been proven in the field (WHO, 2000 cited in Harvey and Reed, 2004:50). At present, there is little evidence to suggest that governments have facilitated VLOM effectively on their own (Colin, 1999, cited in Harvey and Reed, 2004:50).

Colin (1999 cited by Shaw, 2012:16) found that in many projects, the community management model was built on the premise that it would succeed, without necessarily investigating the risks and constraints associated with it. Shaw (2012: 2) therefore recommended the need to reconsider options to professionalise the management of water points together with life cycle cost arrangements to inform financing mechanisms.

2.5.2 Private Operator Management Model

The European Commission (1998 cited in Acheampong, 2009:19) asserted that private sector participation in water service delivery has been recognised as a means of making water supply services more efficient and cost effective as well as ensuring sustainability. There is a growing evidence of countries paying attention to the development of effective service models for small and medium size towns as a major shift in national urban utility reform programmes, which in the past only concentrates on large cities and targets big international private companies (Triche, Requena and Kariuki, 2006:1). The local private sector is becoming very important in an era where decentralised service delivery is gaining momentum and the accompanying responsibility for managing water supply and sanitation services is shifting from centralised national agencies to small and medium size towns, which may not have the capacity and experience to effectively finance and manage these services (Triche, Requena and Kariuki, 2006:1).

Sansom, et al., (eds) (2003:19) observed that as pressure increases on water utilities to provide a cost effective, quality service to customers in a sustainable manner, the need to ensure sound management and value-for-money has led many utilities to contract out various services to the private sector. They further indicated that, apart from the specific contracts that are given out, key responsibilities remain with the public sector under the service and management contract types of PPP (ibid).

Table 2.3 shows the main contract types and typical allocation of responsibilities between public and private sector for the main contract types

Table 2.3 Main contract types and allocation of public-private responsibilities

Contract type	Asset ownership	Operation & Maintenance	Capital Investment	Commercial risk	Typical duration	Location of examples
Service contracts	Public	Public and Private	Public	Public	1 to 3 years	Mexico City, Chile, and Chennai, India
Management contracts	Public	Private	Public	Public	3 to 5 years	Trinidad & Tobago, Columbia, Uganda
Lease contracts	Public	Private	Public	Shared	8 to 10 years	Guinea, Cote D'Ivoire, Czech Republic
Concession	Public	Private	Private	Private	25 to 30 years	Buenos Aires, Argentina & Manila, the Philippines
BOT	Private and Public	Private	Private	Private	15 to 25 years	Malaysia, Mexico
Divestiture	Private or Private & Public	Private	Private	Private	Not applicable	England and Wales

Source: Sansom, 2004: 4

Table 2.3 shows the roles and responsibilities for the public sector in all contract types, hence the need to leverage a relevant public institution whose core business is drinking water supply.

CWSA fits well on this bill as the most suitable public sector institution to drive and manage the PPP process for small towns in Ghana. Learning from the experiences of Uganda, the MMDAs will need to be directed to delegate their implementation mandate for small towns to CWSA for this to happen (see Sansom, 2004: 1.23).

While service and management contracts generally do not include substantial investment funding, there is a definite need for loans or donor funding to be allied to such a contract as part of a programme of general improvement especially for old and weak small towns water systems, which have gone beyond their design life and are no longer providing adequate, reliable and quality services (see Sansom, et al, eds, 2003:19).

PEM Consult (2006:12) noted that under the National Community Water and Sanitation Programme (NCWSP), communities were to choose to contract operations, maintenance, repairs and/revenue collection functions to a private company or the Urban Water Utility but this received very little attention from communities. Neither has it been actively promoted by CWSA as required by Act 564 (ibid). It doubtful though, if communities have the capacity to contract out to the private sector (see Sansom, et al., eds, 2003:19). PEM Consult (2006: 12)

concluded that with the increase in the number of small towns and the weaknesses in the management of their water supply systems, this is negatively affecting the sustainability of a number of systems.

Acheampong (2009: 26) found that community management with private sector expertise was advocated as a viable option to improve the sustainability resulting in a number of management contracts for the small towns water supply systems in Bekwai, Atebubu, Enchi, and Wassa Akropong.

Acheampong (2009: 26) in evaluating the PPP model for the Bekwai Small Town Water Supply System in Ghana revealed the following key findings and lessons:

1) The use of direct community management was considered inappropriate because of the potential technical, managerial and institutional challenges associated with the size of the water supply system (about 500 house connections and 40 public standposts).
2) The management contract is characterised by performance-based remuneration with penalties for non-performance.
3) Since long interruptions go against the private operator, interruptions are minimal and occur for short durations.
4) It provided technical expertise for efficient operations and introduced **some level of immunity against local politics and political interference**.

A weakness identified, though was the lack of clarity on the responsibilities for major maintenance. There was a problem of where to draw the line between maintenance and rehabilitation to be able to know the responsibilities of the Private Operator and the Water and Sanitation Development Board. This weakness is indicative of the fact that the budgets for operation and maintenance of the system might not have been thorough and comprehensive enough. These could be resolved by a functioning regulator/regulatory framework.

2.6 Private sector participation in small towns piped water services – the case of Uganda

2.6.1 Introduction

This section reviews the experience of private sector participation (PSP) in small towns in Uganda using a WSP Working Paper prepared by Maximilian Hirn (2013:1 to 29).

The water sector reforms of Uganda in the 1990s, which essentially moved away from a highly centralised system of administering water services planning and delivery to a more

decentralised framework anchored on a constitutionally and legally-mandated private sector initiative.

By way of definition, Uganda considers a town 'large' if the water supply in the urban area is managed by the National Water and Sewerage Corporation (NWSC). If not, then the urban area[3] is a small town. 156 urban areas were thus classified as small towns in 2010/2011, with approximately 2.4 million inhabitants.

Of the 156 small towns, 105 had operational piped water systems in 2010/2011 out of which 95 had gazetted Water Authority (WA), normally represented by the town councils. 83 of them had appointed a Water Supply and Sewerage/Sanitation Board (WSSB), which then may hire the Private Operator (PO).

Essentially, the private operator manages the water system in contract with the local government. All assets such as pipes, pumps etc. remain under the ownership of government. Customers pay for water to cover O&M costs, though O&M is partly subsidised whilst system construction and extensions are generally financed publicly.

As at February 2012, there were 21 POs (i.e. Private Companies) operating small towns water systems under active contract with the WSSB. The POs are usually engineering and contracting firms most of which are based in the national capital (Kampala) offering other services and are therefore not specialised water system management firms. Some town councils especially those with small systems hire private individuals to oversee their networks; a common practice in rural growth centres (settlements with population between 2000 and 5000) too. The POs employ an average of five staff per system, although they may all not be full time. It was noted that managing small towns systems is not big business in Uganda as even the largest Operator is paid just above US$25,000 per month for managing 16 systems and makes a net profit of about US$5,000 after meeting the costs of staff, power and minor repairs as well as taxes.

There have been some significant achievements as outlined below:

1) Connections have expanded and system sustainability has improved to the point that over US$2 million tariffs are collected annually and the average system can cover operating costs
2) Collection efficiency in PSP towns has improved to over 90%
3) Water metering is almost universal
4) Water has remained affordable

[3] There were about 186 urban areas in Uganda.

5) There is much better data collection than was previously the case
6) The sector has been reorganised with regular reviews attended by all stakeholders

On the other hand, some challenges have been identified as follows:

1) Non-clustering of the small towns for POs resulting in high overheads
2) Short duration of contracts, traditionally three years but now shifted gradually to five years after some pilots.
3) Long delays in contract renewal sometimes stretching for 10 months creating a management vacuum between the end of one contract and the beginning of another. Town authorities step in and manage the systems during this period.
4) Procurement corruption and commercial corruption
5) Possibility of over-declaring some expenditure items and over-stating non-revenue water to increase actual profits over reported profits
6) Irregular monitoring of POs through spot checks/Performance data not regularly and comprehensively verified
7) Low opportunities for private financing from Banks, for instance.

2.6.2 Reflections on the Uganda Case Study

The fact that Uganda recognised the urban bias of small towns and adopted private sector participation as the foundation for the water sector reforms in contrast to community management for point sources is commendable.

However, there appears to be too much involvement of both central government and local government, which might compromise the autonomy of the private operator. Furthermore the appointment of the Water Supply and Sewerage Board by the Water Authority/Town Council, which signs the contract with the POs and also signs a Performance Agreement with the Ministry of Water and Environment (MoWE), is an area of weakness. This is because the members of the WSSBs are not technical people who can effectively supervise the POs. It was observed by the evaluation that, the POs are increasingly becoming more knowledgeable than the WSSBs, who are sometimes changed after elections.

The technical professionals who may not have the numerical strength to be able to regulate, and supervise the POs will be compelled to rely on the local governments for this important oversight responsibility, which does not happen because of capacity gaps.

The fact that tariffs are required to cover O&M costs only, excluding capital expenditure renders both the POs and the water systems dependent on government for major replacements, extensions and expansions. This dependence on government for these

expenditure exposes the systems to the risk of long downtimes and reduced service levels since government usually have funding/budget shortfalls and financing will become a problem. The ultimate burden falls on the user population, who incidentally are not given any clear role in this management arrangement. The water services do not have the opportunity to climb the O&M ladder from minor repairs, to major repairs and replacements, to rehabilitations, to extensions, and expansions, which to a large extent have to be self-financing to ensure sustainable service delivery (see IRC and Agua Consult, 2011:3).

Since the government places a cap on water tariffs, it should be clear whether government has budget to promptly make up the shortfall in tariffs, which comes about as a result of the ceiling.

2.6.3 Lessons and recommendations from the Uganda Case Study

Key lessons that could be learnt from the Uganda Case Study are:

1) The introduction of private operator management model does not automatically guarantee sustainability. A lot of work is needed in modelling it for success.
2) Too elaborate government control and regulation creates dependency syndrome and pre-dispose the services to political interference.
3) Putting POs under local government control/supervision usually result in monitoring and supervision deficiencies due to unequal capacity in terms of knowledge and skills.
4) The incidence of reported corruption in POs procurement and commercial activities in amidst heavy government and local government involvement in the PO arrangements calls for more transparency and accountability systems, including regular independent audits and technical monitoring and supervision.
5) The size of small towns requires clustering a number of them to make them more attractive in terms of profitability and reduced overhead costs.
6) If the government is not able to provide revenue shortfalls arising from the tariff ceilings imposed, then water services should be allowed to recover full costs but cut down on unnecessary expenditures in order to make the services still affordable.
7) Contracts should have relatively longer duration, a minimum of five years to provide incentive to POs to source finance and inject into system expansion and extensions.
8) It is not helpful to have a lull between two contracts (the end of previous contract and the beginning of new a new one). That will give room for accountability and responsibility challenges. Old contracts should have a smooth transition into new contracts. The contracting procedures should be made more efficient and less cumbersome avoiding delays/red tape.

9) Private operator management makes reporting and data collection easy and efficient as staff from intermediary agencies do not have to travel frequently to all the systems for performance data. These are self-reported. What will be needed is regular verification of the [performance data through spot checks.
10) Too much control of POs from central and local government stifles initiative, innovations and does not allow POs to take risk, which is a key attribute of entrepreneurship.
11) There are hidden profits, which can be checked through a more professional oversight.
12) Whilst there are some positive outcomes, there does not seem to be conscious efforts to undertake periodic assessments and resolve emerging challenges.

2.7 Monitoring and evaluation

Monitoring and evaluation and reviews are essential requirements for sustainability of water supply and sanitation services. Harvey and Reed (2004: xxi) describe it as the mortar that holds the building blocks for sustainability together and ensure the integration of the different sustainability factors. It is a dynamic process that should cover all levels of operation, from national level through to the community level, and all aspects of rural water supply programmes namely policy, institutional functionality, finances, technology and O&M (ibid).

The Sustainability Charter (2012) commits to utilise appropriate and consistent metrics, evaluation criteria, and tools to monitor and measure performance relative to long term service delivery throughout the solution life cycle. This will help ensure timely identification of service delivery challenges and to continuously improve the situation (ibid). The results of monitoring are useful not only for decision making and performance improvement (Harvey and Reed, 2004: xxi) but also for reporting and knowledge sharing (Sustainability Charter, 2012).

IRC and Agua Consult (2011:24) during the Ghana Country Study acknowledged that little data exists, a situation that might be due to weak M&E systems in which data is rarely collected regularly for analysis, planning and decision-making.

2.8 Changes in the service levels of small towns

In comparing theory versus reality, IRC and Agua Consult (2011:24) concluded that many inhabitants of small towns access a service that is, at best, sub-standard. On a positive note, however, it was noted that small towns still present a bright spot on Ghana's water supply service delivery landscape (ibid).

Without an effective sustainability profile of water supply services, communities, particularly small towns will continue to experience negative changes in their service levels since the water supply systems may not be rehabilitated, upgraded or expanded to meet the growing demand from an increasing population (Caplan and Harvey, 2010:7).

2.9 Chapter summary

The literature review brought to the fore the uniqueness of small towns and the 'management gap' associated with it (Pilgrim et al., 2007:1). The rapid rates of population growth in small towns relative to the classical urban settlements support the need to develop adequate management capacities, which will respond to the increasing future demands. Professionally flexible, dynamic and adaptive institutional attributes are required to meet the changing needs of small towns populations.

The literature did not highlight the behaviour of high water consuming groups such as house connections, boarding schools, large health institutions, and barracks vis a vis sustainable management of piped water services.

The following are lessons learnt or conclusions from the literature review:

1) Understanding the unique character of small towns as rapidly growing and diverse group of people with different kinds of water demand is crucial in order to appropriately adapt the design of piped water infrastructure and management models to their needs.
2) Targeting small towns with piped water supply systems has the potential of significantly increasing coverage levels and helping to speed up progress towards the MDGs because of their relatively dense population.
3) Increasing water supply coverage through the provision of new water supply infrastructure in order to meet targets is as important as sustaining existing ones if progress is to be made.
4) Rationalising the mandates and leadership roles of key actors and stakeholders will promote greater responsibility, commitment and accountability, which will engender institutional confidence and attract more funding.
5) Strengthening operation and maintenance for sustainability requires a mainstreamed monitoring and evaluation system.

CHAPTER THREE

3. Methodology

3.1 The Research Approach

The case study approach was selected because of its strength in doing a detailed in-depth investigation into one or a few instances of a phenomenon (Descombe, 2010: 52). Feagin et al., (1991 cited in Tellis, 1997:1) also noted that case study is an ideal methodology when a holistic, in-depth investigation is needed. The need for "how" or "why" questions; when the investigator has little or no control over events; and when the focus is on a contemporary phenomenon within a real-life context, are conditions, which justify the choice of the case study method (Yin, 2009:3). Yin (2009:11) further noted another distinguishing characteristic of case study as opposed to history as its reliance on two additional sources of evidence namely:

1) Direct observations of the events being studied and
2) Interviews of the persons involved in the events.

Further, the case study approach' is seen as a systematic inquiry into an event or a set of related events, which aims to describe and explain the phenomenon of interest (Bromley, 1990:302 cited in Zucker, 2009:1). According to Mariano (1990, cited in Zucker, 2009:1), the purpose of a case study research may be exploratory, descriptive, interpretative and explanatory. Guba and Lincoln (1981; cited in Zucker, 2009:1) also identified factual, interpretative and evaluative case study types. Furthermore, the flexibility of the case study approach, which allows, invites and encourages the use of a variety of sources, a variety of data types and a variety of methods (Denscombe, 2010: 54) provided additional incentive for its adoption for the research. Below is the four-stage methodology for case studies recommended by Yin, 1994 (cited in Tellis, 1997:1), which was adopted for the research.

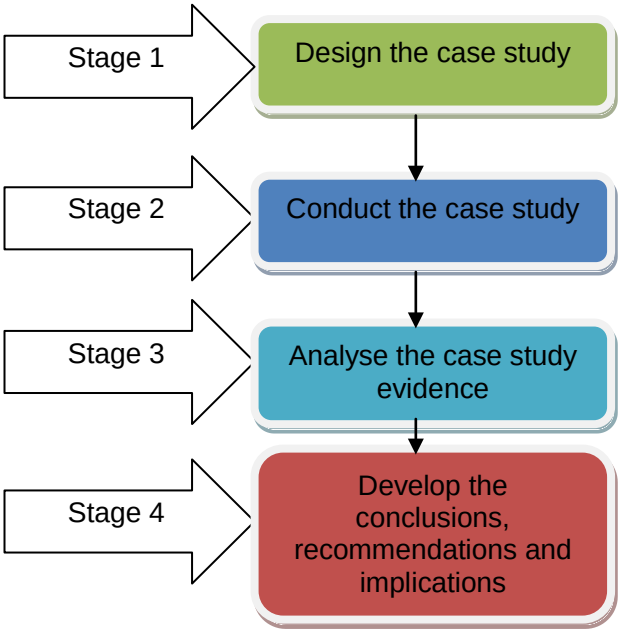


Figure 3.1 The four-stage methodology adopted for the research (source: Yin (1994, cited in Tellis, 1997:1)

3.2 The research aim, objectives and research methods used

The research reviewed and analysed the situation, effectiveness and prospects of small towns piped water services sustainability with respect to such factors as finance, functionality, operation, technical, management/governance, social and institutional capacity issues and interrelationships (see table 3.1).

Table 3.1 Aligning research objectives and questions with data collection methods

Research objectives/questions	Research methods and sources of data
Objective 1: Assess the status, effectiveness and prospects of the various aspects of sustainability and their potential impacts on small towns piped water services in Ghana: Research question 1.1: What is the state of the small towns piped water services as well as options available for improvement?	• Documents review including grey literature from the WSMTs, MMDAs and CWSA (Regional Office and Head Office) • Key informant interviews using semi-structured interview guides/questionnaires • Direct observation in the communities • Focused Group Discussion with the WSMTs along with the administration of a detailed open-ended questionnaire
Objective 2: Assess the effectiveness and outcomes 'of sustainability structures, systems, procedures, and principles implemented in small towns' water supply projects in Ghana with respect to the performance of communities (WSMTs) and the private sector organisations they use. Research question 2.1: How strong/effective are WSMTs and their governance systems	• Focused Group Interview/Discussion (with WSMTs) using open-ended questionnaire; • Key Informant Interviews with relevant Local Government Departments and Community Water and Sanitation Agency as well as the WSMTs/Operating Staff; • Documents review including grey literature (which covered operational and management, financial and maintenance records of the WSMTs; and • Direct Observations of the physical components of the water systems
Objective 3: Identify gaps, weaknesses, and strengths of existing institutions/governance structures and systems for small towns piped water supply. Research question 3.1 What are the strengths, weaknesses, opportunities and threats of key institutions connected to small towns piped water services? Research question 3.2: What lessons can be learnt from existing literature on experiences of water supply sustainability?	• Key informant interviews with Staff of CWSA Regional Office and the Head Office, Staff of Local Government Departments for Water and Sanitation, and Private Sector Service Providers • Key Informant interviews with WSMTs, Operating Staff and the relevant institutions (Local Government Authorities and CWSA) • Administration of open ended questionnaires
Objective 4: Assess the support systems available for community management with respect to the role of	• Key Informant interviews

Research objectives/questions	Research methods and sources of data
Local Government (District Water and Sanitation Teams (DWSTs)), CWSA and the private sector service providers. Research Question 4.1: Do the community management structures receive technical and financial support from the Local Government Authorities (MMDAs) and CWSA after projects have ended? Research question 4.2: Who regulates the relationship and transactions between the communities (WSMTs) and the private sector service providers and how well do they perform this role? Research Question 4.3: Are maintenance services from the private sector easily accessible? Research Question 4.4: Are there guarantees or warranties for defect liability in respect of services provided by the private sector and how effective are these warranties?	• Administration of semi-structured and open-ended questionnaires • Direct observation and • Review/analysis of grey literature.
Objective 5: Assess/identify the critical success factors under each of the sustainability themes (i.e. financial, operational, technical, functionality, institutional) Research question 5.1: What are the critical success factors for financial, institutional, operational, technical, and functionality aspects of sustainability in small towns?	• Key informant interviews of Operating staff of WSMTs, Staff of Local Government Authorities and CWSA, Private Sector Service Providers as well as focused/mixed group discussions with WSMTs, and review/analysis of grey literature • Administration of semi-structured and open-ended questionnaires • Documents review • Direct observation or technical inspections
Objective 6: Identify other sustainability-related needs of the communities (Water and Sanitation Management Teams and their Operating Staff). Research question 6.1 What are the needs of the community/WSMT in terms of sustainability?	• Administration of semi-structured interviews • Key Informant interviews with WSMTs, operating staff, DWSTs and CWSA • Documents review from different sources and by different means including textbooks, Practitioner Papers, Reports of Studies, and the internet particularly with Google search engine
Objective 7: Make recommendation for improvement of small towns piped water services Research objective 7.1: What actions are required to improve upon the sustainability of small towns piped water services?	• Documents review, • Analysis of research findings • Key-informant/semi-structured interviews with WSMTs, Operating Staff and Staff of Local Government Authorities and CWSA

Source: Author's construct, 2014

3.3 Selection of study area

Four small towns in the Central Region of Ghana were selected for the case study. The selection of the Central Region was guided by its long history of implementing small town piped schemes since 1995 with support from different External Support Agencies (ESAs)

including the French Development Agency (AFD), European Union, the IDA of the World Bank, and DANIDA. The criteria used for the selection of the four case study sites were:

1) The town should fall within the population definition of small towns by the CWSA i.e. 2000 – 50,000 (CWSA, 2003: 5).
2) The small town piped service should have a Water and Sanitation Management Team (WSMT) who will be available for interviewing
3) The piped system in the small town should be five years or older.
4) At least three of the selected small towns should be in different districts to allow for a review of the institutional support provided by the water and sanitation departments of different local governments.

These small towns were expected to be representative of all small towns in Ghana as they were implemented within the same policy, legal and institutional frameworks.

Four case study sites (see the map below) out of the 47 functioning small towns in the region at the time were selected:

1) Assin Akropong in the Assin North Municipal
2) Assin Bereku in the Assin North Municipal
3) Twifo Akropong in the Twifo Atti Morkwaa District and
4) Aburansa in the Komenda Edina Eguafo Abirem (KEEA) Municipal

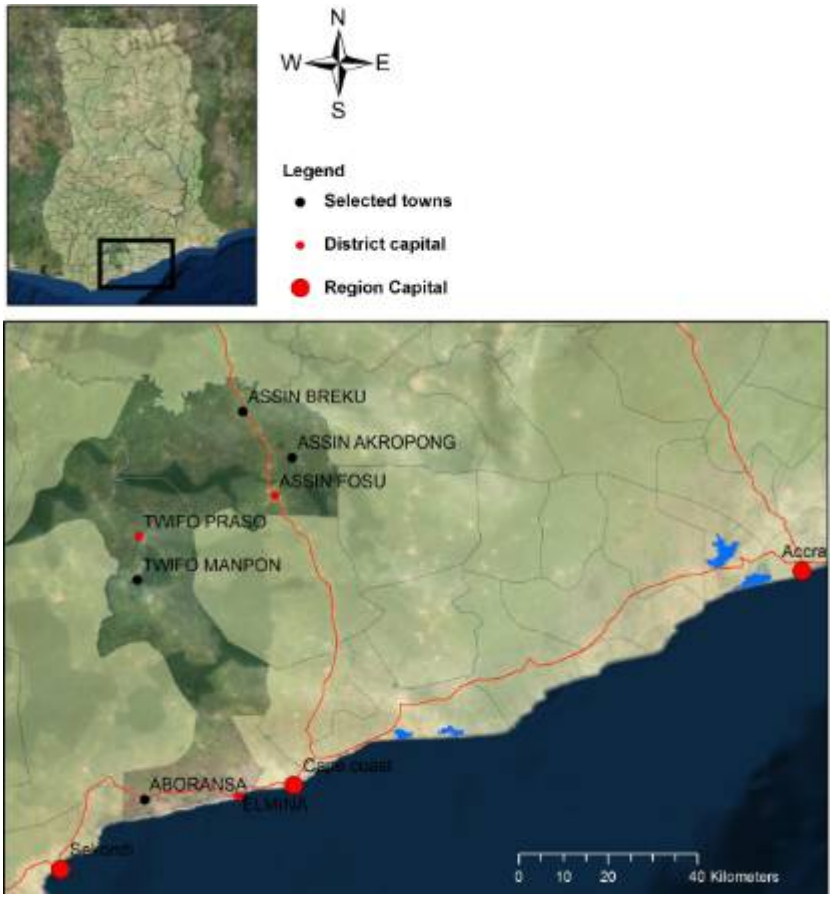


Figure 3.2 Map showing the case study sites (Source: Author's construct, 2014)

Size was an important criterion for the selection of the research sites, in which case all the four cases selected (see table 3,2) were small towns per the definition of CWSA (2003: 5), which have piped drinking water (Denscombe, 2010: 57).

Table 3.2 Selected small towns for the case study and some characteristics

District/ Municipality	Community	Estimated population as at 2014 by participants	Specific source[4] (if any of current estimated population by participants)	Municipal and District Assembly's 2013 Projections based on the 2010 Population Census	Description of water system	Year of completion
Assin North Municipal Assembly	Assin Akropong	7000	Assemblyman and Unit Committee Chairmen	**4,247**	Groundwater based piped scheme hooked to the national electricity grid	2010
Assin North Municipal Assembly	Assin Bereku	15,796	Population from a 2013 Household Census conducted by the Assin North Municipal Assembly with funding from USAID	**8,637**	Groundwater based piped scheme hooked to the national electricity grid	1998
Twifo Atti Morkwaa District	Twifo Mampong	5,700	From the Assemblyman, who made reference to the 2010 Population Census	**3,998**	Groundwater based piped scheme hooked to the national electricity grid	1993
Komenda Edina Eguafo Abirem	Aburansa: and the other six communities namely: Aborebeano, Kafodidi, Dominase, Antado, Nyinase and Kwesikwaa	12,000	WSMT's own rough estimate for 2014	**13,035**	Multi-village Groundwater-based Mechanised Piped Scheme hooked to the national electricity grid and based on 1 borehole with 5 High Level Tanks (1 big and 4 other smaller tanks) serving 7 communities	1996 (but started operating it in 1997)

Sources: Field Survey, 2014 and the Municipal and District Assemblies' Official Projections, 2013

[4] The estimations from participants and other sources may not be deemed acceptable nor official but offers an important validation of how much communities feel their populations have been underestimated especially as it represents a key basis for planning, design capacity and water tariff setting

3.4 Description of data collection methods and tools used

The qualitative method of data collection was mainly used although tools were developed to capture as much quantitative data as possible. These methods adopted and the tools developed were intended to introduce consistency into the process and create conditions of comparability among the four case study sites during the process of data analysis.

3.4.1 Data collection techniques used

The main data collection method used was the case study. Multiple techniques were used in order to triangulate responses and enhance the reliability and validity of the data. These were:

1) Documents review, including grey literature
2) Archival records
3) Interviews - semi-structured interviews with key informants and different categories of respondents
4) Direct observation

All the above evidence sources have their strengths and weaknesses as presented in the table below culled from Yin (1994:80 cited in Tellis, 1997:8).

Table 3.3 Data sources and their strengths and weaknesses

Source of evidence	Strengths	Weaknesses
Documentation	• stable - repeated review • unobtrusive - exist prior to case study • exact - names etc. • broad coverage - extended time span	• retrievability - difficult • biased selectivity • reporting bias - reflects author bias • access - may be blocked
Archival Records	• Same as above • precise and quantitative	• Same as above • privacy might inhibit access
Interviews	• targeted - focuses on case study topic • insightful - provides perceived causal inferences	• bias due to poor questions • response bias • incomplete recollection • reflexivity - interviewee expresses what interviewer wants to hear
Direct Observation	• reality - covers events in real time • contextual - covers event context	• time-consuming • selectivity - might miss facts • reflexivity - observer's presence might cause change • cost - observers need time

Source: Yin, 1994:80 cited in Tellis, 1997:8

3.4.2 Data collection tools used

Detailed questionnaires were developed with open-ended questions, carefully formulated to guide the discussions and interviews and to help cover as many issues as possible and organise the thinking processes into a logical flow of open-ended questions and answers.

The questionnaires were designed for different groups of respondents at different levels including:

1) The Water and Sanitation Management Teams and their operating staff
2) A Plumber
3) District Water and Sanitation Teams at the District and Municipal Assemblies
4) The Central Regional office of the Community Water and Sanitation Agency and
5) The Community Water and Sanitation Agency Head Office.

Some data capture templates were also developed for the collection of data from grey literature whilst digital camera was used to capture some physical components or situations.

3.5 Sources of information

Table 3.4 shows the sources of information, informants, location, and rationale

Table 3.4 Types of data and information sources

Type of data	Source of data	Informants (if applicable)	Location	Rationale
Policy, legal mandate and formal institutional arrangements/capacity	Existing Documents (Policy and legal documents, and guidelines) Interview	DWST members CWSA Head Office CWSA Regional Office	Internet, District Assemblies (Assin Fosu, Twifo Praso, and Elmina) and CWSA at Cape Coast and Accra	To understand the institutional arrangements and responsibilities for sustainability and how well they are being discharged
Coverage data	CWSA statistics on rural water supply coverage in Ghana	MIS Units: CWSA Head Office and CWSA Central Regional Office	CWSA in Accra and Central Region CWSA in Cape Coast	To obtain official statistics to support the analysis
Community institutional set-up for community management	Grey records, documents, and the members of the WSMTs interview	Members of the WSMTs and their operating staff Programme Officer of TREND Group responsible for the	Assin Akropong, Assin Bereku, Twifo Mampong and Aburansa CWSA, Cape Coast	Evaluate the composition of the WSMTs, their functions and effectiveness as well as linkages with the District

Type of data	Source of data	Informants (if applicable)	Location	Rationale
		ongoing IDA-funded Small Towns Project in the Central Region	TREND Group in Cape Coast	Assembly, CWSA and the Private Sector
Operational records/issues including water production, consumption, consumer mix and implications and water quality issues	Grey literature: Operational records of the WSMTs Interview Direct observation	Water system operators, System Managers and the members of the WSMTs Programme Officer of TREND Group responsible for the ongoing IDA Small Towns Project in the Central Region	Assin Akropong, Assin Bereku, Twifo Mampong and Aburansa TREND Group in Cape Coast	Analyse how water demand is being met; levels of non-revenue water, evaluate management effectiveness and water system viability using the water meter as a tool
Technical data including design records	Archival records Grey literature	Water System Operators, Managers and the Chief Water Supply Engineer of CWSA, Central Region	Assin Akropong, Assin Bereku, Twifo Mampong and Aburansa Central Region, CWSA, Cape Coast	Assess original capacity of the water supply system and determine the scope of extension or expansions made or needed
Maintenance data or information	Grey literature: Maintenance records Direct observation	Water system operators, managers	Assin Akropong, Assin Bereku, Twifo Mampong and Aburansa	To analyse the maintenance challenges being faced and assess system functionality and quality of service provided by private sector
Financial and management issues	Grey literature: WSMTs' Cash Book, Bank Books, Revenue Records, Billing records	Accounts Clerk or Financial secretaries, WSMT executives Programme Officer of TREND Group	Assin Akropong, Assin Bereku, Twifo mampong and Aburansa TREND Group in Cape Coast	To evaluate the financial viability of the water service, determine revenue collection efficiency and non-revenue water,

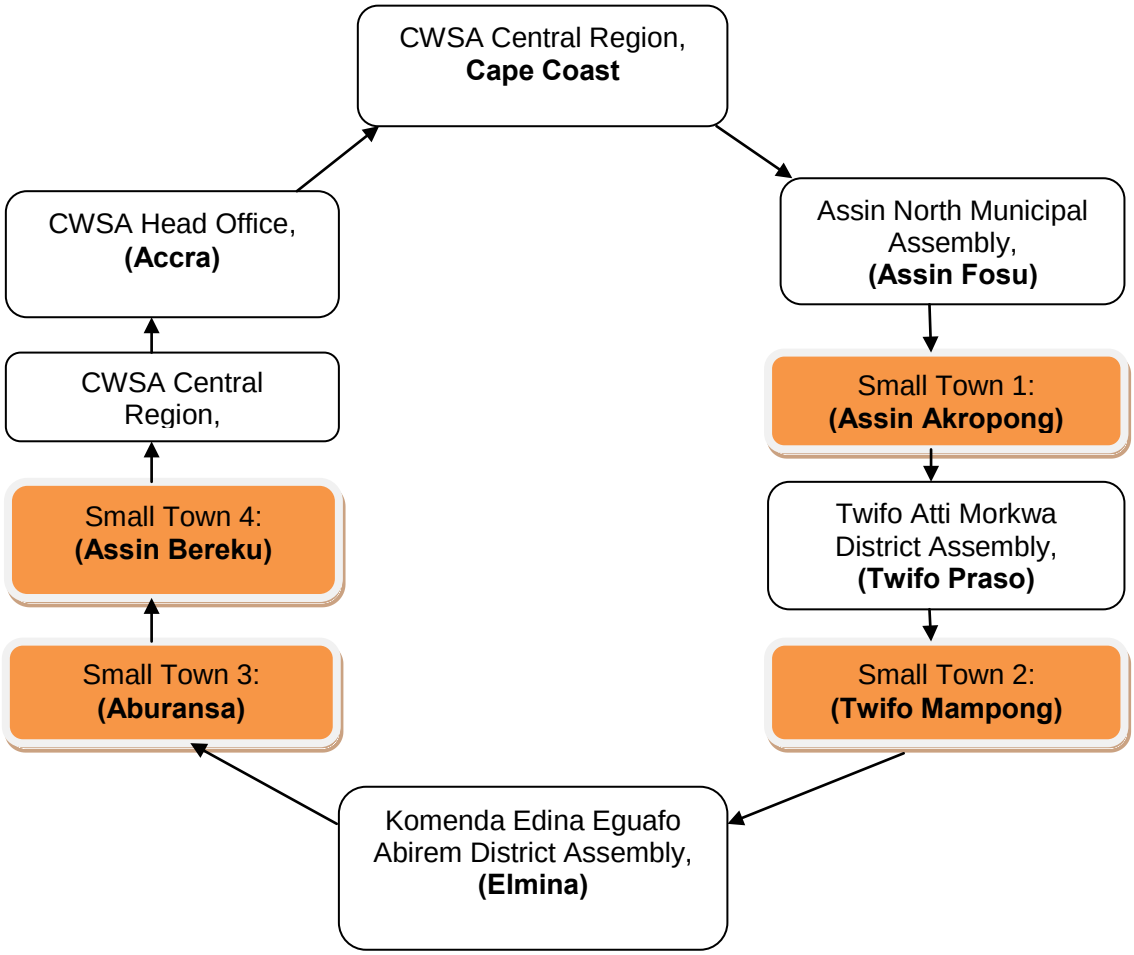
Type of data	Source of data	Informants (if applicable)	Location	Rationale
		responsible for the ongoing IDA Small Towns Project in the Central Region		analyse the utilisation of funds generated
Governance and accountability data and information	Bye laws for WSDBs, sector policies and members of the WSMTs	WSMTs, DWSTs, CWSA Programme Officer of TREND Group responsible for the ongoing IDA Small Towns Project in the Central Region	Assin Akropong, Assin Bereku, Twifo Mampong and Aburansa CWSA, CR – Cape Coast and CWSA HQs, Accra TREND Group in Cape Coast	To understand the governance structures and accountability systems and within and across levels and inter-relationships
Monitoring and Evaluation	Monitoring reports, Activity plans etc. Monitoring frameworks	DWSTs, CWSA Programme Officer of TREND Group responsible for the ongoing IDA Small Towns Project in the Central Region	DWSTs and CWSA, CR – Cape Coast and CWSA HQ, Accra TREND Group in Cape Coast	To understand the M&E framework for small towns and assess the extent of its implementation and effectiveness

Source: Field survey, 2014

3.6 Organisation of the field work

Research permission was obtained by presenting the introductory letter obtained from WEDC to the Central Regional Director of CWSA, who in turn prepared a letter introducing the researcher to the participating Districts and requesting their assistance and support for the research. The members of the three participating DWSTs also helped to arrange meetings with the WSMTs and operating staff of the four selected small towns. These entry protocols were particularly helpful in getting the attention of the respondents and most importantly their willingness to freely provide/share information, with the understanding that it is just for academic purposes although lessons could be learnt to help them overcome challenges and improve the quality of water supply services.

The field data collection was undertaken within the period of July and August, 2014 with some mopping-up in September, 2014.The diagram below illustrates the movements during the field work excluding the multiple visits to some of the places due to unanticipated changes in the appointments.



Flow chart on the author's sequence of movement (Source: author's construct, 2014)

3.7 Reliability of the information

The reliability and validity of the data collected was enhanced by ensuring adherence to the case study protocols and using multiple data sources for triangulation. The case study methodology is essentially a triangulated research strategy because of its characteristics of using a variety of data sources, a variety of data types and a variety of methods (Denscombe, 2010: 54).. Stake (1995), (cited in Tellis, 1997:2) described the protocols that are used to ensure accuracy and alternative explanations as triangulation observing that the need for triangulation arises from the ethical need to confirm the validity of the processes. Yin (1994, cited in Tellis, 1997:2) stated that in case studies, triangulation is done by using multiple data

sources. Again, Yin (1994, cited in Tellis, 1997:3) suggested the need to use multiple sources of evidence to ensure construct validity. Knafl Breitmayer, (1989, cited in Baxter and Jack, 2008: 556) concluded that the collection and comparison of data enhances data quality based on the principles of idea convergence and the confirmation of findings.

It is therefore expected that the data collected and analysed are reliable and valid by virtue of the inherent triangulations in the case study methodology and the conscious efforts made by the researcher to obtain credible data.

3.8 Analysis of data

In view of the qualitative nature of case studies, the analysis was largely descriptive and evaluative with appropriate interpretations of the evidence gathered and synthesised. According to Yin (1994, cited in Tellis, 1997:13), data analysis in case studies consists of **examining**, **categorising**, **tabulating**, or otherwise **recombining the evidence** to address initial propositions of a study. Since analysis is one of the least developed aspects of the case study methodology, the researcher relied on experience and the knowledge/insight gained from existing literature to present the evidence in various forms, using various interpretations (ibid). There were convergence of ideas and conclusions from multiple data sources in the process of analysis, which added strength to the findings (Baxter and Jack, 2008:554).

A comparative analysis between the Ghana Case Study and the experience from Uganda shows key differences and similarities in the small towns sub-sector (see table 4.22).

3.9 Limitations and constraints

It was a bit difficult to have access to some respondents, especially some senior management category, who are usually busy. The strategy used to overcome this was patience and flexibility to work into the times convenient for such officials. Another way out was to interview other senior staff. One key district respondent had to be eventually interviewed via telephone.

The questionnaires with open-ended questions were too detailed as a result of which quite a lot of time was used in completing them with the respondents. Moderating the discussions, keeping to the questions, and only probing when necessary to validate and clarify responses, minimising digression and creating a relaxed and free atmosphere in which the respondents took charge of the process, helped to overcome this limitation and facilitated the satisfactory completion of the sessions.

Almost all the WSMTs of the selected small towns did not have adequate operational, financial, maintenance, management records/data, and where some of these were available, they were not properly organised and updated. This caused delays and created avoidable data gaps. In such situations, qualitative description of the situation was resorted to instead of the more desirable quantitative analysis.

Closely related to the problem of inadequate records is the non-functionality and non-use of water meters. This was overcome through relevant interpretations during the analysis of the overall sustainability of the water services.

The loss of archival records and institutional memory especially by the small towns water services, which did not have an office and those which have had to change members and staff of the Water and Sanitation Management Teams over the years. This constrained efforts at making quick references to validate dates and other records as needed. The author consulted other levels of stakeholders especially the MMDAs and CWSA for such information.

The research was time consuming mainly because of the number of case study settings used (four) and the many factors of sustainability investigated. The attitude adopted was to be motivated by the value in having diverse contexts for the case study and the opportunity to discover unique lessons and challenges from the various sites for comparative analysis to establish differences and similarities. Selecting districts, which were not too far apart, was also helpful in minimising logistical challenges. The many sustainability factors covered by the research also gave the research a wider framework/focus.

The element of subjectivity on the part of the researcher could not be ruled out since the case study was of the descriptive and intrinsic type (Stake, 1995 cited in Tellis, 1997:1). Defining clear objectives and questions, development of tools used to collect data and getting other people's perspectives helped to minimise biases. The researcher also tried to avoid influencing the responses of participants by allowing them to flow in answering the questions and sharing their perspectives on the subject and coming in only when necessary to probe further to validate or clarify responses.

Triangulating the questions by asking the same questions in different ways and asking different respondents similar questions also helped to overcome subjectivity.

3.10 Chapter summary

The case study approach proved useful in delving deep into the issues and helped to gather adequate data and information for analysis and discussions. The strength of case studies for

researching into more practical and real-life phenomena or situations was confirmed. As observed by Yin (1994, cited in Telis 1997:13), developing the analysis and report writing stages of case studies will be important in moving the methodology forward. It offers superior value if used for institutional analysis/assessments, project assessments/evaluations, and performance assessments of services as its findings and recommendations are real and relevant in terms of achieving desired improvements/transformations for greater effectiveness, efficiency, sustainability, equity, inclusion and pro-poor outcomes. The opportunity for comparative analysis with other case studies has the advantage of promoting cross-learning and replication.

It is important to be conscious of the limitations of the case study methodology and take steps to minimise them especially in determining the scope of the topic, geographical coverage and the number of interviews to conduct/volume of data or information to gather. It is useful to be purpose-driven and impact-focused.

CHAPTER FOUR

4. Key Findings, Analysis and Discussions

4.1 Introduction

This chapter mainly addresses objectives one to six (see table 3.1). It is organised under three broad institutional headings namely CWSA (Head Office and Regional Offices), MMDAs, and the user communities, and also covers the Ugandan case study on private sector participation in the management of small towns piped services.

4.2 CWSA (Head Office and Regional Offices) and the sustainability of small towns water services in Ghana

4.2.1 Institutional arrangement and culture of CWSA

The general orientation and organisational culture of CWSA point to a professional and service oriented entity (PEM Consult, 2006: 52). It has a Head Office in Accra and Regional Offices in all the ten administrative regions of Ghana with staff including Water Supply and Sanitation Engineers, Hydrogeologists, Extension Service Specialists, Management Information System Specialists. The Chief Executive is the overall head of the Agency and Regional Directors head the various Regional Offices.

Whilst CWSA has been instrumental in the progress achieved in having delivered hundreds of small towns piped drinking-water supply services across the country, it is yet to develop a small towns unit, which will take ultimate responsibility for small towns water supply, sustainability and monitoring and evaluation and by so doing respond to the peculiar needs and challenges of small towns and peri-urban communities in Ghana. Instead, small towns have been treated in much the same way as rural communities, with majority covered by the community management model. The organisational culture of CWSA, which is more of professionalism with emphasis on technical capacity building, is a strength which can be leveraged for the benefit of sustainable water services for small towns in Ghana. (see figure 4.1 below).

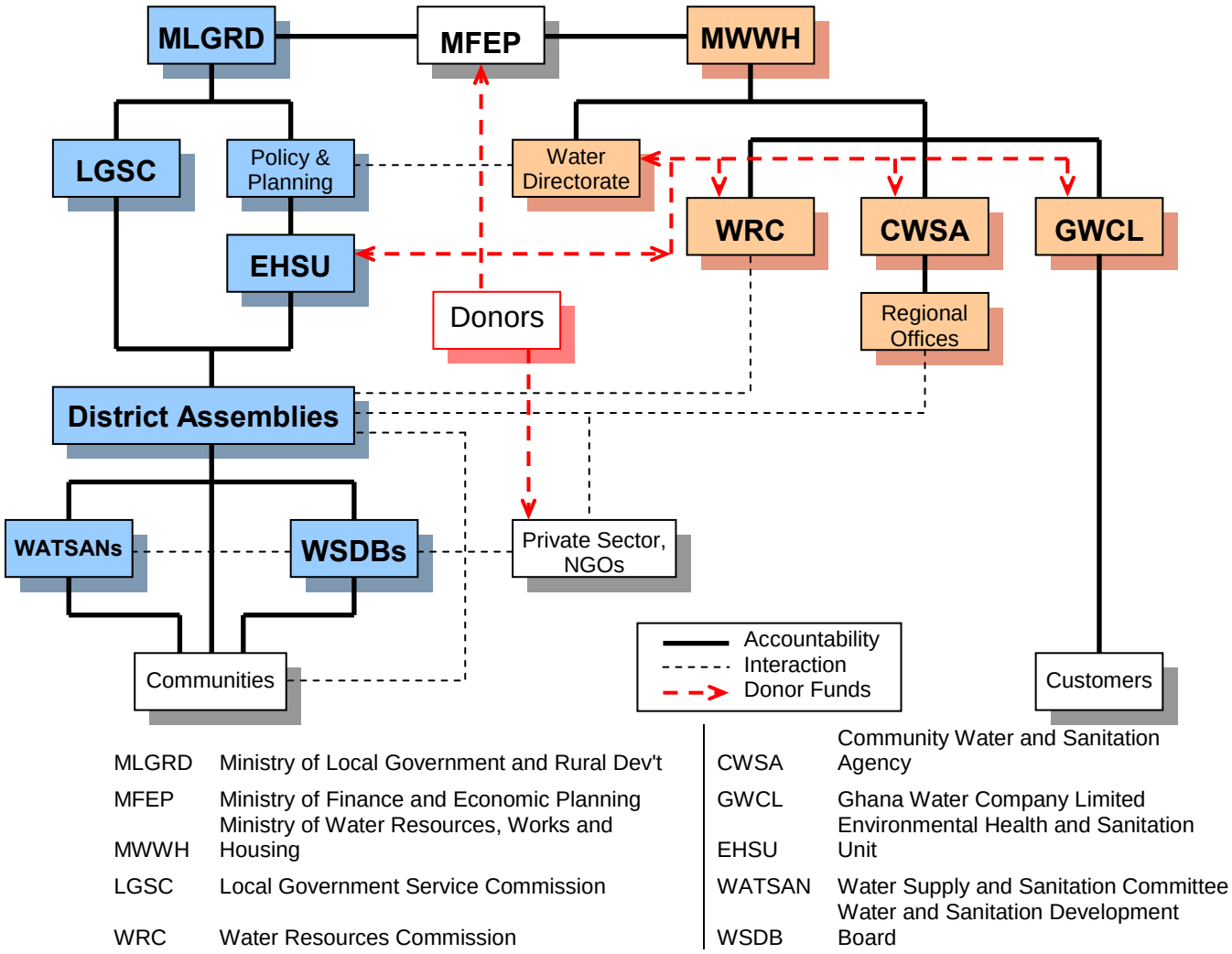


Figure 4.1 Institutional arrangement for rural WASH in Ghana (Source: PEM Consult, 2006:5)

4.2.2 General monitoring of small towns water services

The research found that regular and systematic functionality monitoring of small towns water services was not being done by CWSA and the various MMDAs. This has implications for sustainability as O&M problems may not be detected early. Inadequate operational budget from government to be used for vehicles/motorbikes, maintenance and fuel was identified as major reason for not doing the monitoring especially after projects have ended (see Delbos, 2006: 89).

4.2.3 CWSA's framework for assessing and monitoring rural and small towns water services in Ghana

With the support of the IRC/Triple 'S' Project, CWSA in March 2014 published a framework for the assessment and monitoring of rural and small towns water services in Ghana (CWSA

2014). It is a comprehensive framework, which presents an opportunity for future research into how it is operationalised and how the results are being used to improve the sustainability of small towns piped water services in Ghana.

4.2.4 Implementation of accompanying measures for small towns water services

There is evidence to show that CWSA in collaboration with its partners implemented a number of measures and actions aimed at ensuring the sustainability of the small towns' water services. This has enabled communities to manage the services mostly throughout design life. However, the inability of CWSA and its partners to continue supporting the community management structures after donor-funded projects have ended resulted in some failures in operation and maintenance/sustainability. Almost all the cases studied did not demonstrate the capacity to continue providing adequate service levels at acceptable quality to the people beyond the design life[5] of the systems. Whilst the sustainability gains during donor-funded project implementation are important, the real test of sustainability comes during the post-project phase.

4.2.5 Small towns piped systems functionality database

The CWSA has been promoting the District/Development Monitoring and Evaluation System (DiMES) as the official database for WASH over the years. This, notwithstanding, functionality data is not collected regularly making that part of the Database a bit redundant. The MMDAs interviewed also did not seem to have full knowledge of the DiMES and have not got it installed. The non-availability and use of the DiMES or a national WASH database in some of the MMDAs/DWSTs is an indication of the lack of systematised M&E system for the rural WASH sector of Ghana.

4.2.6 CWSA's role for spare parts of piped schemes (for small towns)

CWSA has facilitated the establishment of spare parts warehousing system for handpumps through private sector participation, with outlets in Accra/Tema, Kumasi and Tamale. However, there has not been a conscious effort to increase access to spare parts for small towns piped drinking-water facilities. One of the towns covered by this research mentioned inadequate access to water meters as a constraint even though that WSMT stopped using the water meters since 1996. The increasing number of small towns water services in Ghana has created good local demand for such spare parts.

4.2.7 The place of O&M and M&E in the institutional set up of rural WASH in Ghana

The research found that, whilst CWSA reflects sustainability objectives in its vision and plans, the human resource requirement for the operation and maintenance of water and sanitation

[5] The design life for small towns piped schemes in Ghana is 10 years

services has not been well-defined and projected institutionally. For instance, CWSA does not have dedicated staff for monitoring and providing leadership for operation and maintenance, even though, it expects the technical (i.e. the Water Supply and Sanitation Engineers and Extension Service Specialists) staff to include it in their core job descriptions. It is believed that O&M and monitoring can easily be taken up by both the engineering and extension services units, even though the available evidence does not support it. However, the institutional and organisational assessment of the CWSA in 2006 concluded that "given the pressure to deliver new systems, the mixing of responsibility for monitoring operation and maintenance (MOM) with other responsibilities inevitably leads to its being sidelined thus supporting the validity of the principle of establishing MOM Units in each region (PEM Consult, 2006:37).

The absence of designated O&M staff at the Head Office and the Regions and M&E staff in the regional Offices of CWSA affects prioritisation and resource allocation for O&M and M&E, which are needed for the sustainability of small towns piped drinking-water services

4.2.8 Fallouts from the community ownership policy

The assumption that, promoting community ownership of the small towns' water infrastructure will translate into better care and management from the community has brought about two serious un-intended outcomes, which are being counterproductive:

a) The habit of community leaders dissolving WSMTs in collaboration with Assembly members[6] and Unit Committees[7]. The effect has been the loss of local capacity and institutional memory for community management of the water services as well as the loss of important documents, records and assets of the WSMTs. Lack of accountability and poor performance of the WSMTs are usually cited as the reason for such dissolutions. This problem can be avoided through the adoption of the private operator management model as an alternative to the community management model, whereby both the legal and de-facto ownership of the piped water services are taken up by the responsible public institution for instance, the CWSA, which optimal regulatory functions.

b) Increasing interest of some community leaders (i.e. traditional chiefs and Assembly members/key opinion leaders) in the O&M funds generated from the sale of water. The revenue generation potential of small towns water services have been noted with interest by the community leaders including local politicians resulting in the use of the small towns water services as a reliable and convenient source of funds for other

[6] The Assembly member is the representative of an Electoral Area at the Local Government Assembly – they have tenure of 4 years.

[7] The Unit Committee is the lowest level of the national decentralisation structure and a sub-structure of the Area or Town Councils of the District Assemblies/Local Government

community development projects or purposes (as was the case in Aburansa and Assin Akropong).

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4.2.9 'Fixed-term of office' for members of WSMTs

Section 6, sub-section 1 of the District Assemblies Model Bye-Law (MoLGRD, 2008) for the Establishment and Operations of Water and Sanitation Development Boards[8] states that:

> "Persons elected to the Board shall serve a four-year term and members, subject to good behaviour shall be eligible for re-election for another four-year term. No person shall serve more than two four-year terms as a member of the Board".

The research, however, found that, this policy has the same effect as the dissolution of WSMTs since there is usually no arrangement for training the new members, who have been chosen to replace those who have finished their maximum terms of office. This does not allow small towns to benefit from the experiences acquired over the years by those replaced. The assumption that the old members may transfer their knowledge and skills to the new members is not consciously followed through.

4.2.10 Implications of the facilitative mandate of CWSA on the sustainability of small towns water services

CWSA, by its mandate, is supposed to build the capacity of MMDAs specially the M/DWSTs and facilitate them to be able to give the necessary support to water beneficiary communities. Unlike other technically biased departments like the Environmental Health and Sanitation; Community Development; Ghana Health Service; Education and Agriculture, which have district offices with technical reporting lines to their regional offices, CWSA does not have a presence at the district level. In other words, CWSA does not have a department at the MMDA, with which it has a direct technical reporting relationship. This makes its role quite challenging and a bit complicated as they can only offer 'non-binding' technical advice, when needed. This also affects monitoring of water services.

4.2.11 Sustainability of the DWSTs without donor projects

Originally, the DWSTs were composed of two full-time seconded staff: one from the Department of Community Development and the other from the Environmental Health and Sanitation Unit working under the leadership of a Technician Engineer recruited by the District Assembly. It has been a Team of three, which had undergone extensive capacity building programmes and were supported with logistics and funding from donor-sponsored WASH projects. District Planning Officers or District Budget Officers were later appointed by the Local

[8] The Water and Sanitation Development Boards (WSDBs) are now called Water and Sanitation Management Teams (WSMTs)

Government Authorities as Desk Officers to coordinate the activities of the DWSTs and serve as a link between the Management of the Assembly and the DWSTs. The research, however, identified a challenge of the sustainability of the DWSTs themselves in the absence of donor-funded projects. The cases studied revealed different shapes and compositions of the DWSTs.

The issue of some DWSTs becoming defunct or disbanded when there are no WASH projects, with consequences for sustainability of existing small towns' piped drinking-water services is becoming common. It is a weakness identified by the research.

4.2.12 Likely challenges of the regulatory mandate of CWSA

CWSA Legislative Instrument 2007 (see CWSA 2011), gives the Agency regulatory powers in addition to its facilitative role. The regulatory mandate is expected to be exercised in collaboration with the MMDAs. This presents another interesting area of research to highlight the operational mechanisms of the Legislative Instrument (LI) and the changes it will bring to the small towns water services sub-sector. Ideally, the regulator should exercise the mandate over the implementer, which in this case are the MMDAs but the nature of the institutional arrangement means that the MMDAs will be assisted by CWSA to regulate the sector. Using the LI to regulate the private sector will, however, be helpful in making sure that they conform to sector policies and standards.

4.2.13 Small towns piped drinking-water supply schemes in the Central Region

The research shows the slow rate at which small towns water systems are being constructed compared to point sources. The result is a manageable number of small towns water services relative to point sources (see table 4.1). The moderate numbers of small towns water services makes them amenable to adequate institutional support to ensure sustainability.

The table (4.1) below shows the number of small towns piped drinking water-services in the central region of Ghana over the period 1993/1995 and 2014.

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Table 4.1 Number of small towns in the Central Region of Ghana

Description	No. of small towns piped water services	No. functioning	No. completely broken down
Existing small towns piped schemes	51	47	4
Small towns piped schemes under construction (to be completed by the end of December, 2014)	15	NA	NA

Source: Field survey, 2014

4.2.14 Management Model for small towns piped water services in the central region

Out of the 51 existing small towns piped drinking-water services in the Central Region of Ghana, only one was being managed by a Private Operator (The Assin Fosu Small Town Water System) as at the time of the research, representing 2%. Thus, 98% of the small towns piped drinking-water services in the region are under the community management model.

4.3 The Metropolitan, Municipal and District Assemblies (MMDAs)

4.3.1 Locus of the DWST within the District Assembly Structure

The MMDAs or Local Government Authorities formed the DWSTs under the facilitation of the CWSA. The DWST is legally not a department of its own. Discussions have been ongoing to integrate it within the Works Department of the District Assembly.

4.3.2 Technical support and monitoring of community management by DWSTs

There are constraints, which prevent the DWSTs from providing periodic technical assistance to communities. The interviews conducted revealed their inability to undertake community outreach and monitoring due to inadequate access to fuel and logistics.

4.3.3 Number of small towns piped drinking-water services in the three case districts

Although there are so many communities in the districts with WASH interventions, the numbers of small towns piped drinking water services are relatively low. Mixing point source[9] communities with small towns piped drinking water services will make monitoring and technical support seem impossible for the few DWST members. One way out might be to use a phased approach, targeting small towns initially and adding point source communities later when resources and logistics situation improve.

Table 4.2 Number of communities with WASH interventions/small towns in districts

Municipal/District	Estimated number of communities with WASH interventions	Number of small towns piped water services	% small towns piped water services out of the total
Assin North	250	10	4.0%
Twifo Atti Morkwaa	170	3	1.8%
Komenda Edina Eguafo Abirem (KEEA)	66	1	1.5%

Source: Field survey, 2014

4.3.4 Small towns piped systems in the case study districts and the populations served

The key informant interview with the M/DWSTs and documents review showed that there are few small towns' piped drinking-water services.

Tables 4.3 and 4.4 and their corresponding graphs present the small towns and their populations in the Assin North and Twifo Atti Morkwaa districts.

[9] Point sources refers to boreholes or hand dug wells equipped with handpumps

Table 4.3 Small towns and their populations in Assin North Municipal Area

No.	Communities	2010**[10]	2013**[11]
1	Assin Foso	30,394	36,267
2	Assin Bereku	7,966	8,637
3	Assin Akonfudi	5,007	5,573
4	Assin Akropong	4,343	4,247
5	Assin Nyankumasi	4,050	4,034
6	Assin Praso	3,806	3,769
7	Assin Dansame	3,409	4,007
8	Assin Awisem	3,230	2,654
9	Assin Kushea	2,989	3,019
10	Assin Dompem	3,028	3,293
11	Assin Wurakese	2,408	2,207

Source: Field Survey, 2014

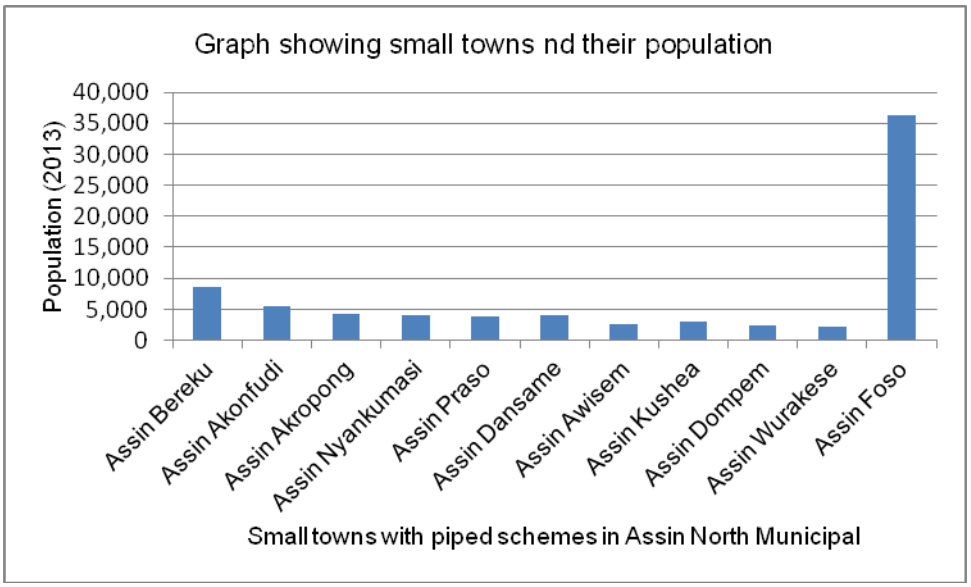


Figure 4.2 Small towns and their population in Assin North Municipal

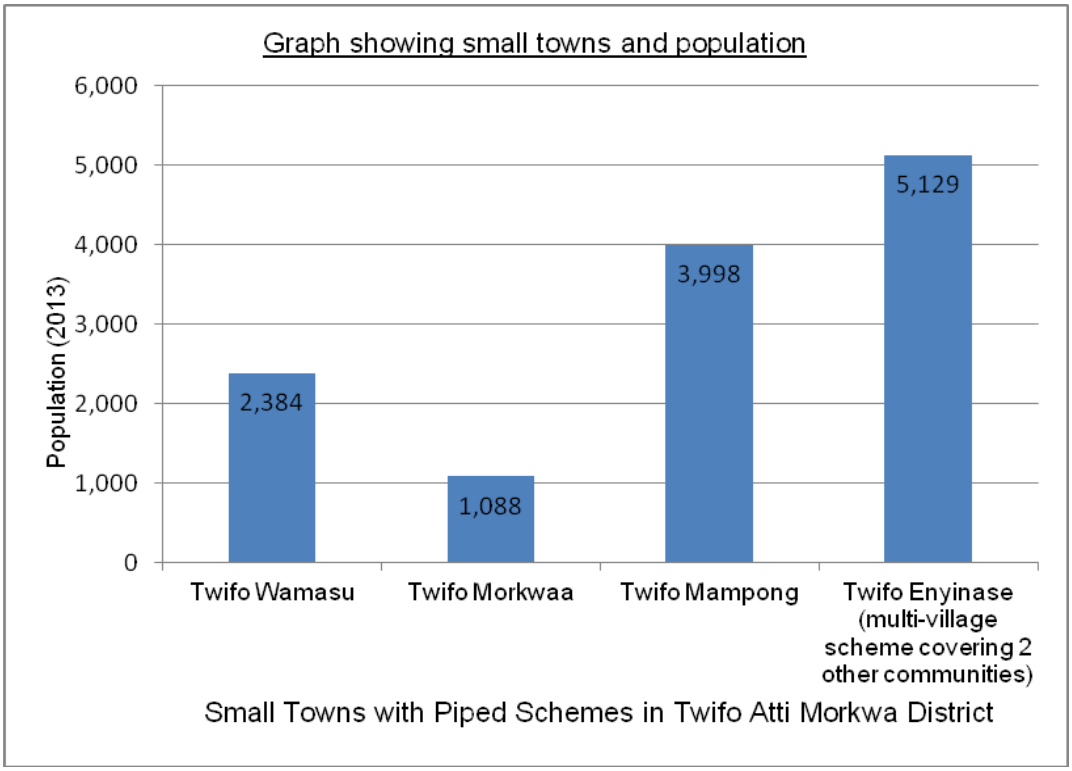
The above graph shows that, apart from Assin Fosu, which is the Municipal capital the rest of the small towns are at the lower end of the population bracket for small towns, and may not be attractive to potential private operators.

[10] ** Figures from the 2010 National Population Census
[11] *** Projections by the Municipal Assembly based on the 2010 National Population Census

Table 4.4 Small towns and their population in Twifo Atti Morkwaa district

Community	2013 Population*[12]	Remarks
Twifo Wamasu	2,384	Existing water system
Twifo Morkwa	1,088	Existing water system
Twifo Mampong	3,998	Existing water system
Twifo Enyinase (2,959)	5,129	New water system under construction (IDA Project) – Multi-village piped scheme
Twifu Kayireku (1,483)		
Twifo Adodom (687)		

Source: Field survey, 2014



4.3 Small towns and their population in Twifo Atti Morkwaa district

4.3.5 WASH Operational Budgets/Funding of WASH activities by the MMDAs

There is very little funding for the implementation of DWST's activities including outreach and monitoring especially after projects have ended and donor funds are no more available. The yearly budget allocations for the operations of the DWSTs are rarely disbursed (see Table 4.5).

[12] Projected population based on the National Population Census of 2010 in Ghana

Table 4.5 Yearly budget allocations and actual disbursements by MMDAs for WASH

Municipal/District	Year	Annual Budget Allocation	Budget Actually Disbursed	Remarks
Assin North	2011	GH₵6,000	GH₵1,000	Not given to the Unit or Team as Yearly Allocation. Based on fuel requests made in respect to some emergencies, which come up
	2012	GH₵6,000	GH₵1,000	
	2013	GH₵6,000	GH₵1,000	
Twifo Atti Morkwaa	2011	GH₵7,000	Nil	
	2012	GH₵7,000	Nil	
	2013	GH₵7,000	Nil	
Komenda Edina Eguafo Abirem	2011	GH₵4,000	Nil	
	2012	GH₵4,500	GH₵600	
	2013	GH₵6,000	Nil	

Source: Field survey, 2014

4.3.6 Key achievements of the M/DWSTs

The key achievements outlined by the Water and Sanitation Teams of Assin North Municipal Area and Twifo Atti Morkwa district did not include sustainability of water supply systems but covered other equally important outcomes as presented in Table 4.6. Komenda Edina Eguafo Abirem Municipal Assembly, however, mentioned the functionality of most facilities as its achievement even though the only small town piped system in the Municipal area covering seven communities had been broken down for over 10 months and the people have resorted to the use of unwholesome water sources.

Table 4.6 Key achievements mentioned by the M/DWSTs

Municipality or District	Key achievements of the M/DWSTs
Assin North Municipal	Good response from schools on handwashing with soap campaigns
	Good response to hygiene and sanitation promotion
	More household latrines being constructed
	Construction of school latrines has reduced open defecation among school children
	There are trained WSMTs to manage the water services
Twifo Atti Morkwaa District	The workshops, which the M/DWSTs have been attending have helped to acquire improved capacity
	Audited two WSMTs' Accounts in April 2012 as part of a mission commissioned by the District Chief Executive to go and resolve a problem in the two communities
Komenda Edina Eguafo Abirem Municipal	Most of the water facilities are functioning because the WSMTs have been sensitized

Source: Field survey, 2014

4.3.7 Major constraints facing DWSTs

The DWSTs identified some specific constraints, which hinder the performance of their work. All three DWSTs were concerned about how they are unable to visit the communities to do monitoring and support them in the management of the water services (see table 4.7)

Table 4.7 Constraints identified by the DWSTs

Municipality or District	Major constraints faced by the M/DWSTs
Assin North Municipal	Inadequate funding of WASH services, poor access to fuel and vehicle for field work
	Bad road network to communities
	Instability of WSMTs due to their frequent dissolution by Assembly members and chiefs
	Forceful take-over of the water systems, sometimes by the Assembly members
	Direct payment of water tariff at the public standposts (Pay-As-You-Fetch) not working well
	Most communities having boreholes or hand dug wells with handpumps are fetching water free. O&M cost recovery is broken down
	Exorbitant charges from private sector service providers is a common complaint received from communities/WSMTs
Twifo Atti Morkwaa District	There is a pick-up vehicle provided by the IDA/World Bank Project but no funds for fuel
	Low motivation due to the absence of Allowances
	No fuel allocations for the Team for fieldwork
	Unable to visit communities because of these constraints
Komenda Edina Eguafo Abirem Municipal	Lack of fuel for the motorbike
	Poor conditions of the roads to the communities

Source: Field survey, 2014

4.3.8 Definition of sustainability and factors influencing sustainability from DWSTs point of view

The three DWSTs demonstrated understanding of the functional view of the concept of sustainability and its influencing factors as shown in their responses captured in 4.8 below.

Table 4.8 Definition and influencing factors of sustainability by DWSTs

Municipality/District	Definition of sustainability	Factors influencing the sustainability of small towns water services from the DWST's point of view
Assin North	Sustainability is the running of the facility so that they (the population) will get safe drinking water all the time	Operation and management of the facility
		Pay-As-You Fetch
		WSMT in place
		Capacity building of the WSMTs
		DWST/CWSA's continuous support for the WSMTs
		Private Operator Management Model is positive. ("The Assin Fosu Small Towns Water Service is under a Private Operator and it is working very well")
Twifo Atti Morkwaa	Implementation of the Pay-As-You-Fetch Tariff System to enable the WSMTs get money to maintain the system	Lack of education or awareness on water
	Regular WSMT meetings ("without meetings, people will be using the money anyhow")	Non-payment of water user fees
	Proper accounting	Inadequate records
	Proper record keeping	Lack of maintenance
Komenda Edina Eguafo Abirem	Regular maintenance	Finance
	Management of finances	Culture of maintenance

Source: Field survey, 2014

4.3.9 Challenges or problems affecting the sustainability of small towns water services

The DWSTs outlined key challenges affecting the sustainability of the small towns' water services. Most of the community-specific challenges mentioned were confirmed.

Table 4.9 Challenges/problems affecting water services sustainability

Municipal Area/District	Key challenges/problems affecting the sustainability of small towns water services from the DWST's point of view
Assin North	Assembly members/chiefs dissolving the WSMTs without the knowledge of the Municipal Water and Sanitation Team (The disbanded members of the WSMTs, which have been trained and coached over time, are usually replaced with completely new set of people who have not benefited from any training). *This action is usually attributed to dissatisfaction of the community leaders over the performance of the WSMTs.*
	Inability of the DWSTs to do regular field visits due to funding and logistics constraints
	WSMTs not rendering accounts to community members
	It is difficult to increase water tariff without which electricity bill could not be paid
	WSMTs not submitting monthly reports since the Municipal Water and Sanitation Team does not visit them regularly
	High service charges by private sector firms

Municipal Area/District	Key challenges/problems affecting the sustainability of small towns water services from the DWST's point of view
	Assembly members do not usually support moves to increase water tariff
Twifo Atti Morkwaa	Family relationships
Komenda Edina Eguafo Abirem	Frequent breakdown of the water system
	Inability to visit them regularly to offer technical support due to funding and logistics constraints

Source: Field survey, 2014

4.3.10 Specific supports given to WSMTs and WSMTs' needs according to M/DWSTs

The support purportedly given to the WSMTs by the DWSTs and the WSMT-specific needs identified are presented in table 4.10.

Table 4.10 WSMT needs and support services provided by DWSTs

Municipality/District	Specific supports given to the WSMTs by the DWSTs	Perceived needs of the WSMTs from the point of view of the DWST
Assin North	Auditing	Training in the Management of O&M/Capacity Building
	Monitoring	They need regular technical support from the M/DWSTs
	Supervision	
Twifo Atti Morkwaa	Meet with them and discuss O&M issues	Training on the management of the water supply system
	Sensitise them to get capable replacements members who are no more on the Team	Records keeping
	Educate them to keep proper records	The WSMTs need a functioning Office
Komenda Edina Eguafo Abirem	Technical advice towards the sustainability of the water system	Re-training

Source: Field survey, 2014

4.3.11 Review of the District Assemblies Model Bye-Law for WSDBs

The Ministry of Local Government and Rural development with the support of the Community Water and Sanitation Agency of Ghana, in February 2008, introduced a District Assemblies Model Bye-Law for the establishment and operations of Water and Sanitation Development Boards. It is a well-crafted document covering almost every important detail of activities and procedures required for the sustainable management of small towns piped water services. Its provisions are simple, clear and implementable. However, the adaption and implementation of this bye-law by the community-based Water and Sanitation Management Teams and the MMDAs themselves need improvement. Clearly, the bye-law is not being consciously

implemented and enforced. Also, since its passage in February 2008, the bye-law has not been evaluated or reviewed (see appendix 2 for details).

The review by the author confirmed the non-implementation of the model bye-law of the WSDBs by both the WSDBs/WSMTs and the Assemblies.

4.4 Community level findings

This section presents the key findings from the four communities selected for the case study.

4.4.1 General findings

The four communities ironically have some good visions, missions and objectives for their small towns piped drinking-water services. These are presented in table 4.11.

Table 4.11 WSMTs vision, mission and objectives

Community	Vision of the WSMT from their own point of view	Mission of the WSMT	Major objectives of the WSMT
Assin Akropong	Will like to construct another Storage Tank.	We want to provide good drinking water for the community always	1. Raise awareness of the importance of the water system so it can be maintained well to be there always. 2. Raise the needed funds if everyone will pay in order to maintain and expand the system.
Assin Bereku	To have about three boreholes and three High Level tanks to fully serve the community	Sell water to raise funds. To satisfy the community with good drinking water. To help promote sanitation	
Twifo Mampong	To see to it that the job is going on well and extensions will be done; to make sure that there is enough water for the community; to do extensions to make sure that everybody gets adequate drinking water.	Get enough money and see to it that water is flowing and is of good quality	
Aburansa	To expand the water system and go into other business ventures like the production of sachet water; invest in treasury bills in order to become more financially self-sufficient	To provide potable water always;	To give the population good drinking water; to generate funds for the community; to have sufficient funds at all times to be able to sustain the water facility.

Source: Field survey, 2014

There is obviously a high level of awareness among the WSMTs concerning their jobs and the responsibility of ensuring sustainability of the services. This, however, contradicts their actual performances and capacity to meet the challenge as reflected in the ‘struggling’ state of all the four small towns water services studied.

4.4.2 Community level institutional issues

All four communities have a management committee for the piped water services. With the exception of Assin Akropong, which has an Interim Management Committee (IMC) constituted since December 2012, the rest have Water and Sanitation Management Teams. The WSMTs were formed with the inception of the water supply projects in the 1990s and have benefited from a couple of training workshops to build their capacity in sustainable management of operation and maintenance (see appendix 4 for community-specific details). The following sub-sections profiles the institutional development situation of the WSMTs.

a) The management arrangements of the WSMTs

The WSMTs showed a lot of concern for the water systems under their management. They are, however, becoming helpless and overwhelmed by the complexity of the problems they are expected to surmount. They have executives including chairman, vice chairman, organiser, secretaries, financial secretaries. The WSMTs/communities clearly need financial help and technical assistance to rehabilitate the water supply systems.

b) Sitting Allowances for members of the WSMTs

Members of the WSMTs are essentially volunteers as they are not paid for the work they do except a small sitting allowance which they receive when they attend meetings and it ranges from GH₵5 per member per sitting to GH₵20 per member per sitting. The frequency of these meetings is either monthly or quarterly. Officially, the interim management committee at Assin Akropong does not take allowances. They also do not hold formal meetings even though they often meet informally to discuss burning issues and take quick decisions.

c) Operating staff employed by WSMTs

WSMTs have engaged operating staff who are responsible for the day-to-day running of the water systems. They include System Manager, System Operator, Accounts clerk or 'Accountant', Revenue Collectors, Meter Reader(s) and water vendors.

The core system staff are paid monthly remunerations, which vary from community to community but in the range of GH₵60 to GH₵250 depending on the community and the position of the staff.

The evidence gathered indicates that the staff put in their best but there is more room for improvement. They could be better paid if the overall performance of the water services improves. They, however, require technical and managerial oversight in order to improve upon their performance.

d) Water vendors' compensation

The approach to compensating the water vendors also varies depending on the community. In Assin Akropong and Assin Bereku, although bills are presented to water vendors based on water meter readings, the water vendors prefer to be paid fixed amounts instead of being given a percentage of the sales made as commission. Their preference for fixed amounts in commission is influenced by the need prevent the situation of low remunerations in the rainy season when water sales falls sharply (Appendix 5 provides community-specific details on the commissions or compensations paid to water vendors). There are water vendors for handpumps in some of the communities also.

e) Review of meetings

Apart from the Interim Management Committee of Assin Akropong, which does not hold formal meetings, the three other WSMTs hold monthly meetings, which are well attended by the members. However, meeting with the whole community is becoming impractical in small towns, mainly because these towns are quite large, heterogeneous, more commercial, and are not as cohesive as rural communities. Some of the WSMTs have therefore adapted to the situation by briefing the chiefs and their elders who are seen as the representing the interest of the whole community. The disadvantage of this is the missed opportunity of getting the public's inputs into the management of the water services. Also, the wider community might not have the opportunity to scrutinise the reports of the WSMTs especially the financials upon which to hold the managers of the water services accountable. On the hand, the WSMTs and their operating staff may not have the opportunity to correct public perceptions and suspicions. Also, it may not be guaranteed that all community leaders will represent the interest of the whole community all the time.

f) Office accommodation

Apart from Assin Bereku, which has a functioning office from where the WSMT and staff operate, the other three small towns did not have offices. The effect has been the loss of vital documents, records and some assets belonging to the WSMTs as they have to be kept in individual homes and in most cases get lost when those individuals are no longer part of the WSMT or staff. The research identified the existence of a functioning office for the WSMTs as essential for community-level institutional sustainability.

The Assin Bereku example is worth emulating as the building of their office was through a self-help initiative and funded by the WSMT itself at the cost of GH₵2,400 in the year 2004.

Figure 4.4 Assin Bereku WSMT Office- exterior and interior

Figure 4.5 A section of the WSMT in their office during the interview - Assin Bereku

There are, however, examples of some WSMTs having offices, which are not being used, hence the need to include the position of an Office Assistant in the operating staff, who will not only help keep the office functional but will also do data entry, and records/documentations management.

g) Linkages of the WSMTs with the Private sector and the issue of guarantees

The WSMTs have been engaging private sector service providers and suppliers for various services covering repairs, cleaning of High Level Tanks, drilling and mechanisation of new boreholes, and the extension of services to new areas of the town, without external support and the needed regulation from either the MMDAs or CWSA. Even though the WSMTs indicated that have good relationship with those private sector firms and individuals, and sometimes negotiate the charges downwards, the WSMTs can be seen as coming from a position of weakness in such relationships especially where there are presently no guidelines from CWSA on acceptable charges or fees for various services and works. All four WSMTs interviewed have not had any previous training in basic contract procurement and management practices. Currently major services are provided without any written contracts and without any performance guarantees or warranties (see Box 1).

Box 1 illustrates the importance of regulating the relationship between WSMTs and the private sector in order to protect the communities.

BOX 1 EXPERIENCES OF WSMTs WITH PRIVATE SECTOR SERVICE PROVIDERS

Aburansa

The WSMT of Aburansa in the Central Region of Ghana, recounted an unpleasant experience of buying a motorised pump from a shop in Accra (the national capital of Ghana) at the cost of ***GH₵2,450 (US$790).*** *Unfortunately, this pump failed to work upon installation and the supplier refused to take it back after just three days of buying it. Thus all that money and related costs 'went down the drain'.*

Assin Bereku

The WSMT of Assin Bereku also engaged a private drilling contractor in 2011 to drill a new borehole for mechanization. The contract for the drilling alone was at the cost of ***GH₵12,500 (US$4,032)****. Due to lack of funds the borehole was capped since 2011 until 2014, when another contractor was engaged for the pump installation, which cost a total of* ***GH₵9,676 (US$3,121).*** *The WSMT is yet to finish paying for the submersible pump installation having already paid* ***GH₵7,900****.*

Assin Akropong

The WSMT engages a private firm from Takoradi, the capital of Western Region for the cleaning of the High Level Tank. The Private firm recommended that the High Level Tank be cleaned every quarter and ***each cleaning comes at the cost of GH₵500****. Hence, if the quarterly schedule is followed, the WSMT should be spending* ***GH₵2000 (US$645)*** *every year on the cleaning of the tank.*

4.4.3 Technical issues (including maintenance)

The technical state and performance of the water supply systems in all the four cases was not too good mainly due to aging, reduced service levels and weak O&M fundamentals. The systems showed visible signs of distress.

The WSMTs and operating staff specified reduced operating capacity of the water systems and frequent breakdowns including bursting of exposed pipes (often PVC) mainly due to weak O&M systems and aging of the facilities as major technical problems. The population for which the 40% storage capacity of the water systems was calculated and pipe sizes selected have increased and more than double in some cases.

This brings up the need to review the design parameters for small towns and decide whether reasons of cost should continue to underpin decisions on design capacity of the piped schemes or the potential for meeting increasing future demand, including the high rate at which people are applying for house/yard connections (higher service levels).

Power supply from the National Electricity Grid, which generally represents the cheapest source for the piped water services, is becoming more and more unreliable due to supply-demand imbalances, justifying the need for stand-by generators for all small towns piped schemes as part of the primary technical solutions, which should not be compromised on the basis of its effect on the capital costs.

Some of the concrete structures especially the standpost platforms, drains, and soakaway pits have visible cracks whilst some taps have broken down as shown in the photographs below.

A cracked drain and eroded platform

Having reliable access is a right

Figure 4.6 Cracked and eroded concrete platform, defective taps and a girl fetching water at Mampong

a) Maintenance Challenges of Iron removal plants

There are cases of high iron content in some of the small towns piped water services in the Central Region. The key informant interviews revealed that about 15 of the small towns piped

systems in the central were identified as having this problem necessitating the installation of iron removal plants. One to two iron removal plants have been installed for these water systems depending on the iron content. However, some of these water treatment plants have broken down and completely out of use. The effect of bypassing the iron removal plant is only aesthetic, including bad taste or discolouration (Folkl, 2014:1) and poses no real health risk. Water sources with iron content in excess of 0.25mg/l[13] require the installation of iron removal plants to treat the water.

The WSMTs did not make provision for the repair and replacement of these iron removal plants, which have an average life span of about 15 years depending on the usage. Some WSMTs fell on the MMDAs for assistance in the form of loan or grant but without success so far. It costs an estimated GH₵100,000 (US$32,258) to procure and install one iron removal plant, including the training of the operator, a challenge the WSMTs may not have the capacity to overcome. Including treatment plants in the maintenance regimes for water systems need to be prioritised by the WSMTs. The plants are, however, not available in-country and have to be imported when ordered (see Figure 4.8 and 4.9).

Figure 4.7 Evidence of iron in the water and broken down iron removal plant at Mampong

Figure 4.8 Dysfunctional iron removal plant and a High Level Tank at Assin Akropong

[13] The acceptable limits for iron by the Ghana Standards Authority's Guidelines is 0 – 0.3mg/l

b) Maintenance challenges of broken down water meters

Seven water meters for private connections (comprising 4 house connections and three institutional water meters) as well as the bulk meters of three of the water systems were not functional but have not been repaired.

c) Functionality, down-time and repair/replacement issues

Table 4.12 outlines some major breakdowns experienced by three of the four piped water services studied, which required significant funds to fix thus leading to long downtimes and a return to unwholesome by the populations. This justifies the need to accumulate significant levels of funds towards major repair and replacement requirements that will come up in the future. It had to take one of the small towns about one year to raise a Bank loan of GH₵15,000 (US$4,839) to get the water system back on stream.

Table 4.12 Overview of recent major breakdowns

Community	Date of last breakdown	Description of the breakdown	Downtime	Reason for the down time	Action taken by the WSMT
Assin Akropong	No major breakdown	NA	NA	NA	NA
Assin Bereku	,2010	The original borehole dried up. The yield was so low.	12 months	The process of applying for and getting the loan was lengthy	Took a loan of GH₵15,000 from a Rural Bank to drill another borehole for the water system
Twifo Mampong	April, 2014	Breakdown of the submersible pump;	3 weeks	Delay in the purchase of the pump. Had to go to Accra for it	Replaced the pump at a total cost of GH₵2,700 (Cost of pump GH₵2,600; related expenses - GH₵100). *This problem occurred three times recently*
Aburansa	2nd Feb, 2014	The motorised pump broke down	10 months	Lack of funds	Approached the KEEA Municipal Assembly for help since February 2014. The DA promised to intervene but has so far only sent an Engineer in May 2014 to assess the problem. The WSMT was not given copy of the assessment report. No information from the DA since.

Source: Field Survey, 2014

d) Extension and expansion of the piped drinking-water services

All four small towns water supply services including the one, which is just 5 years old (Assin Akropong) have articulated the increasing need for extensions and expansion in terms of the construction of additional standposts and bigger size HLT. The general feeling was that the

capacity of the system is no more adequate for the growing populations. Three of the small towns water supply systems have been operated beyond their design life of 10 years. The Twifo Mampong water system was constructed in 1993 (21 years old), Aburansa built in 1997 (18 years), Assin Bereku was completed in 1998 (16 years) and Assin Akropong was completed in January 2010 (5 years).

The WSMT of Assin Bereku drilled and mechanised two new boreholes. They also bought a 10m3 Polytank, which was in the process of being mounted at the time of the research, to supplement the existing HLT. The WSMT also constructed five additional standposts in new areas in response to demand.

Figure 4.9 Community-funded HLT tower about to be erected at Bereku

It is a proactive WSMT with impressive self-determination to succeed. The need to provide standard design drawings, for instance, of public standposts and valve/water meter chambers to WSMTs was identified (see figures 4.11.and 4.12).

Figure 4.10 The WSMT Chairman, operator and water vendor at the 2nd borehole mechanised in Bereku

Figure 4.11 The WSMT-financed mechanised borehole/pumphouse and standpost in Bereku

The need for extensions and expansions are arising at a time of frequent breakdowns putting pressure on the financial resources of the WSMTs. However, the small towns have not planned for and saved towards the water services' extension and expansion. The anticipated support from government and local governments for major rehabilitations has also not been forthcoming causing WSMTs in good standing to fall on the Banks for small loans, just enough for limited extensions.

e) The need to weed around pump houses and High Level Tanks

It is important to keep the surroundings of pump houses, and reservoirs clear of weeds for the safety of people particularly the operators. Leaving the areas bushy exposes the operator and others to the dangers of reptiles.


Figure 4.12 Bushy surroundings of a Pumphouse and a HLT

4.4.4 Operational issues

Operating the piped water systems to make potable water available, accessible and reliable is at the core of the management responsibility of the WSMTs. Providing adequate quantities of water at the required and acceptable quality and meeting reliability standards are functions of the quality of operation and maintenance management.

a) Water quantity

There is a general imbalance between water supply and demand from the population arising mainly from relatively reduced design capacity, increasing demand for house connections, which is considered a higher service level (whilst the systems were designed mainly for the provision of basic service level (20 lpcd)) as well as frequent mechanical breakdowns resulting in the loss of access to potable water. All the WSMTs interviewed mentioned construction of additional standposts and High Level Tanks as priority needs.

Without strong O&M systems with the capacity to respond to maintenance, rehabilitation and system upgrading requirements to match the growing demand from a rising population, access to potable water supply will reduce and sometimes become zero when the water systems eventually collapse.

b) Water quality

Notwithstanding the relatively high iron content in the water, which resulted in the installation of iron removal plants on some of the water systems, the perception of water quality is deemed acceptable to the people in the research communities.

On a more general note, previous water quality analysis results could not be found in any of the four study communities due mainly to the lack of proper documentation and archival management. The WSMTs have not been undertaking periodic water quality monitoring, which is supposed to be a routine monitoring issue. They also did not know how much it will cost

them to do the water quality analysis. The reason for not doing this was more of lack of awareness on the importance of doing water quality monitoring and the absence of institutional support, which is required to provide information and facilitate the process.

c) Reliability and rising cost of electric power supply

The general challenges of unpredictable and for that matter unreliable power supply in Ghana is having a toll on the small towns water services as well.

Closely related to the unreliable power supply problem hindering water production is the rising cost of power from the National Electricity Grid, which is seriously impacting on the finances of WSMTs. With the culture of not reviewing water tariffs frequently, some of the WSMTs are continually in arrears to the Electricity Company of Ghana. All the WSMTs mentioned this dual challenge as a major problem being faced.

In view of the rising cost of electricity, WSMTs should become more efficient in their expenditures, and spend only on essential items only. They need to adopt a process of periodic revision of water tariffs in cooperation with the community taking into account the increasing cost of electricity.

d) Use of water meters

With the exception of Twifo Mampong where four house connections and three institutional connections have not been metered the communities have metered all connections. This indicates the high level of awareness in relation to metering. However, this has not been accompanied by a corresponding level of consciousness regarding the purpose and usefulness of both the bulk water meter and the consumer waters. An exception though is Assin Bereku, which consistently uses the water meters to bill consumers.

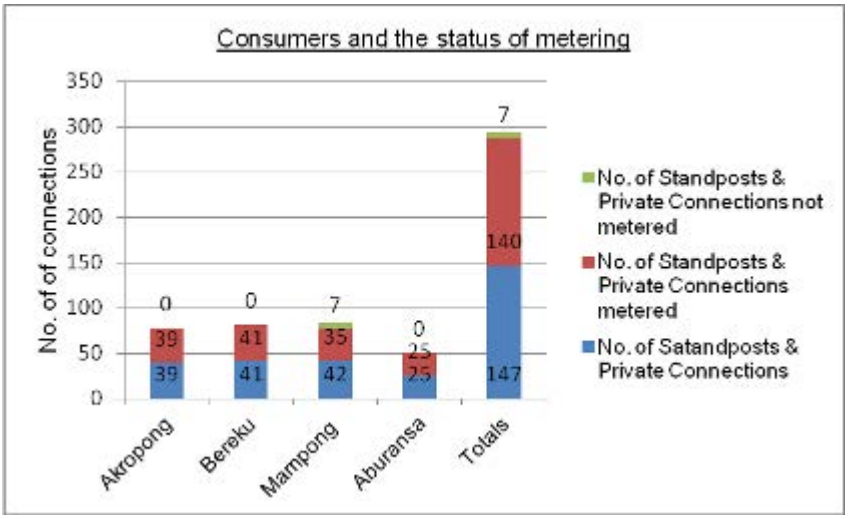


Figure 4.13 Status of water metering in the four towns studied

Figure 4.14 Photographs of production and consumption water meters

BOX 2 THE SITUATION OF WATER METERS AND THEIR USE IN THE 4 TOWNS

Assin Akropong *has 2 bulk meters at the 2 pumping stations and consumer water meters, all functioning. The WSMT reads the waters and use it to prepare water bills, which are presented to the water vendors and private connection owners. Even though, the WSMT is able to establish the indebtedness of water vendors, it is not able to recover the shortfalls from the water vendors. The water vendors are still paid their full* ***commission of 20%*** *out of whatever amount they hand in, notwithstanding shortages. According to the WSMT, they will not like to sanction defaulting water vendors for the fear of losing them.*

Furthermore, the WSMT is unable to recover the indebtedness of private customers, who cumulatively were owing the WSMT ***GH₵4,500 (US$1,452)*** *as at the time of the research in July 2014. According to the WSMT they are unable to disconnect defaulting private connection owners because they do not know how to disconnect them without affecting other households, which do not owe but are on same outlet from the Distribution DPPCs. There are about five to six in a DPPC. The WSMT also does not read and document the bulk water meters consistently apparently because the use and importance of the water production records from the bulk meters has not yet been fully appreciated.*

Assin Bereku *uses the water meter quite well in billing both water vendors and private connection owners. However, it does not compensate water vendors based on commission (%on sales). Rather a graduated flat rate payment system is used to compensate water vendors: Water vendors, who sell water at levels equal to or more than GH₵300 get GH₵35 as commission; sales of GH₵250 to GH₵299 attracts a commission of GH₵25. Finally, sales at the level of GH₵100 and below attract a commission of GH₵20.This approach will not be efficient and optimal in terms revenue generation and accounting for water sold.*

Twifo Mampong *stopped reading water meters to bill since 1996. Even though water is sold at the standposts directly to the public at 10 pesewas per 18L-container (i.e. Pay-As-You-Fetch) the WSMT does not bill water vendors and private customers. They simply receive any amount the water vendors hand in as sales. The WSMT has, however, set a tariff of GH₵1/m3 for private connection owners even though they apply a flat rate of GH₵25/month on private customers (house connection owners and institutions).*

Aburansa *reads the water meters alright but pays a flat rate of GH₵20 as commission to the water venders. This will not motivate the water vendors to work hard. The water vendors also complain of unjustifiable shortages attributed to them which they suspect might be due to faulty water meters. Training the water vendors in the simple technique of testing the correct functionality and accuracy of water meters is required. The water meter records were, however, not available to the researcher.*

e) Use of small town piped water service to operate a public flush latrine (water closet)

The research learnt that there are a number of towns in the central region, which were supported under a WASH Programme to build and operate public flush latrines with a bath in 2011. Twifo Mampong was one of those towns. Here, two Public Flush Latrines and bath (shower) were constructed. Each of these two latrines has 12 privy rooms (six for the female section and another six for the male section). In addition to the water closets, six bathrooms or shower (three bathrooms each for the female and male sections) were part of it. The original idea was to make these services accessible to transient populations. However, the patrons of this facility are the inhabitants of the community. There are caretakers for both latrines/baths who open the place at 4am and close at 9pm and are given 25% of the total revenue collected at the end of the month. There is also a standpost by the latrine. The user fee[14] of GH₵0.20 per use of the WC or shower or both appear reasonable on assumption that the patrons will use about 26 litres of water for bathing and 10 litres for flushing.

Whilst this sanitation intervention is significant in providing easy access to improved latrine for the population, the O&M concern observed was the fact that the facility is not metered to establish the actual volume of water it uses, which will enable the WSMT charge realistic user-fees. Installing water meters on the two public flush latrines will provide basis for comparing the revenues collected and handed over by the latrine caretakers with the volume of water used by the latrine facilities for improved accountability. The current situation will contribute to non-revenue water and reduce the potential for revenue generation.

Figure 4.15 Public flush latrines (water closets) and bath and a nearby unmetered standpost at Twifo Mampong

[14] The tariff per 18L container at the public standpost is GH₵0.10

4.4.5 Financial issues

a) Willingness and ability to pay

Buying water at the public standposts in all the four small towns studied is no longer an issue. People willingly buy water and recognise that as a civic duty. However, inefficient management and inappropriate utilisation of the funds generated from the sale of water have emerged as the new challenges facing the financial sustainability of the water services (see box 3).

BOX 3 THE NEW FINANCIAL CHALLENGE TO SUSTAINABILITY OF SMALL TOWNS DRINKING-WATER PROGRAMMES

Willingness and ability of communities to pay for using potable drinking water sources no longer poses a challenge to small towns piped water supply programmes in Ghana. The new challenge, however, has to do with the inefficient management and utilisation of the funds so generated, which are sometimes misapplied to the detriment of future major maintenance works, rehabilitations, extensions and expansion of the water services. The realisation of the high revenue generation potential of small towns water services in Ghana by community leaders and local politicians has given rise to open interest in the use of the O&M funds for other community projects and events completely unrelated to WASH with some communities formalising this by asking for a fixed percentage of the water revenue every month.

One such community allocates 30% of the monthly water sales to the chiefs of the town to be used for development projects and sanitation? In fulfilling this obligation, **the WSMT paid GH₵5,800 (US$1,872) to the chiefs in 2012 alone**. Interestingly, the submersible pump of their water system broke down in February, 2014 and till now (more than 10 months from the time of breakdown), water supply to the people could not be restored because the WSMT does not have the money to replace the pump. Unable to find help from the Municipal Assembly, the WSMT sought the Assembly's consent to franchise the water system to a Private Operator who will repair and run it for a **period in order to recover his/her cost and of course with some profit.**

A similar challenge was observed in another research community. The only difference being that, in this other community, there is no agreed fixed percentage dividend for the chiefs/community. However, the chiefs fall on the WSMT anytime the community needs money for a social event or a development project.

These new challenges have adverse impacts on financial sustainability.

b) O&M Budgeting

None of the four research communities had a budget for managing operation and maintenance of the water services. The implication is that the exact amount needed to manage the water services sustainably is not known by any of the WSMTs. In effect the financial management of the small towns water services is more or less arbitrary and reactionary, without a comprehensive financial plan. Without this budget, the basis for the water tariffs being implemented in the four communities becomes questionable. Regular budgeting of operation and maintenance (including major repairs, rehabilitations, extensions and expansion) is so important to make sure that the people are not paying more or less than it is needed to sustainably run the service. Under a more formal/professional and business oriented management of small towns water services, this will find expression in the Business Plans for the service.

c) Water tariff mechanism

Unlike the early days of small towns water programmes in Ghana, which witnessed communities' unwillingness to adopt the system of direct payment for water at the public standposts, all small towns water services in the region within which the research was carried out implement the direct payment system, commonly known in Ghana as Pay-As-You-Fetch. It is a major achievement for the sub-sector as the implementation of an efficient and sustainable tariff mechanism represents a fundamental pre-condition for sustainable management of small towns piped water services. House and institutional connections, however, remain the exception since prepaid metering system has not yet been introduced.

d) Water tariff setting

With the exception of Aburansa, which demonstrated an understanding of the method/procedure of tariff setting by linking the water 'produced' to the O&M cost, the other communities occasionally increase the tariff arbitrarily with the understanding of the community. In other words the tariff set at the time of commissioning the water system is reviewed periodically. This will be much improved by basing the water tariff on realistic O&M budget for the water service.

e) Water tariffs

As indicated earlier, water is sold directly at the water points. Another positive development from two of the small towns (Assin Akropong and Twifo Mampong) was the direct sale of water at the boreholes fitted with hand pumps at the same price as the standpipes. The difficulty, however, will be how accountability will be achieved or managed around those handpumps, which of course will not be an issue in Twifo Mampong where the water meters on the standposts and private connections are not being read/used for billing.

Different levels of water tariff were observed during the research and these are presented in table 4.13.

Table 4.13 Water tariffs at public standposts and for private connections

Community	Water tariff per 18L container at the Public Standposts (GH₵/18L container)	Water tariff per container at the Public Standposts (US$/18L container)	Water tariff per cubic meter at the public Standpost and Private Connections(GH₵/m3)	Water tariff per cubic meter at the public Standpost and Private Connections (US$/m3)
Assin Akropong	GH₵0.05 per 18 Litre Container	US$0.02 per 18 L container	GH₵3/m3	US$0.94/m3
Assin Bereku	GH₵0.05 per 18 L Container	US$0.02 per 18 L container	GH₵2.5/m3	US$0.79/m3
Twifo Mampong	GH₵0.1 per 18 L container	US$0.03 per 18 L container	GH₵1/m3 and GH₵25 per month for unmetered house connections	US$0.31 per m3
Aburansa	GH₵0.1 per 18 L container (from August , 2013)	US$0.03 per 18 L container (From August, 2013)	GH₵5.27/m3	US$1.66 per m3

Source: Field survey, 2014

The research, however, identified some errors in the cubic meter water tariffs being applied in three out of the four communities studied and corrected them (see table 4.14).

Table 4.14 Corrected cubic meter water tariffs[15]

Community	Prevailing water tariffs per cubic meter at the public Standpost (GH₵/m3) at the time of the research	Corrected: per cubic meter at the public Standpost (GH₵/m3)	Corrected: per cubic meter at the public Standpost (US$/m3)
Assin Akropong	GH₵3/m3	GH₵2.5/m3	US$0.78/m3
Assin Bereku	GH₵2.5/m3	NA	NA
Twifo Mampong	GH₵1/m3 and GH₵25 per month for unmetered house connections	GH₵5/m3	US$1.57 per m3
Aburansa	GH₵5.27/m3	GH₵5/m3	US$1.57 per m3

Source: Field survey, 2014

It could be seen from table 4.13 that water vendors at Assin Akropong and Aburansa were being over-billed by 17% and 5% respectively. On the other hand, Twifo Mampong would have

[15] The author made 10% provision for water losses in correcting the tariffs in table 4.14

been under-billing the water vendors by 500% if they were using the water meters and the ruling cubic meter tariff.

These levels of water tariff are quite high. Meanwhile, the water tariffs were not directly related to the O&M costs (as O&M costs were not estimated and used in setting the water tariff). The high tariff levels also do not manifest in improved financial situation of the WSMTs. The lesson learnt though is that, increasing water tariffs does not necessarily result in increased revenue accumulation or financial performance. It has to be backed by improved revenue collection efficiencies and efficient funds utilisation/management.

There has been a history of upward reviews in water tariffs by the WSMTs of all the four small towns. This, however, does not seem to change the financial fortunes of the water services. Whilst it is a convenient way of raising revenue, it could as well be a transfer of responsibility for the inefficient management and utilisation of the funds onto the consumers (see Box 4).

BOX 4 EXAMPLE OF WATER TARIFF INCREASES - ABURANSA

In the case of Aburansa, the water tariff from 2007 to 2009 was GH₵0.025/18L container. From 2009 to July 2013, it was increased to GH₵0.05/18L container. From August 2013 to date, there has been a further increase of water tariff to GH₵0.1/18L container. That is to say the water tariff was increased by about 300% over the past five years.

f) Revenue situations

This section is aimed at understanding the outcome of revenue mobilisation efforts over the past one year or more, for operation and maintenance of the piped water services in the four small towns. Apart from Aburansa, which could only provide data for 2012 the other three small towns had data covering 2014 and 2013. These are presented below.

Table 4.15 Revenue and expenditure situation

Community	Range of Monthly Revenue mobiised over the past 12 months (minimum and maximum amounts)	Total Revenue mobilised over the past 12 Months - GH₵	Period of Revenue mobilisation
Assin Akropong	GH₵62-GH₵1,491	GH₵9,962.65	June 2013 to May 2014
Assin Bereku	GH₵1,086.50-GH₵3,753	GH₵31,414.00	July 2013 to June 2014
Twifo Mampong[16]	GH₵778.40-GH₵3,301.70	GH₵10,691.70	January 2014 to June 2014 (6 Months)
Aburansa[17]	GH₵637.30-GH₵3,826.65	GH₵25,878.25	January, 2012 to December 2012

Source, Field survey, 2014

g) Total Revenue and Expenditure Levels and Relationships

To gauge the financial capacity of the small towns towards major maintenance needs, the study tried to assess the total revenues in relation to total expenditure over specific periods mainly one year (and in one instance, six months). The table below illustrates this situation.

Table 4.16 Overview of revenue, expenditure, Bank Balance and Cash in Hand

Community	Total Revenue mobilised over 12 Months - GH₵	Total Expenditure over 12 months	Annual Surplus or Deficit (GH₵)	% of income spent	Bank Balances as at the time of the research (GH₵)	Cash-in-Hand
Assin Akropong	GH₵9,962.65	GH₵9,962.65	0	100%	0	0
Assin Bereku	GH₵31,414.00	GH₵17,504.80	GH₵13,909.20	56%	GH₵1,048.63.63	0
Twifo Mampong	GH₵10,691.70	GH₵10,497.92	GH₵193.98	98%	GH₵2,503.38	GH₵706.6
Aburansa	GH₵25,878.25	GH₵17,428.00	GH₵8,450.25	67%	GH₵60.23[18]	0

Source: Field survey, 2014

It is evident from the above table that there is a mismatch between the surpluses as determined from the data collected and the actual Bank balances and cash in hand. This is indicative of incompleteness and/or inaccuracy of the financial data/records. Either some expenditure may not have been recorded or otherwise. The evidence of this mismatch could be seen in Assin Bereku and Twifo Mampong. Aburansa's case is different as the Bank

[16] The figures of Twifo Mampong covered Six Months and not one year because; the new WSMT took over and started real work from January, 2014.

[17] The WSMT of Aburansa could not provide recent revenue data (though they have out of service for over Six Months as at the time of the research). They however, provided revenue data on the 2012 operations

[18] With respect to Aburansa, unlike the revenue and expenditure data which was for 2012, the Bank Balance was their current balance in the Bank Book

Balance reflects the current situation (2014) whilst the revenue and expenditure data were for 2012. Appendix 6 gives details of the monthly revenues and expenditure records of the small towns.

h) Major expenditures incurred by the WSMTs

The WSMTs encountered some major problems and had to take some actions to fix them and restore service. The table below describes one example each from three of the communities. The water system at Assin Akropong is relatively new (constructed in 2010), just about five years in operation, which may partly explain why it has not yet experienced a major breakdown.

Table 4.17 Major maintenance requirements, down-times and actions taken

Community	Major maintenance problem	Down-time	Reason for the down-time	Action taken by the WSMT
Assin Akropong	No major breakdown experienced	NA	NA	NA
Assin Bereku	The original borehole dried up. The yield was so low and it had to be replaced	One year	The process of applying for and getting the Bank loan was lengthy	Took a loan of GH₵15,000 from a Rural Bank to drill another borehole for the water system
Twifo Mampong	Breakdown of the submersible pump in April, 2014	about 3 weeks	Delay in the purchase of the pump. Had to go to Accra for it	Replaced the pump at a total cost of GH₵2,700 (Cost of pump GH₵2,600; related expenses-GH₵100). This problem occurred three times
Aburansa	The submersible pump broke down	> 6 months	Lack of funds	Approached the KEEA District Assembly for help since February 2014. The DA promised to intervene but has so far only sent an Engineer in May 2014 to assess the problem. The WSMT was not given copy of the assessment report. Nothing has since been heard from the DA.

Source: Field survey, 2014

i) Banking

All four communities opened and operate Bank Accounts. The WSMTs were facilitated by the MMDAs and CWSA to open and operate three separate Bank Accounts into which net revenues will be deposited in the following ratios:

Table 4.18 Types of Accounts required and percentage of net revenue to be deposited

No.	Type of Account	Percentage of net revenue to be deposited
1	Operational Account for recurrent expenditure	70%
2	Replacement or Capital Account	20%
3	Sanitation Account	10%

Source: Field survey, 2014

None of the communities operates all three Accounts. Assin Akropong, Twifo Mampong and Aburansa operate only the Operational Account whilst Assin Bereku operates two, namely: the Operational Account and Replacement/Capital Account, even though there was only GH₵474 as at July, 2014 in the Replacement Account of Assin Bereku. They explained that they do not get enough revenue hence are unable to operate all three prescribed accounts.

The only exception was Assin Akropong, which no longer have a Bank Account because of the acrimonious replacement of the WSMT with an Interim Management Committee (IMC), which comprised the Assembly member and the Unit Committee in December, 2012 as a result of which the Bank Book was not handed over.

Table 4.19 Bankers for the WSMTs and levels of Bank Balances and Cash in Hand

Community	Name of the Bank	Bank Balances (GH₵	Cash in Hand (not yet sent to Bank)
Assin Akropong	Agricultural Development Bank at Assin Fosu	0.00	0.00
Assin Bereku	Akoti Rural Bank - Assin Bereku	1,048.63	0.00
Twifo Mampong	ECOBANK, TOP Branch, Twifo Praso	2,503.38	706.60
Aburansa	Akatakyiman Rural Bank at Komenda	80.23	0.00

Source: Field survey, 2014

Box 5 provides a lesson on the need for WSMTs to use credible financial institutions.

BOX 5 THE EXPERIENCE OF TWIFO MAMPONG

The WSMT of Twifo Mampong lost GH₵3,400 (US$1,097), when the Mampong Branch of the Mustard Seed Micro Finance Company, with which it had an account with collapsed between October and December, 2013 (Before the current WSMT took over the management of the water services.

j) Savings accumulation

Table 4.19 above shows that the WSMTs are not accumulating sufficient savings to be able to meet major O&M requirements. That explains why the Assin Bereku WSMT has resorted to taking Bank loans to finance such expenditures. This can be attributed to inadequate revenue mobilisation/generation and uncontrolled expenditures thus rendering the water services non-viable and vulnerable.

The graph below on the savings situation of Aburansa illustrates the trend of its Bank Balances from December 2007 to March 2014.

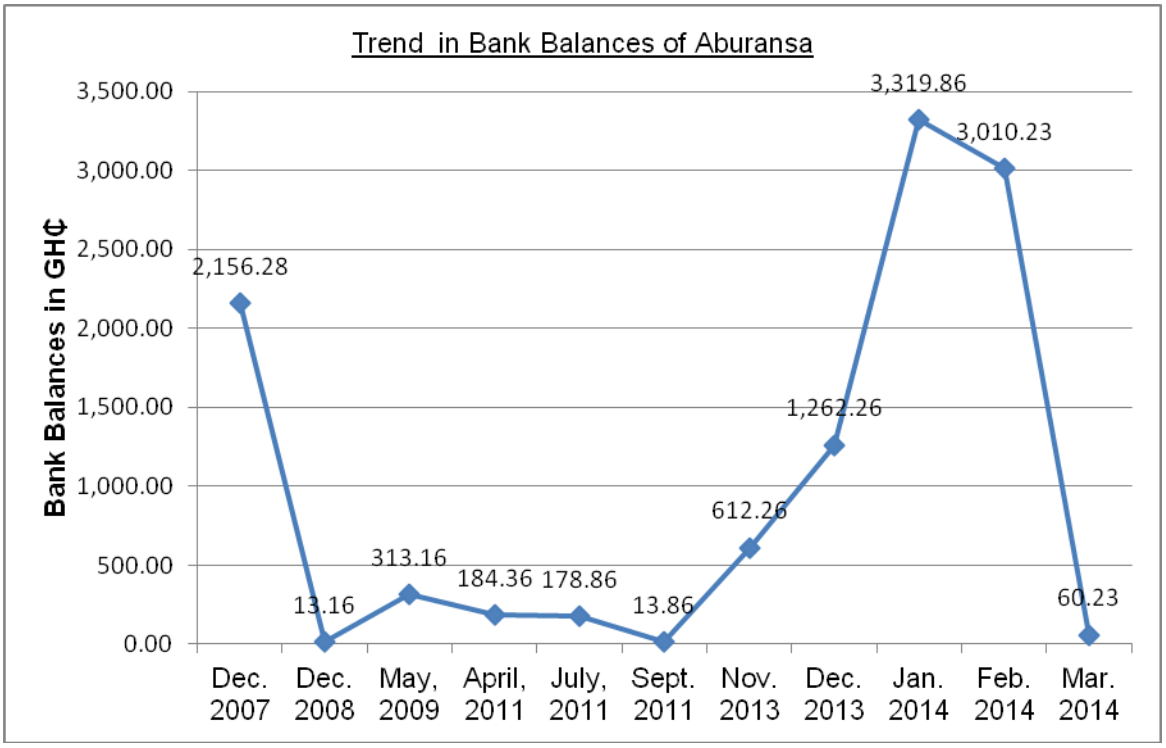


Figure 4.16 Graph showing the trends of Bank Balances of a WSMT

k) Water funds utilisation and management

As noted in Box 3, some WSMTs use funds generated from the sale of water for other things besides water, sanitation and hygiene thus undermining the WSMTs' financial capacity to meet current and future major O&M needs.

4.4.6 socio-cultural and political issues

The research finds that the communities are using the water services. However, the size of these communities does not provide that cohesiveness necessary for full community participation in the management. Organising community meetings on water, sanitation and hygiene in such towns can be challenging. The chiefs, Assembly members, unit committees are recognised as the authorities, who the WSMTs accordingly respect and report to.

It was clear from the research that, for small towns, the population is only interested in having adequate and reliable access to the piped-drinking water services all the time and not so concerned about participating in the management of the service or holding the managers accountable.

The interference of the chiefs and local politicians is another socio-cultural and political issue which affect the financial performance of the WSMTs and the sustainability of the water services.

4.4.7 Comparative overview of the four small towns piped water services researched

The table below compares the four small towns water services, which were researched and respond to research questions 1.1 and 2.1.

Table 4.20 Comparison of the four water services, which were researched

Parameter/ Characteristics	Assin Mampong	Assin Bereku	Twifo Mampong	Aburansa
District or Municipal Area	Assin North Municipal	Assin North Municipal	Twifo Atti Morkwaa district	Komenda Edina Eguafo Abirem Municipal
Population (2013)	4,247	8,637	3,998	13,035
Year of construction	January, 2010	1998	1993	1997
Iron Removal Plant Installed	Yes but not functioning	No	Yes but broken down	Yes but broken down
No. of Public Standposts	8	6	5	19
No. of House Connections	22	28	27	5
Number of institutions connected	8	1	4	1
Management organisation in place	Interim Management Committee (IMC) replaced the WSMT since December, 2013	WSMT	WSMT	WSMT
Total membership	4	9	13	13
Number of women in the management organisation	0	3	2	4
Availability of Bank Account	No	Yes	Yes	Yes
Bank Balances as at the time of the research	0	1,049	2,503	80
Cash in Hand as at the time of the research	0	0	707	0
Total Funds (Bank Balance plus Cash In Hand)	0	1,049	3,210	80

Parameter/ Characteristics	Assin Mampong	Assin Bereku	Twifo Mampong	Aburansa
Total Revenue over a period of one year (Six Months for Twifo Akropong)	9,963	31,414	10,692	25,878
Total Expenditure over the same period of one year (Six Months for Twifo Akropong)	9,963	17,505	10,485	17,428
Annual Balance (Revenue - Expenditure)	0	13,909	194	8,450
Range of monthly revenues recorded over a period	GH₵62 to GH₵1,491	GH₵1,086 to GH₵3,753	GH₵778 to GH₵3,301	GH₵637 to GH₵3,826
Tariff mechanism implemented	Direct Payment at the Standpost	Direct Payment at the Standpost	Direct Payment at the Standpost	Direct Payment at the Standpost
Ruling water tariff	GH₵0.05 per 18L container AND GH₵3 per m3	GH₵0.05 per 18L container AND GH₵2.5 per m3	GH₵0.1 per 18L container AND GH₵1 per m3 or GH₵25 per month for house connections	GH₵0.1 per 18L container and GH₵5.22 per m3
O&M Budget available?	No	No	No	No
Number of water vendors	9	11	14	19
Commission/compensation for water vendors	20%	Graduated: GH₵35 for ≥GH₵300; GH₵25 for revenues ranging from GH₵250 to GH₵299; GH₵20 for GH₵100 and below	20%	GH₵20 per month
Water Quality Analysis Results available?	No	No	No	No
Major water quality problem perceived	None	None	None	Iron
Functionality of water system	Functioning	Functioning	Functioning	Broken down (for more than 10 months)
Adequacy of the water system (installed capacity)	Not adequate	Not adequate	Not adequate	Not adequate
Meeting holding	No formal meetings	Used to meet monthly but changed it to quarterly to save money	Meet monthly	Not applicable as the system has been down
Use of Bulk water meters to measure water production	No	No	No	No

Parameter/ Characteristics	Assin Mampong	Assin Bereku	Twifo Mampong	Aburansa
Use of consumer water meters	Yes, but do not keep accurate and up-to-date records	Yes	No (Stopped reading meters since 1996)	Yes
Major break down experienced in recent times	NA	Original borehole dried up	Motorised pump broke down	Motorised pump broke down
Down time	NA	12 Months	3 weeks	>10 Months
Action taken to fix the major breakdown	NA	Took a loan of GH₵15,000 from the Akoti Rural Bank to drill another borehole for the water system	Replaced the pump at a total cost of GH₵2,700 (Cost of pump GH₵2,600; related expenses - GH₵100). This problem occurred three times recently	Approached the KEEA Municipal Assembly for help since February 2014. The DA promised to intervene but has so far only sent an Engineer in May 2014 to assess the problem. The WSMT was not given copy of the assessment report. No information from the DA since.
Availability of Office Space for the management Committee	No	Yes (functioning office)	No	No
Demand for extensions	Yes	Yes	Yes	Yes

The above table shows that, all the small towns have similar sustainability issues or circumstances. Assin Bereku appears to be more resilient and capable in managing their water services whilst Aburansa is in severe distress and needs external support in terms of complete rehabilitation. Their operating cost coverage ratios (i.e. total annual operational revenues/total annual operating costs) fall short of the acceptable value of 2 (Sansom, 2004:1.9). This ratio is expected to be >2 to enable investment in replacing old infrastructure and providing new infrastructure for an expanding population.

4.5 SWOT Analysis of key institutions for small towns water supply in Ghana

Table 4.21 below provides an overview of the relative strengths, weaknesses and threats of the key institutions involved in the small towns piped water services sub-sector in Ghana using the SWOT Analysis Tool. It addresses research question 3.1.

Table 4.21 SWOT Analysis of key institutions for small towns water supply in Ghana

Key institution	Strengths	Weaknesses	Opportunities	Threats
Community Water and Sanitation Agency (CWSA)	Highly qualified staff in various areas of specialisation (civil engineers, hydrogeologists, socio-economists, MIS/IT Specialists, and Support Staff	The restrictions imposed by the facilitative mandate of CWSA whereby they can only advise the MMDAs	The relatively few and manageable number of small towns piped water services in the regions relative to point sources	Donor preference for district-based implementation without due consideration to the capacity and organisational of MMDAs for effectiveness, efficiency and sustainability
	Technically/professionally biased organisational culture	High Staff turnover due to their competitiveness	Government's decision to implement the Public-Private Partnership Policy, which was approved by cabinet in 2011. A CEO was appointed and a secretariat established for take-off.	International NGOs in WASH may not be willing to comply with national policies and strategies for small towns
	Have a well-resourced and equipped Head Offices and 10 Regional Offices (in all the 10 Administrative Regions of Ghana)	Inadequate operational budget, which affects field monitoring and technical support programmes	The inappropriateness of the community management model for small towns	Government may not prioritise small towns piped water services and may not prioritise the sector in the national agenda
	Have cross country vehicles, for rough terrains	Lack of direct technical reporting relationships with the District Water and Sanitation Teams/MMDAs	The good prospects of Private Sector Participation in the management of Small Towns Water Services, which require a professional facilitative and regulatory authority	The lower middle income status of Ghana and its attendant loss of grants opportunity for small towns water services may affect operations of the Agency
	The agency has a vast project management experience with expatriate TAs in addition to having credibility with donors and development partners	They do not receive performance monitoring reports regularly from the MMDAs but have no compelling powers		Small towns not prioritised by government as a unique segment of society requiring special attention

Key institution	Strengths	Weaknesses	Opportunities	Threats
	The staff have benefited from various professional training programmes in Ghana and outside Ghana under different projects	CWSA ending at the Regions and not having district presence		Political instability
	The staff have good international exposure and thus familiar with international best practices	High number of beneficiary communities - over 22,000 as at the end of December, 2013		Conflicts (Chieftaincy, tribal, and land)
	The agency has experience and expertise in supporting MMDAs and communities in project planning, implementation, monitoring and evaluation			
	Familiarity with different socio-cultural settings in-countries including the local drivers and barriers of community-based development			
Metropolitan, Municipal and District Assemblies	They are the planning and decision making authorities at the lowest level of the decentralisation programme	It has multiple functions including executive, legislative, administrative, and planning functions	Good prospects for off-loading the management of small towns to CWSA for Public Private Partnership (PPP)	Change in governments may come with changes in political and administrative heads and policies
	Closest to the communities as there are presently 216 MMDAs in Ghana	Water and sanitation has to compete with all other departments	Will concentrate on the simpler water supply technologies i.e. Point Source Communities	Conflicts (Chieftaincy, tribal, and land)
	The District Assembly Common Fund, which comes from central government quarterly to be used for infrastructure projects	Very low budget support in terms of actual disbursements for DWSTs	Will get more reliable and up-to-date data on small towns from the PPP arrangement which may be facilitated and regulated by the CWSA	Political instability
	They have Water and Sanitation Teams (especially when there is an ongoing donor-funded WASH Projects in the MMDA	Inability of the DWSTs/MMDAs to visit the communities due to financial and logistics constraints	May give the monitoring of some point source communities in the same catchment to the private operator to undertake	Extreme events of climate change like floods and droughts

Key institution	Strengths	Weaknesses	Opportunities	Threats
	It will be easier and cheaper for the MMDAs to undertake community outreach and support community management	Very low support for community management structures and systems in small towns	The financial sustainability to be achieved will free the MMDAs with the responsibility of intervening in the repairs of broken-down small towns	
	There is a District Assemblies Model Bye-law for the establishment and operations of WSDBs/WSMTs	Inadequate monitoring and in some cases, lack of monitoring of small towns water services		
	The staff of the MMDAs benefit from so many workshops organised by different organisations for capacity building	Use of seconded staff from other departments to form the DWSTs thus creating conditions of double allegiance. Arbitrary transfers of Water and Sanitation Staff by their mother Departmental Heads affect the human resource capacity for water and sanitation at the MMDAs		
Water and Sanitation management Teams (at the community level)	They are inhabitants of the community and have a direct stake in the water supply service	Inadequate oversight/supervision of the WSMTs and their operating staff	The prioritisation of sustainability by the international community and national government agencies may bring about increased support and capacity building	Conflicts (Chieftaincy, tribal, and land). Will make the management difficult
	Have capacity through various training programmes	Inability to disconnect defaulting private connection owners due to the use of DPPCs and also because interwoven family relationships. Also, most private connection owners are usually the opinion leaders, who are usually more powerful and influential than the members of WSMTs	The scale of operation and revenues can support a gradual modernisation of the management and thereby challenge them to become more professional	Emergence of Public-Private Partnerships as superior alternative management model
	Scale of operation and responsibility is manageable as they are in charge of only	Inability to use water meters to track water production,	Partnership with other stakeholders and service providers	Rising interest in the O&M funds by the chiefs and opinion leaders of

Key institution	Strengths	Weaknesses	Opportunities	Threats
	one piped water supply system	consumption and revenue collection efficiency		small towns
	Entitled to regular technical support from MMDAs	Lack of professionalism and business aptitude from the community management structures and systems	Technical assistance from MMDAs and CWSA	Rapid population growth, expansion of towns and demand for more services
	Have private sector service providers within their areas who can be called upon for maintenance or supplies.	Inefficient funds utilisation and inadequate financial management	Become an asset to the community to lead in managing other community development initiatives	Arbitrary dissolution of WSMTs by chiefs and local politicians
	Entitled to the support and cooperation of the community and its leaders	Low savings accumulation for major O&M needs		Currency depreciation
	Low cost of personnel or staff	Overcharging by some private sector service providers for services rendered		Unreliable supply of power and the rising cost of the electricity
		Inability to undertake major repairs, rehabilitation and expansion		Water quality challenges such as chemical contamination with fluoride and arsenic for instance
Private Firm/Private Operator	More professional and business minded	May not balance profit motive with the public's good	Government's commitment to implement the Policy on Public-Private Partnerships in Ghana	Grand corruption in procurement processes and commercial corruptions
	Better prospects for savings accumulation and investments for major maintenance work and system upgrade	Usually characterised by corruption	Access to private financing due to improved performance indicators and business/professional credibility. (may reduce the cost private finance due to the reduced risk)	Political interference in the selection of POs and possible favouritism
	Motivated by profit to work hard to protect the investments	The size of the small towns water system might not make the service profitable	Possibility of clustering a number of small towns services to make the services more attractive to the private sector	Political instability

Key institution	Strengths	Weaknesses	Opportunities	Threats
	Subject to supervision/oversight from the contracting authority and regulator	Some interference might be experienced from the community without a strong regulator.	Investment in other towns (by the Private Operators) by way of plowing back profits to expand their business	Macro-economic instability e.g. high interest rates, currency depreciations and the effects of inflation
	Data management and reporting requirements are more likely to be met	High transportation cost as the Private Operator might not be resident in the community	The planned establishment of Infrastructure Fund by government	Lack of continuity in case the contracts do not get renewed
	Better insulated from community interference as well as interference from local politicians	Lack of a detailed and comprehensive financial plan or business plan	Development Partners or the Donor Community favours PPP and are likely to support the private operators and the process with capacity building and technical advice and possibly project funding, building on experiences from other countries	Conflicts (Chieftaincy, tribal, and land). Will make the management difficult
	Better capacity to respond to increasing demand at higher quality	Weak monitoring from technically competent authorities		Extreme events of climate change like floods and droughts
	Will be more efficient in cutting down cost in order to maximise profits	Short-term duration of contracts may not help for long term planning and investment		
	Amenable to penalty and incentives for improved performance	Tariff reductions from the regulator, for which the revenue shortfall might not be bridged or paid for by the regulator or government		

4.6 Comparative analysis of the small towns water services sector of Ghana and Uganda

This section compares the small towns water services sub-sector of Ghana with that of Uganda (see table 4.22).

Table 4.22 Comparison of the small towns water services sub-sector of Ghana and Uganda

Characteristics/Feature	Ghana	Uganda
Water Sector Reform	Started in the 1990s	Started in the 1990s
Definition of small town	Community Water and Sanitation Agency – Small Towns Water Policy (Design Guidelines) of 2003 defined settlement s within the population bracket of 2000 to 50,000 as small towns The National Water Policy of the Ministry of Water Resources, Works and Housing (2007) uses the population bracket of 2000 to 30,000 in defining small towns	Small towns are settlements outside the jurisdiction of NWSC (urban water utility). The population of small towns ranges from 5000 to 15,000. Rural growth centres, which have populations in the range of 2000 and 5000 inhabitants are also served with piped water systems (Hirn, 2013)
Management Model from the onset of the reforms	Mainly Community Management (Over 98% of small towns water services are under community management)	All piped schemes for small towns and rural growth centres have Private Operators: either Private Firms or Individuals (especially for smaller systems and the rural growth centres)
	Later piloted a few PSPs, which have not been scaled up	Community Management is applied to Point Sources
Place and role of government in PSP	Usually the contract is between Local Government and the PO	There is an elaborate relationship from the MoWE including the Water Directorate; gazetted Water Authorities; WSSBs and then POs. Too many layers of government and local government actors
Legal framework	Legal provisions not yet elaborated for small towns although the few pilots have some contractual obligations that are binding	PSP found expression in the 1995 constitution of Uganda, which formally called for greater use of private initiative. The Water Statute (1995), Water Act (1997), and the National Water Policy of 1999 operationalised the PSP framework
Service Performance	Fairly ok. The community management structure is able to run the system at least throughout the design life.	Relatively better service performance as reflected in collection efficiencies of 90%, positive operational cost ratios, and performance reporting. Systems delivering service.
Reporting/M&E/Verification	There is no regular data capture and submission by the managers of the small towns services be it the large majority of the community-managed services and the few pilot PPPs	90 gazetted water systems submitted performance data regularly as at 2010/2011

Characteristics/Feature	Ghana	Uganda
Budgeting for major repairs, replacements, rehabilitations, extensions, and expansion	Budgeting not done in some cases	O&M costs estimated but do not include capital expenditure. Covers only routine O&M costs. Rehabilitations and extensions are the responsibility of the public/government
Savings accumulation	Not encouraging. In some cases the services merely breaks even	Not mentioned. It was said that the revenues are able to help operate the system
Incidence of corruption	Not consciously established may be because it is mainly community managed.	A recent report (prior to the evaluation in December, 2013) by the Water Integrity Network, WSP, and Transparency International found that corruption is pervasive in the Ugandan Water Sector", both grand corruption during procurement processes and petty corruption during commercial operations. POs reported that bribes and kickbacks are common and generally up to 10% of contract value
Capacity Building	Not much after projects have ended	Umbrella organisation of WSSBs, and the Association of Private Water Operators are able to access funds to continue training the POs
Community Participation/Involvement	High	Minimal. It is mainly government-led with Private Participation
Private Sector Participation (PSP)	Minimal: the few pilot PPPs. PSP with community management is limited to providing such services as repairs, supply of spare parts etc.	High: Almost all the small towns water systems and the rural growth centers use PSP.
Stability of management	Relatively better stability especially with operating staff. Unless a political interference or other reasons lead to the dissolution of the members of the community management organisation and their staff.	The short duration of three years traditionally made it unstable. The change to five years is an improvement though
Supervision and oversight	Very low	Not effective due to capacity weaknesses and changes in the membership of the WSSBs after elections
Civil Society Actions	Very low	High due to the strong national umbrella organisation for WSSBs and the APWOs who are well-funded
Use of water meters	Relatively low	Almost universal use of water meters have been achieved making it possible to monitor and track collection efficiencies
Collection Efficiencies	Low	High (90%)
Self-reliance of the water service for major repairs and replacements, rehabilitations, extensions, expansion	Low	Low. High dependence on government as the POs are not allowed by government to reflect capital expenditure in water tariffs
Bureaucracy	Low. The community is free to make decisions without being necessarily controlled by local government or central government	May be high due to the multiple levels and reporting relationships from the community through the WSSBs, the Water Authorities/Town Councils and then the Ministry of Water and Environment including the Water Directorate

Characteristics/Feature	Ghana	Uganda
Sustainability	Demonstrable ability to provide services throughout the design life of the water system, However, sustaining the service levels and quality beyond the design life cannot be guaranteed	Ability to provide services throughout the design life of the water system, However, sustaining the service levels and quality beyond the design life cannot be guaranteed
Service reliability	Cannot be guaranteed in times of capital expenditure financing. The result will be long downtimes as governments and local governments do not have a history of promptly responding to distressed calls from water services for major maintenance needs and repairs	Cannot be guaranteed in times of capital expenditure financing. The result will be long downtimes as governments and local governments do not have a history of promptly responding to distressed calls from water services for major repairs
Need for clustering	Not applicable	Highly needed to create the required economies of scale to attract the Private Sector

Source: Author's construct, 2014

4.7 Chapter Summary

The findings, analysis and discussions confirm the neglect of small towns water services in Ghana and highlights the need for a nationwide assessment of the state of 'the first generation of small towns piped water services including the120 GWCL piped systems transferred to the MMDAs in 1999 for community management. This assessment will inform a massive donor-funded rehabilitation and sustainability improvement programme to mark the official adoption of the Private Operator Management Model for small towns water services in Ghana within the policy framework of Public-Private Partnership. Guidance from the Water and Sanitation Programme of the World Bank and the publication on contracting out water and sanitation services by Sansom, et al., (Eds) (2003) will be helpful in the transition of small towns from community management to private operator management.

The four small towns studied are in precarious conditions. One of them is already out of service and has been so for over 10 months. The other three do not have money and any major breakdown will potentially result in long down-times as well. The sustainability of these services is very weak and uncertain whilst demand keep for potable services from the population keep increasing, and challenges are huge.

The lessons from Uganda also reveal that Private Operator Management does not absolve the relevant public institution(s) from responsibilities and key roles, thus requiring some institutional reforms and re-alignment particularly with respect to CWSA.

It must be mentioned, however, that the community management approach, though not the most appropriate for small towns has not been a complete failure, since it achieved some significant successes including the management of most services throughout their design life

(see table 4.22). The story would have been more positive if the community management organisations and systems had received the needed institutional support, oversight and regulation from the MMDAs and CWSA.

Overall, the decentralisation paradigm has not worked for small towns water services as a result of which an alternative national or regional body will need to be considered going forward (see Delbos, 2006: 20).

CHAPTER FIVE

5. Key conclusions

The analysis and discussions point to some major conclusions which require urgent attention.

5.1 Most important factors of piped water services sustainability

The research made a profound revelation about the most important factors of piped services sustainability, which should be prioritised by WASH programmes and weighted more in sustainability assessments relative to other factors. These are the management model adopted, financial and institutional/governance factors. Once, these three factors are right, all the factors of sustainability will fall in line. Adopting a private operator management model within a strong and capable institutional and regulatory environment whilst recovering and efficiently managing life cycle O&M costs of the water supply infrastructure will result in a more responsive and self-reliant small towns piped drinking-water services.

5.2 The time concept in sustainability

The findings from the research brought to the fore the need for policy makers, researchers, managers and practitioners in the rural water supply sector to engage in a process of refining the time concept for sustainability. Various definitions made mention of “the service producing benefits for a long or prolonged period of time” without any specific time line, whilst others use the design life of the water systems (10 years in the case of Ghana) as the reference point for measuring or assessing sustainability (see section 1.3).

However, the author observed that the real test for sustainability occurs after the design life of the piped water service has elapsed. In the view of the author, the piped water supply is supposed to perform or operate optimally during its design life (i.e. if designed properly) anyway except for some minor and routine maintenance requirements, which might arise. Operation and maintenance management of the water system during its design life could be used as the time for preparation towards making the service sustainable in the long term (i.e. throughout its working life, which goes way beyond the design life). This preparation could be measured in terms of how much savings the management team of the piped water service is able to accumulate or how much investments have been entered into over the years purposely for future major repairs, replacements, rehabilitation, system extensions and expansion. Sustainability of the piped water supply service can actually be assessed based on its capacity to meet the new challenges of major repairs, replacements, rehabilitation, extensions, and

system expansion in order to achieve reasonable levels of water supply and demand balance beyond the design life of the water system.

5.3 Institutional arrangement and legal mandates

Whilst the Community and Sanitation Agency, has done quite well in planning for and implementing services for small towns and peri-urban communities, it has applied the same implementation and management principles, approaches and strategies to small towns as well as rural communities. Consequently, the specialised requirements of small towns water services are not fully met mainly due to the inadequacies of its mandate, initially as only a facilitator and later a regulator as well. Most of the assumptions behind the existing legal framework for rural WASH and for that matter the sustainability of small towns water services have proved otherwise. A typical example is the assumption that MMDAs will effectively discharge their mandate for implementation of rural WASH and the sustainability of services. This was found not be true as WASH and the institutional support for community-based services are not prioritised by the local government authorities who incidentally have other competing executive, bureaucratic, political, and legislative functions to perform resulting in human resource, logistics and financial capacity constraints.

It should be noted that the situation of the 120 small towns, which were transferred from utility management to the MMDAs for community management in 1999 and others will not be any different from the small towns installed under the NCWSP. It will be good to evaluate the outcome of that decision and action, which assumed at the time that MMDA-supported community management model could work for those systems.

A research conducted into “Small Towns Water Supply Services in Ghana: Reality and Challenges” by Delbos Baptiste in 2006 confirmed this situation, when the DWSTs of four Municipal and District Assemblies mentioned that they lacked sufficient resources to effectively carry out their duties, specifically vehicle and fuel allocations, which they need to undertake field work (Delbos, 2006: 89).

He surmised that the poor guidance from senior management and the lack of strategic planning at the MMDAs favoured inertia and bureaucracy in the day-to-day work of DWSTs, who ultimately became unaware of or indifferent to the challenges of their work (ibid). Delbos (2006: 20) citing Sansom and Fisher (2005:5) admitted that it is worth reconsidering the appropriateness of national or regional authorities in the wake of the weaknesses and challenge posed by the decentralisation paradigm to small towns piped service delivery. For a technical area like water and sanitation, a bureaucratic set up may not be the best option.

Meanwhile, the restrictions placed on CWSA by the facilitative mandate means that its potentials and capacity, which could have been placed at the disposal of small towns piped drinking-water services are being underutilised.

Figure 5.1 CWSA Head Office and Greater Accra Regional Offices in Accra-Ghana

CWSA does not also have operation and maintenance, outfit within its institutional set-up even though the Technical services Unit and Extension Services Unit try to blend O&M issues into their plans and activities. It is unclear if O&M will get the same level of effort and time as the real implementation issues of facilitating/engaging the private sector to mobilise, animate and build community capacity as well as the design and construction of new water services.

The current situation whereby CWSA 'does not have physical presence' at the MMDAs which will allow direct reporting and support relationship on technical matters is a major weakness in the institutional arrangement. This is compounded by the fact that all the three core members of the DWSTs at the MMDAs (Technician Engineer, Environmental Health Officer and Community development Staff) are all seconded staff who have their mother departments at the Assembly, and will not be affected too much if there are no resources to carry out WASH activities and community outreach to ensure sustainable water supply services. The Desk Officers for the DWSTs, who double as either the District Planning Officers or District Budget Officers also, have their core functions and responsibilities. The question then is why WASH cannot be fully institutionalised? Clearly, the current situation of making WASH an appendage

to existing departments is one of the critical institutional weaknesses identified at the decentralised level (MMDAs). One could imagine what would have happened if there was no autonomous agency like the CWSA for rural WASH in Ghana and rural WASH was made an appendage to an existing institution. Quite obviously, the story would not have been different from what is happening at the MMDAs.

5.4 Service delivery versus service sustainability

CWSA acting with the delegated mandate of the MMDAs (for capacity reasons) has achieved remarkable improvements in drinking water supply for the populations. For example, through the planning and implementation of various water supply projects across the country, CWSA along with its partners increased safe water coverage for the populations of rural communities and small towns from 40% in the year 2000 to 63.66% at the end of 2013. It is becoming increasingly clear that once a water facility is installed, its sustainability depends to a large extent on the institutional arrangements and management systems put in place (Asimah, 2009:30). More than that, is how well those institutional arrangements and management systems, which have been put in place to ensure sustainability, are actually working or functioning. That is a challenge to sustainable service delivery.

There is however a weakness in the area of service sustainability, where it is assumed that the MMDAs will fully take up in providing the necessary institutional support to the communities through monitoring and evaluation, participatory planning, capacity building and specialist technical assistance, including financial support (Harvey and Reed, 2004: 51). This has not been happening.

5.6 Capacity constraints of rural WASH at the MMDAs

The DWSTs are not enabled by the Managements of the MMDAs to function, as they lack operational budget, logistics and other support, which affect their ability to provide technical support to the communities or the community management structures. They also are not able to carry out routine monitoring and evaluation, which affects the sustainability of the services as problems are not identified in time and resolved. This affects reporting on water supply services to the MMDAs, Regional Coordinating Councils, CWSA and other stakeholders.

5.7 District Assemblies Bye-Law on the establishment and operations of WSDBs/WSMTs

The non-implementation and lack of periodic evaluation and review of the District Assemblies Model Bye-Law on the Establishment and Operations of Water and Sanitation Development Boards (now WSMTs) introduced by the Ministry of Local Government and Rural Development (in February, 2008) shows the low level of awareness and commitment to the responsibilities

and respective mandates of the key actors (MMDAs and the communities) with respect to this bye-law.

5.8 Impact of inadequate institutional support for community management

Community management cannot be successful without adequate institutional support. Thus weaknesses in the MMDAs and CWSA, which do not enable them to fully support the communities, are partly responsible for the failure of community management. Hence, the poor sustainability of water services could not be attributed to the failure of community management alone but also the weaknesses of the implementing, facilitative and regulatory institutions. There is no oversight for the community management teams and operating staff. In other words, nobody supervises their work and that has implications for performance improvement, control and accountability.

5.9 Complications of the community ownership and management concept for small towns

The concept of Community Ownership and Management may not be appropriate for small towns. The evidence obtained by this research shows that the 'gate-keeping' role expected from the communities is being seriously undermined and compromised by the increasing interest of traditional leaders, Assembly members, and Unit Committees in the funds generated by the WSMTs for O&M and have therefore become potential threats to sustainability. They do not appreciate the scale of investment needed for major replacement, rehabilitation, extension and expansion, which will arise in future hence the tendency of some of them to replace traditional sources of revenue for other community projects and events (development levies) with funds from the WSMT, which appears more convenient and predictable. The relatively large size of small towns does not promote community participation or actions, which will hold the service providers accountable for their stewardship.

5.10 MMDAs support for rehabilitation of old and weak piped schemes in small towns

The MMDAs have not been able to support the communities financially in times of major breakdowns. They are also unable to support the communities to rehabilitate old systems without having a donor-funded project. Some WSMTs of very old small towns water services are having to fall on the Banks for loans, that is if they have the required collaterals. Out of the four cases, Assin Bereku seems to be in good standing for Bank loans. They once accessed **GH₵15,000 (US$4,839)** to drill a new borehole to replace the old one and currently at an advanced stage of getting another loan of **GH₵10,000 ((US$3,226)** for some extension works.

BOX 6 A SUCCESS STORY OF A WSMT RELATIONSHIP WITH A BANK

It was an impressive spectacle when a Team of four Bank Officials from the District Capital, Assin Fosu, drove in, smartly dressed in suits to hold a meeting with the ***WSMT of Assin Bereku*** *in the WSMT's Office on the same day the researcher was having the interviews with them. The purpose of the meeting was to discuss a pending loan application (GH₵10,000) submitted by the WSMT, clarify some issues, and in the process do final due diligence on the loan application. It is a useful relationship developed by the WSMT with a formal financial institution. The key lesson learnt is that, a good performing informal community management system becomes attractive to formal financial institutions/private sector for business relationships.*

This means that small towns water services if managed well can become credit worthy and self-sustaining without outside help. Being self-reliant will insulate the small towns water services from local politics and political interference and give them the needed autonomy.

5.11 Use of bulk and consumer water meters as a management tool

WSMTs and communities are not fully aware of the importance and uses of both the bulk meters (for water production) and consumer water meters (for public standposts and private connections). This is both an awareness raising and a capacity building issue, which need to be emphasised in training modules and follow-up support services for communities.

5.12 Outcomes of O&M training of WSMTs and additional needs

Training of WSMTs in management of operation and maintenance is no guarantee that the systems will be well managed with full application of the knowledge, skills and tools acquired from the training. In most cases, either the training was not enough or those trained are no more with the WSMT. The important O&M activity of monitoring and coaching for the WSMTs was not happening. However, it could be said that the O&M trainings and refreshers conducted by leading training organisations have been useful as the WSMTs have relied on the knowledge and skills gained from those training programmes to at least manage the water services to the end of their design life.

Some new training needs identified by the research for emphasis are:

1) Procurement and contract management
2) Water quality issues and monitoring
3) Effective use of water meters as a management tool for piped water services
4) Life cycle budgeting, and water tariff setting based on realistic O&M budgets

5) Business/professional approach to piped water service management for small towns and business plan preparation and
6) Practical training for operators in plumbing skills

There is also no provision for training of new members of the WSMTs especially in the cases where the WSMTs have been dissolved and replaced with completely new members or the Unit Committee, who do not have any prior training. Also refresher trainings are not planned for and implemented for WSMTs without donor projects.

5.13 Scope for financial sustainability

Achieving financial viability and sustainability for a small town piped drinking-water service depends on many more factors than simply increasing water tariffs. That is why the situation in the communities studied have not improved much even though water tariffs have been increased a number of times over the years.

Not budgeting for operation and maintenance results in unplanned and reactionary financial transactions, lack of proper financial controls, adoption of unrealistic water tariffs and the lack of provision or advanced preparation for future major repairs, rehabilitation, extension and expansion works.

Also important is the issue of revenue collection efficiency, which has to be consistently monitored and bottlenecks removed for improvement. The utilisation and management of the funds generated is very important, without which the efforts at generating more revenues will not count very much.

5.14 Challenges of managing private connections and institutional connections

Private connections (households, commercial enterprises) and institutional connections (especially for boarding schools and large health institutions) are a major customer group for WSMTs. However, most of them, especially the households are defaulting heavily in paying their bills and the WSMTs do not have the means to disconnect them, which according to the WSMTs is due to the use of DPPCs, which hook a number of houses to the same line (outlet from the DPPC). Ironically, however, the demand for private connections especially house connections in the communities is increasing, probably because the people are beginning to climb the improved water supply ladder and wish to move from basic service level to higher service level. The evidence obtained shows that these demands may not be backed by the willingness to pay for the service. Also, private connections pay the same water tariff as those

who fetch from the public standposts, sometimes even lower, in places where they are charged flat rates by the WSMT.

5.15 Cost and reliability of electricity

Electricity for piped water services is becoming increasingly unreliable and costly and it is affecting the operations of the services thus making the provision of stand-by diesel generator for piped schemes more of a necessity. Furthermore, there will need to be greater flexibility in adjusting water tariffs to accommodate rising costs of energy for water production.

5.16 Instability of WSMTs

Political interference and arbitrary dissolution of WSMTs as well as the four-year tenure, maximum two terms is problematic and affects community level institutional sustainability.

5.17 Prospects of private participation in small towns piped water services

The fiscal challenges of government and local government authorities in recent times make it unlikely for government and the MMDAs to prioritise and invest in the sustainability of small towns water services through institutional reforms that will translate into CWSA having District Offices, with which it has direct technical working and reporting relationships, with high operational budget requirements. Hence the expectation of regular institutional support for community management, monitoring and evaluation of piped water services and funding support for communities to undertake rehabilitation, extension and expansion of old systems may not be met.

Furthermore, lessons and experiences from the Central Region (Assin Fosu), other parts of Ghana (Bekwai, Atebubu etc.) and Africa in general (especially Uganda) point to good prospects for successful private operator management of piped water services.

The above therefore presents a unique opportunity for a more elaborate private sector participation in the management of piped drinking-water services of small towns.

5.18 Scope for collaboration between small towns and conventional Urban Water Utility

The increasing number of small towns piped drinking water services developed by CWSA since the early 1990s as part of the National Community Water and Sanitation Programme has created demand for some parts and accessories of piped schemes. With the 465 piped schemes (for 331 small towns and 134 small communities) constructed by CWSA with sponsorship from the donor community as at the end of December, 2013 and still counting, an effective demand for such key spare parts as **water meters, valves, power stabilisers and**

submersible (motorised) pumps have been created. The need for these has become more urgent as the water systems age and operation and maintenance becomes important. Service rehabilitations, extension and expansion will require these essential parts among others. The handpump distribution/sales outlets operating under a private sector participation facilitated by CWSA, in Tema, Kumasi, Accra and Tamale as well as the other regional capitals will be useful in making the parts for piped schemes more accessible to small towns. The scope of these handpump spare parts warehouses and outlets could be expanded and diversified to include the parts for the piped schemes.

Presently, the market for such spare parts and equipment is fragmented, remote in some cases, inaccessible and unregulated. The implication is that CWSA may not be taking advantage of the economies of scale that the emerging small towns water services sub-sector has brought to organise and negotiate a good deal for communities.

With the long history of the Ghana Urban Water Company Limited in piped schemes, there is scope for collaboration and learning between the small towns section of CWSA and the Ghana Urban Water Company Ltd. for purposes of ensuring compliance with standard specifications, and possibly leverage the capacity of the Urban Water Utility in stocking/warehousing some of those parts especially the water meters as well as sharing water meter servicing or repair outfits.

5.19 Some assumptions behind the National Community Water and Sanitation Programme in Ghana, which appear not to be holding

The following assumptions have characterised the rural sector in Ghana but appear not to be holding:

1) That MMDAs will take up the responsibility for sustainability through O&M follow-up and support to communities after CWSA has facilitated the projects' implementation.
2) That MMDAs will allocate financial resources and logistics to support the community management of small towns water services
3) That MMDAs already have the capacity to fully take on WASH implementation management and O&M support without needed institutional reforms or strengthening.
4) That MMDAs will use WASH project resources solely for WASH activities
5) That DWSTs will continue to function in much the same way even without donor-funded WASH projects
6) That communities will be interested in or have the capacity to hold WSMTs accountable for their stewardship
7) That new members of WSMTs will benefit from knowledge and skill transfer from the old members

8) That the WSMTs and staff will have the capacity and aptitude to manage the water systems well.
9) That the community management model will work for both small communities and small towns
10) That O&M funds generated will be used solely for expenditures on water and sanitation.
11) Community leaders will not interfere in the use of funds mobilized by the WSMT.

5.20 Evaluating the research questions

An evaluation of the research questions against the findings from the research shows that all the questions have been answered (see Appendix 7).

CHAPTER SIX

6. Recommendations

The problems working against the sustainability of small towns piped drinking-water services are hydra-headed, complex and multi-dimensional thus requiring smart, practical and potentially high-impact decisions and actions to contain them, reverse the trend, and reposition the services on a trajectory of success.

6.1 The concept of time in sustainability of piped drinking-water supply for small towns

The author proposes a time line of 15 to 20 years beyond the design life in further refining the definition of piped drinking-water service sustainability. This could be intellectually debated, brainstormed, discussed and reflected upon for a global consensus.

6.2 Policy guidelines

The current policy of applying the Community Ownership and Management (COM) concept to small towns requires urgent review because the underlying assumptions could not support it and the expected institutional support could not be provided due to varied constraints, which have no end in sight.

6.3 Private Management Model

From the evidence obtained, it is strongly recommended to make the Private Operator Management Model (POM), the national official management model for small towns water supply services. Here, the complete management of the system will be contracted out to a private firm to manage using business approach and adopting very professional and formal management principles whilst assuring the community of sustainable and quality service delivery. This is expected to insulate the water system from local politics and interference whilst ensuring that clear and transparent financing mechanisms are in place to meet the demand from the growing population at all times (Harvey and Reed 2004:97). Harvey and Reed (2004: 99) whilst acknowledging the potential of private sector service providers to be more able to meet the financial requirements for system upgrade, rehabilitation and expansion through the implementation of adequate tariffs as well as the efficient and purposeful use and management of the funds through long-term savings and investments, also mentioned the need for incentive and regulation.

Introducing local private sector participation in the management of small towns water supply services for sustainability requires that governments adapt existing arrangements for engaging

private sector partners to suit smaller and less attractive markets and to encourage and develop local private sector capacity (Triche, Requena and Kariuki, 2006:1; see also Sansom et al., (eds) (2003):51, 52, 53 and 73). Targeted actions at the national and local levels to raise awareness, build capacity and foster joint venture arrangements to enable the local private sector participate effectively in the delivery of these services without taking undue risks was further recommended (ibid).

6.4 Legal mandate

The Metropolitan, Municipal, and District Assemblies will need to delegate their mandate for implementing small towns piped services to the Community Water and Sanitation Agency of Ghana. This is because of the capacity of CWSA at both the national and Regional levels to manage this more effectively, efficiently and professionally. MMDAs already do this (delegate their mandate) in the area of design, construction, and construction supervision where CWSA leverages its capacity to handle these, in collaboration with the MMDAs. The same kind of relationship is being recommended for the sustainability of the small towns piped water services with the understanding that the MMDAs will concentrate on providing institutional support for the tens of thousands of Point Source communities across the country. There are presently over 22,000 communities covered by rural water, sanitation and hygiene nationwide and it may be impossible for the MMDAs to adequately attend to both point source communities as well as the small towns water services. The logistics and resource constraints and human resource capacity gaps also do not allow the MMDAs to follow up and closely monitor the few existing water systems operating under private management. The UN-water Global Analysis and Assessment of Sanitation and Drinking Water identified low capacity at local level in terms of oversight and service delivery as a constraint (UNICEF/WHO, 2012: 17). Another justification is the technical complexity of small towns piped water services and the financial challenges associated with it, Having CWSA to take up direct responsibility for the sustainable management of small towns piped water services will help to better harmonise and coordinate small towns piped water services compared to the 216 MMDAs (in Ghana currently), who may adopt different approaches, methods, standards, norms and policies since they do not report directly to CWSA and are also not bound to take instructions from CWSA. The burden of a highly fragmented small towns water services sector can be avoided through this method.

The scope of this delegated mandate for CWSA will include but not limited to:

1) Contracting Private Sector Firms for Management of all small towns services
2) Facilitating the preparation and review of the Business/Investment Plans submitted by the Private Operators on the small towns piped water services.
3) Supervising and monitoring the performance of the Private Operators and provide regular feedback to the communities and the relevant MMDAs

4) Creating and managing a Database with national-regional-district and community interface on all small towns water services in Ghana.
5) Organising regular (either annual or twice a year) Regional Small Towns Piped Water Services Performance Reviews for learning and sharing as well as solving problems (this could be funded by the Private Operators/WSMTs through monthly contributions into a fund a national-level fund to be hosted and managed by CWSA for this purpose.
6) Regulating the relationship between the Private Operators and other Business Development Services providers like Auditing Firms, Database Specialists, and other specialised consultants
7) Monitoring the replacement accounts of all small towns water services and retaining a transparent gate-keeping role.

6.5 Institutional strengthening/responsibilities/adaption

Once the CWSA assumes responsibility for the sustainability of small towns piped water services in Ghana, it will need to re-engineer its institutional set-up to effectively respond to the water supply and sustainability needs of small towns in Ghana. A re-definition of small towns to include peri-urban communities will expand the scope of responsibility for CWSA and for that matter, the small towns unit of the agency. It is recommended therefore that CWSA creates and designates a small towns piped water services unit (comprising an Engineer and a socio-economist/Extension Services Specialist doubling as a Monitoring and Evaluation Specialist) supported by the IT specialists at its Head Office and the Regional Offices or appoint Focal Persons for Operation and Maintenance Management at the National and Regional levels, whose core duty will be to promote, facilitate and support the sustainable management of small towns piped water services delivery in Ghana. This unit or Management of Operation and Maintenance (MOM) Focal Points will provide leadership, guidance and capacity building for CWSA with respect to policy formulation and planning of measures/interventions, which promote piped water services sustainability. It is important to make O&M a core responsibility of the proposed unit or Focal Persons as opposed to seeing it as a diffused role of the Technical and Extension Services Departments of CWSA.

Adequate and timely budget support for CWSA towards the Management of Operation and Maintenance of these services will be critical for success. This new direction will ensure that service delivery and service sustainability are given fairly equitable attention by the national government and CWSA.

Having come these far with small towns water projects development, it should be considered to prepare and source funding for an innovative sustainability project or programme, which goes beyond documentation and knowledge management, to include real support services/interventions for performance improvement integrated with the complete

overhaul/rehabilitation of aged and weak piped water systems. Having this as a separate project portfolio will make a huge impact on the sustainability profile of small towns piped drinking-water services.

6.6 Partnership

Re-engineering the water sector to better accommodate and promote small towns and peri-urban communities as a key target or user population in which there is a visible small towns institutional presence and an accelerated promotion and adaption of private operator management model as against community management requires strategic partnerships for the right synergies. As mentioned earlier, there are opportunities for the small towns unit of CWSA to collaborate with the urban water utility (Ghana Urban Water Company Ltd. in the case of Ghana) developing effective supply chain mechanisms for critical spare parts such as water meters and valves at affordable prices in support of small towns and peri-urban piped water supply services. Partnership with civil society organisations for advocacy and research into government funding for small towns water supply as well as the adoption and scaling up of pro-poor and rights-based approaches to service delivery will be important. Specialised Business Development Services such as Auditing, Data Management, as well as key formal sector financial institutions like the Banks will be relevant in this partnership, which will have long-term sustainable piped water service delivery as its primary objective.

Triche, Requena and Kariuki, (2006:1) however, admitted that developing effective partnerships between government institutions (typically at local level) and local private operators of water supply has its own challenges with respect to:

1) contract design
2) selection criteria and procedures
3) financing arrangements
4) risk mitigation instruments
5) performance improvement measures to develop technical skills and
6) regulatory and monitoring framework

These challenges will occupy the attention of all the key stakeholders as they work together going forward.

6.7 Monitoring and evaluation

With the manageable number of small towns piped water services in Ghana (465 i.e. including the small community piped schemes as at 2013), it should be possible to plan and implement a regular and systematic performance monitoring of small towns piped water services (covering smart indicators) minimum, twice a year. Combining the monitoring of small towns piped water services with point sources makes it cumbersome, which is partly the reason why

the functionality/performance monitoring is not being done at all. Focusing on small towns water services for a start will be a good entry-point towards a comprehensive monitoring of WASH eventually.

BOX 7 M&E-RELATED ASSIGNMENT FROM GHANA'S MINISTER OF WATER RESOURCES, WORKS AND HOUSING

Volume 2 of the Rural WASH Bulletin (2013b:17), CWSA's official Newsletter, reported that Ghana's Minister of Water Resources, Works and Housing in an address to participants at the 4th Ghana Water Forum (November 5 to 7, 2013) charged respective Ministries, Departments and Agencies to take stock of all non-functioning and decommissioned water facilities in the country and make efforts to rehabilitate them to restore service delivery whilst new ones are constructed.

This call is relevant for the older generation of piped schemes in Ghana (those constructed in the 1990s and early 2000s), which need to be assessed and packaged for major rehabilitation and sustainability improvement projects or programmes building on the lessons learnt so far.

The theme for the above forum was "Monitoring and Evaluation: Key to sustaining and upscaling water, sanitation and hygiene services"

6.8 Technical design issues

It may be required to review the policy on the design of storage tanks, which currently provides 40% daily storage for communities. In view of the rapid population increases in most of these small towns, it is proposed to increase the capacity of these High Level Storage Tanks and also increase the size of the distribution pipe to make adequate provision for extensions and expansion. The technical experts and engineers of water supply might want to subject this to further discussions during their technical forums and put forward concrete proposals regarding this recommendation. Considerations of cost may need to be balanced with the increased demand that the systems have to meet under conditions of rapid population growth.

Additionally, in view of the increasing demand for private/house connections, it should be considered to increase the current provision of 20% in calculating the water demand for the designs. This is because, the small towns are getting more sophisticated as the populations grow and the settlements keep expanding with diverse functions characterised by an emergence of high consuming customers such as sachet water producers, schools with boarding facilities and health institutions.

The increasing unreliability of electricity requires that stand-by diesel powered generators should become a necessary part of the water system designs. Power stabilisers should also be provided to address the problem of power fluctuations.

Small towns should be furnished with information on the O&M, including replacement costs of water treatment plants such as the iron removal plants. The WSMTs should factor these costs into the overall O&M cost of the water system and get it covered by the water tariff.

CWSA will need to provide pricing and fees guidance list to the management of small towns piped water services (e.g. for drilling and borehole development, borehole mechanisation, construction of standposts, pipe laying, high level tanks, submersible pumps, power stabilisers, water meters and valves of different sizes, and taps). The cost of specific software services like assessment of the water services, training delivery, auditing, and data management should also be included in this guidance document. This list to be updated annually will help the service managers in negotiating with private sector service providers in order to avoid getting overcharged and achieve value-for-money in such transactions.

Concerning the inability of WSMTs to disconnect defaulting households/private customers, it should be made a policy to install water meters on each connection, even if they are hooked to the same outlet from the DPPC. The engineering department of CWSA should be consulted for further advice on this.

Well-ventilated and furnished office accommodation should be constructed as an integral part of the small towns piped systems.

6.9 Updating the training packages for WSMTs

The training packages need updating to respond to emerging O&M needs of the piped water services. The update of the O&M training curriculum for managers of small towns/peri-urban piped water services should include procurement and management of contract; negotiating for services; water quality issues and monitoring; effective use of water meters as a management tool for piped water services; life-cycle cost estimation and water tariff setting based on realistic O&M costs; business plan preparation, and plumbing skills training (for operators).

6.10 O&M budgeting

Comprehensive operation and maintenance budget should be prepared by the management of each piped water service to cover all anticipated expenditures including routine administration and maintenance expenditures, major repairs and replacements, rehabilitation, extension and expansion. If it is agreed to contribute to other community development activities or projects, this should also be factored into the budget and covered by the water

tariff. The same applies to sanitation and hygiene expenses as well as contributions to be made to the regional piped water services performance reviews or learning platforms, which has been recommended to be organised regularly by CWSA to serve as a learning, sharing, mutual accountability and peer-review platform/opportunity.

6.11 Water tariff setting and revisions

Water tariffs should be set based on the O&M budget prepared and the expected water consumption. In so doing, care should be taken to make the water tariff realistic and affordable in order not to drive people back to the unwholesome water sources. The services should also not recover less than required for optimum O&M performance and sustainability.

6.12 Revenue generation and management

Revenue generation, including revenue collection efficiency should be monitored closely and measures instituted for improvement.

The utilisation of the funds should cover only necessary budgeted expenditures and controlled within the context of accountability. The funds should also be well managed to avoid losses and maintain or enhance the value of the money. In the view of Harvey and Reed (2004: 98), generating adequate revenues covering regular operation and maintenance costs, system upgrade, rehabilitation, extension and expansion will require a transparent, secure and sustainable mechanism for saving and investing money for use.

6.13 Replacement Accounts

The replacement account concept introduced by CWSA is very good for sustainability and should be encouraged even under Private Operator Management (POM) but monitored closely for it to achieve the desired results.

6.14 Water Quality Issues and monitoring

Water quality monitoring should be done at least once a year and the anticipated costs included in the Annual O&M budget for the piped drinking-water service.

6.15 Making water meters, valves, taps, power stabilisers and submersible pumps more accessible

The private sector spare parts warehousing programme facilitated by CWSA should be diversified to include the parts for piped schemes especially water meters, valves, taps of various sizes.

6.16 Regulation

CWSA will need to deepen its regulatory functions especially regarding service charges by private sector service providers and also the accumulation and investment of revenues meant for future major works on the systems.

The key respondents from CWSA Head Office; CWSA Central Regional Office; Municipal and District Water and Sanitation Teams; and the Water and Sanitation Management Teams of the four study communities also put forward specific recommendations, which in their view will help promote sustainability. Most of their recommendations are similar to those outlined by the author. Issues like institutional support by the MMDAs and CWSA, regulation of charges by private sector service providers, training of DWSTs and WSMTs in O&M, adopting Private Operator Management Model for small towns especially the bigger ones, and increased operational budget and logistics support for community outreach were some of the recommendations made. The WSMTs recommended a complete rehabilitation of their water systems, which according to them are old and weak thus breaking down frequently and have become inadequate in meeting their demands (see appendix 8 for the recommendations for improvement from the respondents).

The confirmation of their recommendations with the author's recommendations is an important indicator of the validity and reliability of the findings and for that matter the case study methodology used.

6.17 Assessment of the operational condition and sustainability of GWCL transferred systems

A number of small towns water systems previously constructed and managed by the Urban Water Utility were transferred to MMDAs for community management in 1999.

It will be useful if CWSA commissions an assessment of those systems in order to build on the lessons and recommendations for updates in policy, operational strategy and other interventions that might be needed to restore and shore up their sustainability. It is a special category of small towns water services for which this proposed assessment will help create better understanding and appreciation of their peculiar needs, challenges and characteristics.

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Appendices

Appendix 1

Sustainability factors covered by the mapping and other characteristics

Organisation	Name of Tool	Sustainability factors covered	Country experience to date	Technical design/Methodologies	Scoring	Output
AGUASAN (Network)	Sustainability Assessment Tool (SAT)	Social, Economic, Environmental, Institutional, Technological, and Knowledge	Kosovo, Haiti, Nepal and Mali	Primary and secondary data collection, review of policy and programme documents, semi-structured interviews with key informants and field observations	22 Indicators having between 2 and 8 sub-indicators giving (total of 110 questions) to derive indicator score of 0 to 100	Factor scores are graphically represented by a radar graph, and the quantitative indicator scores are shown in a traffic light system (low sustainability: red - 0 to 39; potential sustainability: yellow - 40 to 59; or high sustainability: green - 60 to 100). Recommendations at sector level useful for future planning and assessment are provided
Dutch WASH Alliance (DWA)	Sustainability Monitoring Framework (SMF)	Financial, Institutional, Environmental, Technical and Social (FIETS)	Philippines, Ghana, Dominican Republic	Surveys, Focus Group Discussions, and Documentation review. Indicators presented in the form of questions targeting actors at different levels (consumer level, operating level and governing level)	Track where there is a positive effect, negative effect or whether the effect cannot be determined. No weighting factors are used in the framework and the questions and sampling methodology are adapted to each context	Series of Excel-based graphs presenting the results for each FIETS dimension. In addition, a 'reliability' score describes the number of questions that answered and an overall sustainability score represents the aggregate of the five dimension scores

Organisation	Name of Tool	Sustainability factors covered	Country experience to date	Technical design/Methodologies	Scoring	Output
UNICEF Mozambique	Sustainability Check	Weighted Factors: Institutional (10%), Social (25%), Service (12.5%), Financial (6%), Technical (32.5%) and Sanitation (65%)	Ghana	Random sampling of 10% of Programme Interventions. Data Collection Methods: semi-structured focus groups with District Authorities, facility audits of water points, audits of ODF villages, and semi-structured household surveys in ODF villages	Indicator scores averaged to obtain factor score, followed by an overall score that is aggregated to the provincial and programmatic level using averages	Scores are provided and recommendations conveyed through a management memo and audit statement to inform decision makers

Source: Boulenouar, Schweitzer and Lockwood (2013)

Appendix 2

Reflections/review of the District Assemblies Bye-laws for WSDBs/WSMTs

Relevant sections of the Bye Law	Provisions in the District Assemblies Bye Law for the WSDBs/WSMTs	The Reality	Remarks
Section 3, sub-section 1b	"The Assembly, through resolution and in consultation with the area or community, has the power to dissolve the Board/WSMTs on stated grounds".	The Board/WSMTs are rather being dissolved by Assembly members in the community and/or the traditional rulers (chiefs)	There is the need clarify whether the power to dissolve WSDBs/WSMTs has been vested in or delegated by the District Assemblies to the Assembly members. Even if it turns out to be so, its outcomes have been beneficial to the sustainability of the water services (see4.2.11 Table xxx under 4.2.8)
Section 11, sub-section 2a	"The WSDB/WSMT shall prepare plans for the establishment, rehabilitation, replacement and expansion of existing as well as new systems in its area of jurisdiction"	This is not being done. Responses are more reactionary and adhoc	The current context of community management does not adopt a formal business or professional approach. There is therefore little chance that such forward-looking plans for rehabilitations, extensions and expansions will be prepared. The willingness and ability of the WSMTs to engage consultants to help them in this process is as well doubtful.
Section 11, sub-section 2h	"The WSDB/WSMT shall prepare and submit to the Assembly for its approval an annual business plan for the management of the system and the promotion of improved sanitation and hygiene"	This is not being done. Responses are more reactionary and adhoc	Same as above

Relevant sections of the Bye Law	Provisions in the District Assemblies Bye Law for the WSDBs/WSMTs	The Reality	Remarks
Section 17, sub-section 1a	"For the purpose of managing its finances the WSDB/WSMT shall establish at least three accounts which shall be designated as 'Operational Account', 'Capital Account' and Sanitation Account'. Other accounts may be established for particular activities"	These Accounts were opened as project requirements but have not been effective or fully operational. In some of the small towns, the capital and sanitation accounts have become dormant.	
Section 17, sub-section 3b	"The WSDB/WSMT shall make a monthly payment to the Capital Account at a figure to be determined by the WSDB/WSMT provided that the figure shall not be less than 20% of the net monthly revenue accrued to the WSDB/WSMT after all regular operation and maintenance costs have been paid"	This is not being done. The WSDBs/WSMTs explained that they are not even getting enough revenue to cover their operational expenditures	Apparently, these funds allocations have not been provided in the O&M Budget prepared by the WSDBs/WSMTs. As long as these have not been included in the O&M budget and reflected in the water tariffs, it will be difficult for the WSMTs to meet this requirement. Some WSDBs/WSMTs do not prepare O&M budget.
Section 17, sub-section 3c	"The Assembly may allocate funds annually through its regular budgetary allocation to the capital fund"	There is presently no evidence to show that this is being done.	This may not be a reliable source for the WSDBs/WSMTs as it is a usual practice for Assemblies to make budgetary allocations but default in their actual disbursements to the user departments. The experiences of the M/DWSTs support this.
Section 17, sub-section 4b	"The WSDB/WSMT shall make a monthly payment to the Sanitation Account at a figure to be determined by the WSDB/WSMT provided that the figure shall not be less than 10% of the net monthly revenue accrued to the WSDB/WSMT after all regular operation and maintenance costs have been paid"	Same as above (for the capital account)	Same as above (for the capital account)
Section 17, sub-section 4c	"The Assembly may allocate funds annually through its regular budgetary allocation to the capital fund"	Same as above (for the capital fund)	Same as above (for the capital fund)
Section 18, sub-section b	The M/DWST shall provide the WSDB/WSMT with technical assistance in the preparation of its annual workplan and budget	This is not being done due to budgetary and logistics constraints as revealed during the key-informant interviews and community visits	There is need for institutional re-engineering of rural WASH. This is fundamental to any challenges or constraints being faced by the rural institutions at all levels from the community through the Districts to CWSA (at regional and national levels)

Relevant sections of the Bye Law	Provisions in the District Assemblies Bye Law for the WSDBs/WSMTs	The Reality	Remarks
Section 19, sub-section b	"The books and accounts of the WSDB/WSMT shall be audited annually by auditors approved by the Assembly within three months of the end of the immediately preceding financial year"	This is not being adhered to religiously. The field interviews, however, revealed that this is sometimes done. In some cases, it was more in response to complaints received from the communities.	It is also doubtful if the conventional auditing process is what is required for a highly informal community managed water services and how the outcomes of these audits are helping to transform the performance of the WSDBs/WSMTs. A more comprehensive alternative approach Management of Operation and Maintenance (MOM) Audits, which goes beyond just financial audits, will be more helpful. Furthermore, in a situation where there is no direct oversight for community management, the likelihood of implementing the audit recommendations is doubtful

Source: Ministry of Local Government and Rural Development, 2008; and Field survey, 2014

Appendix 3

Challenges affecting the performance of WSMTs and WSMTs' specific needs

Community	Challenges affecting the performance of the WSMTs	Specific needs identified by the WSMTs
Assin Akropong	Water vendors complain of the water meters not working ell-giving wrong readings	Need more public standpipes
	Water vendors owe the WSMT- revenue received fall short of the billed amount	Need additional storage tank
	People are buying are water but the water vendors keep declaring shortage	Need motivation for the Interim Management Committee/WSMT
	Private customers (House Connection Owners not paying their bills - they owe a total of about GH₵4,500. Meanwhile there is more demand for new private connections to the water supply service lines.	
	Do not have the Know-how to disconnect defaulting customers since closing the valves in the DPPCs affects other people	
	Low water tariff (the tariff of 5 pesewas per 18L container is still seen as expensive by the people and they complain about it as being too expensive)	
	The quarterly cleaning of the overhead tank by a private company from Takoradi, which costs the WSMT GH₵500 per cleaning. The frequency of the cleaning is upon the recommendation of the same company	
	The number of Public Standposts are woefully inadequate but unable to construct new ones for lack of funds	
	Interference from the community in terms of demands for money for other things unrelated to WASH	
	Unreliable electricity power supply	
Assin Bereku	Inadequate water supply due to power outages and the small size of the High Level Tank (HLT)	Need 2 more High Level Tanks (HLTs)
	A looming competition from the Roman Catholic Church, which has constructed a borehole for mechanisation and production of water for sale	The WSMT and Operating Staff need Training in the Management of

Community	Challenges affecting the performance of the WSMTs	Specific needs identified by the WSMTs
		Operation and maintenance
Twifo Mampong	Access to water meters is a challenge	Need training in the use of the water meter in managing the water service
	Frequent breakdowns of the water system (since it is old and weak)	Need training for the WSMT and staff in management of O&M
	Size of the water system small now, compared to the current demand	Need financial support to rehabilitate the water supply system
	Indebtedness of private connection owners	Need improved access to spare parts
	Inadequate funds for maintenance	Need bigger pipelines
	Small size pipelines whilst the population keeps growing - Bigger pipelines are needed	
Aburansa	Old age of the water facility leading to frequent breakdowns	Need solar-powered system because of the increasing cost of power from the National Electricity Grid
	High iron content of the water	Need the government to take over the payment of electricity bills
	Salinity problem due to the closeness of the town to the sea causing severe corrosion of metal parts. This made them to replace all the galvanised pipes with PVC pipes	Need expansion of the water system to meet the increased demand resulting from population growth
	Inadequate water supply due to population growth	Need a new iron removal plant to replace the old broken down plant
	Short-life span of the submersible pumps they buy (usually lasts for only 1 to 2 years). Bought about 8 submersible pumps in about 6 years (2008 to February 2014)	

Source: Field survey, 2014

Appendix 4

Brief profile of the WSMTs covered by the case study

Community	Year WSMT was formed	Current membership strength of WSMT				Last date of training of the WSMT	Training Facilitators	Remarks
		Male	Female	Total	No. of active members			
Assin Akropong	The suspended WSMT was formed in 2007. The IMC was formed in December, 2012	4	0	4 (IMC)	4	NA	Don't know	The old WSMT made up of 13 members were trained several times but the IMC, which effectively started operations from January 2013 has not been trained
Assin Bereku	1998	6	3	9	9	2008	University of Cape Coast and TREND	Trained at Cape Coast and Betanya
Twifo Mampong	1993	11	2	13	13	NA	NA	2 of the members from the previous WSMT, which got all the training are part of the new WSMT
Aburansa	1996	9	4	13	13	Jun-08	TREND	Includes the 2 Assembly members. This is the 4th WSMT.

Source: Field Survey, 2014

Appendix 5

Compensation of water vendors

Community	Compensation for water vendors	Remarks
Assin Akropong	20%	8 Public SPs and 1 Borehole with Handpump. Water vendors are paid their commission even if the fall short of their bills
Assin Bereku	Graduated: GH₵35 for ≥GH₵300; GH₵25 for revenues ranging from GH₵250 to GH₵299; GH₵20 for GH₵100 and below	Supposed to be paying the vendors' 5% Commission but the water vendors opted for fixed allowances because they do not get much money in the rainy season when on commission
Twifo Mampong	20%	Includes water vendors for 3 Boreholes with Handpumps
Aburansa	GH₵20 per month (GH₵20x19=GH₵380 per month)	

Appendix 6

Details of revenue and expenditure records for the four small towns

Assin Akropong – Revenue and Expenditure Records		
Month/Year	Revenue GH₵)	Expenditure (GH₵)
January, 2013	1,248.60	Assumed that every money collected has been spent since there was no Cash in Hand or in the Bank, whilst the IMC was indebted to ECG at the time of the research
February, 2013	1,491.80	
March, 2013	763.65	
April, 2013	506.40	
May, 2013	531.25	
June, 2013	524.60	
July, 2013	724.70	
August, 2013	572.70	
September, 2013	782.40	
October, 2013	451.70	
November, 2013	729.40	
December, 2013	1,039.20	
Annual Total	**9,366.40**	
January, 2014	714.00	
February, 2014	1,414.00	
March, 2014	1,210.65	
April, 2014	835.60	
May, 2014	963.70	
June, 2014	62.00	
Semi-Annual Total	**5,199.95**	

Twifo Mampong – Revenue and Expenditure Records					
Month/Year	Revenue (GH₵)- From Water Supply	Revenue (GH₵)- From the 2 Public Latrines (12-Seater with 3 Bathrooms each) constructed in 2011	Total Revenue (GH₵) (From Water Supply and the 2 No. WC Public Latrines)	Expenditure (GH₵)	Balance GH₵
January, 2013	2,444.60	857.10	3,301.70	1,477.60	1,824.10
February, 2013	1,425.20	533.00	1,958.20	2,763.72	-805.52
March, 2013	1,739.60	410.00	2,149.60	1,888.00	261.60
April, 2013	1,114.50	599.90	1,714.40	1,080.50	633.90
May, 2013	653.40	136.00	789.40	1,928.50	-1,139.10
June, 2013	463.40	315.00	778.40	1,359.40	-581.00
TOTALS	**7,840.70**	**2,851.00**	**10,691.70**	**10,497.72**	**193.98**

Assin Bereku - Revenue and Expenditure Records			
Month/Year	Revenue GH₵)	Expenditure (GH₵)	Balance GH₵
January, 2013	4,223.00	742.70	3,480.30
February, 2013	3,295.00	1,075.40	2,219.60
March, 2013	1,188.00	2,781.00	-1,593.00
April, 2013	2,664.00	789.00	1,875.00
May, 2013	3,779.00	666.60	3,112.40
June, 2013	2,373.00	1,084.00	1,289.00
July, 2013	3,265.00	1,252.40	2,012.60
August, 2013	2,901.00	1,391.00	1,510.00
September, 2013	2,045.00	1,100.00	945.00
October, 2013	1,914.00	860.00	1,054.00
November, 2013	2,747.00	1,131.40	1,615.60
December, 2013	3,753.50	1,854.10	1,899.40
Annual Total	**34,147.50**	**14,727.60**	**19,419.90**
January, 2014	3,625.00	1,308.00	2,317.00
February, 2014	1,086.50	1,290.00	-203.50
March, 2014	3,636.00	1,194.00	2,442.00
April, 2014	2,691.00	1,066.90	1,624.10
May, 2014	1,525.00	2,473.00	-948.00
June, 2014	2,225.00	2,584.00	-359.00
Semi-Annual Total	**14,788.50**	**9,915.90**	**4,872.60**

Aburansa - Revenue and Expenditure Records			
Month/Year	Total Revenue (Public Standposts and Private Connections) (GH₵) in 2012	Total Expenditure (GH₵) in 2012	Balance (GH₵) in 2012
January, 2012	3,826.65	1,290.00	2,536.65
February, 2012	3,004.85	1,122.00	1,882.85
March, 2012	2,605.10	932.00	1,673.10
April, 2012	1,210.10	2,775.00	-1,564.90
May, 2012	1,450.55	1,447.00	3.55
June, 2012	1,038.40	920.00	118.40
July, 2012	637.30	910.00	-272.70
August, 2012	1,568.55	2,425.00	-856.45
September, 2012	1,933.65	1,080.00	853.65
October, 2012	2,452.60	1,101.00	1,351.60
November, 2012	2,747.05	1,045.00	1,702.05
December, 2012	3,403.45	2,381.00	1,022.45
TOTAL	**25,878.25**	**17,428.00**	**8,450.00**

Appendix 7

Evaluating the extent to which the research questions have been answered

Research objectives/questions	Extent to which the research answered the questions
Research question 1.1: What are the critical success factors for financial, operational, maintenance, management, institutional sustainability?	-The management model adopted for the service -Institutional support for community management -Monitoring and evaluation -Clarity of leadership and legal mandate -Savings accumulation -O&M Budget implementation -Financial control -Autonomy of the management structure/team -Transparency and accountability -'Hands off' water funds
Research question 2.1: How strong/effective are WSMTs and their governance systems?	-They are quite effective but not very efficient -Weak governance: Lack of oversight, political interference, weak records keeping and accountability systems -Inappropriate funds utilisation -Lack of technical support and coaching opportunities
Research question 3.1: How well do private sector service providers and suppliers perform their roles? Research question 3.2: Who regulates the relationship between communities/WSMTs and the Private Sector Service Providers? Research question 3.3: How adequate is the institutional support for community management by Local Government Authorities and CWSA after projects have ended?	-They are not supervised. There are complaints of overcharging. -There is no regulation Highly inadequate due to low prioritisation and resource constraints.
Research Question 4.1: To what extent have training, community management, the existence of WSMTs and the implementation of water tariff been effective in guaranteeing sustainability of small towns' water services? Research question 4.2: What other factors apart from water tariff collection need to be considered in order to achieve financial sustainability?	-To some extent. These functions enabled the WSMTs to manage the systems at least through their design life, though their capacity for major repairs, rehabilitation, extension and expansion is seriously highly fragile. -Setting appropriate water tariffs based on comprehensive O&M budget. -Protection of water funds from misappropriation and misapplication and misuse. -Monitoring revenue collection efficiency -Controlling expenditures through regulation -Reducing unaccounted-for-water
Research question 5.1: Who moderates the charging and quality-assures the work of the private sector for communities? Research question 5.2: How transparent are the regulatory and quality assurance mechanisms to protect communities from possible exploitation? Research question 5.3: How effective are these guarantees/defect liability warranty for services rendered to communities by the private sector (if applicable)? Research question 5.4: If applicable, who enforces these guarantees?	-No one moderates the charging. It is a free market. There is no guidelines to help the WSMT negotiate or bargain -Not applicable. There is no such mechanism -Guarantees/warranties not provided by private sector service providers and suppliers. There are no written contracts to guide the relationships (See Box 1) -Not applicable. Formal contracts not entered into.
Research question 6.1 What lessons can be	-community management model is not appropriate for

Research objectives/questions	Extent to which the research answered the questions
learnt from experiences and innovations for water supply sustainability from existing literature (available information)?	small towns services. Private Operator Model preferable. - Good performing communities become attractive to the Banks and more likely to be self-reliant. -It is possible to for small towns piped services to develop the capacity to become self-reliant in times of major repairs, replacements, rehabilitation, extension and expansion. -Being self-reliant prevents political interference. - Policies, Guidelines and Principles need periodic reviews and evaluations to inform changes: E.g. The mandate of CWSA vis a vis the MMDAs, Application of the Community Ownership and Management concept to small towns, and opportunities for partnership with the Urban Water Utility to leverage comparative strengths and advantages and the regulation of the sector.
Research objective 7.1: Besides the existing knowledge, what innovative strategies can be adopted to enhance the sustainability of small towns piped water supply systems?	- MMDAs delegating the mandate for small towns to CWSA take up fully. - Making Private Sector Operator Management Model the Official management model for small towns water services and strengthening the capacity of CWSA Head Office and the 10 Regional Offices to work with the M/DWSTs to regulate them. - Adopting business approach to the management of small towns piped drinking water services and thereby making it more professional and formal. -Being responsive and adaptive to the management challenges posed by the various customer-mix namely: Private Connections/Households and commercial enterprises, institutional consumers and the public particularly with revenue collection.

Appendix 8

Recommendations from respondents on how to improve service sustainability

Institution/ Respondents	Recommendations for the improvement in the sustainability of small towns piped services
CWSA Head Office	There should be a framework for the assessment of the system regularly
	There should be a platform where the Water and Sanitation Management Teams can meet, network and share experiences.
	MMDAs to ensure that proper water tariffs are set for cost recovery
	There is need for supervision of the WSMTs and provide the right capacity building for them
	The DAs should be able to enforce the Model Bye Law of the Small Towns
	Annual Auditing
	Refresher Training
	Encourage private operation of the bigger water supply systems
	The water systems should be run as business/more professionally
CWSA Central Regional Office	Projects should not end with construction. There should be a post-construction phase for consolidation of capacity building outcomes (for both the M/DWSTs and the WSMTs)
	There should be regular water quality monitoring
	There should be regular monitoring of WSMTs and small towns services by both the CWSA and MMDAs
	There is the need to start disengaging from Community Ownership and Management to Private Ownership and Management (From COM to POM) in the case of small towns especially where the communities are large since small towns do not have such conditions needed for COM like community homogeneity
	Introduce the pre-paid water metering system learning from Uganda's experience with slams
Assin North Municipal Water and Sanitation Team	The Municipal Assembly must support the Municipal Water and Sanitation Team to be able to undertake regular monitoring visits to communities in terms of providing logistics and funds
	Funds should be made available for the training of the members of reconstituted WSMTs in view of the frequent changing WSMTs
	The existing WSTMs also need refresher training since the MWST is not able to visit them.
Twifo Atti Morkwaa District	DWST should do constant monitoring of facilities and audit the accounts
	WSMTs should be given refresher training. (New members have not received any training)
Komenda Edina Eguafo Abirem District Water and Sanitation Team	The Municipal Assembly or the Member of Parliament should help with the rehabilitation of the multi-community water system at Aburansa
	MWST should be provided with resources for more frequent community visits
Assin Akropong	Periodically perform water quality analysis
	Do periodic maintenance of the High Level Tank
	Train the Technical Operators since the management aspect can easily be done'
	Government should set aside a percentage of the District Assemblies Common Fund for major repairs of small towns water supply systems

Institution/ Respondents	Recommendations for the improvement in the sustainability of small towns piped services
Assin Bereku	There is the need donor support for one additional borehole and a High Level Tank
	Need donor assistance to construct a new water system since the existing system has grown far older than the design life
Twifo Mampong	The WSMT and the operating staff/management should be trained to become more capable in managing the water system. This is necessary because the new WSMT has not received any training at all
	Government and the NGOs should support the community to rehabilitate the water supply system
Aburansa	WSMT members should be given monthly remuneration
	The water system needs a major rehabilitation
	There should not be frequent changes of the WSMT as this results in the loss of records, documents, institutional memory and sometimes the incoming WSMT does not meet any money with which to operate the system
	The WSMT should be given some autonomy to minimise the problem of undue control