Management models for the provision of small town and peri-urban water services in Ghana

TPP synthesis report

Marieke Adank
Benedict Tuffuor

TREND
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Tripartite Partnership (TPP) Project

IRC

Management models for the provision of small town and peri-urban water services in Ghana

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RCN Ghana is a network of institutional partners seeking to promote Knowledge Management in the Water, Sanitation and Hygiene (WASH) Sector in Ghana. The vision is a dynamic knowledge-driven WASH sector providing improved and sustainable pro-poor services.

Cover photos Right: Bekwai small town system (Marieke Adank)

Left: Young women fetching water from a public standpipe (Peter McIntyre)

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The TPP project

This document is an output of the Tripartite Partnership Project (TPP). TPP aims to strengthen sector capacity for planning and delivery of pro-poor Water, Sanitation and Hygiene (WASH) services in Ghana, through the generation, packaging and dissemination of knowledge, especially with regard to sustainable and equitable management models, based on the partnership between public, private and civil society actors. The project was coordinated by TREND Group in partnership with IRC International Water and Sanitation Centre and in a close collaboration with CONIWAS, CWSA and PRUSPA.

The first phase of the TPP Project, which ran from January 2009 to 2010, concentrated on the sector review studies and the documentation of interesting models and best practices, and was funded by members of the Netherlands Water Partnership NGO-Group: ICCO, Aqua for All and Simavi. In the second phase of the project, three pilot projects were implemented in (peri-) urban areas and small towns of the TPP Project, funded through an Africa Water Facility grant from the African Development Bank.

Within the framework of this first phase of the TPP project, a number of sector studies have been executed. This included a review of global literature on pro-poor urban and small town water services, an institutional mapping of the small town and urban water sector in Ghana, and a mapping of small town and urban water management models in Ghana. A number of these management models identified in Ghana, were selected for further study through the documentation of case studies. The sector review and case studies have been published under the TPP Working Document series and were presented to the sector at the National Level Learning Alliance Platform meeting (NLLAP) on 30 June 2010 for feedback and verification. This document presents a synthesis of the findings of these studies.

For more information on TPP, please visit http://www.washghana.net/page/687.

TREND Group

TREND Group is a Ghanaian NGO, focuses on training, research and networking for the development, delivery and sustained management of water and environmental sanitation facilities. Development of low-cost technologies, household sanitation, and documentation and dissemination of sector information are key roles of TREND.

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IRC International Water and Sanitation Centre Ghana

IRC International Water and Sanitation Centre is a global 'think-do-tank' that is committed to supporting the delivery of water, sanitation and hygiene services that last. It works with a worldwide network of partner organisations in order to achieve equitable and sustainable water, sanitation and hygiene (WASH) services. IRC's roots are in advocacy, knowledge management and capacity building. The organisation was founded in 1968 and established a branch office in Ghana in 2012.

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Executive summary

This paper describes and discusses existing and emerging models for the provision of urban and small town water services in Ghana. It is the result of studies conducted under the first phase of the Tri-Partite Partnership (TPP) project, which took place in Ghana from 2008-2010. The focus is on describing the different management models within these service delivery models, in theory and in practice.

There is no single unambiguous definition in policy or legislation in Ghana that defines a small town according to population size or any other criteria. Basically, the Ghana water sector has been divided into two subsectors since the sector reforms of 1998. The 'urban water sector', with utility managed water supply, managed by Ghana Water Company Limited (GWCL) / Ghana Urban Water Company (GUWC), and the 'rural and small town water sector', with community managed schemes, facilitated by Community Water and Sanitation Agency (CWSA).

Management models

The two main formal management models in urban areas and small towns in Ghana are utility management and Community Ownership and Management (COM). In addition to these formal management models, Urban Water Boards are an informal, emerging community management model. Also a number of private, informal management models can be found in peri-urban areas and small towns such as water vendors, water tankers and independent service providers.

The **utility management model** is the main model for urban water supply in Ghana. It has a clear institutional and regulatory framework and provides high level water services through household connections. The tariff related to accessing these water services is relatively low. As the owner of the assets, GWCL is responsible for implementation of new infrastructure and rehabilitation and expansion of existing infrastructure.

Community Ownership and Management (COM) model is the main model for water service delivery in small towns which are not covered by the utility network. The Community Ownership and Management model is implemented under the National Community Water and Sanitation Programme by the Community Water and Sanitation Agency (CWSA). Under this model, water services are provided by Water and Sanitation Development Board (WSDBs), either directly, or through a Private Operator (PO). Unlike under utility management, the focus under the COM model is on providing a basic level of service to the majority of the population through standpipes, rather than on providing a high service level to a small group through household connections. Community managed small town water supply can thus be considered pro-poor focussed.

Especially in the densely populated low income urban areas which are not (yet) connected to the utility managed network, private entrepreneurs play an important role in the provision of water services. Informal private water service providers either sell water obtained from the utility network or from schemes developed independently from the utility. **Water vendors** sell water from standpipes, mainly in densely populated low income neighbourhoods. Domestic vendors take their supplies from **tanker operators** where the utility's supply is insufficient, rationed, or where there is no reticulation at all. In that case, the tanker operator sells a bulk amount of water to the vendor,

who stores and sells it to its customers. Overall, the activities of water vendors and tanker operators are largely unregulated, in terms of price and water quality. In the case of **independent private providers**, an individual, organization or a company owns, manages and operates the water supply from source to distribution point, for example individuals with a private hand dug well, borehole, spring etc. who sell water to neighbours. Inclusion of the private sector in the management of small town water supply has not really caught on at a large scale.

Tariffs

Under utility management, profitable schemes cross-subsidise less profitable schemes. In this way, the tariff for utility managed services can be kept the same for all utility managed schemes. Community and privately managed schemes do not benefit from such cross-subsidies and hence the tariff for community and privately managed services vary widely.

People served by the utility pay less per unit volume than people served by community managed small town schemes for a similar level of service. People served by privately managed informal water supply pay even more.

Serving the poor

The poor are usually not serviced by the utility managed model. In Ghana, the Joint Monitoring Programme estimates that in 2008 only 30% of the urban population was served by piped water into a dwelling, plot or yard, and 60% by other improved sources. The poor face different barriers in getting connected to the network service provided under the utility managed model. Technically, the densely populated, unplanned areas where many of the urban poor reside -often located at some distance from the network - are the most difficult and expensive areas to connect to a network.

Utilities are reluctant to extend services to these areas, because of the lack of security guarantees for the water infrastructure (Almansi et al 2003). Utilities generally require proof of land ownership in order to connect people to the piped network. For the many middle income and poor people in developing countries, who rent properties from landlords, this poses a barrier to get connected.

Extension of services to new consumers is also often not in the mandate of utilities, which are only responsible for operating existing schemes. The responsibility of extending services lies with the asset holder, typically the State. When the utility is the asset holder, and as such responsible for service extension, they tend to serve the relatively well-off, who are likely to be more vocal and organised, and live in areas that are technically easier to serve. In both case, low-income and marginalized communities remain unserved.

Perceived problems of affordability and fear of non-payment of water fees also prevent utilities from extending services to the poor (Almansi et al 2003). In addition, high connection costs also tend to preclude the poor from getting access to piped water services.

The poor tend to rely on private service providers which often provide lower levels of service at higher costs. Different innovative models are being piloted on a small scale try to address these challenges, such as subsidised tanker services. Under these models arrangements are put into place, which are meant to improve service level and lower prices. The price people pay for these services is

generally lower than for (informal) privately managed services. However, scalability and sustainability of these models is an issue.

Cost recovery and financial sustainability

Under all studied management models for small town and peri-urban water supply in Ghana, clients, both individual households as well as institutions, are required to pay for the provision of water services. The revenues are, under all models, used to cover the expenditure on operation and maintenance, and in some cases contribute to the investment costs and/or costs of major repairs, rehabilitation and expansion. In the cases studied that had WSDB management, the annual revenues outweigh expenditure on operations and minor maintenance more than in the studies cases of WSDB management with private operators.

High rate of non-revenue water are a big challenge effecting financial sustainability. The percentage of non-revenue water is especially high under utility management. Another common challenge to cost recovery and financial sustainability in all models is the low consumption level. Non-payment of institutional water bills also poses a big challenge for cost recovery and financial sustainability for the community management models.

Many of the small towns which were transferred from the utility to CWSA and were managed under community management models, were considered not economically viable, and were generally populated by the poorer strata of the Ghanaian society.

Institutional arrangements

The institutional set-up varies under the different models. For utility management, institutional arrangements for the management of existing schemes are clearly defined, including the roles and functions of the regulator. Under community management and private management, a variety of sub-models can be found and the institutional arrangements related to authority functions around private and community management are not well defined.

For small towns, especially those with a population of more than 5,000 people the design demand is far higher for utility managed schemes than for community managed schemes. This is to a large extent due to the fact that under the utility model, focus is on service provision through household connections, while under community management models focus is more on service provision through standpipes. However actual consumption levels are far lower than the design demand, both in utility managed as well as in community managed schemes, and in many cases even below the basic water supply standard of 20 litres per capita per day. This is due both to under-performance of the schemes, as well as to low demand.

Hybrid variations of the utility managed model are applied in a number of small towns in Ghana. In small towns the utility managed model is different from urban water supply as it focuses on the provision of a basic level of water services through public standpipes, rather than through household connections. As tariffs are not regulated centrally, a range of tariffs is applied under these models, as set by the water service provider and the service authority.

With the development of the Community Water and Sanitation Agency (CWSA) guidelines and model by-law, steps have been taken to define, formalise and standardise these models. However this research shows that the actual institutional arrangements and practices differ significantly from the prescribed models.

The situation in reality differs from the institutional arrangements in small towns especially in the area of tariff setting and the provision of direct support by the MMDAs. There is also still a lack of clarity on the division of corporate oversight and operations roles and responsibilities, the role of WATSANs in community managed small town water supply and on who is responsible for major repairs, rehabilitations and expansion.

There is a lack of clarity of who is responsible for authority functions related to the provision of water services in small towns, such as providing direct support to service providers and performance regulation. At the moment, there seems to be an overlap in functions between the (relatively weak) local government and the (relatively strong) CWSA.

Way forward

There is a need for affordable innovative management models for water provision in peri-urban areas, the formalisation and regulation of existing privately managed services, and new thinking about the use of subsidy to reduce the huge and inequitable range in the tariffs paid by the poor.

There is not much clarity as to who is supposed to be responsible for ensuring that these unserved will be served and what management model should be employed to achieve that (and on who actually decides on this). Although officially local government is supposed to play an important role in making this kind of decision, in reality, the selected model, and with that the price people have to pay to access the water services, seems to be mostly determined by infrastructure implementation projects, without or with limited involvement of local government. There is a need for the development of well structured, formalised and regulated models for reaching the urban poor, who are not connected to the utility network.

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List of Acronyms

ADB	African Development Bank
AFD	Agence Française de Développement
AfDB	African Development Bank
ATMA	Accra Tema Metropolitan Area
AVRL	Aqua Vitens Rand Limited
BNWP	Bank Netherlands Water Partnership
CIDA	Canadian International Development Agency
COM	Community Ownership and Management
CONIWAS	Coalition of NGOs in the Water and Sanitation Sector
CWSA	Community Water and Sanitation Agency
DANIDA	Danish International Development Agency
DCD	District Coordinating Director
DFID	Department for International Development
DWSP	District Water and Sanitation Plan
DWST	District Water and Sanitation Team
EPA	Environmental Protection Agency
GDP	Gross Domestic Product
GH₵	Ghana cedi
GSS	Ghana statistical Services
GSS	Ghana Statistical Services
GUWC	Ghana Urban Water Company
GWCL	Ghana Water Company Limited
GWSC	Ghana Water and Sewerage Corporation
IRC	International Water and Sanitation Centre
JICA	Japan International Co-operation Agency
JMP	Joint Monitoring Programme of WHO/UNICEF
KNUST	Kwame Nkrumah University of Science and Technology
LGSS	Local Government Service Secretariat
lpcd	Litre per capita per day

MDG	Millennium Development Goals
MMDA	Metropolitan, Municipal, District Assembly
MoFEP	Ministry of Finance and Economic Planning
NCWSP	National Community Water and Sanitation Programme
NDF	Nordic Development Fund
NDPC	National Development Planning Commission
NGO	Non-Governmental Organisation
PRUSPA	Private Utility Service Providers Association
PURC	Public Utilities Regulatory Commission
PURC	Public Utility Regulatory Committee
RCC	Regional Coordinating Council
RCN	Resource Centre Network Ghana
SD-MLGRD	Sanitation Directorate of the Ministry of Local Government and Rural Development
SIP	Strategic Investment Plan
Triple-S	Sustainable Service at Scale Project
TPP	Tri-Partite Partnership Project
TREND	Training, Research and Networking for Development
UNDESA	United Nations Department of Economic and Social Affairs
USD	United States Dollar
WASH	Water, Sanitation and Hygiene
WATSAN	Water and Sanitation Committee
WD-MWRWH	Water Directorate of the Ministry of Water Resources, Works and Housing of Ghana
WHO	World Health Organisation
WRC	Water Resource Committee
WSDB	Water and Sanitation Development Board
WSMP	Water and Sanitation Monitoring Platform

1 Urban and small town challenges

The world is becoming more and more urban. In 2009, the number of people living in urban areas (3.42 billion) surpassed the number living in rural areas (3.41 billion). Virtually all of the expected growth in world population will be concentrated in urban areas of the less developed regions (UNDESA 2010). While the Joint Monitoring Programme (JMP) of UNICEF/WHO reports that the number of people without access to safe water is by far the greatest in rural areas, it also shows that progress is being made in these areas. This is not the case for urban areas. The percentage of the urban population in Sub-Sahara Africa with access to safe water actually declined from 83% in 1990 (the reference year for the MDGs) to 82% in 2000, before climbing up to 83% in 2010. The percentage of people with access to piped services on their premises however declined from 43% in 1990 to 34% in 2010 (UNICEF/WHO, 2012). This indicates the struggles of service providers to keep pace with the increase in population, caused by urbanisation, and highlights the need to develop innovative approaches to reach the unserved.

Small towns account for an increasing proportion of the world's growing urban population. In 2009, cities with fewer than 100,000 inhabitants accounted for one third of the world urban population, amounting to 1.15 billion people (UNDESA 2010). Pilgrim et al (2007) estimate that for every large town (50,000 to 200,000 people) there are ten smaller ones (2,000 to 50,000 people).

Providing water services to a growing urban population in cities and small towns, and especially to the poor, is a big, if not the biggest challenge for water service providers. This document describes and discusses existing and emerging models for the provision of urban and small town water services within a specific country: Ghana. It is the result of studies conducted under the first phase of the Tri-Partite Partnership (TPP) Project, which took place from 2008-2010.

This chapter presents challenges related to the provision of water services in small towns and urban areas, with a special focus on services to the urban poor. This is followed by a description of the main terms and definitions used in this document to describe existing and emerging models. Finally, an outline of this document is provided to guide easy navigation through this document.

1.1 Water services for the urban poor

Piped water supply with a connection into a dwelling, plot or yard is generally considered the highest step on the water ladder[1]. Although the percentage of people with access to this level of water services has increased globally in the period 1990-2006, it has not been the case in Sub-Sahara Africa, where piped service provision has remained stagnant

[1] The 2010 JMP report for example presents drinking water coverage as a three-step ladder, with people using water piped into a dwelling, plot or yard as the highest step on the ladder. Similarly, the five-step water service ladder devised by IRC International Water and Sanitation Centre under its WASHCost and Triple-S projects, perceives on-demand (piped) water supply as the higher level of service.

(UNICEF/WHO, 2010). In Ghana, JMP estimates that in 2008 only 30 percent of the urban population was served by piped water into a dwelling, plot or yard, and 60 percent by other improved sources, while only 3 percent of the rural population was served by piped water into a dwelling, plot or yard. The percentage of Ghana's total population using piped water, delivered into a dwelling, plot or yard was only 17 percent.

Low-income urban communities face various barriers in accessing piped water services, many of which are related to the utilities' perceptions (Franceys and Gerlach 2008), but also to the utilities' ability to provide these services. Many utilities lack the autonomy, the financial and human resources and the incentives to provide services to the urban poor (McIntosh et al 2009). Extension of services to new consumers is often not in the mandate of utilities, which are only responsible for operating existing schemes: the responsibility of extending services lies with the asset holder, typically the State. When the utility is the asset holder, and as such responsible for service extension, they tend to serve the relatively well-off, who are likely to be more vocal and organised, and live in areas that are technically easier to serve. In both case, low-income and marginalized communities remain unserved.

Technically, the densely populated, unplanned areas where many of the urban poor reside - often located at some distance from the network - are the most difficult and expensive areas to connect to a network. Katakura and Bakalian (1998) describe the chaotic and densely populated areas usually occupied by the urban poor as a 'water engineer's nightmare'[2]. Physical and technical challenges and the high investment cost of conventional technologies make extending formal piped water supply into these unplanned and often informal settlements more difficult (McIntosh, et al 2009). In addition to the physical and technical difficulties, perceived problems of affordability and fear of non-payment of water fees prevent utilities from extending services to the poor (Almansi et al 2003). The issue of land tenure, which lies outside the water sector, can also have a fundamental impact on the ability and willingness of authorities to serve the poor. Many city authorities simply can or will not countenance diverting energy and resources to ensure services for people living on land zoned for other activities, or in settlements which are considered 'illegal'. Utilities are reluctant to extend services to these areas, because of the lack of security guarantees for the water infrastructure (Almansi et al 2003).

In areas which are served by the piped network of the utility, the poor face different barriers to getting connected to this network. These barriers include land ownership and tenure issues (McIntosh, et al 2009). Utilities generally require proof of land ownership in order to connect people to the piped network. For the many middle income and poor people in developing countries, who rent properties from landlords, this poses a barrier to get connected. Landlords may not be willing to invest in infrastructure for their tenants. In addition, high connection costs tend to preclude the poor from getting access to piped water services. This was shown by data analysis from four countries within the framework of the study 'Charging to enter the water shop', which found an average cost of 295 US$ to acquire

[2] Katakura and Bakalian specifically refer to the situation in the crowded and chaotic Brazilian favelas, but the same could easily be said for most of the often unplanned and densely populated areas populated by the urban poor all over the world.

a functioning piped water connection, which was regarded as unaffordable for the poor (Franceys, 2005). Also, cumbersome administrative procedures pose a major barrier for getting connected to the piped network. The poor may be unaware of the administrative and legal requirements, or find it difficult to understand and comply with these. (Almansi et al 2003; McIntosh, et al 2009).

When the poor do manage to get connected to the piped scheme, it does not necessarily mean they have access to reliable and high quality services. As Franceys and Gerlach (2008) note, these services, generally delivered by monopoly utilities under public ownership and management, are often of poor quality, only available for limited periods during the day, at a price well below the actual cost. In contrast to the richer strata of the urban population, the poor connected to the piped scheme usually do often not have the resources to put in place measures to mitigate the low level of services, like water storage tanks or water filters.

In addition, tariff systems like increasing block tariffs penalize clusters of households that share a single connection (McIntosh, et al 2009; Castro, 2009) as they will fall in a higher tariff block because of the higher level of consumption from the water point, which means they pay more per unit water than households with a private tap.

In the absence of (access to) an effective utility providing high quality, reliable services, the poor seek service through a host of alternative water service providers. These, often small scale, alternative service providers serve about 25 percent of the urban population in Latin America and East Asia, and an estimated 50 percent (BMGF 2006) to 80 percent (Collignon and Vézina, 2000) of the urban population in Africa. In Accra, it is estimated that 40 percent of the population, most of which urban poor, do not have a direct connection to the utility's mains (PURC, 2002). They largely depend on private water service providers.

1.2 Small town water supply: a special challenge

The water services provided in small towns can be considered to exist somewhere in the continuum between the truly rural and the truly urban services. In between the high volume, high quality water services provided to people's doorstep, strived for in urban areas; and the lower volume, lower quality water services provided at some distance from people's homes through point sources, which are common in most rural areas.

Unlike larger towns or cities, these smaller towns often lack the financial and human resources to independently plan, finance, manage, and operate their water supply schemes (Pilgrim et al, 2007). Identifying, developing and holding on to the human resources required to provide the services required by small towns is a constant struggle. In general, larger towns with better services, development opportunities and places of leisure, are more attractive for competent professionals than smaller towns, where these facilities are often of lower standard or absent. Smaller towns thus struggle to maintain skilled human resources, with a constant tendency for these to migrate to larger and better equipped centres. Mugabi and Njiru (2006) also note that unlike big urban centres, small towns often lack larger commercial and industrial consumers of water, which means that cross subsidy is not an available option.

Box 1: Defining small towns

It is generally recognised that conceptually 'small towns' are difficult to define. During the 2000 e-conference on small town water and sanitation, it was suggested to define small towns based on a number of characteristics, including size, technology, water source, management type, operations and maintenance requirements and local infrastructure:

'Small towns are settlements that are sufficiently large and dense to benefit from the economies of scale offered by piped schemes, 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 to meet the growing demand for water. Small towns usually have populations between 5,000 and 50,000, but can be larger or smaller[3]*'(David and Pilgrim 2000)*

Commenting on this definition, Njiru and Sansom (2002) note that there is no evidence to support the assertion that a 'conventional urban water utility' would not be able to efficiently manage water and sanitation services in small towns. According to them, there is no agreement on what constitutes a 'conventional' urban water utility, since different institutional models currently exist and manage water and sanitation services with varying levels of performance. Moriarty et al (2002) argue that the focus on piped schemes of the above definition is too narrow, as generally a mixture of water sources can be found in small towns. Mugabi and Njiru (2006) also note that often population densities are lower than in larger towns, impacting upon technology choice. Pilgrim et al (2007) further confirm this, suggesting that small towns may have a densely populated core served by a piped scheme, but less densely populated fringes, served by standpipes or other point sources.

Moriarty et al (2002), Pilgrim et al (2007) and Mugabi and Njiru (2006) note that the definition presented above misses out on important aspects of small towns, in particular, their transitional nature, defined by dynamics of change and rapid growth that puts existing schemes under pressure and calls for strong planning processes.

An additional issue that needs to be taken into account is the mix of rural and urban livelihoods (and thus demand for water) of inhabitants of small towns. On the one hand, this means that salaried professionals living in modern houses will require per-capita service levels comparable to those of larger towns. On the other hand, it may well mean that families living on the periphery of small towns have requirements for water for agricultural or other productive uses that they will seek to take from the domestic scheme.

1.3 Key concepts and definitions

This section gives an introduction to the key concepts and definitions used in this document to describe and discuss models for providing water services in urban areas and small towns.

1.3.1 Water service provision functions

Lockwood and Smits (2011) define **Service provision functions** as those functions related to the actual day-to-day provision of water services to users. These include tasks such as operation, maintenance and administration of the water scheme. Pilgrim et al (2007) consider service provision to be a combination of the corporate oversight and operation

[3] Pilgrim et al (2007) define the population size of small towns, in the grey area between rural and urban, as ranging from 2,000 to 20,000 people for small towns, from 20,000 - 50,000 for medium sized towns and from 50,000 - 200,000 for large towns.

roles. According to them, **corporate oversight** is vested with the body responsible for decision making regarding the management of the water scheme. It involves activities such as preparing (with the help of the operator) and approving budgets and business plans. A corporate oversight body is typically responsible for managing the operator. Actual **operation** includes the day to day management of the water supply hardware, collection of user fees, preparation of business plans etc. This is the responsibility of the operator.

Urban, and especially small town service providers typically need **direct support** in two key areas:

1. Training of staff in routine functions;
2. Supporting non-routine functions through technical assistance: i.e. auditing, business planning, tariff setting, expansion planning, efficiency improvement, trouble shooting and communication, customer relations (BNWP 2002).

Performance regulatory functions revolve around monitoring operator performance (technical and financial standards) and may extend to the approval of tariffs, fees, and business plans, and working with national or state government to ensure that conditions for public health (water quality) and water resources (abstraction) are met, and performing any environmental (discharge) monitoring and enforcement tasks delegated to the town by the national or state government. The primary focus of regulation is to reconcile financial viability with the need to protect customers and the environment and to uphold quality standards (Pilgrim et al, 2007).

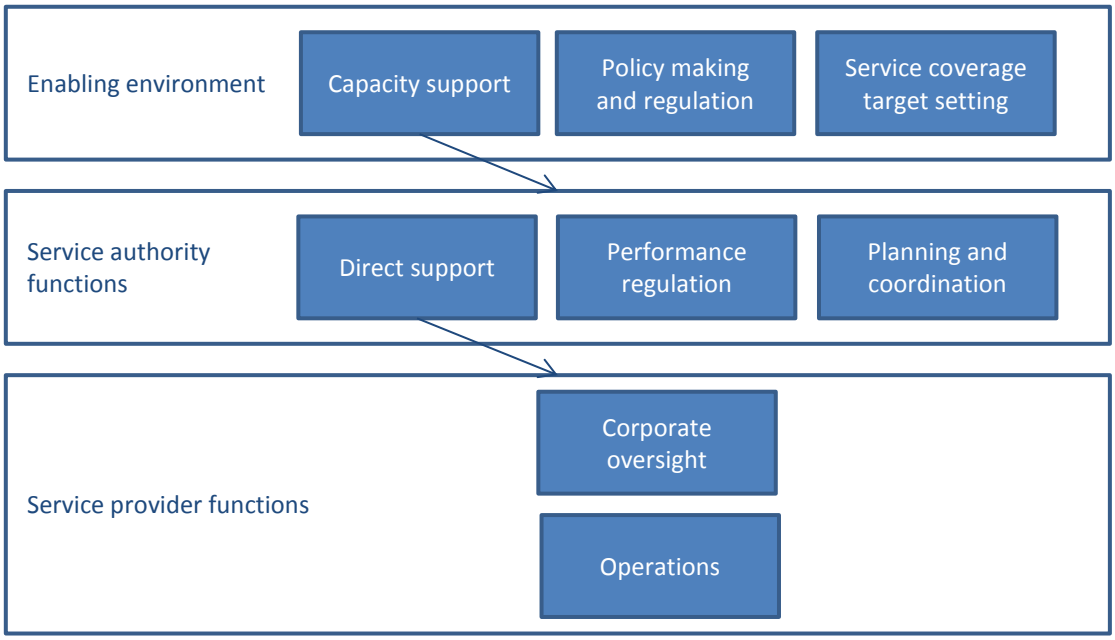
Regulation of different aspects can be done by different bodies, as long as the regulator is legally and operationally separate from the service provider (corporative oversight and operational bodies). National and regional level utilities are commonly regulated by national level regulatory frameworks and tools. However, these frameworks and tools are often not well suited for the regulation of small-scale private companies (Valfrey-Visser, 2006) and community managed water service providers in the large number of dispersed small towns. In small town schemes, the owner, often the municipality, generally acts as the local regulatory oversight body for those aspects most directly related to service provision, such as tariff setting (Pilgrim et al 2007). In addition, where communities play a role in the selection of the operator through some form of formal selection process, they can themselves play an important regulatory role (Valfrey-Visser, 2006).

Lockwood and Smits (2011) consider direct support and performance regulatory functions as **service authority functions**, which also include functions such as **planning and coordination** at decentralised level. These functions are generally provided at the level between the community and the national level (e.g. district, woreda, municipality, region, province, etc. depending on the country context).

Policy making and **regulation**, defined by Lockwood and Smits (2011) as functions related to the '**enabling environment**', generally takes place at national level. At this level, policies are set that define how sector entities are to operate and provide services. **Regulations** provide detailed instructions about how policies are to be implemented. They also set technical and

financial standards for the operations of the sector, including reporting requirements that provide the government with the information necessary to monitor the performance of service providers and to judge whether standards are being met. To be effective, regulations should also provide for remedial measures in cases where standards are not being met (Pilgrim et al, 2007). Furthermore, **service coverage targets** are generally set at this level (Pilgrim et al, 2007) and **capacity support** is provided from this level to the service authority level (Lockwood and Smits, 2011). An overview of the main functions at different levels related to water supply is presented in Figure 1.

Figure 1: Water supply functions



Clarity as to **ownership** is important as a precondition for revenues being reinvested in the scheme (or alternative financing secured) for maintenance, renewal and replacement, and expansion. Ownership is usually vested in the served town or community, unless privatisation of services and divestiture of assets is the option being pursued (Pilgrim et al, 2007).

Management models describe the roles and responsibilities of different stakeholders related to the above described functions related to the provision of water services. Different management models are commonly applied to manage different types of schemes. Big, complex, urban piped schemes are for example commonly managed by utilities, while smaller, more rural schemes are often community managed.

Management models are an integral part of **Service Delivery Models**. In addition to describing the management model, Service Delivery Models describe the scheme used to provide services and the level of services provided, in terms of quantity, quality, reliability and accessibility of the water services.

This document describes different service delivery models applied in small towns and urban areas in Ghana, describing the applied systems, the services provided and the management

models applied. Focus is however on describing the different management models within these service delivery models, in theory and in practice. Before starting our exploration of these models in Ghana, common urban and small town management models are described below.

1.3.2 Common urban and small town management models

Urban piped water services are generally provided by national or regional utilities under the utility management model. However, as mentioned, a large part of the (mostly poor) urban population does not have direct access to the piped water services provided by these utilities, but depend on small scale alternative service providers. As observed by Kariuki and Schwartz (2005), while some of these small scale water service providers are community-based, not-for-profit organizations, the majority of these are private vendors, with a significant share of capital financing coming from private sources, selling water on a commercial basis.

These alternative water service providers can generally be divided into two distinct types (Plummer, 2003; WUP 2003; Moran and Batley, 2004; Sansom, 2006; Franceys and Gerlach, 2008):

- Independent water service providers, providing services from their own source, not connected to the utility pipe network;
- Intermediate water service providers: obtaining water, directly or indirectly, from the utility piped network.

Table 1 gives an overview of the most common urban water supply management models.

Table 1: Overview of urban management models

Model	Utility management	Private or community management of independent water supply	Private or community management of intermediate water supply
Ownership	State	Private / civil society	Private / civil society
Service provider	National or regional utility	Independent water service providers	Intermediate water service providers
Corporate Oversight	Board of Directors appointed by the Ministry	Private / civil society	private / civil society
Operations	Managing Director and utility staff	Private / civil society	private / civil society
Area where the model can be found	Urban area	Area not covered by the utility (mostly peri-urban areas)	Area covered by utility, but with barriers to households for connecting to the utility scheme (mostly densely populated urban and peri-urban areas)

In addition to the classification of alternative service providers into independent and intermediate service providers, Kariuki and Schwartz (2005) classify alternative service providers[4] according to the kind of technology used, as can be seen in Table 2.

Table 2: Alternative providers

		Relationship to source	
		Independent (Independent provider)	**Dependent (Intermediate provider)**
Technology employed	**Grid or network**	Integrated production / generation with transmission / distribution	Purchasing water or electricity and on-selling through mini-grid / network
	Point source	Own source, fixed location vendor	Connected to utility fixed location vendor
	Mobile distribution	Own source, mobile vendor	Purchase from utility mobile vendor

Source: Kariuki and Schwartz (2005)

An overview of the five most commonly applied management models for small town water service provision, in presented in Table 3.

Table 3: Overview of small town management models

Model	Utility management	Private management	Municipal management	Water Board	Water Association
Ownership and regulation	State	Owner-Manager, and/or shareholders	Town	Town / Water Board	Town / Water Association or central or local government
Service provider	National or regional companies	Small-scale Private Water Company	Municipal Water Department	Water Board	Water Association
Corporate Oversight	Board of Directors appointed by the Ministry	Owner-Manager	Town Council water committee	Water Board	Executive committee of Association
Operations	Managing Director and utility staff	Company staff	Municipal Water Department	Scheme manager and staff, or private operator	Scheme manager and staff, or private operator
Area where the model can commonly be found	Medium-sized and large towns	Typically start in small towns, but expect to grow	All sizes of towns	All sizes of towns	Rural small towns and 'satellite' communities

Source: Adapted from Pilgrim et al (2007)

[4] Kariuki and Schwartz (2005) actually use this classification for small private water providers, but the same classification could be used for alternative service providers in general.

1.4 Overview of this document

This document explores, describes and analyses existing and promising models for providing water services to the poor living in the growing number of (peri) urban areas and small towns in Ghana. It brings together the findings from a number of studies, undertaken under the first phase of the Tripartite Partnership Project (TPP), which ran from 2008 to 2010. These included a review of global literature on urban and small town water management and an institutional analysis, based on review of sector documents and interviews with key stakeholders. In addition, a mapping of existing management models for urban and small town water supply in Ghana was undertaken. For this, data and information on small town water schemes was collected from main sector agencies and visualised in maps, bringing the data from the different agencies together to provide a comprehensive overview of different small town and peri-urban management models in Ghana. A number of identified models were selected for more elaborate case studies on the performance of these models.

In Chapter 2, which follows this introduction chapter, a picture is painted of the water sector in Ghana in general. Chapter 3 gives an overview of the main models for water service delivery in (peri-)urban areas and small town in Ghana. The chapters that follow, Chapters 4 to 8 present case studies of the different small town and peri-urban Service Delivery Models in Ghana, focussing on the delivered services and management models, in theory and practice.

Chapter 4 presents the common model for small town water supply in Ghana, in which the small town piped scheme is managed by a community-based water service provider under the **Direct Water and Sanitation Development Board (WSDB) management model**. The chapter focusses in on the cases of Asesewa and Asiakwa as examples of typical towns with piped schemes under direct WSDB management. Furthermore, the cases of Abokobi and Pantang are presented, as examples of direct WSDB management of multi-town piped schemes in a peri-urban setting.

Chapter 5 presents a case of a variation on the Direct WSDB model: Direct WSDB management of bulk water supplied by the utility. The **'Direct WSDB management of bulk supply from the utility'** model is applied in the town of Savelugu in the Northern Region and in several small communities in the Volta region, where surface or groundwater resources are difficult to exploit and the utility piped network is close by. Here, the utility has signed an agreement with local government and the community-based water service provider (the WSDB) to supply bulk treated water.

Chapter 6 presents the cases of Bekwai and Atebubu, where management of the small town piped scheme has been delegated to a private operator, overseen by the Water and Sanitation Development Board. This model is refered to as the '**WSDB management with Private Operator**' model.

Chapter 7 focuses the so-called **Three Districts Water Supply Scheme (3DWSS**), as a model for service delivery through a complex piped scheme, providing water to a variety of rural and small town communities, managed by a WSDB with Private Operator. Although the management model is in principle not very different than the 'WSDB with Private Operator'

management model described in chapter 6, the fact that this scheme serves multiple rural and small town communities, does imply a different application of the general management model.

Chapter 8 presents a variation on the private intermediate water service providers in Ghana: **vendors supplied by tanker services subsidised by the utility**.

Chapter 9 introduces a number of **emerging peri-urban service delivery models**.

Chapter 10 discusses the differences and commonalities between the different described service delivery and management models.

Finally, conclusions are presented in Chapter 11.

2 An introduction to Ghana's water services

This chapter gives an introduction to the water services sector in Ghana. Before an overview is given of the institutional set-up of the sector, its history and the facts and figures related to water coverage and the country context are briefly presented.

2.1 Country context

The West African county of Ghana is divided into 10 administrative regions, which are in turn sub-divided in a number of districts, as shown in the figure below. The figure below also shows an overview of facts and figures related to the country. Below, these are discussed in more detail.

Figure 2: Ghana map, facts and figures

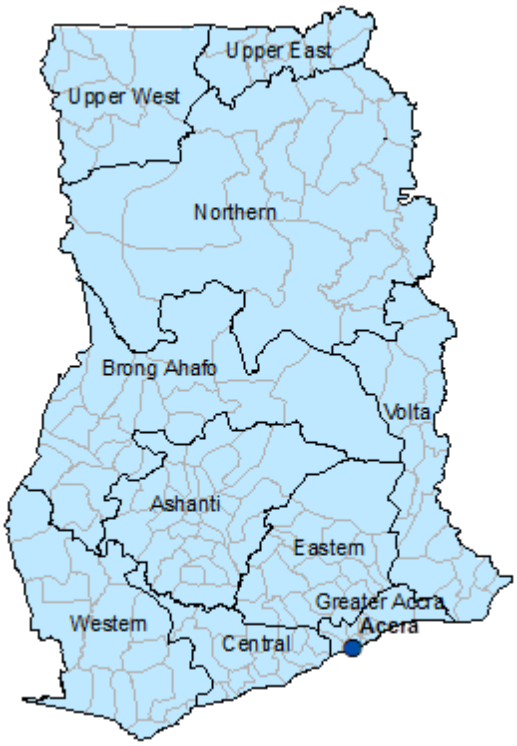
Ghana facts and figures

- Total area: 239,460km^2
- Population (2010): 24.66 m*
  - Rural population: 12,11m (49%)
  - Urban population: 12,55m (51%)
- Population growth rate: 2.5%*
- Water coverage: 86%**
  - Rural coverage: 80%
  - Urban coverage: 91%
- GDP per capita (2011) 1,570***
- GDP growth (2011): 14.4%***

** Source: GSS, 2012*

*** Source: UNICEF/WHO, 2012*

**** Source: World Bank, 2013*



2.1.1 Population and urbanisation

Ghana has a total land area of 239,460 km^2. Between the 1984 and 2000 censuses, Ghana's population grew from 12.3 million to 18.9 million, representing an annual growth rate of 2.7 percent (GSS, 2002). By 2010, the population had grown to 24.7 million, with an annual growth rate of 2.5%. At this rate, it will take about 28 years for the population to double (GSS, 2012). Whilst this rate is lower than those of its West African neighbours, it is above the average of 2.0 percent for developing economies and well above the global rate of 1.5 percent. At current trends the population is expected to reach 27.9 million by 2015, the year in which various targets set by the UN Millennium Development Goals are to be achieved. Rural-urban migration is high at around 3.5 percent, even though in reality some

areas, most notably the Greater Accra Metropolitan Area, Kumasi, Obuasi in Ashanti and Tarkwa, Bibiani and Prestea in Western Region, have been net receivers of migrants, whilst Central, Volta, Upper East and West have seen net out-migration.

The 2010 census recorded a population density of 103 per km^2 and a level of urbanisation of 50.9 percent (against 43.8 percent in 2000). However these figures mask vast regional disparities. For example, Greater Accra Region, which had an urban population of 90.5 percent, recorded a population density of 1,236 persons per km^2. Northern region is the most sparsely populated region with a population density of 35 persons per square kilometre, with 30.3 percent of its population living in urban settlements. Upper West has with 16.3 percent the lowest proportion of urban population (GSS, 2012).

Where today about 51 percent of the population of Ghana lives in urban areas, this percentage is expected to increase to 65 percent by 2030. There has been a gradual extension of the urban boundaries towards the rural areas. For example, Farvacque-Vitkovic et al (2008) note that '*localities adjoining Accra such as Dome, Taifaa, Gbawe, New Achimota, Anyaa, Sanata Maria, Amanfrom, Nii Boye Town, Mallam, Kissieman and Agboba, which were classified in the 1984 census as rural, have attained urban status in the 2000 census. In Tema, Ashaiman has outstripped the area controlled by the Tema Development Corporation,* [and has now been categorised a municipality]. *In Sekondi-Takoradi areas like Diabenkrom, Inchaban, Kansaworodo and Bronikrom, which were considered to be remote, have now become part of the metropolitan area*'. The same is the case in many other cities.

The urbanisation process is noted to have resulted in increasing poverty in urban areas. It is estimated that 1.9 million people, or 15% of the urban population live below the poverty line in Ghanaian cities (Farvacque-Vitkovic et al, 2008). Farvacque-Vitkovic et al (2008) further note that the urbanisation pattern reveals strong physical growth, which is typified by moderate and patchy densification within the city core, involving the replacement of residential by commercial users, and uncontrolled and low density peripheral growth. This also means a rapid growth in informal settlements.

2.1.2 Governance and administration

Ghana's governance and policy framework takes its legitimacy from the 1992 Fourth Republican Constitution, which emphasises transparency, integrity, accountability and participation in all spheres of development. Article 35 (5d) of the Constitution requires the State '*to take appropriate measures to ensure decentralisation in administrative and financial machinery of government and to give opportunities to people to participate in decision-making at every level in national life and government*'.

In 2011, Ghana consisted of 170 Metropolitan, Municipal and District Assemblies (MMDAs) in the 10 regions of Ghana. Each Assembly has a Chief Executive, who is appointed by the President and has to be approved by at least two-thirds of the members of the Assembly. Under the Local Government Act of 1993, Ghana's Metropolitan, Municipal, and District Assemblies (MMDAs) were given the status of autonomous local governments with legislative and executive powers within their areas, and the power to prepare and approve

annual budgets, raise revenues, borrow funds, acquire land, and provide basic services and local infrastructure.

The Local Government Service Act (Act 656) was passed in 2003 to ensure effective local government administration in Ghana through decoupling the Local Government Service from the Civil Service. However, progress for its implementation has been slow and it was only in January 2008 that a comprehensive Road Map and workplan was agreed on for implementing the Local Government Service, even though the Local Government Service Secretariat (LGSS) was established as far back as 2004.

2.1.3 Socio-economic situation

In the first 10 years of this millennium, Ghana has recorded an average real GDP growth in excess of 5 percent. In 2011, GDP growth rate was even recorded to amount to 14.4 percent, with an average GDP per capita (2011) of 1,570 US$ (World Bank, 2013). Poverty numbers have been dropping from 51.7 percent of the population in 1991/2 to 39.5 percent in 1998/99 and further to 28.5 percent in 2005/6. (GSS 2007) This decline has led to a reduction of the absolute numbers of poor from around 7.9 million in 1991/92 to 6.2 million in 2005/6.[5] The percentage of rural population living below the poverty line has decreased from 64 percent to 39 percent over the same period. It is significant that in the case of Accra, there have been mixed results over the period. In 1991/92, about 23 percent of the population fell below the poverty line. This fell to 4 percent in 1998/99, but had risen significantly to about 11 percent by 2005/6.

2.1.4 Water and sanitation coverage

In 2008, estimates of coverage in urban areas range between 58 and 90 percent[6] and between 57 and 74 percent in rural areas[7]. The Joint Monitoring Programme (JMP) report of the World Health Organisation and Unicef (WHO/UNICEF 2012) estimates the total population using improved water sources in 2010 to be 86 percent, with 91 percent or the urban and 80 percent of the rural population covered.

JMP further estimates that 73 percent of the urban population of Ghana uses shared sanitation facilities, which are considered 'unimproved' by JMP. The proportion of the urban population using improved (i.e. improved household) sanitation facilities is estimated to be 19 percent. The rural population served by improved sanitation is estimated to be only 8 percent, while 43 percent uses shared facilities. This brings the national sanitation coverage based on improved facilities at 14 percent with a further 58 percent of the population using shared facilities (WHO/Unicef 2012).

[5] This is based on poverty line of GH¢370.9 per annum.

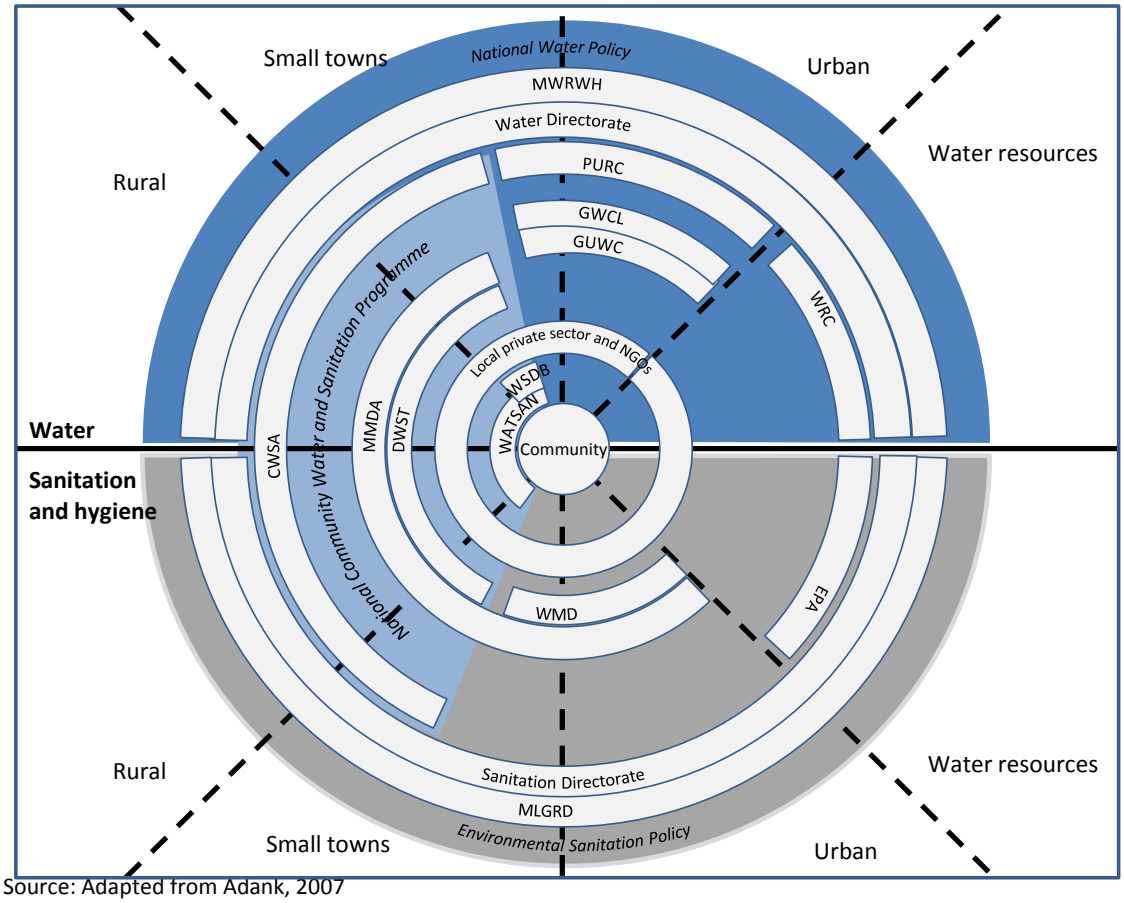
[6] Based on the ratio water demand versus water production, urban water coverage was estimated by GWCL to amount to 58% in 2008. JMP estimated coverage to amount to 90% in the same year, using users data.

7 Based on system data, CWSA estimated rural water supply coverage (including small towns) in Ghana to be 57.1% in 2008. In the same year, JMP estimated rural coverage to amount to 74%, based on users data.

2.2 Introducing the players: an overview of institutional arrangements in the Ghana water sector

The figure below gives a schematic overview of the institutional arrangements in the water, sanitation, and water resources sector in rural, small towns and urban areas in Ghana. It shows the main sector policies and the main institutions active in the different sub-sectors.

Figure 3: Institutional structure of Ghana's WASH Sector



Source: Adapted from Adank, 2007

This document focusses on the 'water' half of the diagram, and more specifically on the 'small town' and 'urban' parts of it.

The figure illustrates that there is an overlap of institutional arrangements in the small town water sub-sector. Before addressing this overlap in more detail in the next chapter, an introduction of the main stakeholders and institutional arrangements is given below, going from the outer rings of the diagram below, towards the inner rings.

2.2.1 The National Water Policy

Ghana's **National Water Policy** (2008) is guided by a number of principles, based on which policy objectives have been defined. Several of these principles are presented in Box 2. At the centre of the policy on drinking water supply, is the principle of fundamental right of all people, without discrimination, to safe and adequate water to meet basic human needs and ensuring a minimum water requirement for the maintenance of health and well-being is

assured. Consumption standards to meet this 'minimum requirement' are however not indicated in the Policy.

Box 2: Key principles guiding Ghana's National Water Policy

1. The principle of fundamental right of all people without discrimination to safe and adequate water to meet basic human needs;
2. The principle of meeting the social needs for water as a priority, while recognising the economic value of water and the goods and services it provides;
3. The principle of recognising water as a finite and vulnerable resource, given its multiple uses;
4. The principle of improving equity and gender sensitivity;
5. The principle of subsidiarity in order to ensure participatory decision-making at the lowest appropriate level in society;

Following the publication of the National Water Policy early 2008, the Ministry of Water Resources Works and Housing (MWRWH) commissioned the preparation of various strategies for its implementation.

2.2.2 Ministries, Departments and Agencies

The **Ministry of Water Resources Works and Housing (MWRWH)** is the principal water sector ministry responsible for the overall policy formulation, planning, coordination and harmonisation, monitoring and evaluation of programs for the water supply and water related sanitation. It should perform these tasks through its **Water Directorate (WD)**, established in 2004. The Water Directorate oversees the Community Water and Sanitation Agency (CWSA), the Ghana Water Company Limited (GWCL), and the Water Resource Committee (WRC).

The **Ghana Water Company Ltd (GWCL**) as the asset holder and the **Ghana Urban Water Company Ltd (GUWC)** as the operator, are responsible for urban water supply.

The **Community Water and Sanitation Agency** (CWSA) is the main government agency active in the 'community water and sanitation sub-sector', which deals with rural and small town water supply. Its main mandate is to support and build the capacity of Metropolitan, Municipal and District Assemblies (MMDAs) to implement their WASH programmes. It also sets appropriate standards and defines regulations for the delivery of WASH services in small towns and rural communities. Its key functions are set out in the Community Water and sanitation Agency (CWSA) Act, 1998 (Act 564).

The **Water Resources Commission** (WRC) is responsible for the regulation and the management of the country's water resources and for the related coordination of policies and collaboration with other stakeholders in the water sector. The responsibilities of the commission are set out in the Water Resources Commission Act, 1996 (Act 522). The Act stipulates that ownership and control of all water resources are vested in the President on behalf of the people, and clearly defines the WRC as the overall body responsible for water resources management in Ghana. The Commission is supposed to regulate the abstraction of water resources and institute a system for registering all drilling companies and their activities.

The economic and drinking water quality regulation for utility water supply in urban areas and small towns with utility water supply, is undertaken by the **Public Utilities Regulatory Commission (PURC**). The PURC is an independent multi-sector regulator, established by an Act of Parliament (Act 538), Oct. 1997 to oversee the provision of utility services, including water, electricity and gas. For administrative purposes, PURC falls under the office of the President .

The **Ministry of Finance and Economic Planning (MoFEP)** is to provide the finance to support the delivery of WSS infrastructure as well as the operational and capital expenditure budgets of the sector institutions. Most development assistance from Development Partners is channelled through the MoFEP.

2.2.3 Development partners

The rural and small town water sector is supported by a variety of development partners, including African Development Bank (AfDB), Agence France de Developpement (AFD), CIDA, DANIDA, GTZ/KfW, UK's DfiD, European Union, Japan International Co-operation Agency (JICA), World Bank and UNICEF. The Netherlands and the World Bank are the most prominent development partners in the urban sector.

The Netherlands has provided financial support to the urban sector through the ORET (Development-Related Export Transactions Programme) Water Facility and ORIO (Facility for Infrastructure Development) facility.

The World Bank supports the Urban Water Project, whose two principal development objectives are to: (i) significantly increase access to the piped water scheme in Ghana's urban centers, with an emphasis on improving access, affordability and service reliability to the urban poor; and (ii) restoring long term financial stability, viability and sustainability of the Ghana Water Company Limited (GWCL). This project runs from 2004 to 2012 and has a total budget of 120 million US$, of which 5 million from the Nordic Development Fund (NDF), 12 million from the Government of Ghana and a 1.3 million IDA Grant. (World Bank Group, 2004).

2.2.4 Local government

The **Metropolitan, Municipal and District Assemblies (MMDAs)** are the basic units of government at the district level and are the statutory deliberative and legislative bodies for the determination of broad policy objective of the development process within their jurisdictions. They are responsible for the planning and implementation operation and maintenance of water and sanitation facilities as the legal owners of community managed infrastructure. The detailed functions of the MMDAs are defined in Local Government Act, 1993 (Act 462) and the establishment instruments (Legislative Instruments) of the respective Assemblies. MMDAs may delegate any of their functions to Town, Area, Zonal or Urban Council or Unit Committee. MMDAs are responsible for the preparation of the **District Water and Sanitation Plan (DWSP)** and are required to ensure the formation of, and give recognition and support to, WATSAN Committees for rural communities and Water and Sanitation Development Boards (WSDB) for small town. Furthermore, **MMDAs** play a role in regulating and approving water tariffs set by community-based water service providers.

Besides their role in providing direct support to community management structures for water supply (WATSANs and WSDB), and their regulatory function of approving water tariffs, the **MMDAs** are supposed to contribute to the creation of an enabling environment for these structures to operate effectively and efficiently. The detailed functions of the MMDAs are defined in Local Government Act, 1993 (Act 462) and the establishment instruments (Legislative Instruments) of the respective Assemblies. MMDAs are responsible for the preparation of the District Water and Sanitation Plan (DWSP). MMDAs may delegate any of their functions to Town, Area, Zonal or Urban Council or Unit Committee. MMDAs are required to ensure the formation of, and give recognition to community management structures for water supply (WATSANs and WSDB).

2.2.5 Community based water service providers

In towns beyond the reach of the utility, community management of water supply is the common management model. Here, **Water and Sanitation Development Boards (WSDBs)**, consisting of community and (ex-officio) MMDA representatives, are the main service providers. **Water and Sanitation Committees (WATSANs)** are community management bodies responsible for the management of water points, including rural hand pumps and small town standpipes.

In recent years there has been a trend, albeit slow, to involve the **local private sector** in the management of small towns water supply, in partnership with communities. In addition to those working in partnership with communities, there are a few emerging cases of independent producers, who supply water to small towns but remain un-recognised and unregulated.

2.2.6 The Private sector and local NGOs

The **private sector** and **local NGOs** are engaged in a variety of water related activities, including:

- Consultancy (design and construction supervision, hydrogeological, training, community sensitization and mobilization, hygiene promotion, institutional support, etc.);
- Construction of civil works;
- Operation of small town schemes;
- Supply and installation of equipment, spare parts, etc.

NGOs in the water and sanitation sector have formed an association known as **Coalition of NGOs in Water and Sanitation (CONIWAS)**.

2.3 An historic overview of the development of the water supply sector in Ghana

The Ghana Water Sector has gone through a series of reforms to reach its present status. From 1965 to 1998, the Ghana Water and Sewerage Corporation (GWSC) was the institution responsible for the provision of improved water, as well as sanitation services, for the country's entire population. With a low delivery capacity, all efforts were focused on urban areas, which meant that, generally, the poor (mostly in rural and small towns) were not

served. While between 1965 and 1985 water supply coverage for the urban area was estimated at 60 percent, the small town and rural coverage figure stood at 28 percent (CWSA, no date). This led, in 1986, to the creation of a department within the corporation solely in charge of the provision of improved water and sanitation to small towns and rural populations.

Some progress was made with the implementation of facilities, but this was not sustainable due to non-payment of tariffs and poor maintenance culture. The situation called for the development of the National Rural Water and Sanitation Sector Strategy, which led to the launch of the National Community Water and Sanitation Programme (NCWSP) in 1994. A semi-autonomous unit, Community Water and Sanitation Division (CWSD) was created within GWSC to manage the delivery of water and sanitation services in rural areas and small towns (CWSA, no date).

With the sector reforms of 1998, provision of improved sanitation services became the responsibility of local government (Act 564 of 1998, Act 461 of 1993 amended by LI 1648 in 1999). In the same year, the division was transformed by an act of parliament (Act 564) into an agency: the **Community Water and Sanitation Agency (CWSA**). The objective of CWSA is the coordination and facilitation of the implementation of the National Community Water and Sanitation Programme (NCWSP). Water schemes provided under NCWSP are to be owned by the district assemblies and managed by the community under the Community Ownership and Management (COM) model. The agency has been operating since then as an autonomous body, focused on small towns and rural water service delivery.

After the unbundling of the CWSA, the remainder of the GWSC was transformed into a limited liability company in 1999: the **Ghana Water Company Limited (GWCL)** by with the amendment of Act 461 of 1993 by LI 1648, with a focus on providing potable water for the population in the urban sector (GWCL, no date). GWCL was to concentrate on the provision of safe water to larger and more urbanised towns and therefore transferred the responsibility for about 120 small-town schemes to Metropolitan, Municipal and District Assemblies (MMDAs). Most of these schemes, according to the CWSA, were still relatively large but were transferred because they were less economically viable. Some of these schemes have since been handed over and undergone rehabilitation under the National Community Water and Sanitation programme, through a process facilitated by CWSA.

The transfer of the less economically viable schemes was also regarded by many as a way to make the urban water scheme more attractive for privatisation. However, in 2006 the attempt to privatise urban water supply in Ghana was abandoned. The reasons for this included:

- Changes to previously agreed business packaging and mis-procurement, causing frustrations and subsequent delays in the procurement process;
- Inadequate stakeholder consultations and ineffectiveness of the public awareness campaign and the lack of visibility in the private sector participation process and have been inadequate; and

- Civil society opposition to 'privatisation of water in Ghana', led by ISODEC and the Coalition against Privatisation (CAP) and the leadership of the TUC. This included:
    - Assertions that cost recovery, a feature of private sector participation, will hurt the poor;
    - Criticisms that the process only favoured large foreign multinationals and repatriation of profits from wholly Cedi-based revenues will put pressure on the local currency. (MIME Consult, 2009)

Although initially Private Sector Participation in the urban sector was foreseen through a 10 year lease agreement, it was finally decided to opt for a 5 year Management Contract instead. There were a number of reasons for this, the key one being the lack of investor appetite for a lease contract (MIME consult 2009). The Management Contract was signed in 2006 between GWCL and the Dutch-South African joint venture Aqua Vitens Rand Limited (AVRL). In 2011, the Ghana Urban Water Company Ltd (GUWC) was established to take over the operational roles and functions AVRL had been fulfilling the period 2006-2011.

3 Overview of urban and small town water supply in Ghana

This chapter discusses how urban areas and small towns are defined in Ghana. This is followed by an introduction to the main models for delivering water services in urban areas and small towns in Ghana: the utility management model, the Community Ownership and Management model and the main private management models. The chapters that follow (chapter 4-9) each present specific case studies on variants of community management and private management models. As no case study will be presented on utility management, this model will be discussed in more detail in section 3.3 of this chapter.

3.1 Defining urban areas and small towns in Ghana

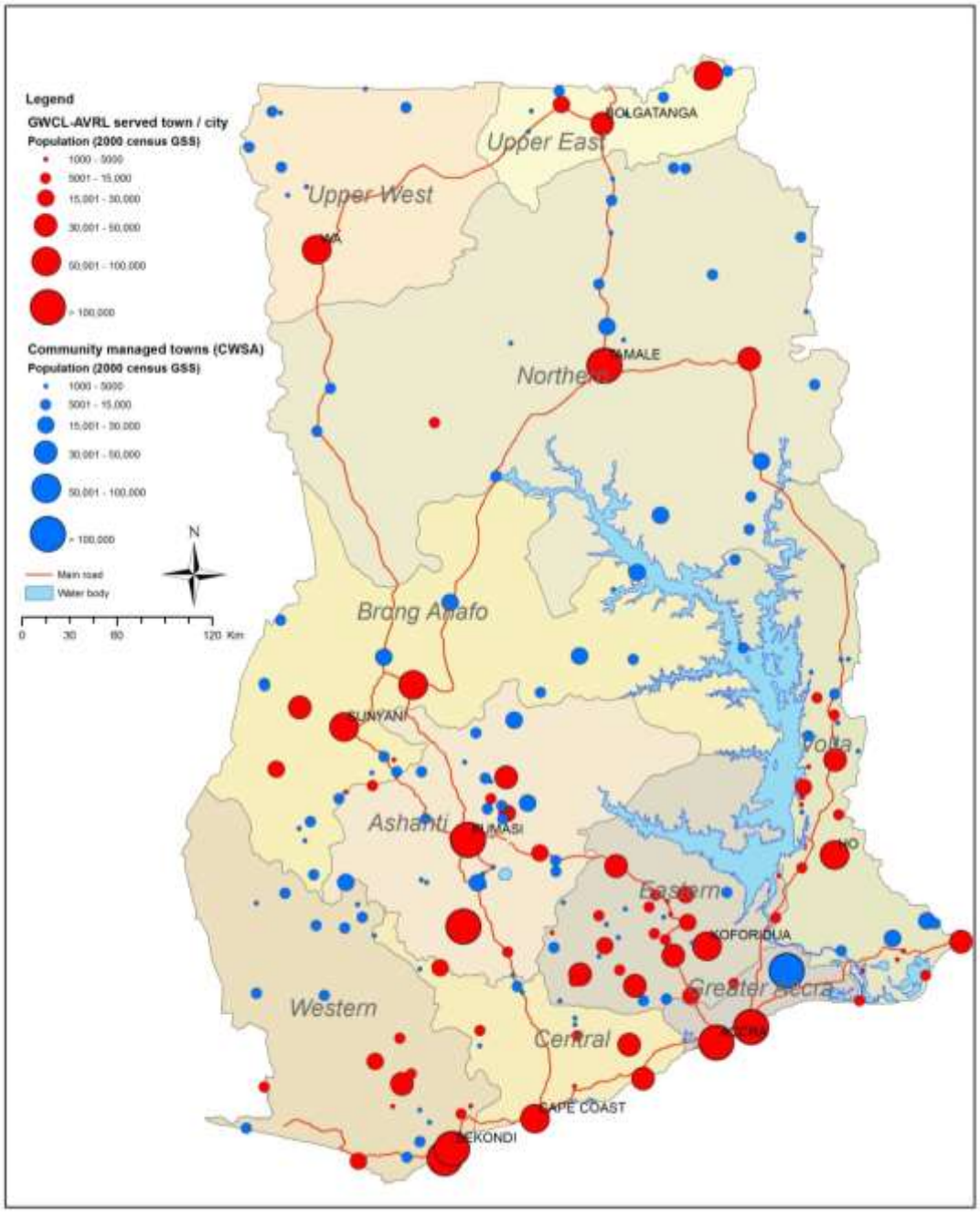
In Ghana, three different (and conflicting) definitions are in use as to what constitute urban communities and small towns:

- The Ghana Statistical Service (GSS, 2002) defines urban communities as those with populations 5,000 and above, which implies that communities smaller than 5,000 inhabitants are considered rural.
- The CWSA Small Town Sector Policy (CWSA, 2010a) defines a small town as a community with population of 2,000 to 50,000. This would seem to imply that, at least as far as CWSA is concerned, areas with populations above 50,000 are urban, and less than 2000 rural. It would therefore follow that as the utility is responsible for water supply in the urban areas, these larger towns would fall under its mandate, while towns under 50,000 inhabitants would fall under the mandate of CWSA.
- The National Water Policy (Government of Ghana, 2007)) defines small towns as '*a community that is not rural but is a small urban community, with population between 2,000 to 30,000 that has been mandated by the relevant authority(ies) to manage its own water and sanitation systems*'. According to this definition it is, therefore, within the utility's mandate to manage water supply for communities smaller than 30,000 people, if so decided by the local authorities.

The figure below displays urban areas and small towns in Ghana, distinguishing between those with water supply managed by the utility, GWCL, and those with community managed water supply, under CWSA's National Community Water and Sanitation Programme (NCWSP). It shows that some towns, especially the ones with a population between 15,000 and 30,000 can, in practice, fall under either model regardless of the population size.

Around larger urban areas, especially Accra, the border between the 'urban' area under the utility's mandate and the 'rural' areas, under CWSA's mandate, is seldom clearly defined. Several metropolitan and municipal areas and districts with large urban centres have schemes under both main models (see inset in Figure 4 showing the Greater Accra Metropolitan Area being served by both the utility network, 3 community managed small town piped schemes and several privately managed schemes).

Figure 4: Small towns and urban areas in Ghana

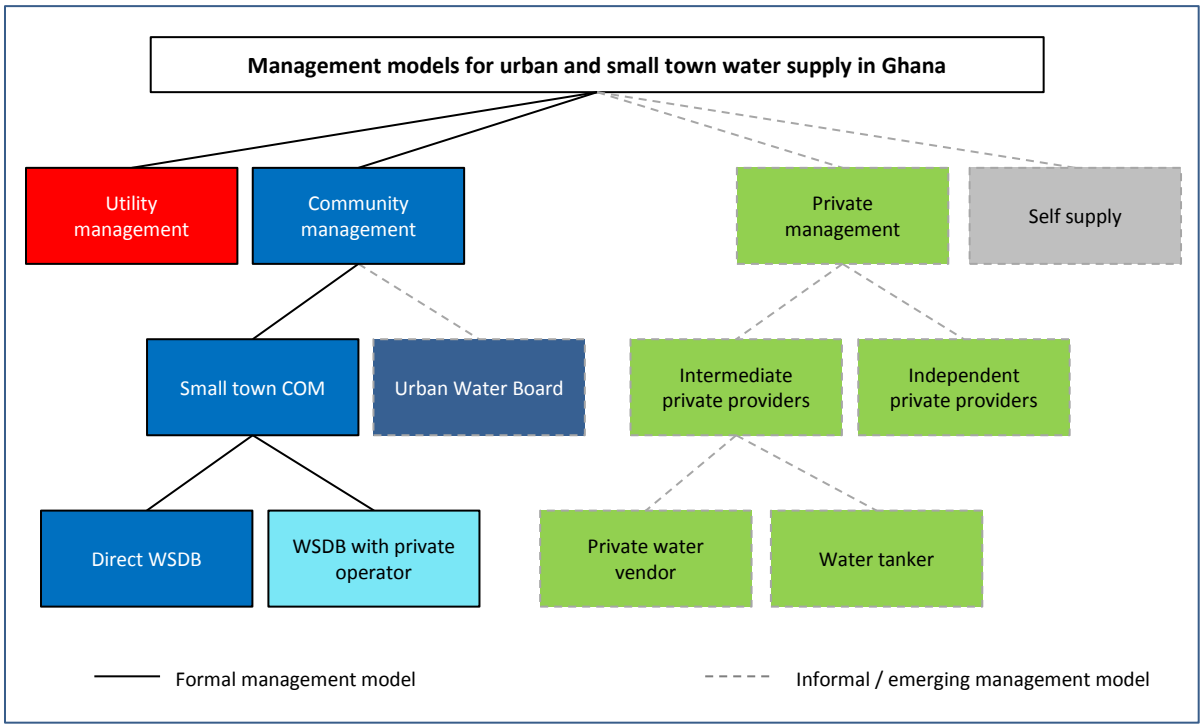


There is, therefore, no single unambiguous definition in policy or legislation that defines a small town according to population size, or that delimits clearly the different areas of responsibility of CWSA and GWCL. Basically, the water sector has been divided into two subsectors since the sector reforms in 1998: the 'urban water sector', with utility managed water supply, managed by GWCL/GUWC, and the 'rural and small town water sector', with community managed schemes, facilitated by CWSA. There is a degree of (unavoidable) fuzziness in delimiting their respective areas of influence.

3.2 An overview of urban and small town water management models in Ghana

As illustrated in Figure 5, there are two main formal management models in urban areas and small towns in Ghana: utility management (see section 3.3) and Community Ownership and Management (COM) (see section 3.4). Under the Community Ownership and Management model, facilitated by CWSA under its National Community Water and Sanitation Programme, water services are provided by Community-based Water and Sanitation Development Board (WSDBs), either directly, or through a Private Operator (PO), overseen by the Water and Sanitation Development Board.

Figure 5: Overview of urban and small town management models in Ghana



In addition to these formal management models, the figure shows Urban Water Boards as an informal, emerging community management model. Also, a number of private, informal management models can be found in peri-urban areas and small towns, as indicated in the figure (and further discussed in section 3.5). These include both intermediate service providers, like water vendors and water tankers, selling water sources from the utility scheme, as well as independent service providers, selling water from their own private sources. These emerging models are mostly applied on small scale on a pilot basis and are discussed in more detail in Chapter 9. Also, some water schemes in urban areas and small towns are owned and managed by individual households. Although possibly an important source of water supply for many people in per-urban areas and small towns in Ghana, this so-called 'self-supply model' will not be discussed further in this document. Figure 6 shows where the main management models are applied in Ghana.

An overview of the main management models, the types of schemes managed under these models under these models and case examples of these models described in this document, is presented in Table 4. The table also gives a (because of lack of data, rather rough) estimate of the number of schemes and size of population served under the main management models at the time of writing of this document.

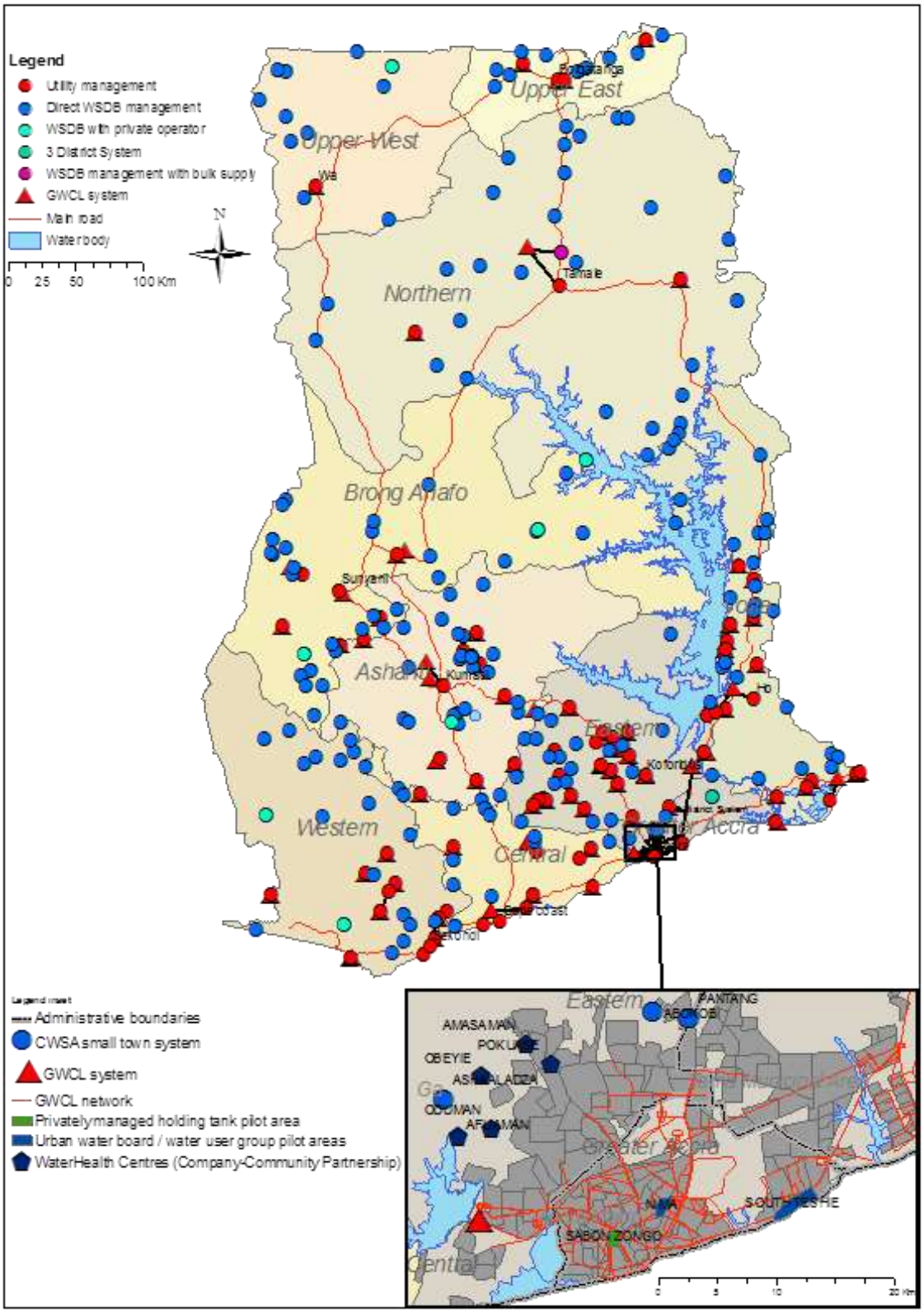
Table 4: Summary of main management models and variants

Main management models	Management model		Estimated number of schemes	Estimated number of people	Type of scheme	Case examples
Utility (see section 3.3)	Utility management		77	5,662,243[8]	Piped scheme	
Community management	COM in small towns (see section 3.4)	Direct WSDB management	185	1,217,476[9]	Independent single-town piped scheme	Asiakwa and Asesewa case presented in chapter 4
					Independent multi-town piped scheme	Abokobi and Pantang case presented in chapter 4
					Piped scheme with bulk water supply from utility	Savelugu case presented in chapter 5
		WSDB management with private operator	3	84,000[10]	Independent single-town piped scheme	Bekwai and Atebubu case presented in chapter 6
					Independent multi-town piped scheme	3 District Water Supply Scheme presented in chapter 7
	Community Management of bulk water supply in urban areas		Unknown		Piped scheme or storage tank with bulk water supply from utility	Emerging models presented in chapter 9
Private management (see section 3.5)	Intermediate private provider	Tanker service	Unknown	84,870 [13]	Water tanker	
		Water vendor	Unknown	320,620[11]	Storage tank, with bulk water supply from utility	Emerging models presented in chapter 9
					Storage tank, with bulk water supply from tanker services	AVRL water tanker supply in Accra, presented in chapter 8
	Independent private provider		Unknown		Independent point source	Emerging models presented in chapter 9
Self-supply	Self-supply		Unknown	1,329,630 [13]	Independent point source	
Unserved				424,350 [13]		

The sections that follow take a closer look at each of the three main management models, in terms of the implementation of infrastructure under these models, the levels of services provided, the institutional arrangements, tariff setting and cost recovery arrangements and the level of attention to providing services to the poor under the management models.

[8] Estimate, based on 2006 GWCL coverage data.
[9] Based on the small town systems with a 2006 population over 2000, as mapped under the mapping exercise under the TPP project, based on CWSA data.
[10] Based on Tuffuor, 2010.
[11] Estimate, based on GSS, 2008 (2006 data).

Figure 6: Urban and small town water management models in Ghana



3.3 Utility managed water supply

Under the utility management model in Ghana, piped schemes are managed by the Ghana Water Company Ltd (GWCL) and the operator, which was Aqua Vitens Rand Ltd (AVRL) from 2006-2010 and the Ghana Urban Water Company Limited at the time of writing of this document. In total, about 90 water supply schemes are managed by GWCL, supplying water to a total of about 77 piped schemes, serving about 85 cities and towns, grouped into 37 service areas.

For administrative purposes, each service area is divided into districts (75 in total). The Accra Tema Metropolitan Area (ATMA) for example, is a service area covering the cities Accra and Tema, divided into a total of 18 districts, served by a total of 6 schemes. The map below shows the locations of the schemes and the cities and towns served by the utility.

As shown in Table 5, of the 77 schemes, only 27 schemes are designed to serve a 2007 population of over 50,000. The majority of schemes (42 of the 77) are intended to serve a (2007) population of 30,000 or less. Indeed, the same analysis based on actual production figures for 2007 shows that only 9 of the 77 schemes actually produced water sufficient to serve 50,000 people. This re-emphasises the overlap between so-called 'urban' water management by the utility and community management of small town schemes.

Table 5: GWCL/AVRL schemes and design populations

Number of schemes with 2007 design population of < 5,000	7
Number of schemes with 2007 design population of 5,001-30,000	35
Number of schemes with 2007 design population of 30,000 – 50,000	8
Number of schemes with 2007 design population of 50,000 – 100,000	14
Number of schemes with 2007 design population of > 100,000	13
Total	77

Source of data: adapted from Tahal Group 2008a

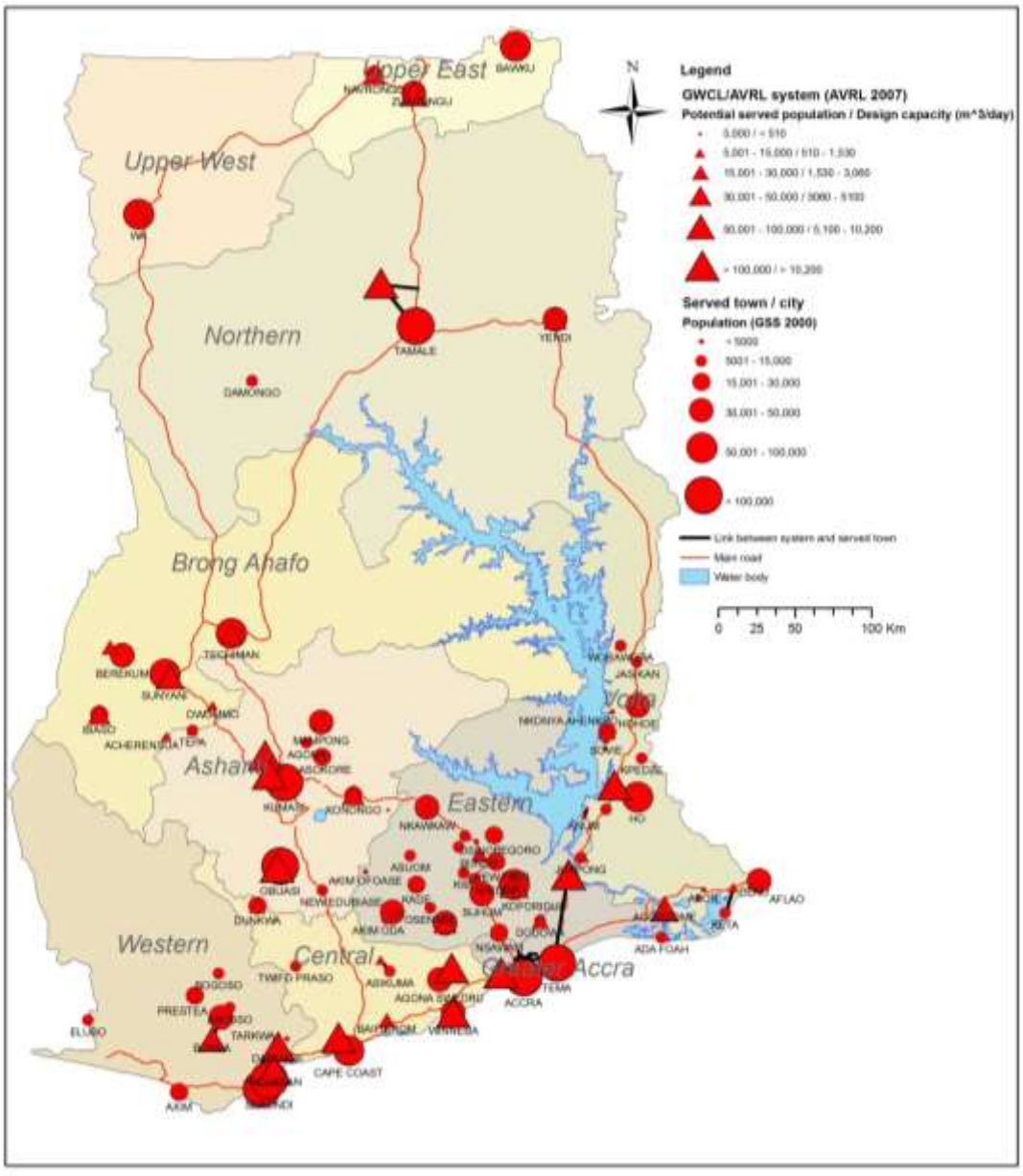
3.3.1 Implementation of infrastructure

As the GWCL is the owner of the assets, it is responsible for implementation of new infrastructure and rehabilitation and expansion of existing infrastructure. Investment plans have been defined in GWCL's Strategic Investment Plan (SIP), which was last reviewed in 2008. The objectives of the SIP review and updating was to identify and assess the overall physical and investment requirements for rehabilitation and expansion of the existing urban water supply schemes to meet their short term (2011) and long term (2015, 2025) water demands in line with the MDGs (Tahal Group, 2008).

In the revised GWCL SIP (Tahal Group, 2008), Eng Prosper K. Ofosu (Planning Department of GWCL) suggest that communities with a population of more than 2000 should be considered for connection to the existing utility network. The revised GWCL SIP identifies 53 unserved communities with a population of 3,200 or above each, representing a combined population of 285,210 in 2007. The majority of these communities were however found to be located at tens of km away from the utility network, making connecting them to the existing network difficult, even when ignoring other possible challenging factors like topography, scheme capacity etc. In addition, several hundreds of communities with a population size of 2,000 to

3,200 were identified in the SIP, totalling 251,859 in 2007. However, whether or not these communities should and could be connected to the utility network, is not clear.

Figure 7: GWCL/AVRL schemes and served cities and towns



3.3.2 Service level and water use

Part of the population served by the utility has access to water services though household connections, while others depend on standpipes. There do not seem to be clear standards set related to the amount of water per capita per day that should be provided through utility managed household connections and standpipes. Nor does a standard seem to have been set for the maximum number of people per standpipe or the distance people have to cover to access the standpipe. The drinking water quality standards to which utility managed water supply has to adhere, are set by the Ghana Standard Board.

In order to estimate coverage, GWCL compares the amount of water produced with the water demands for a specific area. To estimate this demand, GWCL uses an average water demand of 102 lpcd (WSMP, 2010). An overview of the estimated coverage and population served is presented in Table 6.

Table 6: GWCL coverage and estimated population served

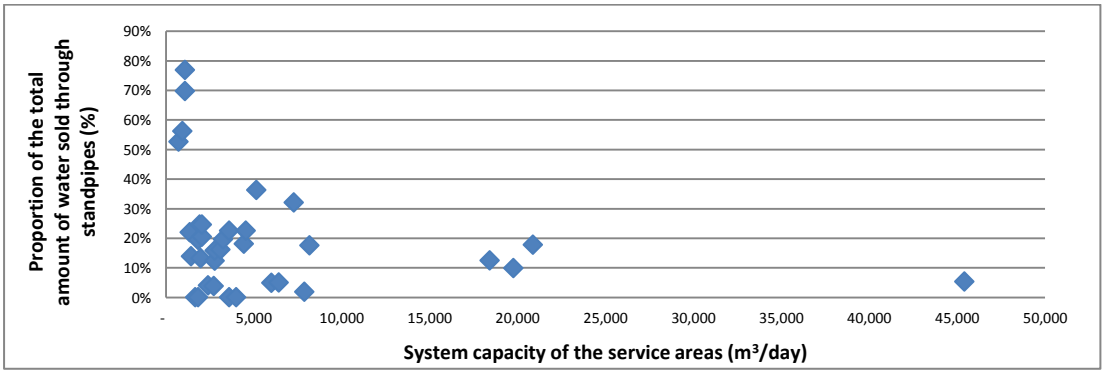
Year	Population	Demand (m^3/day)	Production (m^3/day)	Coverage (%)	Served population
2003	9,421,372	960,000	570,000	59	5,558,609
2004	9,704,013	990,000	570,000	57.5	5,579,807
2005	9,995,133	1,020,000	580,000	56	5,597,274
2006	10,294,987	1,050,000	580,000	55	5,662,243
2007	10,603,837	1,080,000	606,000	56	5,938,149
2008	10,872,716	1,100,000	636,000	58	6,306,175

According to GWCL/AVRL sales data from 2007, an average total amount of 279,281 m^3/ day was sold in that year, which amounts to an average of 47 litres per served person per day. Comparing this to the average production of 606,000 m^3/ day, gives a non-revenue water rate of 54%, which means that more than half of the drinking water produced is not sold due to physical (like pipe bursts) and commercial losses (like illegal connections and non-or under-metering of water use).

Customer data from December 2007 puts the total number of domestic household connections at 310,649. Assuming 10 people per household connection, the number of people served through household connections amounts to a bit more than 3.1 million, with the remaining 2.8 million (out of the total served population of 5.9 million, as presented in Table 6) accessing the utility services through standpipes.

People depending on standpipes use less water than people with access to household connections. In general, in small towns a high percentage of the population is served through standpipes, while in larger towns and cities, a higher percentage of the population is served through household connections, as illustrated in Figure 8.

Figure 8: Relation between town size and scheme capacity



Source of data: AVRL (2007)

Because emphasis in smaller towns is on water service provision through standpipes, while in larger towns and cities emphasis is more on household connections, the per capita demand for smaller towns is estimated to be lower than that of larger towns and cities, as can be seen in Table 7. This table presents the per capita demand for settlements with different population sizes, as determined by the 2008 revised Strategic Investment Plan (Tahal Group 2008). These per capita demands include commercial use and industrial use, in addition to domestic use.

Table 7: Per capita water demand used in the revised GWCL Strategic Investment Plan

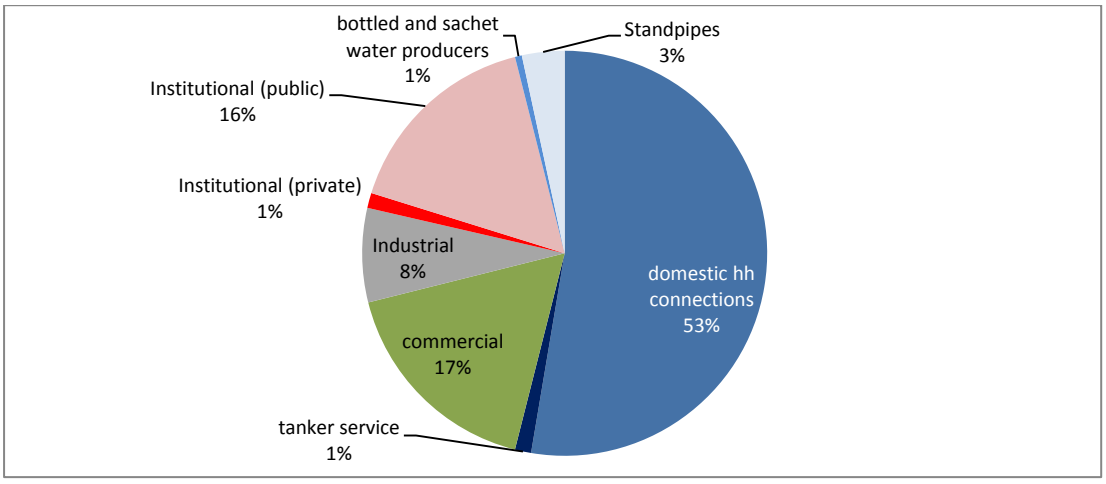
Population	Water demand 2005 (lpcd)	Water demand 2020 (lpcd)
2000 – 5,000	30 (60 – 150 m3/day)	35
5,000 – 10,000	55 (275 – 550 m3/day)	65
10,000 – 20,000	75 (750 – 1500 m3/day)	85
20,000 – 50,000	85 (1700 – 4250 m3/day)	95
>50,000	105 (5,250 m3/day)	120
Kumasi and Sekondi-Takoradi	115	130
Accra	138	144

Source: Tahal Group 2008a

The total amount of water used from standpipes, in relation to water used from household connections, is relatively small, as can be seen in Figure 9. Currently, there is no data available on the number of people using water provided by the utility through standpipes. When assuming that indeed about 2.8 million people depend on utility standpipes for their water supply, this would mean that each of the 6,221 standpipes served an average of about 455 people. With an average amount of water used from standpipes of 9,491 m^3 per day as per the 2007 sales data, this suggests an average per capita water use of only some 3 lpcd.

With a total amount of water sold through domestic household connections of 53,677,885 m^3, and an estimated 3.1 million people depending on household connections, the average water use from household connections is estimated to amount to about 47 lpcd.

Figure 9: Water use for GWCL provided services (2007)



Source of data: AVRL (2007)

The amount of water that people use from household connections varies with the reliability and regularity of supply and with the economic status of the household. According to Lamptey (2010), actual water consumption for households connected to the utility scheme in Accra ranges from 138 lpcd for high income households with household connections with continuous flow conditions, to 43 lpcd for poor households with household connections with poor intermittent flow conditions.

It should however be noted that the reliability of the data on the amount of water used is questionable, due to lack of metering and under-reading of water meters.

3.3.3 Institutional arrangements

The figure below gives a schematic overview of the institutional arrangements of the utility management model. GWCL is the owner of urban water schemes and, until 2006, was also in charge of the production and distribution of water for domestic, public, industrial and commercial purposes within the urban sector. From 2006 to 2010 the service provision functions were the responsibility of AVRL, after which these were handed over to the newly established Ghana Urban Water Company Ltd (GUWC). GWCL performs the main service authority functions, including providing support to GUWC and regulating the performance of the operator. In addition, utility services are regulated by the Public Utility Regulatory Commission (PURC). Its role includes the following:

- Provide guidelines for rates to be charged by utilities;
- Examine and approve rates to be charged by utilities for services provided;
- Monitor standards of performance for provision of utility services;
- Protect interest of both consumers and providers of utility services;
- Promote fair competition among public utilities;
- Conduct studies relating to economy and efficiency of public utilities; and
- Make such valuation of property of public utilities as it considers necessary for the purposes of the Commission.

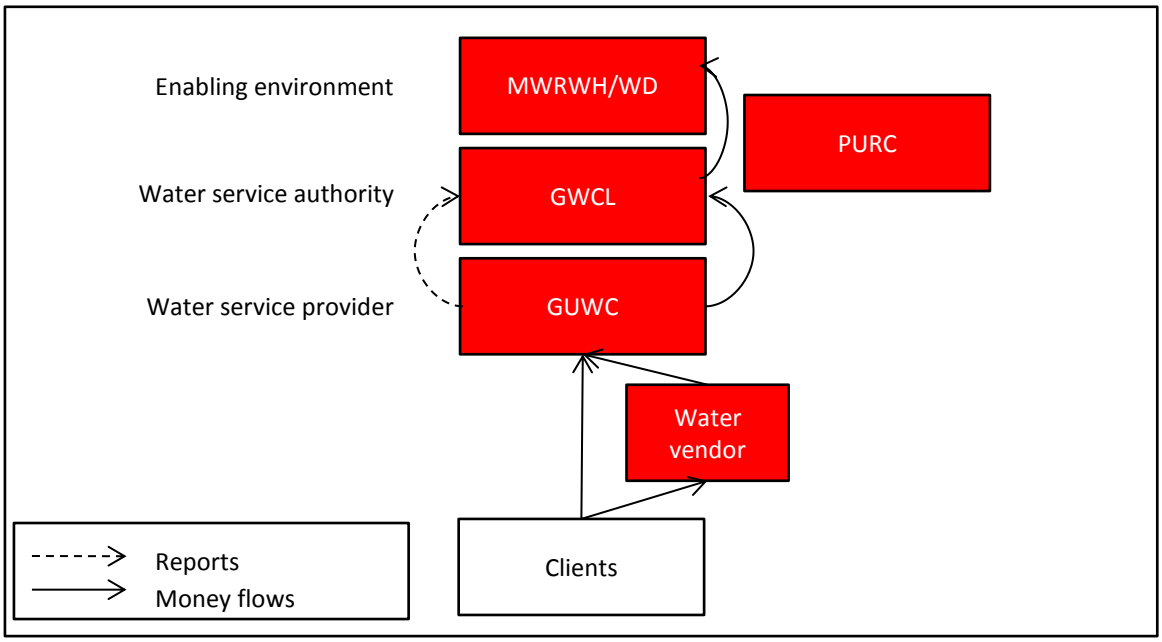
PURC's mandate covers utility managed urban water schemes and not supply of water operated and managed under community management arrangements. Although services provided by water tankers are not a strict utility service, they are being superintended by PURC because they cover a broad segment of the population and are considered to have public health implications.

As mentioned above, GWCL/GWUC supplies water to its clients through household connections and standpipes. After bad experiences working with District Assemblies and community management bodies like Water Boards and Water Committees, the utility decided to rely on the appointment of agents, who are engaged to sell water from utility standpipes, on behalf of the utility. These agents are paid a 20 percent commission on their sales. To make it work in favour of both the utility and the commissioned agent, metres are supposed to be read weekly and invoiced.

GUWC has a central headquarters in Accra, in addition to regional and district offices. The boundaries of the GUWC regions coincide with the national administrative boundaries of the regions, except in the case of Greater Accra Region, which has been divided into three

different GUWC regions. The boundaries of the GUWC districts do not, however, follow the national district boundaries.

Figure 10: Utility management model



3.3.4 Tariff setting and cost recovery

The National Water Policy [Section 2.2.5] prescribes that full cost recovery of urban water supply should be implemented. GWCL should ensure that '*in any given year, its outgoings [expenditures] are fully matched by its incomings [revenues]*'. PURC has also indicated it is an objective of its regulatory decisions to achieve full cost recovery, and this is clearly stated in its Urban Water Tariff Policy document as well as its Water Rates Setting Guidelines and Procedures (PURC 2005).

Costs are recovered though water tariffs. Water tariffs are proposed by the utility for approval by the PURC. Bills are sent to customers by the utility for payment on a monthly basis. With effect from June 2010, the GWCL tariff amounts to USD \$0.55[12] (GH₵0.80) per cubic meter for a monthly consumption of up to 20m^3 ('life-line' tariff), and USD 0.83 (GH₵1.20) per cubic meter for consumption above a monthly consumption of 20m^3. Table 8 presents the tariff details.

However, as mentioned in Chapter 1, lifeline tariffs targeted at the poor often fail to benefit the targeted population. This is also the case in Ghana, as the poor are either not connected to the GWCL network, or live in 'compound houses'[13], in which multiple households depend on one connection and, therefore, have a total monthly consumption considerably in excess of the life-line consumption of 20m^3. This underscores the need for more innovative approaches that will effectively target the poor.

[12] Based on exchange of USD 1.00 to GH₵1.45.
[13] It is estimated that in Ghana about 55 percent of the urban population lives in such compound houses (GSS 2008).

Table 8: GWCL tariffs, 2010

Customer	Tariff
Metered Domestic 0 - 20m^3/month > 20m^3/month	 GH₵ 0.80 /m^3 (USD 0.55) GH₵ 1.20 m^3 (USD 0.83)
Premises without connection (standpipe)	GH₵ 0.80 m^3
Unmetered Premises	GH₵ 5.20 /house/month
Public Institutions/Gov't Depts	GH₵ 1.54 /m^3
Commercial/Industrial	GH₵ 1.80 /m^3
Special Commercial	GH₵ 4.79 /m^3

Source: PURC, 2010

The utility is working towards charging economic tariffs for services. However, this has not been easy, with consumer agitations and resistance on the basis of poor services in both quantity and quality. The poor services have resulted from a combination of weak maintenance culture, inadequate sector investment in expansion of capacity and poor operational efficiency. It is, for instance estimated that about 55 percent of customers are not metered but billed on the basis of flat rates (Lievers and Barendregt, 2009). Based on a tariff of GH₵ 0.80 per m^3, an unmetered house paying GH₵ 5.20 GHp per month, presupposes a consumption of only 6.5 m^3 per month, which is about 21 lpcd, assuming a household of 10 people. The fact that actual consumption is likely to be far beyond 6.5 m^3 per month, contributes to high levels of non-revenue water presented above.

3.3.5 Utility management and the poor

With its focus on providing high level services through household connections, the focus of utility management is obviously not on providing services to the poor in urban areas and small towns. Pro-poor issues are addressed by the provision of water services through standpipes, by the 'lifeline' tariff (which actually often does not benefit the poorest, who live in compound housing) and by relatively low monthly levies of unmetered housed.

The poor in urban areas and small towns largely depend on water provided through community or private service delivery models, which are discussed below. However, as will be shown below, these services are generally provided at much higher tariffs than the utility tariff.

3.4 Community Ownership and Management (COM) of small town water supply

The main model for water service delivery in small towns not covered by the utility network is the Community Ownership and Management (COM) model, as implemented under the National Community Water and Sanitation Programme by the Community Water and Sanitation Agency (CWSA). As mentioned in Chapter 2, many of the small towns which were transferred from the utility to CWSA and were managed under community management models, were considered not economically viable, and were generally populated by the poorer strata of the Ghanaian society. This section gives a description of the COM service delivery model for providing water services in small towns, including the level of service provided and the different management models which are applied to provide these services.

It mainly describes the characteristics of these management models in theory. A number of variations of this model and what these look like in practice will be presented in chapter 4 to 7.

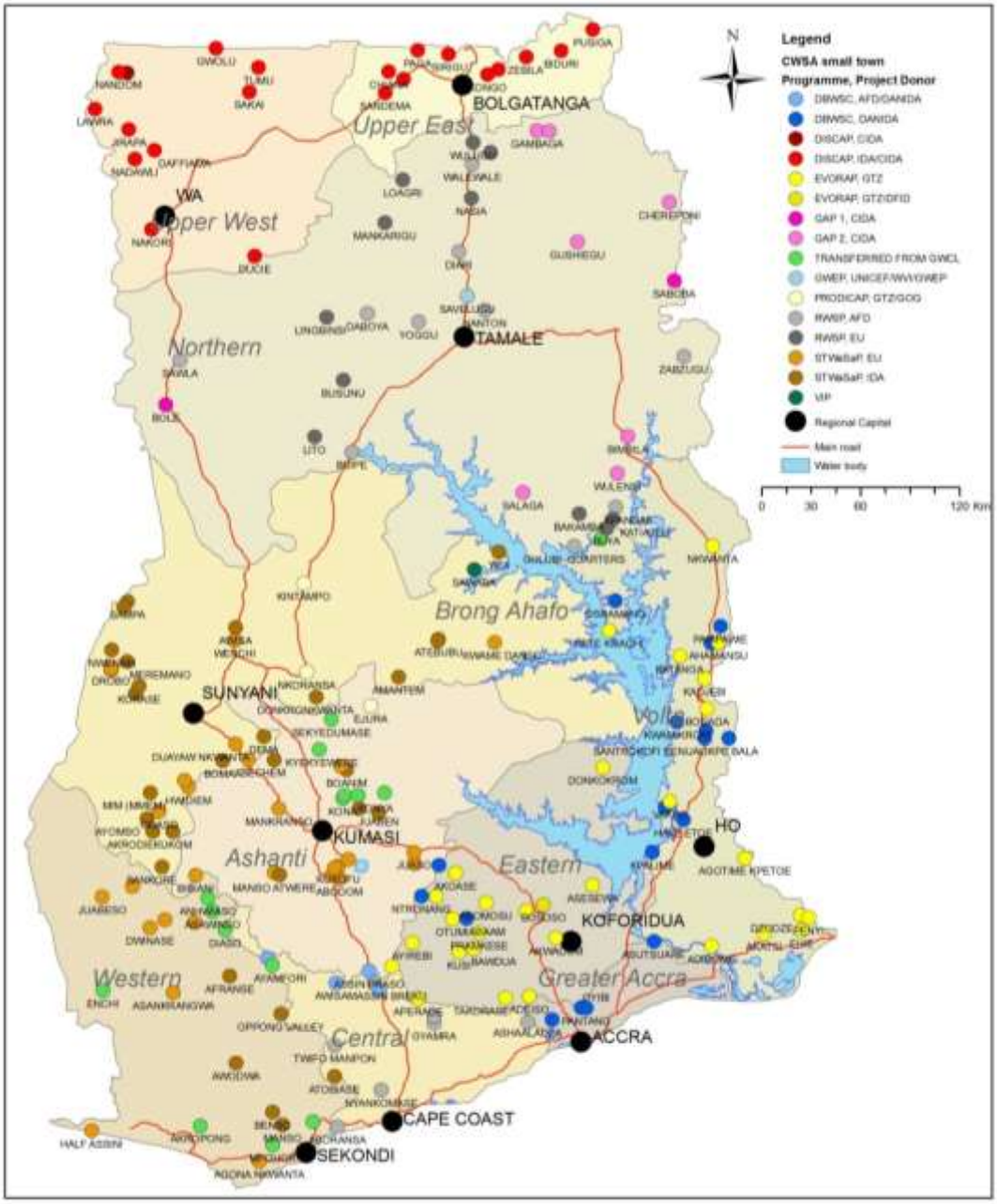
3.4.1 Implementation of infrastructure

According to Act 462, Municipal and District Assemblies are '*responsible for the overall development of the district*'. This includes the planning and implementation of water services. Most small-town water supply schemes are however implemented through donor-funded projects facilitated by CWSA, and not necessarily based on plans developed by the MMDAs. In the small-towns water sub-sector, direct involvement by donors and their projects is very visible and stronger than in the urban water subsector. Typically, major donors are associated with specific regions or areas that they operate and where they play a direct role in facilitating the delivery of the service through strong collaboration with the CWSA, often involving the provision of technical assistance. This is illustrated in Figure 11, which shows the geographic distribution of small-town piped schemes funded by different donors under different projects and programmes. These different projects and programmes each come with their own ideas about technology and management models, which has led to the introduction of slightly different models under these different projects and programmes.

Besides implementation or rehabilitation of infrastructure and the set-up of the management model to manage the scheme, elements of strengthening the service authority functions to provide direct support to service providers are typically included in the programmes and projects. The CIDA supported District Capacity Building Project (DISCAP) and the GTZ supported Promotion of District Capitals Project (PRODICAP) for example focussed on building the capacity of local government (District Assemblies) for the provision of post construction support services. Under the GTZ supported Eastern and Volta Regions Assistance Project (EVORAP), direct post construction support was provided by project staff for the duration of the project. This kind of support was however project focussed and therefore time-bound.

Until recently, users were expected to make a contribution to the capital costs of projects of 2.5-5 percent of the total capital costs of the new or rehabilitated scheme. This was believed to contribute to the community's 'sense of ownership' and by that its willingness to take up (costs for) operation and maintenance of the scheme. It should be noted that the 5 percent community contribution never existed for urban users and was applied to widely different degrees (and sometimes not at all) by different projects. Although never officially announced, it is now generally accepted that community contribution to the capital investment costs no longer needs to be raised.

Figure 11: Map showing Project Donors in the Small Towns Water Sector



3.4.2 Service level and water use

Community managed water supply in small towns is aimed at meeting the basic water needs of the population, through either standpipes or household connections. Unlike under utility management, under the COM model for small towns, focus is on providing a basic level of service to the majority of the population through standpipes, rather than on providing a high service level to the fortunate few through household connections. Community managed small town water supply can thus be considered pro-poor focussed.

The CWSA design guidelines for small town schemes (CWSA, forthcoming)[14] prescribe a design water demand of 20 litres per capita per day for people with access to standpipes and 60 litres per capita per day for people with access to household connections. In addition, an industrial and commercial demand of 10 - 20 percent of the domestic demand and physical losses of 10-15 percent in case of new small town piped schemes, or 15 - 20 percent in case of existing schemes, which are to be rehabilitated, should be taken into account in the design of small town schemes. Taking this into account, demand thus ranges from 73 litres per capita per day to 86 litres per capita per day for household connections, and from 24 litres per capita per day to 29 litres per capita per day for standpipes. The share of the population with access to standpipes and house connections is determined based on socio economic and willingness-to-pay studies, and in accordance with the criteria set out in Table 9. This table also shows the estimated average water demand for towns of different sizes.

Table 9: Design water demand under the COM model

Category*	Population*	% Standpipes*	% Household Connections*	Estimated design water demand (lpcd)
Category I	2,000 – 5,000	80% - 90%	10% - 20%	29 - 40
Category II	5,001 – 15,000	75% - 85%	15% - 25%	31 – 43
Category III	15,001 – 30,000	70% - 80%	20% - 30%	34 - 46
Category IV	30,001 – 50,000	60% - 75%	25% - 40%	36 - 52

*= Source: CWSA, forthcoming

In addition to setting a standard for the amount of water to be provided by community managed small town piped schemes, the CWSA guidelines set the following standards:

- Water quality: should be in line with the standards set by the Ghana Standard Board.
- Number of people per standpipe: not to exceed 300 people per standpipe spout.
- Distance from standpipe: should not exceed 500 metres.
- Reliability: The scheme should provide services for at least 95 percent of the time.

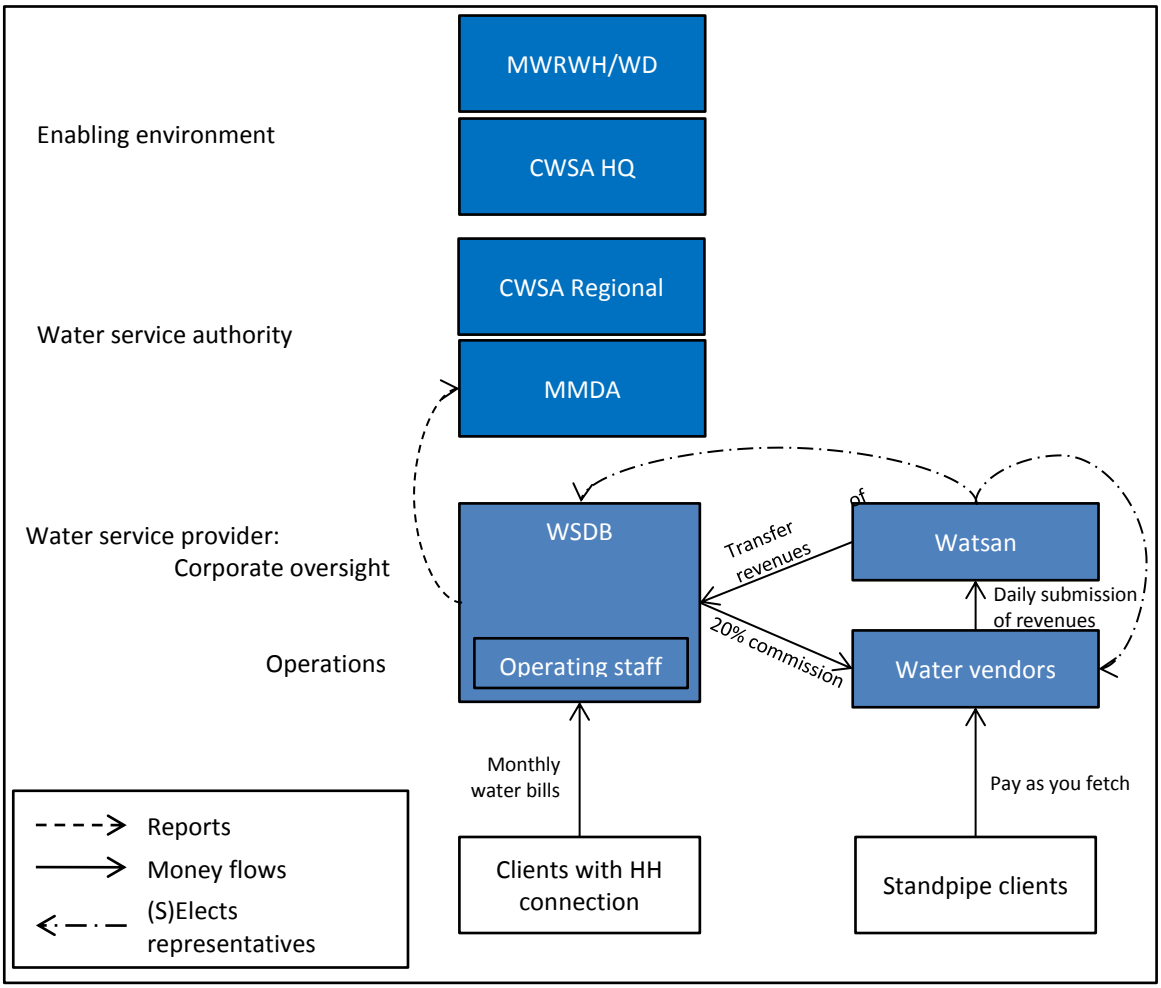
3.4.3 Institutional arrangements

Figure 12 gives a schematic representation of the main roles and responsibilities of the different stakeholders under the 'direct WSDB management' model.

Under the COM model, management of small town piped schemes is delegated to Water and Sanitation Development Boards (WSDBs), which are supposed to be set-up for each scheme. Model by-laws have been developed for guiding and legalising the set up and operations of WSDBs. According to the model by-laws (MLGRD, 2008), a WSDB takes its legal authority from the MMDA. The Assembly vests the WSDB with the authority and jurisdiction over operation and maintenance of water schemes. The Assembly, through resolution and in consultation with the community, maintains the power to dissolve the WSDB.

[14] At the time of writing of this report, the revised and updated CWSA guidelines (CWSA forthcoming) had not been formally launched yet. This document therefore mostly refers to the CWSA guidelines as developed in 2010 (CWSA 2010a and 2010b).

Figure 12: Direct management with WSDB model



The model by-laws prescribe that the WSDB should consist of 10-15 members, of which at least 1/3 are women and at least 1/3 are representatives from the Assembly or Town / Area Council. According to the by-laws, WSDB members should be elected from the different groups within the community, with each group determining its own electoral procedure, facilitated by the DWST. These groups should include WATSAN Committees, Assembly members, Town or Area Council members, water user groups, women's groups, and traditional authorities.

WSDB members should serve a 4 year term and are subsequently eligible for re-election for one more term. The WSDB should elect an Executive Committee consisting of at least 5 members, comprising a Chairperson, Secretary, Treasurer and 2 technical staff (an operational staff member and a sanitation and hygiene focussed staff member). At least one member of the Executive Committee should be a woman. A DWST representative should attend meetings of the Executive Committee (MLGRD, 2008).

The WSDB is responsible for undertaking service provider functions, including:

- collecting technical data on the management of the water supply scheme and checking financial records on a monthly basis;
- preparing financial records for operation and maintenance and providing these records to MMDA and CWSA for inspection; and

- reading out technical, administrative and financial reports to the community at least once every six months (CWSA, forthcoming).

Users are expected to pay for the provided water services through tariffs. People with household connections should be presented with monthly bills, while people using stand pipe connections should pay as they fetch, usually per bucket. Depending on the size and complexity of the scheme, the WSDB may directly employ vendors to operate tap-stands, for which vendors receive a commission of 20 percent of the revenues at the standpipe, or may delegate Water and Sanitation Committees (WATSANs) to manage one or several standpipes serving a community on their behalf (CWSA, 2004a).

According to the CWSA guidelines (CWSA, forthcoming), Water and Sanitation Committees (WATSANs) should be formed in the various zones/wards of a given town to provide complementary support services. These should be in-charge of the selection of vendors to manage the standpipes in the area, and of monitoring their activities. In addition, the WATSAN Committee is responsible for educating the people in their area on hygiene and sanitation. They should have a membership of 5 with at least two female representatives.

Vendors should collect revenues from the standpipe on a pay as you fetch basis, which are submitted to the WATSAN Treasurer on a daily basis. Adequate daily records of meter readings and sales at standpipe are to be kept. Vendors should be paid a commission of 20 percent of the monthly sales. The WATSAN Treasurer should deposit the collected revenues into the WATSAN Account and the WATSAN Committee should transfer monthly revenue to the WSDB.

The WSDB should employ permanent staff to be responsible for operation and maintenance of the water scheme. This should include a System Manager, who on behalf of the WSDB oversees the management of the scheme. The WSDBs can contract the operation and maintenance to a private operator or employ technical persons who work directly under them (MLGRD, 2008). The CWSA Small Town Operation and Maintenance guidelines (CWSA, forthcoming) provide broad recommendations for management options for different size town. Table 10 gives an overview of these recommended options.

Table 10: Small town population size and recommended management options

Population	Recommended management option
2000- 5000	*Option 1*: WSDB supported by skilled artisans from within the community, whose services may be procured when necessary on a retainer basis
5,001 – 10,000	*Option 2*: WSDB with certified/reputable firm to carry out specialised functions as and when needed; or, preferably *Option 3*: WSDB with contract with a firm or firms to perform specialised functions on a periodic basis
> 10,000	*Option 4*: WSDB + a contracted firm (private operator) to completely operate and maintain the water supply scheme

Source: CWSA, forthcoming

Options 1 to 3 can be considered 'Direct WSDB management', with different degrees of private sector involvement. The private sector plays a more prominent role in Option 4, in which the WSDB actually contracts a private firm to do the operation and maintenance of a small town scheme on its behalf. As can be seen in Table 10, the 'direct WSDB management' model (Options 1 to 3) is much more common than the 'WSDB with private operator' model, even in towns with more than 10,000 inhabitants.

In principle, MMDA are responsible for fulfilling service authority functions, including:

- Regulation:
  - To review and approve community tariffs in accordance with CWSA guidelines;
  - To approve by-laws for the operation of WSDBs and WATSANs; and
  - To provide technical approval for WSDB plans (extensions etc.);
- Direct support:
  - To monitor operation and maintenance of schemes in terms of financial, technical and administrative performance;
  - To periodically audit WSDB accounts; and
  - To support DWD/DWST to provide technical support to WSDBs.

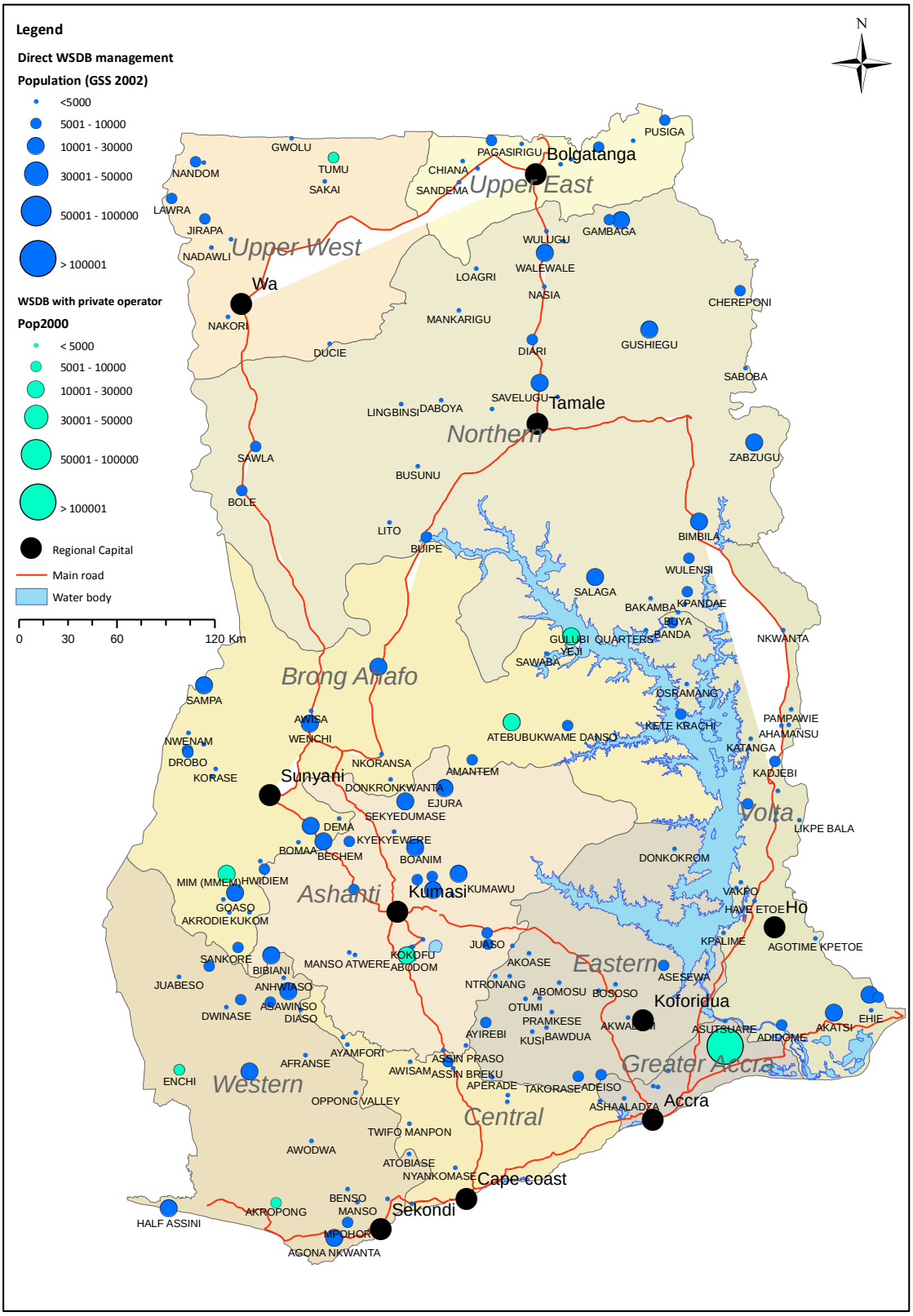
Formally, the Metropolitan, Municipal and District Assemblies are the owners of the schemes on behalf of the community[15] and, as such are also in the end responsible for their repair and rehabilitation.

The District or Municipal Water and Sanitation Team (DWST or MWST) are a semi-formal three-member team drawn from Environmental Health, Community Development and the Works Departments. The Planning Officer is responsible for coordination of the activities of the Water and Sanitation Team and serves as link between the Team and the District management.

CWSA is responsible for creating the enabling environment for community managed small town water supply, by facilitating Community Ownership and Management, providing guidelines and setting standards, and providing professional back-up support to MMDAs (CWSA, forthcoming). It does so through its headquarters in Accra and Regional offices in each of the ten regions. The CWSA Regional Offices do however also play a role in providing direct support to community-based service providers, the WSDBs, and therefore can be considered to take up part of the service authority functions as well, as illustrated in Figure 13.

[15] It should be noted that 'communities' are not legal entities in Ghana. The lowest level of government is the Metropolitan, Municipal and District Assemblies (MMDAs), with its sub-structures (area and town councils). The 'Ownership' in 'Community Ownership and Management' is thus rather meaningless.

Figure 13: Community management models supported by CWSA



3.4.4 Tariff setting and cost recovery

According to the model by-laws (MLGRD 2008), the WSDB should calculate tariffs using the CWSA tariff setting guidelines. The Assembly should consider and approve the tariff. The CWSA guidelines (CWSA, forthcoming) prescribe that components of the tariff should include:

1. Water production costs (including staff and casual labour working on production), chemicals, electricity, fuels and lubricants and other production expenses)
2. Distribution expenses (including staff and casual labour and chemicals)
3. Routine maintenances and repair works
4. Water quality monitoring
5. Tariff collection expenses (vendors) (not more than 20 percent of the total tariff)
6. Replacement costs (20 percent of 1-5)
7. Rehabilitation and expansion 5 percent of 1-5
8. Sanitation fund (8 percent of 1-5)
9. Contingency (2 percent of total)

According the CWSA guidelines (CWSA, forthcoming), the amount of non-accounted for water (non-revenue water) should not exceed 20%.

The model by-laws (MLGRD 2008) suggest that WSDBs should set up at least 3 accounts of the financial management of the scheme:

- *Operational account*: all revenues from water sales and other receipts should be paid into this account. All regular operation and maintenance costs should be paid from this account.
- *Capital account*: to be used for major repairs, extension and replacement. No less that 20 percent of the net revenues should be paid into this account on a monthly basis. The assembly may also allocate funds annually through its regular allocation to the capital fund. The District Coordinating Director should co-sign cheques drawn from this account.
- *Sanitation account*: to be used for the promotion of sound sanitation and hygiene practices. The WSDB should pay not less than 10 percent of net monthly revenue into this account. The assembly may allocate funds annually through its regular allocation to the sanitation fund.

3.4.5 COM and the poor in small towns

As mentioned above, Community Ownership and Management of small town water schemes is, by definition, pro-poor. The focus is on providing a basic level of service to all, rather than providing a high level of service to the part of the population that has the capacity to pay for such high level services (as often happens in utility managed schemes). Furthermore, during training of the Water and Sanitation Boards, communities are sensitised on the need to recognise the poor in their decision making. But this is often at their discretion, as there are usually in-built social safety nets within homogeneous communities.

This model and variations on it will be discussed in more detail in Chapters 4 and 5. The 'WSDB management with private operator' model will be discussed in more detail in Chapters 6 and 7.

3.5 Privately managed informal water supply

As an estimated 69.6 percent of the urban population in Ghana is not directly connected to the utility scheme through indoor plumbing or household standpipes (GSS, 2008), private entrepreneurs play an important role in the provision of water services in urban areas, especially in the densely populated low income areas, which are not (yet) connected to the utility managed network. Informal private water service providers either sell water obtained from the utility network (intermediate private providers) or from schemes developed independently from the utility (independent service providers). This section discusses these different private management models and the services that are provided under these models in more detail.

3.5.1 Implementation of infrastructure

Implementation of privately managed water supply infrastructure is generally arranged and financed by a private entrepreneur, for both intermediate and independent service providers.

3.5.2 Service level and water use

The type of service delivered under private management models depends to a large extent on the type of service provider. Water vendors and water kiosks generally provide water by the bucket on a 'pay-as-you fetch' basis, similar to the community and utility managed standpipes. This obviously limits the amount of water that can be collected. Abraham et al (2007) estimate water use for people using these services to be 25-60 litres per capita per day. However, as this water has to be fetched and carried to the place of use, it is unlikely that water use will exceed 20 litres per capita per day.

Water tanker service providers deliver water to people's doorstep, or rather, to their water storage devises. The amount of water used provided by tanker services, thus, depends more on the storage capacity of the household and the financial capacity to pay for the more expensive tanker water on regular basis. Based on his research on tanker services in Accra, Owusu Kanin (2010) calculated that high income households supplied by tanker trucks use on average 149 litres per capita per day, while middle income households use 101 litres, and low income households use only 51 litres per capita per day.

3.5.3 Institutional arrangements

There are different types of intermediate private service providers, including tanker operators and domestic vendors, who depend on the utility for their water supply. These service providers are all, to a greater or lesser extent, informal. Most are neither recognised, nor regulated.

Water vendors sell water from standpipes, mainly in densely populated low income neighbourhoods. Many vendors operate in areas where distribution mains from the utility scheme are available but where, either because of the nature of the development patterns

of the areas or because of lack of capacity on the part of consumers to extend connections to their homes, there is difficulty in connecting to individual homes. A vendor (private person) manages the standpipe and earns profit from selling the water. The vendors pay monthly bills to the utility.

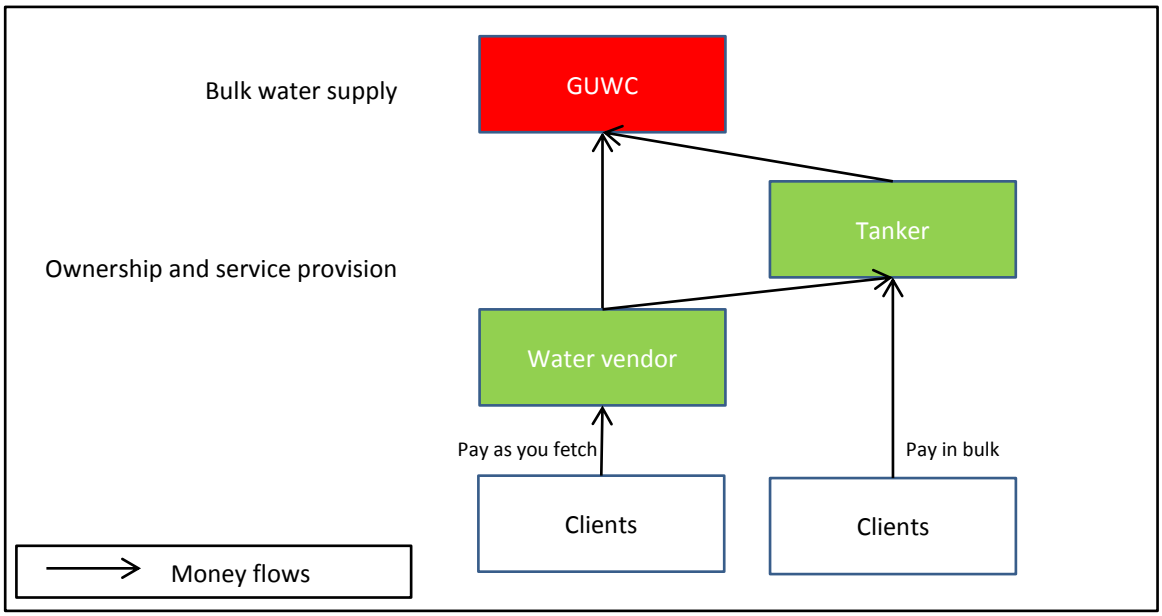
Where the utility's supply is insufficient, rationed, or where there is no reticulation at all, domestic vendors take their supplies from tanker operators. In that case, the tanker operator sells a bulk amount of water to the vendor, who stores and sells it to its customers.

Private Tanker Operators are a key component of the water delivery chain in Ghana's major cities. It is estimated, according to the Water Tanker Service Guideline by PURC (PURC, no date), that there are over 1,000 water tankers in the Accra and Tema Metropolises alone. The demand for the services of tanker operators has been increasing over the years from the late 1980s, due to the inability of the utility to produce and distribute adequate water to the population in the urban area. Dialogue between the GWCL and tanker services has led to the establishment of designated tanker service points, where authorised tanker operators should be able to legally draw water to sell. These points are metered and tanker operators pay tariffs to GWCL, based on the meter readings. In order to streamline the operations of the tanker services, PURC developed Tanker Services guidelines. Nevertheless, according to the GWCL, many tanker operators still fill their tanks at illegal filling points, causing problems in the distribution scheme.

Overall, the activities of water vendors and tanker operators are largely unregulated, in terms of price and water quality.

Figure 14 gives a schematic overview of this model.

Figure 14: Intermediate Providers' management model – Tanker services



In the case of **independent private providers**, an individual, organization or a company owns, manages and operates the water supply from source to distribution point. Figure 15 gives a schematic representation of this model. Examples of this kind of model include individuals with a private hand dug well, borehole, spring etc, who sell water to neighbours, as shown in Figure 16.

Figure 15: Independent private service provider management model

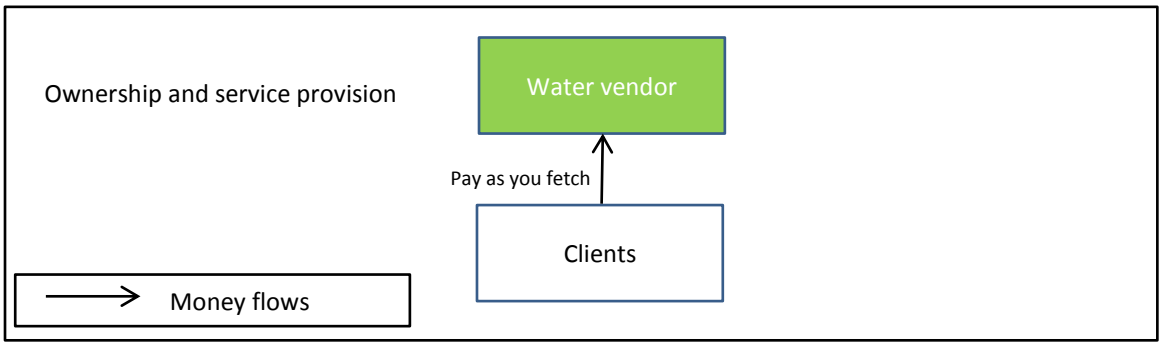


Figure 16: Left: Young boy fetching water from a neighbour in peri-urban Kumasi; Middle: Lady fetching water from a privately-managed limited mechanised borehole in Sunyani West District; Right: Water tanker in Accra.

3.5.4 Tariff setting and cost recovery

Under private management, tariffs are set in such a way that all costs of the entrepreneur can be recovered and a profit can be made. Intermediate private vendors and independent private service providers set tariffs themselves, without being regulated. As a result, the price per unit of water varies widely, depending on the services provided by the vendor, the location and the time of the year. Van Rooijen et al (2008) found that water vendors in Accra generally charge between 3 and 11.50 GH₵/m^3, depending on the area and time of the year.

Owusu Kanin (2010) found that high income households pay about 5.17 GH₵/m^3 and low income households pay about 7.2 GH₵/m^3 for water supplied by tankers. He attributes this difference to the fact that high income households are able to buy water in larger volumes than poor households – due to greater onsite storage capacity. For both, the costs per unit of water are far bigger than the urban utility's 'lifeline' tariff of 0.80 GH₵/m^3.

3.5.5 Private management models and the urban and small town poor

Although services provided under informal private management models are generally more expensive than service provided by the utility, a large part of the urban poor population depends on these kinds of services, as they are unable to access the formal, cheaper utility services.

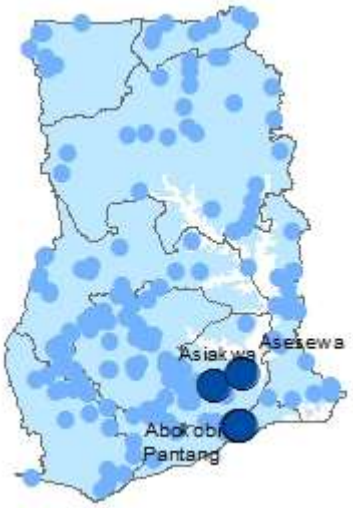
3.6 Summing-up

This chapter has introduced the main models for service delivery in small towns and peri-urban areas in Ghana. It has shown that there are differences, but also similarities in level of service under the different models. Under both utility and community service delivery models, water services are provided through a combination of household connections and standpipes. However, in the case of utility management, emphasis is on household connections, while in community managed small town schemes, emphasis is on standpipes.

People served by the utility pay less per unit volume than people served by community managed small town schemes for a similar level of service. People served by privately managed informal water supply pay even more.

The institutional set-up under the different models varies. For utility management, institutional arrangements for the management of existing schemes are quite clearly defined, including the roles and functions of the regulator. Under community management and private management, a variety of sub-models can be found, some of which will be discussed in the chapters that follow. As shown above however, it is already clear that the institutional arrangements related to authority functions around private and community management are not well defined.

In the chapters that follow, case study examples are presented of a number of variants to community and private models for small town and peri-urban water supply. For each case, an introduction is given to the context of the case study, after which the water services provided, the institutional arrangements under the model and the actual functioning of the model in practice are described, in terms of corporate oversight and operations, tariff setting, cost recovery, record keeping and accountability and the provision of direct support to the service provider.



4 Direct Water and Sanitation Development Board management: The case of Abokobi, Pantang, Asesewa and Asiakwa[16]

As mentioned in Chapter 3, the 'direct WSDB management' model is the most common community management model for small town water supply in Ghana. The implementation of this management model started with the introduction of the concept of community ownership and management of piped schemes in small towns in Ghana in the late 1990s. This chapter presents four cases where this model has been applied. First the cases of Abokobi and Pantang case are presented, which are both multi-community schemes in the peri-urban areas around Accra. This is followed by the Asiakwa and Asesewa cases, where the model was introduced and supported under the Eastern and Volta Region Assistance Project (EVORAP).

4.1 Abokobi and Pantang

4.1.1 Introduction to the case study areas

Abokobi and Pantang are both located in the Ga East Municipal Assembly (GEMA) of the Greater Accra Region of Ghana. Abokobi is the administrative capital of the district. About fifteen years ago, both towns were small Ga indigenous communities of peasant farmers, located about 15 miles away from Accra. However, over the past two decades, there has been a rapid influx of people to Accra and its environs and the stretch of land between the towns and Accra is now fully inhabited. Consequently, there has been a rapid surge in population in the two communities due to the availability of cheap land for housing and the resulting migration of people from nearby Accra (and surrounding communities). Both communities have now become peri-urban, providing shelter for a large number of workers, traders, artisans and students in Accra. The migrant population of both towns constitutes over 60 percent. The indigenous sections of the communities, where the poor live, are crowded and over-populated, giving rise to slum conditions. The (2008) population of Abokobi is estimated to be around 22,840 inhabitants, while that of Pantang consists of about 12,480 people.

4.1.2 Water services, past and present

Abokobi used to rely for its water supply on a borehole fitted with a handpump provided by the 31st December Women's Movement, from where water could be fetched for free, and one privately owned handpump. In 1990 however, both handpumps broke down after about 4 years of use, because of pressure and over-use. Between 1990 and 1995, the Presbyterian mission made a borehole with handpump on its premises available to the public on pay-as-you-fetch basis. However, the majority of community members resorted to the use of ponds, rain water and, those who could afford, tanker services. The acute water problem was aggravated by the rapid increase in population.

[16] This chapter is largely based on case studies done by Philip Francis Ampadu on Asesewa and Asiakwa and on Abokobi and Pantang, within the framework of the TPP project (Ampadu, 2010a; Ampadu, 2010b).

Residents of Pantang depended on a nearby stream and hand-dug wells for their water needs, while a privileged few patronized tanker services.

In both Abokobi and Pantang, small town water supply scheme were implemented in 2006, with support from DANIDA, to improve the water supply situation in the towns. The Abokobi scheme serves three peri-urban communities (Abokobi, Oyarifa and Teiman), while the Pantang scheme serves a total of 10 peri-urban communities. Table 11 gives an overview of the technical details of the two schemes. For details on water production and consumption, see Annex 1.

As shown in the table, in both cases, the amount of water used from standpipes is considerably lower than the design demand of 20 litre per capita per day, and water use from household connections was considerably below the design demand of 60 litres per capita per day. It also shows that the amount of non-revenue water was quite high. In Abokobi, the 2008 water production was 116,788 m^3 (14 litres per capita per day), while sales were 68,266 m^3 (8 litres per capita per day), which is only 58 percent of the amount of water produced, implying a non-revenue water rate of 42 percent. In Pantang, 2008 production was 94,337 m^3 (21 litres per capita per day), of which only 60 percent (56,267 m^3; 12 litres per capita per day) was consumed, giving a non-revenue water rate of 40 percent.

In the Abokobi case, the number of people per standpipe is estimated to be 910, which means 455 people per standpipe spout, as standpipes have two spouts each. This is higher than the maximum of 300 people per standpipe spout, as set by CWSA, and indicates that there is likely crowding at the water points. In Pantang the number of people per standpipe spout amounted to 223, which is within the 300 limit.

Table 11: Overview of schemes and service characteristics: Abokobi and Pantang

Scheme and service characteristics	Abokobi (3 communities)	Pantang (10 communities)
Population	22,840	12,480
CWSA town category (See Table 9)	III	II
Recommended percentage of people with household connection (See Table 9)	20% - 30%	15% - 25%
Number of standpipes	21	22
Number of household connections	374	267
Estimated actual percentage of people with household connection	16%	21%
Percentage of water consumption through household connections	61%	65%
Estimated number of people per standpipe	455	223
Average water production (lpcd)	14	21
Water consumption from standpipes (lpcd)	4	6
Water consumption from household connections (lpcd)	13	37
Non-revenue water	42%	40%

4.1.3 Corporate oversight and operations

In each of the three communities served by the Abokobi scheme (Abokobi, Oyarifa and Teiman), a WATSAN committee has been established. Furthermore, there is a WSDB with 13 members as the overall governing body. The WSDB is constituted by representatives from the WATSAN committees and other stakeholders, including 5 women (about 40 percent, which is slightly above the CWSA prescribed minimum of 30 percent).

To manage the Pantang scheme, WATSAN Committees have been formed in each of the 10 communities served by the scheme, in addition to a 15-member WSDB, consisting of representatives from the WATSAN committees and other stakeholder groups. The number of women on the WSDBs is 5, in line with the CWSA requirement of 30 percent.

In both cases the WSDB engages a System Manager as the technical leader in the operation and maintenance of the scheme, with the responsibility of supervising other operational staff, including an account officer, pump attendants, plumbers, water vendors and security personnel. However, there is a lack of clarity between WSDB and Systems Manager with respect to who has direct control of the operating staff. This creates tension and confusion among members of the WSDB and the Systems Manager.

WSDB members are ordinary community members who do not have prior technical knowledge and skills in the area of water management. The training for the WSDB was a one-off training, which did not expose them adequately to the realities of their task. This is compounded by the voluntary nature of their work as WSDB members are not paid for the work they do, but receive only an allowance. This tends to affect morale of the members.

4.1.4 Tariff setting

The WSDBs of Abokobi and Pantang managed to get tariff adjustments approved by the Ga East Municipal Assembly in 2008. The tariff was at the time set at GH₵ 0.03 per 18 litre container (GH₵ 1.66/m^3).

4.1.5 Cost recovery

The tariff seems sufficient to cover the expenditure on operation and maintenance, which, in 2008, amounted to GH₵ 0.88 and GH₵ 0.83 per m^3 consumed water in Abokobi and Pantang respectively. However, operational staff and WSDB members are of the opinion that compensation for their tasks was grossly inadequate. This has resulted in serious agitations on the part of operational staff for substantial upward adjustment of allowances.

WATSAN committees are in charge of collecting revenue from vendors at stand pipes in their respective communities for onward payment to the WSDBs. However, this has created problems relating to poor accountability by the WATSAN. It has led to incidences of revenue losses because of delays on the part of the WATSAN Treasurer in submitting money to the WSDB, and connivance between vendors and WATSAN Treasurer in accounting for revenues at the standpipe.

The WSDB operates two accounts: an operation account and a maintenance (capital) account, but no sanitation account. The signatories to the operation and capital accounts are

the chairman, secretary and treasurer of the WSDBs. It was however unclear how much of the net revenues were deposited into the maintenance account. Although the model by-law (MLGRD, 2008) state that the District Coordinating Director (DCD) should be a co-signatory, this was not found to be the case here.

Despite the high levels of non-revenue water, the 2008 accounts for Abokobi and Pantang show a positive balance of revenues against expenditure. In Abokobi and Pantang, the expenditure amounted to GH₵ 60,143 (GH₵2.63 per capita) and GH₵ 46,892 (GH₵3.76 per capita) respectively, while revenues amounted to GH₵ 105,091 (GH₵4.60 per capita) and GH₵ 77,022 (GH₵ 6.17 per capita) respectively. Expenditure thus only amounted to 57 percent of the revenues in the Abokobi case and 61 percent in the Pantang case. The tariffs are thus more than sufficient to cater for operation and maintenance, while also allowing for substantial savings for capital maintenance expenditure, even with the high levels of non-revenue water in these cases. Details on revenues and expenditure are presented in Annex 1.

4.1.6 Record keeping, reporting and accountability

Although the WSDB should organise half yearly meetings with the community to present records, this has in reality hardly taken place in Abokobi and Pantang.

There have been reports of cases where the WSDBs had withdrawn money from the bank, supposedly for their operations, without the knowledge of operational staff and without proper documentation, which present transparency and accountability concerns.

4.1.7 Direct support

The monthly reports that the WSDBs should submit to the Municipal Assembly and CWSA are not submitted on a regular basis. This has not resulted in a reaction from the Municipal Assembly, which has not been playing its role of monitoring and supervising the operation of the WSDB.

4.2 Asesewa and Asiakwa

Asesewa and Asiakwa are 2 traditional communities located in Upper Manya District and East Akim District respectively in the Eastern Region of Ghana. Both communities are homogeneous, and dominated by their respective indigenous tribes: Krobo and Akan. Asesewa is a well-known market centre with vigorous weekly commercial activities. It is a district capital, whose population grew from 7,314 in 2004 to 12,300 in 2008 with the influx of civil servants, businesses, and new housing units. Asiakwa, on the other hand, is a small farming community of mostly cocoa (cash crop), plantain, cassava and maize (food crop) farmers, with a population which grew from 3,811 to 5,100 in the period 2004 - 2008. The development of Asiakwa had been stimulated by the rest-stop services provided by the town to passengers travelling on the Accra-Kumasi road which passes through the town.

4.2.1 Water services, past and present

Prior to the completion of the current small town water scheme in **Asesewa,** which was implemented from 1999 to 2004, the town relied on four boreholes fitted with handpumps. These boreholes had been provided by Plan International, handed over to the District Assembly (DA) and the community, and managed by various WATSAN Committees.

However, use of the facilities was seriously over-stretched, especially during market days, causing frequent breakdowns. Alternative sources in Asesewa included a few privately owned open hand-dug wells, seasonal stream water, and rainwater storage in barrels.

Before implementation of the current small town water supply scheme, **Asiakwa** was supplied by an inadequate diesel-powered mechanized hand-dug well with 6 standpipes and a few household connections, transferred from the GWCL to the East Akim District Assembly around 1995. After handing over, the facility was managed directly by the East Akim District Assembly through a Pump Caretaker. Operation and maintenance were poor with frequent bursts, shortages of diesel and lubricants, machine failure, etc. Given the precarious situation of the scheme, many residents depended on nearby streams. Harvested rain water was used for drinking purposes. These alternative sources were considered to provide enough water and thus the presence of a source of safe potable water was not a strongly felt need. However, with the construction of modern houses with plumbing facilities (Water Closets, showers, kitchen sinks, etc), a growing number of residents began to desire a piped water source.

The Asiakwa and Asesewa schemes were completely reconstructed as small town water supply facilities, with assistance from the Government of the Federal Republic of Germany under the Eastern and Volta Regions Assistance Project (EVORAP) (1999 – 2006). The (re)construction of both schemes was completed in 2004 and community managed structures were put in place.

Water services in Asesewa are provided through 20 public standpipes and about 57 household connections. Although the population served by the Asiakwa scheme is considerably smaller than that of Asesewa, there are an almost equal number of standpipes (19 in Asiakwa) and a bigger number of household connections (67) in Asiakwa than in Asesewa. In both schemes, the amount of non-revenue water is lower than the prescribed 20 percent. In 2008, the Asesewa scheme had an average annual production of 57,552 m^3 (about 13 lpcd). The amount of water consumed amounted to 49,355 m^3 (about 11 lpcd), which was 85 percent of the amount produced. The Asiakwa scheme produced an average of 13,205 m^3 (about 7 lpcd), of which about 86 percent, or 10,547 m^3 (about 6 lpcd) was consumed. Details of water production and consumption in Asesewa and Asiakwa are presented in Annex 2 and 3 respectively.

Table 12 gives an overview of the main scheme and service characteristics. In addition to the above mentioned figures, it shows crowding (more than 300 people per standpipe spout) in Asesewa, a low estimated percentage of people with access to household connections in both cases, and relatively low levels of non-revenue water.

Table 12: Overview of scheme and service characteristics: Asesewa and Asiakwa

Scheme and service characteristics	Asesewa	Asiakwa
Population	5,400	12,300
Number of standpipes	20	19
Number of household connections	57	67
Recommended percentage of people with household connection as per CWSA guidelines	15% - 25%	15% - 25%
Estimated actual percentage of people with household connection	12%	5%
Percentage of water used through household connections	18%	20%
Estimated number of people per standpipe spout	587	233
Average water production (lpcd)	13	7
water consumption from standpipes (lpcd)	9	5
water consumption from household connections (lpcd)	44	10
Non-revenue water	15%	14%

4.2.2 Corporate oversight and operations

The establishment of institutional arrangements for the management of the Asesewa and Asiakwa schemes, which took place under the EVORAP Project, pre-dates the development of the CWSA guidelines for small town operation and maintenance and the model by-laws for WSDBs. Because of this, the institutional set-up in Asesewa and Asiakwa differs from the set-up as prescribed by CWSA (as described in Chapter 3) in a number of ways:

- No System Managers were put in place, but rather this responsibility was given to the WSDB through sub-committees (for finance and administration, technical operations);
- No WATSAN Committees were established, but standpipe vendors submit revenues directly to a revenue collector on a daily basis. The revenue collector submits the revenue daily to the accounts officer. The accounts officer deposits the money in the WSDB account the same day;
- For sanitation and hygiene promotion, which would normally be the task of the WATSAN Committees, one person was employed as sanitation 'volunteer' as part of the operation staff. The sanitation volunteer is paid from the revenue from operation as any other operation staff. The sanitation volunteers are given a tool (or tools) to undertake daily promotion of hygiene and sanitation, even beyond the project phase.

However, in reality, the installed sub-committees have not functioned as expected due to a lack of effective leadership of the committees. Monitoring and supervision of the operational staff is increasingly a problem. This poses significant challenges for the management of the scheme, especially during periods of emergencies where important decisions or financial resources are required to solve urgent problems.

The activities of the sanitation 'volunteers' on the other hand have resulted in good hygiene and sanitation practices and have led to some positive behavioural change.

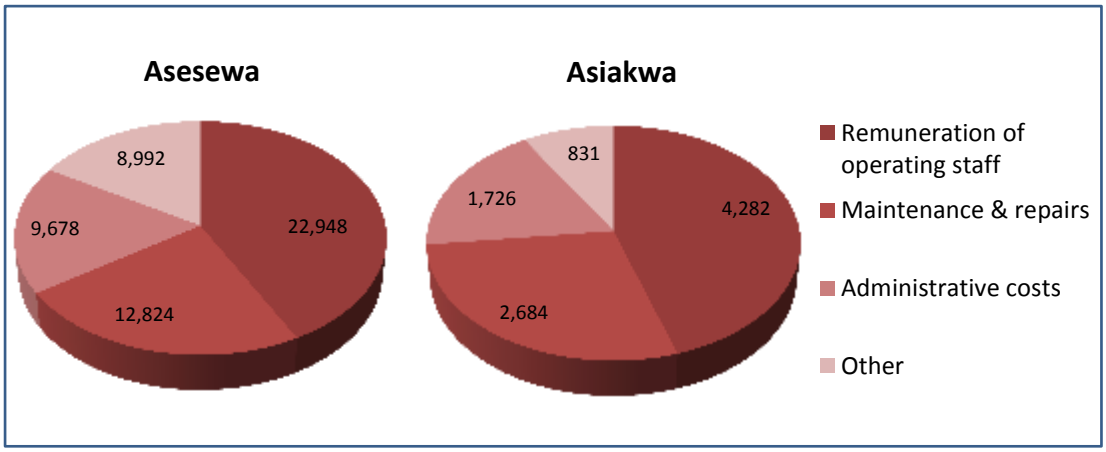
4.2.3 Tariff setting

In **Asesewa and Asiakwa**, the initial standpipe tariffs was GH₵ 1.39/m^3 (GH₵ 0.029 per 18 litre container) and GH₵ 1.11/m^3 (GH₵ 0.025 per 18 litre container) respectively. The initial tariffs were fixed for three years, after which they were to be adjusted. However, no adjustments have been made, as District Assemblies have not had the courage to approve upward adjustments proposed by WSDBs, because of political and pro-poor considerations.

4.2.4 Cost recovery

Figure 17 gives an overview of the operation and maintenance expenditure in Asesewa and Asiakwa in 2008. Details on revenues and expenditure in Asesewa and Asiakwa can be found in Annex 2 and 3 respectively. It shows that remuneration of the operational staff account for a bit less than half of the annual expenditure. The expenditure on operation and maintenance in 2008 was GH₵ 48,616 (GH₵ 4.43 per capita) in Asesewa and GH₵ 13,464 (GH₵ 1.87 per capita) in Asiakwa.

Figure 17: Expenditure on operation and maintenance in Asesewa and Asiakwa in 2008 (in GH₵)

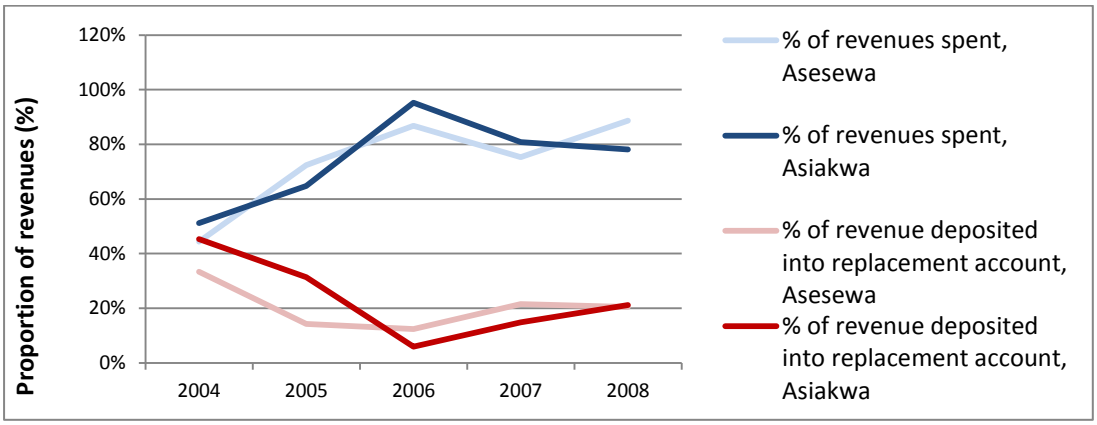


In the same year, the revenues amounted to GH₵ 60,167 (GH₵ 4.99 per capita) and GH₵ 16,852 (GH₵ 2.39 per capita) in Asesewa and Asiakwa respectively. In both schemes the revenues were thus higher than the expenditures and deposits were made into the replacement account. This was the case over the entire period 2004 till 2008, as can be seen in Figure 18. Over this period, 18 percent of the total revenue was deposited into the replacement account in Asesewa and 22 percent in Asiakwa. A full overview of total revenues and expenditure from 2004 – 2008 can be found in Annex 2 and 3.

In Asesewa, the WSDB used its replacement fund to construct an abattoir for the butchers and a 12-seater Water Closet toilet for use in the market area. These facilities are under the management of the WSDB and provide extra income to the WSDB.

However, operation and maintenance staff have not seen review of salaries for more than two years. Growing tension and agitations by the O&M staff could have significant consequences on the operations of the scheme.

Figure 18: Cost recovery in Asesewa and Asiakwa scheme



4.2.5 Record keeping, reporting and accountability

Under the EVORAP project, a comprehensive record keeping system was developed, which includes recording the amount of water consumed, revenues collected and pumping records (time of pumping, amount of water pumped and electricity used) in books, designed under the project. The revenue collectors and vendors should both sign the revenue book to indicate payment by the vendor and receipt by the revenue collector. Both revenue collectors and accounts officers should sign to acknowledge payment into the WSDB account for the day.

4.2.6 Direct support

After the EVORAP Project handed over the water supply schemes for Asiakwa and Asesewa in 2004, the schemes received project support for an extended period of two years to ensure adequate capacity for the WSDBs and the respective DAs for sustainable operation and maintenance.

However, even though the project intended to build adequate district capacity to support WSDBs, with the phasing out of the project in 2006, the DAs have not been able to give the needed management support and the interaction between the DWST/DA and the WSDBs has been getting weaker and weaker. This has had a negative impact on monitoring and tariff adjustments.

4.3 Lessons learnt

Low levels of consumption of water: Comparing the number of standpipes and household connections to the population leads to the conclusion that, when not considering distance or reliability of the services, basic water services seem to be available to all. The quantity of water provided by the schemes under this model is however lower than the CWSA standard of 20 lpcd. This is probably not due to the functionality of the scheme, but rather to low consumption levels, possibly caused by a lack of willingness to pay and the presence of alternative sources of water.

High percentage of water use through household connection in peri-urban Abokobi and Pantang: The percentage of water use from household connections amounts to over 60% in the Abokobi and Pantang case, while this was only around 20% in the Asesewa and Asiakwa

case. This could be explained by the peri-urban nature of Abokobi and Pantang, with a higher demand for higher levels of services.

Lack of clarity on corporate oversight leads to conflict and tension: it is unclear who has direct control over the operating staff: the WSDB or the Systems Manager, who is hired by the WSDB. This leads to conflicts and tension.

Low capacity and lack of leadership in communities: The management body of the WSDB is supposed to be constituted by community members. However, people with the required qualifications and leadership skills are not always available within the community.

Adequate cost recovery: Revenues exceed expenditure on operation and maintenance and funds are saved for replacement and rehabilitation, though not always to the extent prescribed in the model WSDB by-laws (20 percent of net revenues).

Lack of support from local government results in challenges with transparency and accountability: Direct support from local government to the WSDB has been low to non-existent. In Asiakwa and Asesewa, EVORAP project staff instead of local government staff provided post-construction support for the duration of the project. At first sight, this does not seem to have affected the functioning of the WSDB, as in all four cases, the WSDB has been able to manage the scheme in a more or less cost effective way. However, the lack of continuous monitoring, arbitration and technical support from local government to the WSDB has contributed to brewing conflicts and agitations, lack of transparency (e.g. instances of misuse of WSDB funds) and lack of accountability towards the users (e.g. lack of regular reporting to the community).

Positive effect of involvement of Sanitation Volunteers in the EVORAP cases: the Asesewa and Asiakwa cases showed that recruiting (paid) Sanitation Volunteers as part of the operational staff of the WSDB, rather than having WATSAN committees doing sanitation and hygiene promotion, was quite successful.

Detailed recording and accounting contributes to low levels of non-revenue for water in the EVORAP cases: In Asiakwa and Asesewa, the elaborate systems of recording and accounting put in place by the EVORAP Project and the support the project provided for 2 years after the completion of the implementation project, seem to have resulted in considerably lower levels of non-revenue water is in the Evorap cases (Asiakwa and Asesewa), than in the other 2 cases (Abokobi and Pantang).

Summing-up: The direct WSDB model discussed in the chapter is the most common model for the management of small town water supply schemes. However, in order to ensure sustainable water service provision under this model and to prevent conflicts that can lower service quality or threaten its viability, local government will have to (be capacitated to) play its support role to the WSDB, and the legal status of the WSDB and WATSANs needs to be addressed.

5 Direct WSDB management with bulk water supply: the case of Savelugu[17]

A variation on the direct WSDB management model, is direct WSDB management with bulk water supply from GWCL. This model is found in the town of Savelugu in the Northern region, as well as in a number of small communities in the Volta region. This chapter presents the Savelugu case.

5.1 Introduction to the case study area

Savelugu is the capital of the Savelugu Nanton District, one of the 18 administrative districts of the Northern region of Ghana. The Northern Region of Ghana has a peculiar problem with ground water supply and has suffered from water related diseases over a long period of time. The town of Savelugu is located 28 km North of Tamale. Its 2007 population was estimated to be about 30,669 (Tahal Group, 2008). The town is home to the district hospital and the Savelugu Senior High School among other government institutions. Housing in Savelugu consists mainly of large compound houses constructed with mud bricks and mostly haphazardly built. There are limited access roads in the town mostly untarred.

5.2 Water services, past and present

Until 1993, Savelugu Core Township had been served by the Ghana Water and Sewerage Corporation (GWSC). However after breakdown of the scheme, the town was virtually without improved water supply. In 1998 only 9 percent of the town's population had access to potable water (Apoya, 2003). Consequently, Savelugu was leading in the number of guinea worm cases in Ghana. Inhabitants depended on 5 surface dams, dugouts, unprotected traditional wells and hand dug wells that dried up during the dry season. People able to afford it, bought water transported by private tanker operators from Tamale. The poor sometimes had to travel several kilometres to polluted surface water sources for their water supply needs.

A technical feasibility study was conducted in October-November 1998 to determine the most cost-effective and viable water supply option for Savelugu. A number of water supply options were identified, including the implementation of an independent small town pipe scheme based on ground water and one based on bulk supply from the utility managed Tamale scheme. The community preferred an independent piped scheme, based on groundwater, as the low capacity of the Tamale water scheme was perceived as unable to even meet the water needs of the Tamale municipality itself. Furthermore, unreliable delivery of water services from the utility scheme in the past and deep desire to own their own water scheme, like other small towns in the region (e.g. Walawale, Bimbilla, Gambaga etc) contributed to scepticism on the part of the community on the ability of GWCL to supply them with bulk water.

[17] This chapter is largely based on a case study done by Bernard Akanbang, within the framework of the TPP project (Akanbang, 2010)

However, attempts by the Community Water and Sanitation Agency (CWSA), Guinea Worm Eradication Programme (GWEP) and World Vision International at providing the town with a standalone water scheme proved futile. World Vision International with funding from the Hilton Foundation conducted hydro-geological investigations, employing sophisticated techniques including remote sensing and satellite imaging to assess the underground water potential for drilling and mechanisation. After one month of prospecting within a radius of 6 km around the centre of Savelugu, drilling began in February 1999. There were about 48 drilling attempts of which 16 were successful, of which four had yields adequate for mechanisation. Unfortunately, all these were 4-5 km from the town centre, with high financial cost implications for mechanization (Apoya, 2003).

Notwithstanding the strong reservations of the community towards the 'bulk supply from GWCL' option, it was realised that replacing the 4 km pipeline connecting Savelugu to the Ghana Water Company Limited (GWCL) at Kanvilli, would be the cheapest, most easily accessible and easiest to operate option (Apoya, 2003).

Consultative meetings involving Unicef, CWSA, Savelugu District Assembly, under the leadership of Guinea Worm Eradication Programme, resulted in the formulation of a project proposal for which Unicef agreed to contribute seventy percent of the funding (approximately US$450,000) while the DA/Community and WVI contributed 10 percent and 20 percent respectively of the remaining project cost (Apoya 2003). Funds were used to replace mains and to erect a 4.4 m^3 capacity overhead tank provided by GWCL, construction of a booster station, and construction of secondary lines to the six electoral areas. Furthermore, a 90 m^3 reservoir was constructed on one of the high yielding boreholes located five kilometres away from Savelugu. The construction of the secondary lines involved the replacement of 4 kilometres asbestos pipes with PVC pipes and the extension of water to the exterior of Savelugu.

A total of 20 public standpipes were constructed. Private connections were not encouraged because the supply was limited. Water has been extended to the District Assembly, the Savelugu Senior High School, quarters of staff of the District Assembly and other institutions in the district. The 20 public standpipes, each with six spouts, provide water to estimated 30,669 people living in Savelugu, which gives an average of about 255 people per spout, which is within the limit of a maximum of 300 people per spout.

Although improved from the initial situation, water service provision remains a challenge. The total water demand of the Tamale-Dalun scheme, which supplies bulk water supply to Savelugu, was projected to amount to 35,479 m^3/day in 2007, with the demand for Savelugu projected to be 2,638 m^3/day (with 30,669 people demanding 86 lpcd), which is about 7 percent of the total water demand (Tahal Group, 2008). However, as services are provided through standpipes, with each standpipe serving 255 people, the calculated demand of 86 lpcd is not realistic. First of all, carrying more than 4 buckets per person per day from a standpipe is near to impossible, while secondly, this demand would imply that more than 1000 buckets would have to be filled from each standpipe spout each day. Even when filling

a bucket would only take 1 minute, it would take more than 18 hours of continuous use of all standpipe spouts to satisfy a demand of 86 lpcd.

According to production data from AVRL, actual production of the Tamale-Dalun scheme was 15,687 m^3/day in 2007, which was about 44 percent of the total demand. The bulk water supply to Savelugu is estimated to meet only about 30 percent of the water needs of its population. Because of the limited supply of water, supply is rationed on a rotational basis every three days among the six electoral areas making up the town. According to the operators, in the dry season, the minimum quantity of water to be supplied is reduced while in the rainy season where water is not in high demand, the volume of water supplied is so high that it causes the pipes to burst.

Nevertheless, consequential to the flow of water in the town is a drastic reduction in the number of guinea work cases in the town. From an incidence of a little below 700 cases in 1999, the number of cases dropped to less than 50 cases between 2000 and 2002.

5.3 The management model in theory

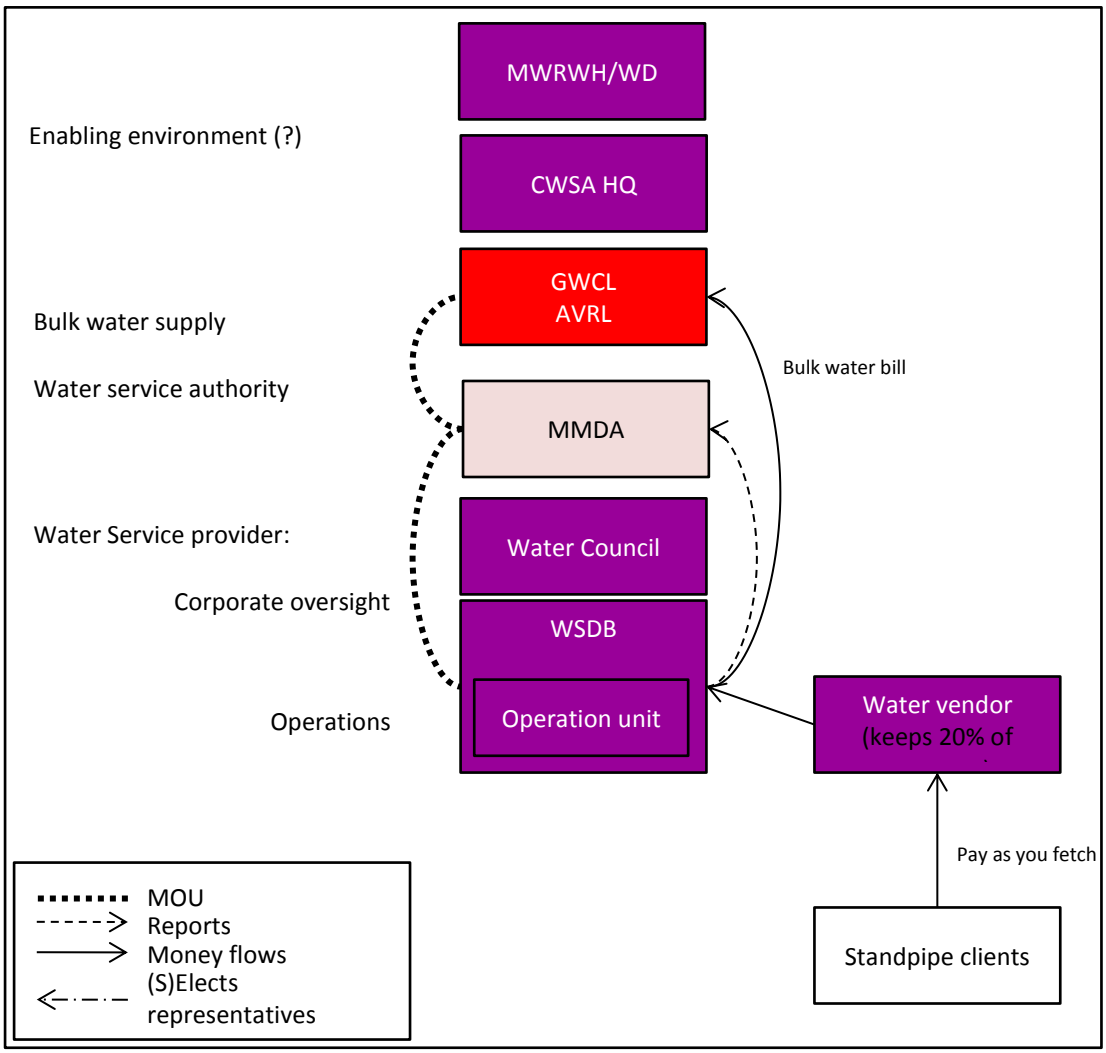
The management model applied in Savelugu is in principle the 'direct WSDB management' model, with the WSDB undertaking service provision functions and the SNMA as the owner of the scheme and responsible for service authority functions, including the provision of direct support to the WSDB, as and when needed. However, as the scheme is supplied with bulk water from the GWCL scheme, this case can be considered a variant to the general direct WSDB management model, with the GWCL as an addition player.

To formalise the model, a Memorandum of Understanding was signed between GWCL, the WSDB and the Savelugu District Assembly. The agreement states that GWCL is responsible for supplying bulk water of acceptable quality according to WHO standards, at a concessionary rate of 30 percent of GWCL tariff to the WSDB, while the WSDB distributes water and collect revenue and pays for the bulk water supplied at the end of each month. GWCL should provide consultancy services and on-site technical advice from time to time on matters related to the distribution of water. GWCL should carry out major repair works on the transmission main within the Savelugu scheme, while the people of Savelugu are to provide labour and financial obligation in respect of the work done. All other payments to the GWCL for other services rendered are to be effected as and when the service is rendered. Partnership meetings to review any modification in the agreement should occur every six months. Related to expansion of the scheme, the Savelugu community is supposed to come up with a plan and provide data and information, whilst GWCL should provide consultancy services and technical support for job execution (Apoya 2003).

The community is involved in decision making related to the water scheme through its 'Water Council', consisting of all identifiable groups in the community, including representatives of religious groups, youth groups, traditional authority, representatives of traders, and some selected opinion leaders. This council gives preliminary approval to new tariff proposals by WSDB and mobilise and educate community members on tariff proposals among others.

The Water Council is supposed to meet every quarter for the WSDB to brief it on its activities. This platform is supposed to provide not only a mechanism for disseminating information, but also to help to keep the wider community informed on the management of the water scheme and grants the council the opportunity to make inputs into the management process. The council members have been oriented on the O&M of the water supply scheme and should therefore be in a responsible position to advice the WSDB on its activities. In practice, the current status of the Water Council is unclear.

Figure 19: Organisational Arrangements for the Management of the Savelugu Water Scheme



From the onset, community members have been involved in analysing and identifying the various options available for improving their water situation and have been part of all discussions aimed at improving their water situation. Events like community durbars (ceremonial gatherings) provided opportunities for community involvement in deciding on organisational arrangements, distribution and location of standpipes, selection of vendors to manage the standpipes, determining tariffs, service levels among others.

5.4 The management model in practice

5.4.1 Corporate oversight and operations

Upon its establishment, the Savelugu WSDB had 11 members, of which two, the District Coordinating Director and District Chief Executive, were ex-officio members. The operating staff of 7 was made up a system administrator, 2 revenue collectors, 2 security officer and 2 plumbers. In addition, there are 40 vendors (2 vendors to each standpipe alternating in their work to ensure that on everyday there is a vendor at post) on the ground attending to day to day operations of the scheme. Meter readings and sales records at the standpipes are taken on daily basis to ensure that the readings are attributed to respective vendors.

WATSAN Committees were put in place at the six electoral areas of the town. Each committee is responsible for at least three standpipes in their electoral area. The Committees mobilised the community to select the vendors to man the standpipes and to elect or appoint representatives to the WSDB and reports faults in the water scheme to the WSDB.

5.4.2 Tariff setting

To build the organisational capacity of the Board to manage the scheme, a software consultant assisted the WSDB in developing an operation and maintenance plan. Based on the operation and maintenance, a tariff was proposed, that encompassed operation and maintenance and expansion/rehabilitation. To ensure acceptability of the tariff, the plan was presented to the wider community. The community felt however that the tariff levels were too high. This resulted in the review of the tariff and the operation and maintenance plan to only accommodate for operation and maintenance, not taking into account expansion and replacement cost. As at July 2009, GH₵ 0.50 is charged for 50 gallons (225 litres) container, which is about GH₵ 2.22 per m^3.

The WSDB permits vendors to allocate a small part of the water (10 percent) for vulnerable people such as the poor widows/widowers, who are allowed to fetch from the standpipe free of charge. This is not included in the calculation of daily sales.

5.4.3 Cost recovery

For the first five years of its existence (1999-2004), cost recovery was not a problem for the WSDB. Between 1999 and 2002, GWCL recovered 100 percent of bills from the WSDB (Apoya 2003). The high rate of cost recovery was mainly due to the fact that customers were paying as they were fetching and that meters were read and sales documented on a daily basis, and vendors received their commission on time. Willingness to pay was not a problem and there were no reported cases of illegal connections and bursting of pipes to protest against tariff levels.

Since 2005 however, following government directive for all public institutions utility bills payment to be made at the central level, the water scheme has suffered a serious setback in terms of its ability to achieve cost recovery. This is due mainly to accumulation of institutional bills by public institutions such as the hospital, secondary school, department of agriculture, the district assembly among others.

In addition, the most significant challenge confronting the scheme at the time of the study was the unilateral decision of GWCL to withdraw the concessionary rate of 30 percent of the normal rate on their tariffs to the WSDB. This means that the WSDB now has to pay the full tariff, in addition to bearing maintenance cost of the distribution lines, the commission of vendors and the cost incurred in billing and revenue collection for water. If this is eventually implemented, the obvious implication is that, the WSDB will transfer the cost onto the consumers.

5.4.4 Record keeping, reporting and accountability

A management audit was commissioned by Unicef and the Savelugu District Assembly in 2006. This showed deficiencies in management resulting in disregard for laid down procedures, like WSDB members assuming the work of the operating staff, under-reading of meters and reporting of sales, tampering of meters among others. This audit had a positive effect in that based on the findings of the audit, attempts were made to address the raised issues, including reconstituting of the WSDB whose tenure of office ended in 2004, negotiations with GWCL to replace faulty meters and the recruitment of a system administrator. However, this audit seems to have been a one-off initiative, initiated by an outside agency (Unicef), rather than structural direct support to the service provider.

5.4.5 Direct support

Arrangements to support the WSDB and the community to manage the scheme, were ill defined. GWCL basically treated the WSDB as any other customer and the WSDB did not receive the requisite technical support to deal with GWCL. They also could not take advantage of mechanism currently in place where CWSA helps the WSDBs to recover bills from government institutions leading to the loss of GH₵ 30,000, as CWSA did not really consider Savelugu to fall under their mandate.

Also, the SNDA did not fulfil its role as provider of direct support, like monitoring, supervision and technical assistance to the WSDB.

5.5 Lessons learnt

Bulk water supply as a useful model for service delivery to an area with is difficult to reach under other models: This model proved useful to supply water to a small town, with limited options for the provision of water services though the development of an independent scheme, but within the reach of a utility managed scheme.

Delays in recovery of institutional water bills lead to problems in paying the bulk water bill: Although this is a challenge that is not unique to the bulk water supply model, the consequences of in payment of institutional bills are potentially more severe under this model, as the WSDB has a responsibility of paying the bulk water to the utility.

An MoU is not sufficient: The bulk water supply arrangement under this model was defined by a Memorandum of Understanding that indicated the responsibilities of each of the parties. However, taking into account the current difficulties with the partnership arrangement, an elaborate contractual agreement that states obligations of partners and penalties for defaulting, in clear and unambiguous terms, is required rather than an MOU.

This could help holding the utility responsible for providing good quality bulk water supply, taking up costs which fall within their ambit and to avoid the transfer of unnecessary costs to the WSDB and the community.

Lack of direct support weakens the partnership: A model like 'Direct WSDB management of bulk water supply' requires monitoring and supervision to regulate the activities of the parties involved in the partnership to ensure that all abide by the tenets of the partnership. Active support of local government in monitoring and providing direct support could have breached the gap between the community, represented by the WSDB, and the utility, and could have identified warning signs and called for them to be addressed before they develop into significant differences that can cause the model to collapse. In addition to the DA, NGOs and the private sector could have the potential for filling gaps in capacity of the community on technical issues and therefore able to facilitate a process that ensured that communities are not disadvantaged.

Summing-up: Providing that regulatory, contractual and direct support arrangements are addressed, this could be an interesting water supply management model for small towns where other options are not technically or economically viable. This model could also be applied in densely populated urban communities in big cities, which are technically (and possibly, legally) difficulty to connect under convention models, like the utility model.

6 WSDB management with private operator: the cases of Bekwai and Atebubu[18]

Although not widely applied (yet), interest in the 'WSDB with private operator' model is growing. This is due to a growing perception of weak WSDB capacity for the operational management of small-town pipe schemes and the complexity of the issues involved in running some of the bigger schemes. Under this model the community, through its WSDB, contracts a Private Operator (PO) to manage the water scheme for them, by undertaking the administration and technical management of the water supply services. The assumption is that the PO would be more efficient in these functions than the WSDB. Although the 2010 CWSA guidelines for small town operation and management suggested recommended the 'WSDB with private operator' model for towns with a population above 10.000, only a few towns selected this option.

This management model was piloted under the EU funded Small Towns Water Supply Project (1998-04) in Bekwai and Atebubu, and under the World Bank Public-Private Infrastructure Advisory Facility (PPIAF)[19] in Enchi and Wassa Akropong. This was followed by the introduction of this model in Yeji and Mim in the Brong-Ahafo Region[20], Tumu in the Upper West Region and Damako-Kpassa in the Volta Region. Currently however, the model is only applied in few towns, including Bekwai and Tumu. It has been replaced by different models (mostly 'direct WSDB management') in the other towns. The model is applied as well in the Three District Water Supply Scheme, which is discussed in chapter 7. This chapter presents the cases of Bekwai and Atebubu.

6.1 Introduction to the case study areas

Bekwai (also referred to as Asante Bekwai) is located about 24 km south of Kumasi, the Regional Capital of the Ashanti Region. Bekwai is the capital town of the Bekwai Municipality, which used to be under Amansie East district. According to the 2000 Population and Housing Census in Ghana, the town had a population of 19,679 in 2000 (GSS 2002). Based on the municipal annual population growth rate of 3.2 percent, current (2010) population is estimated to be around 26,965. The major economic activity in the Bekwai Municipality is farming, followed by trading and formal employment in decentralised departments of the Municipal Assembly, health institutions and schools.

Atebubu is the capital town of the Atebubu-Amanten District in the Brong-Ahafo Region. The population was 20,002 at the 2000 population and housing census (GSS 2002). Using

[18] This chapter is largely based on a case study done by Benedict Tuffuor, within the framework of the TPP project (Tuffuor, 2010a)

[19] PPIAF is a multi-donor technical assistance facility that has the aim of helping developing countries to improve the quality of their infrastructure through private sector involvement.

[20] However, it should be noted that, Atebubu, Enchi, Wassa Akropong and Mim are no longer under this model, due to the fact that for various reasons the respective DAs abrogated the contract with the POs. The system in Yeji has been submerged since 2009 and therefore not operational. The community has reverted to using borehole and surface water.

estimated district population growth rate of 4 percent, the 2010 population of Atebubu is estimated at 30,779. Atebubu town is divided into 13 wards, for the purpose of local administration. The Atebubu community is heterogeneous with an estimated 65 percent being Akans, 30 percent being from northern parts of Ghana and 5 percent being from non-Akan speaking areas in the southern part of Ghana. The main economic activities are farming and fishing.

6.2 Water services

The **Bekwai** small town water scheme has been designed to produce 700 m^3 per day to 28,000 people (25 lpcd). It consists of five mechanised boreholes, 2 reservoirs with a total capacity of 590 m^3, and transmission pipes of a total length of 25 km (Malafosse, 2002). The scheme has 500 household connections and the 40 standpipes, each with two spouts. The average number of people per standpipe spout can thus be estimated to amount to of about 288 people, which is below the maximum of 300 people per standpipe spout, prescribed by the CWSA guidelines.

Water supply is relatively constant and reliable. In 2006 for instance, out of the 365 days, the scheme was functioning for 350 days with only 15 days of downtime (4 percent, which is lower than the maximum downtime of 5 percent prescribed by the CWSA guidelines), caused by maintenance and power outages. Where supply has to be interrupted, the operator gives prior notice to the customers. However, the scheme is not used to its full potential. The amount of water produced was about 150m^3 / day (6 lpcd) in 2006 (Vico Ventures Ltd, 2006), which is only about 21 percent of the capacity.

In the case of **Atebubu**, a new water treatment scheme depending on surface water from the river Pru was put in place in 2001, at a distance of 18 km from the town, after efforts to tap ground water had not yielded adequate results. The water from the Pru river is treated though a self-cleansing slow sand filtration, which does not require washing and re-sanding. The scheme was designed for a population of 20,000 and has 190 house connections and 36 standpipes.

Unlike the other cases presented in the report, the treatment plant in Atebubu could not be connected to the national electricity grid at the time of implementation of the scheme, as the closest access point to the grid, Atebubu, was too far away. Although the DA promised to extend the electricity network to the plant, this has not happened so far. Therefore, the treatment plant at the river is powered by two 60kv diesel powered generators. An additional mechanised borehole has been added to the scheme, which relies on the national grid for power. The total length of the pipe network is 33 km.

Average daily production amounted to 218 m^3 over the period 2003-2007 (an average of only about 10 litres per capita per day). Daily consumption was 169 m^3 (an average of about 7.5 litres per capita per day, far below the design demand of 20 litres per capita per day) over this period, which amounts to 78 percent of the production.

Water services provided by the Atebubu scheme have been very unreliable. Antwi (2010) estimates service to be reliable for only 30 percent of the time (in terms of days that the scheme is functioning). This was to a large extent due to high diesel prices and problems

with the generators. In 2007 for example, both generators broke down and were not replaced or repaired for several months. After replacing one of the generators and repairing the other, in the middle of 2008, one of the two generators broke down again. The functional generator operated for 6 hours every day (3 hours to pump to the intake and 3 hours from the treatment plant to the overhead tank). As the amount pumped was inadequate for the whole town, water was rationed and rotated over three zones, with each zone receiving water for about 3 hours a day. In the absence of reliable water services, people tend to rely on hand dug wells, especially in the wet season.

Table 13 gives an overview of the main scheme and service characteristics.

Table 13: Overview of scheme and service characteristics: Bekwai and Atebubu

Scheme characteristics	Bekwai	Atebubu
Population (2010 projection)	26,965	30,779
Design population	28,000	20,000
CWSA town category (See Table 9)	II	II
Recommended percentage of people with household connection as per CWSA guidelines (See Table 9)	20%-30%	20%-30%
Number of standpipes	40	36
Number of household connections	500	190
Estimated actual percentage of people with household connection	18%	10%
Estimated number of people per standpipe	575	503
Average water production (lpcd)	6	10
Average water consumption (lpcd)	Unknown	7.5
water consumption from standpipes (lpcd)	Unknown	3
water consumption from household connections (lpcd)	Unknown	19
Non-revenue water	Unknown	22%

6.3 Introduction of the model in the case study areas

The process of introducing the model in **Bekwai** started with awareness creation and education of the stakeholders as part of the project to rehabilitate the water scheme by the project consultants and CWSA. The introduction of the involvement of the private operator coincided with the big debate on privatisation of urban water supply. The initial WSDB, which was established in 1998, though composed of qualified and motivated team, was considered lacking the management capacity to carry out the billing procedures for the many private household connections and standpipes. Nevertheless, the WSDB initially raised a strong opposition to the PO involvement and, in the year 2000 presented a resolution to the DA and the CWSA expressing their objection to the PO involvement. With continuous sensitisation, the project consultants convinced the WSDB of the need for private sector participation. This paved the way for a procurement process.

The CWSA head office and the Bekwai project consultants handled the procurement of the private operator. An advertisement was placed in the national dailies for interested private firms to respond by expressing interest in operations and maintenance of small town water schemes in 1998. Over 32 potential private operators responded. As the model of involving a private company in the O&M of a small town water supply scheme was new and untested,

none of these companies had real prior experience. However, many of these companies were constituted by former GWCL staff, with ample experience in urban water supply (Malafosse, 2002).

A shortlist of firms that expressed interest was made and these were invited to bid for the contracts. The consultants and the CWSA selected the best-evaluated bidder. With the assistance of the consultants, the WSDB and the DA negotiated with the operator and then entered into an agreement. The WSDB did not play a significant role in the procurement of the operator.

In Bekwai, Vicco Ventures Limited was selected as the private operator of the scheme. A 5-year management contract was signed in May 2002 between the WSDB (on behalf of the District Assembly[21]) and the private operator whilst the CWSA and District Assembly acted as witnesses. The initial contract expired in 2007 but the private operator was asked to continue operating the scheme with a letter of extension from both the District Assembly and the WSDB. On the 03 April, 2007, a letter was written by the operator to the water board notifying them of the end of the contract which was due on 08 April, 2007. The letter also requested for their intention on the management of the scheme after the said date. The WSDB replied the operator on the 25th March, 2008 renewing their contract for another 5 year term effective from April 2008 to April 2013.

Initially, the **Atebubu** WSDB was not in favour of the private sector involvement in operation and maintenance, but would rather see the role of private sector in providing services in the areas of supply of chemicals, advisory service on water quality testing, routine maintenance and scheme extension. However, the Deputy Coordinating Director of the District at that time (2001) was in favour of proposed PO involvement as a good option to eliminate the many problems they had, including a general lack of capacity of the then operators and difficulty of the WSDB to submit accounts, monthly technical and financial report. He was against arrangements based on voluntarism, as that would result in embezzlement of funds according to him, and advocated for permanent staff from the private sector to work on the scheme to deliver improved services. By that time, the model had started in Bekwai, which gave the Atebubu WSDB and the DA the opportunity to visit the Bekwai scheme to learn from the arrangement. As a result, there was no strong objection to the process. The procurement system was very similar to the Bekwai process. The process led to the selection of Armco Water Company Limited. The Atebubu partnership between the District Assembly, WSDB and the private operator (Armco Ltd) signed in 2003 a similar arrangement as the Bekwai partnership had done in 2002.

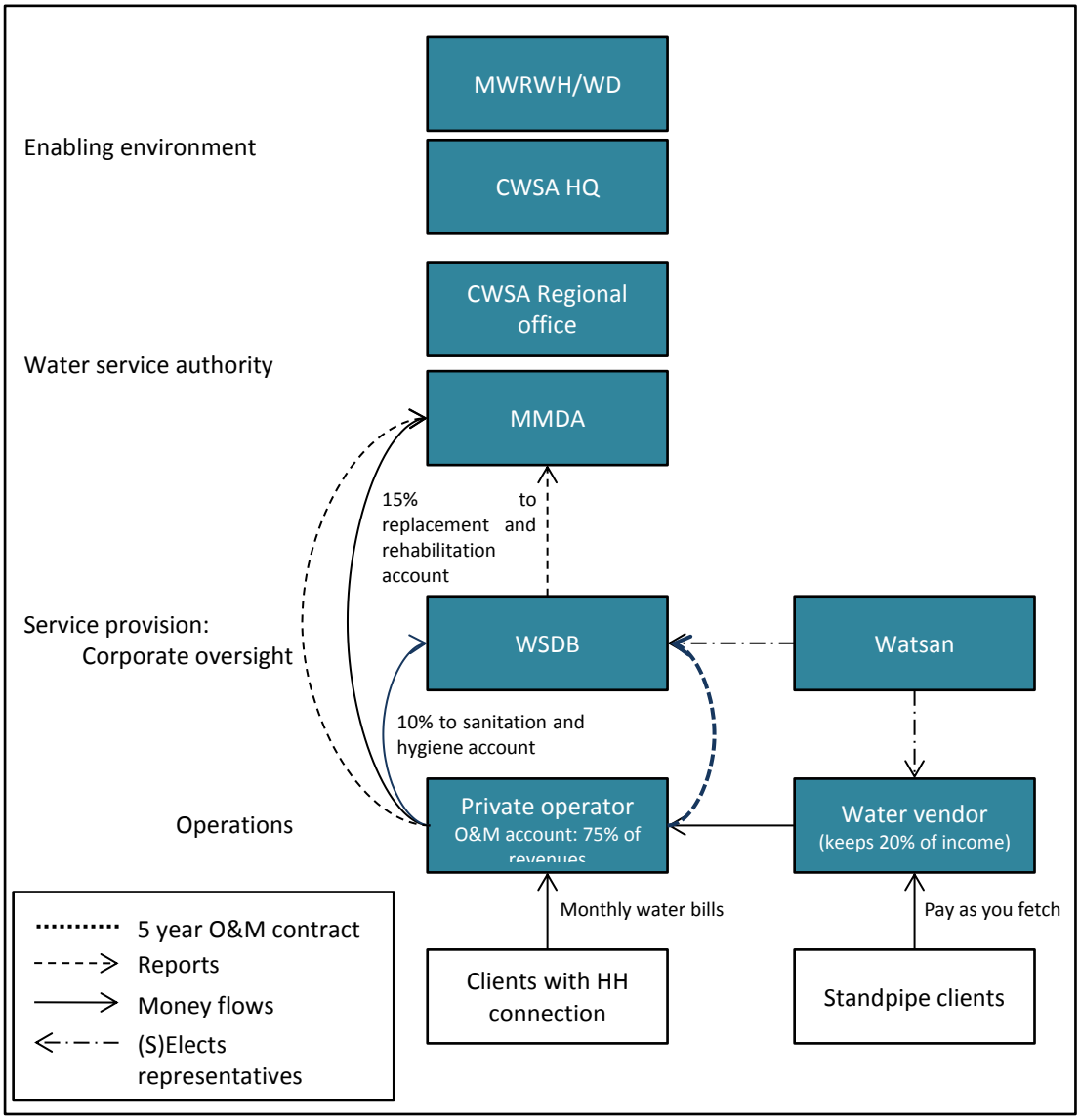
6.4 The management model in theory

The 'WSDB management with private operator' model is also sometimes referred to as 'WSDB with delegated management' or 'Public Sector Participation (PSP)' (e.g. Manu, 2001). Under this management model, the responsibility for operation and maintenance, which lies with the WSDB under the 'Direct WSDB management' model, is transferred to the private operator. The private operator is responsible for operation and maintenance, including the

[21] Bekwai used to be the capital of Amansie East District. In 2009, Bekwai was given the status of Municipal Assembly.

production and distribution of water, collection of revenues and maintenance of the scheme (including pipes, tanks, valves, surge vessels, pumping system). At standpipes, water vendors are engaged, who are entitled to 20 percent of the sales at their water point. The WSDB is supposed to oversee the activities of the operator on behalf of the DA and the community, and is responsible for sanitation and hygiene promotion. Figure 20 gives an overview of the institutional arrangements.

Figure 20: WSDB with Private operator management model



In addition to the CWSA guidelines for small towns and the model by-laws described in chapter 3, this management model is governed by an operation and maintenance contract agreement for a specific period between a private operator and the Water and Sanitation Development Board (WSDB) on behalf of the Municipal or District Assembly (MA or DA). In both cases, management contracts were signed between the PO, WSDB and the DA for a duration of five years, renewable by written agreement.

The contracts include a detailed definition of personnel and logistics put in place by the Operator, which should follow what was put into the technical proposal. Generally, the contract agreement states that the operator is entitled to a percentage of revenue collected from operations, to cover their operational expenses and margins. In the two case studies, this percentage was set at 75 percent. The remaining 25 percent is to be paid to the WSDB and the MA for the following:

- 10 percent for scheme rehabilitation such as renewal of boreholes and tanks;
- 5 percent for extension of the scheme; and
- 10 percent for small scale sanitation and hygiene promotion.

According to the contracts, the PO has to submit monthly, quarterly and annual reports to the WSDB, DA and CWSA. (Malafosse, 2002)

The contract can make provisions for penalties for poor performance, as was the case in both Bekwai and Atebubu (see Table 14). Here, a performance guarantee was set at 5 percent of planned income for the first year and would be given back to the operator at the end of the contract if all facilities would be in good condition.

Table 14: Penalties for non-performance

Description of non-performance indicator	Penalty
Non justified total interruption of the service for more than 12 hours	10 cedis/hour of interruption
Non justified interruption of the service to one or several distribution points for more than 12 hours	10 cedis/hour of interruption
Non submission of reports	1000 cedis
Non adherence to water quality standards and reporting	1500 cedis

Source: Nyarko 2007

6.5 The management model in practice

6.5.1 Corporate oversight and operations

In **Bekwai**, the WSDB consisted of nine members at the time of the implementation of the model. However, over time the number of members has reduced to five. In **Atebubu**, the WSDB consisted of 12 members. In both cases, the WSDBs have an executive committee - consisting of a Board Chairman and a Vice, a Board Secretary, and a Treasurer, who are elected among the representatives that make up the WSDB. WSDB members provide voluntary services and received only sitting allowances.

In **Bekwai**, the operator of the scheme has a staff of ten including a systems administrator, 2 pump attendants, 1 plumber, 2 meter readers, 1 revenue collector, 1 office assistant, 2 security. The PO relies on causal labourers from time to time as and when necessary. In Bekwai, the private operator seems to have generally operated well in terms of production, distribution and supply of water to the community.

Despite the fact the scheme in Bekwai seems to have been operating well, the relationship between the Bekwai WSDB and the Assembly (the former District Chief Executive – 2001-2008) has been far from cordial. In 2002 the DCE dissolved the WSDB in response to the threats of demonstration by community members. It took the Bekwai Chief to help resolve

the impasse between the WSDB and the DA after which the WSDB was re-instated after about 6 months, but relations between the two did not improve. In 2006, the CWSA-Ashanti Region and even national level stakeholders had to step in to resolve the differences[22].

In 2008, the District Chief Executive (DCE) requested for the dissolution of the WSDB, while the WSDB requested for the DCE to provide the proper financial state of their account before they would resign and hand over. The DCE dissolved the board and constituted a new board, which was vehemently opposed by the old board. The old WSDB reported the case in court for redress, demanding accountability of funds paid into the WSDB accounts. However, this ran into the 2008 general elections, which resulted in a change of government and subsequent change of DCE. The new DCE retained the old board. Due to the pending court case however, a formal contract was yet to be signed between the WSDB and the operator at the time data collection in the later part of 2009.

In **Atebubu**, the PO staff originally consisted of 14 staff. However, the DA was never pleased with the performance of the operator and perceived the WSDB as weak for not monitoring the operator to cut down on certain expenses, especially cost on staffing. When the contract of the PO ended in 2007, it was not renewed. According to Antwi (2010), the PO was not interested to continue its engagement in the operation of the scheme either. To the frustration of the PO, the DA had failed to connect the treatment plant to the national electricity grid as it had to run on diesel powered generators that were prone to breaking down. The PO made heavy losses due to inflation in diesel prices resulting in annual deficits.

By the end of 2007, the DA also dissolved the WSDB and put in place a five-member Interim Management Committee (IMC) in January 2008, consisting of a District Accountant, District Coordinating Director, Chairman of Works Sub-Committee of the assembly, a representative from Urban Council and an opinion leader, who is also an assembly member. None of the (all male) interim management committee members served on the previous WSDB. The District Water Sanitation Team leader is an ex-officio member. The idea was that a well-constituted WSDB would be considered as soon as the new DCE would be appointed. The IMC took on 7 of the Private Operator's workers to operate the scheme: the Operations Officer, Commercial Officer, the Revenue Collector, Pipe Fitter, the Headworks Manager and 2 watchmen. The accounting aspects were handled by the DA Accountant.

6.5.2 Tariff setting

In Bekwai and Atebubu, the contract has a tariff adjustment formula based on price changes in electricity for the domestic consumer, minimum daily wage and diesel. However, in reality this formula is not applied.

In **Bekwai**, after one month of operation in June 2002, the operator realised that the water bills for the customers with private connections were rather high. The private operator therefore revised the tariffs and set them at 0.01 GH₵ per 18 litre bucket (0.56 GH₵ per m^3)

[22] According to the 2006 Annual Report of Vicco Ventures Limited, page 14, 'On June 23rd , 2006 the Director of Water from the Water Directorate of the Ministry of Water Resources, Works and Housing, Mr. M. A. Aboagye and the then Acting Chief Executive of Community Water and Sanitation Agency Mr. R. K. D. Van-Ess visited to resolve some issues between the Water Board and the District Assembly.'

for standpipes and GH₵ 0.65 per m^3 for household connections with consumption lower than $10m^3$ per month. A second downward review of tariffs became necessary in September 2002 after the Public Utilities Regulatory Commission's (PURC) approved tariffs for the urban water sector, as a result of which Bekwai customers argued that the Bekwai tariff was far higher than the PURC tariff at the time of GH₵ 0.30 and GH₵ 0.40 per m^3 for monthly consumption below and above $20m^3$ respectively. The private operator, the WSDB, Municipal Assembly, and CWSA met to discuss the issue, which resulted in the lowering of the tariff for household connections to GH₵ 0.55 per m^3, regardless of the amount of water used, with a charge of GH₵ 0.01 per bucket from standpipes.

The procedure for subsequent tariff proposals did not go strictly according to the tariff adjustment factors as stipulated in the contract, even though there were increases in the prices of electricity, minimum daily wage and diesel. The last tariff review in Bekwai took place in 2006, when the tariff was adjusted to GH₵ 1.19 per m^3. For practical reasons, the tariff for standpipes was rounded up to GH₵ 0.015 per 18 litre bucket or the equivalent of GH₵ 0.83 per m^3.

In **Atebubu**, getting the tariff adjusted has been a struggle for the operator. Increase in diesel prices had occurred twice within the first two years of the operation of the scheme, which had led the operator to propose tariff adjustments at that time as well, in line with the contract. However, when the District Assembly approved the first tariff adjustment, a section of the community (the generally poorer Zongo area) demonstrated against the upward review of the tariffs. At that time, the reaction resulted in the suspension of the new tariff by the same District Assembly that approved it.

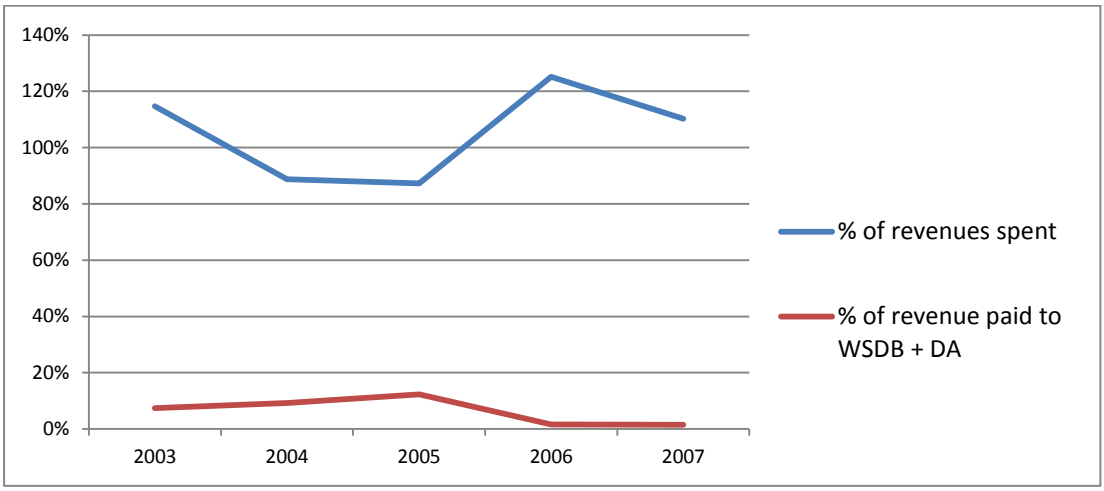
6.5.3 Cost recovery

Cost recovery of the **Bekwai** scheme seems to have been satisfactory and the operator has been able to meet its financial obligation of submitting 25 percent of revenues to the District Assembly and WSDB. In 2006 for example, the revenues amounted to GH₵ 84,641 (GH₵ 3.02 per design capita), while expenditure had been GH₵ 79,185 (GH₵ 2.83 per design capita) (94 percent of the revenue).

A challenge the Bekwai WSDB faces though, is the fact it does not have access to the WSDB account because at the time of opening the WSDB account, only the WSDB chairman, who passed away in October 2006, was a signatory to the account and the signatories have not been replaced since. Furthermore, the long standing conflict between the WSDB and District Assembly has contributed to the WSDB's inability to access the hygiene and sanitation fund, managed by the District Assembly. This has created suspicion on the part of the WSDB that the District Assembly has misapplied the funds.

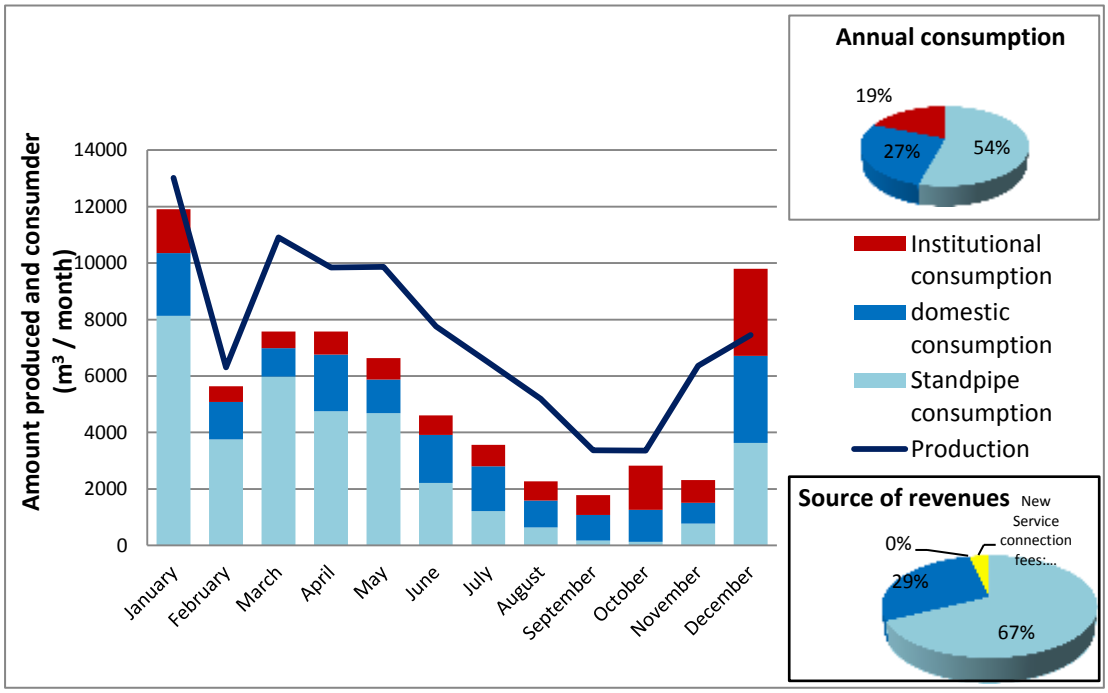
Cost recovery in **Atebubu** has been a struggle. As illustrated in Figure 21, expenditure has been outweighing revenue in most years between 2003 and 2007. Details on revenues and expenditure in Atebubu are presented in annex 4.

Figure 21: Cost recovery in Atebubu



One of the reasons for this, has been the low consumption levels with an average of 9 lpcd. The graph below shows water consumption, especially from standpipes drops considerable during and just after the rainy season (June – November). During this time of the year, water demand is lower as a variety of alternative sources of water are available in and near the community, like dug wells and streams. The graph also shows that only 70 percent of the amount of water produced was consumed in 2007, which means a percentage of non-revenue water of 30 percent.

Figure 22: Production and consumption of water (Atebubu 2007)



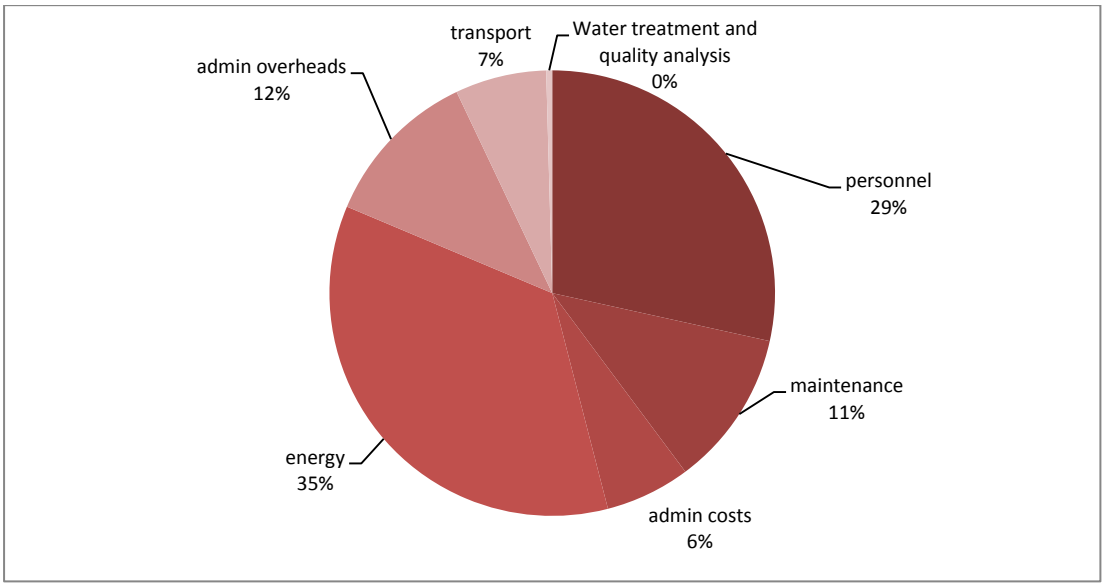
Source: Based on data from the 2007 annual report (ARMCO Water Company Limited, 2008)

Another reason for the low level of revenues, has been the non-payment of institutional water bills. As illustrated in Figure 23, institutional water use was about 19 percent of the annual water use, while payment of institutional water bills did not contribute to the

revenues. Although bill collection ratio was 97 percent for standpipes and 80 percent for domestic connections, the non-payment of the institutional water bills led to a total bill collection ratio of 74 percent in 2007.

In addition, operation and maintenance expenditure was relatively high, at GH₵ 96,894 (GH₵ 4.84 per design capita) in 2007. As shown in Figure 23, a considerable part of the annual expenditure in 2007 was spent on energy and personnel costs.

Figure 23: Expenditure Atebubu (2007)



The expenditure per m^3 consumed amounted to GH₵ 1.46 per m^3, which was less than the tariff which had recently been adjusted to GH₵ 1.61 per m^3 for household connections and GH₵ 1.67 per m^3 for standpipes, implying sufficient revenues to cover operation and minor maintenance.

The Private Operator paid part of the collected revenues to a replacement fund, extension fund and sanitation fund, managed by the district assembly. Table 15 gives an overview of the percentage of the revenues that was submitted to these different funds in the period 2003 – 2007. This shows that the deposits were lower than the required 25 percent.

Table 15: Payment to the District Assembly in Atebubu (in % of the total revenues)

Year	Replacement fund	extension fund	sanitation fund	Total
2003		1%	6%	7%
2004	4%	2%	4%	9%
2005	5%	2%	5%	12%
2006			2%	2%
2007			1%	1%
Total	**2%**	**1%**	**3%**	**6%**

Source: Based on data from the 2007 annual report (ARMCO Water Company Limited, 2008)

6.5.4 Record keeping, reporting and accountability

In both case, the selection process of the prospective operators followed a fair and a transparent process. Both towns made use of the advertisement for potential operators to express interest. The contract had clear durations and mechanism for review of tariff even though they were not used to the letter. CWSA and the project consultants were the key players in the selection process of the private operator, whilst the DAs/WSDBs had minimal roles.

Initially, the private operator in Bekwai was submitting quarterly reporting, as per the contract, but as the MAs failed to audit these reports and provide feedback, the private operator started submitting reports on a half yearly basis and as from 2007, only annual reports were submitted by the PO. The non-adherence to the reporting requirements has not attracted the penalty stipulated in the contract.

In neither case, quarterly meetings with the DA/WSDB have taken place, nor have the WSDBs been organising dialogue sections with the general community. Reporting and communication between the MA/MWST and CWSA was found to be weak or non-existent. The distance between the CWSA regional office and the municipal assemblies made regular engagement difficult (Antwi, 2001).

6.5.5 Direct support

As under the 'direct WSDB management' model, the DA is the legal owner of the facilities and has the responsibility for providing support to major repairs, rehabilitation and expansion, in addition to technical backstopping to the WSDB, through the Municipal or District Water and Sanitation Team. However, in reality in both cases, the Municipal Water and Sanitation Teams did not play their role related to monitoring auditing and providing technical support to the WSDB and the Private Operator.

According to Antwi (2010), the DAs believed it was the PO's duty to cover the needed renewal and replacement of parts of the scheme within the contract period, as the PO had to transfer the scheme in good working order before any further renewal of the contracts. The PO in Bekwai re-developed all boreholes for the next phase of the contract, installing safety devices on all pump houses to curtail the frequent damages to the pumps due to power fluctuations at his expense. This was accounted for as O&M costs, lowering the profit margin of the PO.

In Atebubu, when in 2007 one of the generators in Atebubu suffered a serious breakdown and within the three months it took to mobilise funds to fix it, the other generator also broke down, the community was supported by a philanthropist, who donated a new generator to the town, rather than by the Assembly or the private operator. Later on, one of the old generators was repaired and the pump for the mechanised borehole was also replaced with the assistance of a philanthropist.

6.6 Lessons learnt

This chapter presented the theory and reality of the 'WSDB with Private Operator' model, illustrated by the Bekwai and the Atebubu case.

Technically challenges of the infrastructure contribute to failing management model: As shown by the Atebubu case, the success of the management model is dependent on the technical characteristics of the water supply scheme. A scheme that is technically defective is likely to lead to unreliability of service delivery and consumer dissatisfaction, resulting in lower patronage and hence lower revenues. Costs of managing this scheme are likely to be higher. This will affect the financial viability and sustainability of the service.

Lack of application of transparency and accountability mechanisms: Like under the 'Direct WSDB management' model, mechanisms have been put in place for operational, administrative and financial reporting, both to local government, as owners of the scheme, as well as to the community, as users of the scheme, as well as arrangements for the allocation of revenues to an operational, capital and sanitation account. Under the 'WSDB management with private operator' model, these mechanisms have been further formalized through the signing of a contract between the WSDB, private operator and Municipal Authority, which spells out these mechanisms in detail. This would in theory strengthen these mechanisms. However, as shown in the Bekwai and Atebubu case, in reality, there was the lack of interest, commitment and capacity to ensure that they were adhered to.

Unused potential for revision of tariffs: Unlike the 'direct WSDB management model', a tariff adjustment formula was included in the contract in the two presented cases with a private operator. This provides a formalized opportunity for the revision as and when needed, as per the formula. However, in practice, this formula is not used and Assemblies are often not willing to adjust tariffs because of arguments of affordability and political reasons.

Little impact of poor WSDB and local government relationship on water service provision: The relationship between local government and WSDB is a challenge under all models in which they play a role. However, under this model, the effect of this on service provision is low, to the extent that when there was no WSDB for six months, water services delivery was still reliable (in Bekwai).

Lack of clarity on who is responsible for major repairs: Although the Assembly is officially the owner of the assets, they did not feel responsible for taking up major repairs to the scheme. Instead these major repairs were undertaken by the private operator and philanthropists.

Misuse of capital and sanitation funds: In Bekwai and Atebubu, where the contract made provision of funds for WSDB and District Assembly for system extension and hygiene promotion, these funds were not used as such. In the Bekwai case, the WSDB tried but failed to have access to the funds.

Summing-up: the model of 'WSDB management with private operator' was introduced to overcome the challenge of availability of sufficient capacity in small town communities to manage relatively big and complex piped schemes. However, the model has not really been taken to scale, with communities preferring to keep the management in own hands, through 'direct WSDB management'. Political interference in the management has been substantial, especially in tariff setting, management of funds and the composition of the WSDB.

7 WSDB management with Private Operator in the 3 District Water Supply Scheme[23]

The Three Districts Water Supply Scheme (3-DWSS) is presently the biggest 'community managed' water supply scheme in Ghana, designed to serve a total population of 129,000 of 129 mostly rural communities and 18 institutions in three Districts: Dangme East and Dangme West District in the Greater Accra Region and North Tongu District in the Volta Region. The management model selected for the management of this big and complex scheme is the 'WSDB management with Private Operator' model.

7.1 Introduction to the case study area

The Dangme West District and Dangme East District are both located in the southern part of Ghana, in the greater Accra Region. The population of the districts were 96,809 and 93,112 in Dangme West and East respectively in 2000 (GSS 2002). Both districts are predominantly rural (76 percent and 82 percent in Dangme West and East respectively). Agriculture is the major means of livelihood in Dangme West, with 65 percent of the labour force engaged in crop farming, fishing and livestock rearing. Dangme East is a coastal District, with fishing and fish processing as major sources of livelihood.

The North Tongu District, in Volta region shares borders with the Dangme East and Dangme West Districts to the south west. The District is divided into two by the Volta River which runs from the North to South of the District. The 2000 population and housing census put the population of the area at 130,388 (GSS 2000). The District is comparatively rural. River fishing and livestock rearing are the main source of livelihood.

7.2 Water Services, past and present

Before the implementation of the Three Districts Water Supply Scheme (3-DWSS), only 51.8 percent of the people in Dangme West District and 43 percent of the Dangme East population had access to potable water in the District (DEDA 2008). People living in the North Tongu District depended on raw water from the Volta Lake.

A campaign to drill over 30 boreholes in the **Dangme West District** with support from JICA and DANIDA in 1997 and 1998 respectively, yielded only four successful boreholes. Besides drilling resulting in dry wells, the presence of iron and manganese was a main challenge. Some coastal communities in the Dangme West District were supplied by the Ghana Water Company Limited (GWCL) from the Kpong Water Works, but this supply was highly irregular.

In **Dangme East district**, the GWCL Keseve Water Supply Scheme was the main source of potable water before the implementation of the 3-DWSS. Communities with no access to the GWCL scheme, depended mostly on saline hand dug wells drilled by individuals, dug outs and tanker services (Afrowood consulting Limited, 2003). Supply of water from tanker

[23] This chapter is largely based on a case study done by Joyce Maku Appiah, within the framework of the TPP project (Appiah, 2010).

services in the District was priced at GH₵ 0.22 per 18 litre container. The people in areas without a source of potable water largely depended on unsafe sources such as streams, ponds and dugouts.

In order to improve water services to the people of the Dangme West and Dangme East District, the Greater Accra Regional office of CWSA tasked a local consultant to identify a potential intake source. The consultant recommended the construction of a surface water scheme with an intake from the Volta Lake in Aveyime in the North Tongu District of Volta Region. The choice of locating the intake at Aveyime required CWSA, Greater Accra Regional Office to take into account nearby communities in the North Tongu District in the design of the scheme, hence the name, Three Districts Water Supply Scheme (3-DWSS).

At the intake at Aveyima, the water is treated by a slow sand filtration treatment plant. The capacity is 3,600 m^3 per day, based on a per capita water demand of 28 litres per day. The scheme is connected to the national power grid and has a standby Diesel Generator. A Booster Station with a 400 m^3 ground tank is located in Dawa town, in the Dangme West District. Eight High Level Tanks (HLTs) with a total capacity of 1,450 m^3 are spread over the three Districts. The piped network has an approximate length of 400 km. Water is delivered to a total of 235 public standpipes and 65 institutional standpipes, with each standpipe having two spouts, service an estimated 215 people per spout. There were no household connections at the initial stages, but provision was made to enable household connections in the future.

In 2008, the scheme was supplying potable water to a total of 126 communities, 18 commercial institutions and 8 government institutions. Details of population distribution and accompanying facilities are presented in Table 16. According to the Private Operator, the total number of people served by the scheme in 2009 was 115,092 (Vicco Ventures Limited, 2009).

Table 16: Population distribution and facilities

District	No. of communities	Population	Number of standpipes			Number of people per spout	Chambers (earmarked for private connections)
			Public	Institutional	Total		
Dangme East	54	52,987	116	31	147	180	47
Dangme West	31	24,907	57	15	72	173	20
North Tongu	41	28,135	62	19	81	174	42
Total	**126**	**106,029**	**235**	**65**	**300**	**177**	**109**

Source: Adapted from Afrowood Consulting Ltd, 2008

The actual average consumption of water is far below the design consumption of 20 lpcd, at about 14,000 m^3 per month in the rainy season (4 lpcd), and about 25,000 m^3 of water per month in the dry season (7 lpcd).

Unreliable supply of water and high cost of operations in recent times as a result of frequent pipe bursts have a potential to threaten the technical and financial sustainability of the scheme. Consequently, community members have expressed dissatisfaction in the performance of the WSDB and the Private Operator.

Table 17 gives an overview of the main scheme and service characteristics of the 3-District Water Supply Scheme.

Table 17: Overview of scheme and service characteristics of the 3-DWSS

Scheme characteristics	
Population served (2009 estimation)	115,092
Design population	129,000
CWSA town category (See Table 9)	Not applicable
Recommended percentage of people with household connection as per CWSA guidelines (See Table 9)	Not applicable
Number of standpipes	300
Number of household connections	0
Estimated actual percentage of people with household connection	Not applicable
Estimated number of people per standpipe spout	177
Average water production (lpcd)	No data
Average water consumption (lpcd)	4-7
Non-revenue water	No data

7.3 Introduction of the management model in the case study area

Based on a study to identify an appropriate management model for the 3-DWSS commissioned by CWSA/GAR in 2003, and after careful consideration of the unique characteristics of the 3-DWSS, the 'WSDB with Private Operator' model was selected as the management model for the 3 District Water Supply Scheme. As described in Chapter 6, under this model, the WSDB on behalf of the communities, contracts out the operation and maintenance of the scheme to a Private Operator.

The final decision on the choice of management option was made in consultation with local stakeholders and was communicated to community members. In order to minimise the initial fears of the communities about high water prices due to the involvement of the private sector, the selection of the Private Operator was subjected to open tendering. The assignment was advertised in the National Dailies and bids from interested firms were evaluated by the District Assemblies with technical support from CWSA.

The model was formalised with the signing of an initial **five-year Management Contract** between the PO, the three District Assemblies and the WSDB in June 2007. The operations of the WSDB and its relationship with the Private Operator are governed by a Constitution, which is certified by the District Chief Executives, Co-ordinating Directors and the Presiding Members of the three District Assemblies.

7.4 The management model in practice

7.4.1 Corporate oversight and operations

The WSDB is responsible for corporate oversight, while the Private Operator is according to the contract considered as '*sole and exclusive, Operator and Maintainer of the water supply*

system from and including the intake at the treatment plant to the bulk meter point in each beneficiary community'.

A consultant hired by CWSA facilitated the election of WATSAN members in each of the beneficiary community. The WATSANs were then grouped into seven zones, depending on which high level tank supplied the community. However, to ensure fair representation on the WSDB, the densely populated zone along the coast of Dangme East was divided into two zones, making the total number of zones eight. The consultant facilitated the establishment of the WSDB with membership of two WATSAN representatives from each of the zones, a representative from Central University (the only major institution benefiting from the scheme at time of setting up the management framework) and a Planning Officer from each of the three District Assemblies. The Planning Officers however, do not have voting rights, as they are ex-officio members. The membership of the WDSB is 20, with five of the members elected into executive positions.

The WATSAN and WSDB members were trained by the consultant at the beginning of the implementation of the scheme to build their capacity in order for them to perform their tasks as WSDB members. However, it proved difficult to find residents with financial and technical knowledge and skills for management of a complex water scheme like the 3-DWSS, to serve on the WATSANs and subsequently on the WSDB. About half of the WSDB members elected had not received secondary school education (High school) (Maple Consult, 2007).

WATSANs were originally charged with the responsibility of selecting and supervising water vendors from within the communities. There vendors were trained to maintain the water point and sell water on 'pay-as-you-fetch' basis. The initial arrangement was for the vendors to account to the WATSANs the proceeds from the daily sale of water. WATSANs were to ensure the payment of water bills to the PSO, pay the vendors a commission of 20 percent of the sales and maintain the pipelines and standpipes within the community.

Following huge losses in revenue collection and the inability of the WATSANs to pay for water consumed, the District Assemblies and the WSDB directed that revenues collected by the vendors should be paid directly to the Private Operator instead, only 5 months after the scheme became operational. The payment of vendors' commission also became the responsibility of the Private Operator instead of the WATSANs. The PO was to pay each vendor a commission of 20 percent of the revenue realised at the standpipe each time the meter is read and a bill is presented. Though the current arrangement reduced the default rate of communities in the payment of water bills, it has resulted in the refusal of WATSANs to cooperate with the Private Operator. Vendors have become accountable to the Private Operator instead of to the WATSANs, which has impacted negatively on the authority of the WATSANs. Also, in some cases, newly elected Assembly members have taken over the accounts of the WATSANs for purposes other than operation and maintenance of the pipelines and standpipes within the communities.

7.4.2 Tariff Setting

The setting of the tariff for water use was done in conjunction with all stakeholders. The initial tariff was calculated based on all estimated expenses relating to the operation and maintenance of the water scheme. The estimated cost of capital replacement, water loses

and sanitation improvement was also catered for in the tariff. The price of water at the public standpipes was set at GH₵ 0.02 per 18litre container (GH₵ 1.11 per m^3).

In compliance with the National Community Water and Sanitation Programme at the time, beneficiary communities were asked to contribute to the capital cost by paying five percent of the total capital investment cost of the facilities. The total cost of community contribution was estimated at USD 441,232. In order to raise these funds, financial assistance was sought for from District Assemblies in the form of loans. Dangme West District Assembly supported deprived communities in the district with a loan totalling USD 10,345. Nevertheless, most communities were unable to meet the target of full payment before handing over the facilities to the Private Operator. Communities had at the time of handing over the scheme, mobilised USD 170,997 representing about 39 percent of the total required contribution.

Due to the inability of most of the beneficiary communities to pay up their community contribution to the capital investment costs, a decision was taken by the WSDB and the DAs to increase the price of water from GH₵ 0.02 per 18 litre container to GH₵ 0.05 (GH₵ 2.78 per m^3). The difference was thus used to defray the cost of the capital investment cost contribution. It was anticipated that through this, all communities would have completed payment of their capital cost contribution and would subsequently have reverted to the original tariff of GH₵ 0.02 per 18 litre container by December 14, 2009. However at the end of 2009, communities in the North Tongu District were still struggling to complete payment, due to low patronage of the scheme.

The decision of increasing the tariff was not adequately communicated to communities by the Zonal WATSAN representatives. This resulted in a number of confrontations between the communities and the Private Operator, especially in the relatively urban communities, and some people reverted to the use of unsafe sources because of the increased cost, thus reducing the average per capita consumption of the treated water.

The increase in the price of water from GH₵ 0.02 to GH₵ 0.05 per 18 litre container (GH₵ 2.78 per m^3) in order to pay for the capital investment cost contributions of the communities was considered as unfavourable for the poor. In response to agitations mainly from the youth, some communities, like the Sege community in the Dangme East District, reverted to the original price earlier than the date announced by the WSDB.

7.4.3 Cost recovery

Revenue collected from the sale of water from the standpipes are to be paid into an Escrow Account by the Private Operator. The Escrow Account has the signatures of a representative of the PO and the chairman and the Treasurer of the WSDB. The parties to the Account (Private Operator and the WSDB) are to issue a standing order at the end of every month to transfer money from the Escrow Account to various accounts specified below.

The percentage sharing of revenue mobilised at the standpipes is presented in Table 18. The Capital and Sanitation Accounts are co-managed by the WSDB and the District Assemblies.

Table 18: Percentage sharing of Revenue at standpipes

Recommended accounts according to model by-laws	Type of Account	Purpose	% of revenues
Operational account	Private Operator's Management Fee	Full cost of operation and maintenance	70
	WSDB	Payment of allowances, maintenance of WSDB Office & water quality tests	2
	WATSAN	Operation and maintenance of the facilities within the communities including repairs of pipelines from the bulk meter to the standpipes	3
	Vendors	Commission on total sale of water at standpipes – paid at the point of collection	20
Capital account (20% of net revenues)	Capital account (replacements)	Expansion & major repairs/replacement of parts	3
Sanitation account (10% of net revenues)	Sanitation account	Hygiene and sanitation promotion	2

The allocation of revenues to the sanitation and capital account is considerable lower than that of other schemes with 'WSDB with Private Operator' management, which is commonly set at 10 percent and 15 percent respectively, as mentioned in chapter 6.

According to the Private Operator and the WSDB, cost recovery has been satisfactory. Table 19 gives an estimate of the revenues and expenditure for the year 2009.

Table 19: Revenue and expenditure of the 3DWSS in 2009

	Total (GH₵)	Per capita (GH₵/cap)	Per m^3 estimated consumed (GH₵/m^3)
Revenue	306,977	2.38	1.31
Expenditure	211,778	1.64	0.90

There have been tremendous improvements in the payment of community bills ever since vendors were asked to pay directly to the Private Operator, instead of through WATSAN Committees. This improved billing recovery rate from 30 percent to 99 percent, according to the PO. This is not taking into account the non-payment of institutional water bills from government institutions by the Ministry of Finance and Economic Planning, which has been a problem. The current request for a refund of an amount of about GH₵ 12,280 for the period of January 2008 to May 2009 (which would have amounted to about 4 percent of the total revenues for 2009) is yet to be paid by the Ministry.

Though the Private Operator has been undertaking water quality tests on a regular basis, no water quality test has been conducted by the WSDB in order to validate the results from the water quality testing as presented by the Private Operator, as specified in the WSDB Constitution. According to the WSDB, this was due to lack of funds. However, reviewing the

income and expenditure of 2009, shows that the WSDB on average received GH₵ 1765 per quarter (2 percent of the revenues), spending an average of about GH₵ 580 on sitting allowances, refreshment and transport for quarterly WSDB meetings. Although the balance is indeed not be sufficient to cover the costs of quarterly water quality tests (at an estimated cost of GH₵ 1500 per quarter), it should be sufficient to cover half-yearly independent water quality tests. It was unclear what the quarterly balance of GH₵ 920 was used for.

7.4.4 Record keeping, reporting and accountability

The three DAs are the owners of the assets and are therefore required to demand quarterly technical and financial reports from the Private Operator. However, they have not fully taken up this role.

Stakeholders' review meetings are supposed to be organised on a rotational basis by the three DAs, though these have not been taking place regularly in recent times. Beyond the election of Zonal representatives to the WSDB, there has been very limited communication between the WSDB and the communities. According to the WSDB, this is due to lack of resources available to the WSDB, which limits the implementation of a number of activities planned to enhance information flow.

7.4.5 Direct support

District Assemblies, through their District Water and Sanitation Teams, are responsible for providing technical support (on-the-job coaching) to the WSDB and WATSANs in the management and operations of the scheme. The co-opted Planning Officers of the three beneficiary districts have been attending WSDB meetings on a regular basis, to provide inputs into most of the decisions taken by the WSDB. Follow up visits to communities by the WSDB and DWSTs to provide on-the-job-coaching to the WATSANs and the vendors at the community level have however been inadequate, due to resource limitations.

Although the Memorandum of Understanding (MoU) prescribed an annual external technical and financial audits to assess the performance of the scheme and to serve as the basis for tariff reviews, such audits have never been conducted. Rather, the Private Operator, on its own initiative, audited its accounts for year 2008. The District Assemblies have indicated their plan to use the staff of the Auditing Units of the District Assemblies to audit the financial operations of the Private Operator and the WSDB. There will still be the need for a technical audit to assess the performance of the Private Operator.

7.5 Lessons learnt

Low levels of water consumption: The scheme presented in this chapter focussed on the provision of water services through standpipes, with a design demand of 20 lpcd. In reality however, water consumption was found to be far lower than that (between 4 and 7 lpcd). People in the rural and small town communities served by this scheme, are likely to use other, unimproved sources to satisfy their water needs.

Lack of capacity at community level to provide corporate oversight: The size and complexity in the management of a scheme such as the 3-DWSS requires a WSDB with members who have financial and technical acumen. This technical and financial expertise should be in

accounting, for the analyses and interpretation of financial data and reports presented by the Private Operator, but also in management and engineering. In a situation where people of such calibre are not available on the WSDB, a WSDB should be encouraged to engage the services of people with this expertise on contractual basis to help in an independent assessment of the Private Operator.

Lack of information flow between the WSDB, the WATSANs, community members and the Private Operator: Reporting and information flows are extremely important, especially in schemes of the size of the 3-DWSS. Lack of communication from the WSDB and Private Operator to the community has led to an atmosphere of increasing apprehension, anxiety and suspicion among some communities towards the Private Operator.

Summing-up: This chapter has presented the application of the 'WSDB management with private operator' model for the management of a complex piped scheme, covering a multitude of rural and small town communities. This model is especially relevant for areas with limited (ground water) resources, as was the case in the 3-District Water Supply Scheme. There are however still a number of challenges that will need to be addressed if this model is to be scaled up successfully. These include the lack of capacity of the Water and sanitation Development Board to oversee the functioning of the private operator, the DAs not fully taking up their roles and responsibilities, and the position of the WATSANs. These challenges are not necessarily unique to this model, but addressing them is more urgent because of the complex nature of the scheme and management model.

8 Water supply to the urban poor though selling points, supplied by subsidised Tanker Services[24]

Water supply in Accra has been a struggle for a long time. Intermittent supply from the utility has led to a thriving business of water vending. The majority of these intermediary service providers source their water from the urban pipe-borne network. As mentioned in Chapter 3, there are two main types of intermediary water service providers: tanker trucks that supply water sourced from the utility scheme in large volumes to richer households situated in water scarce neighbourhoods; and the small scale vendors who sell water, either directly from the GWCL network, or from tanker trucks, in smaller volumes to individual households. This chapter describes a variation of the intermediate water service provider model: water supply though selling points supplied by subsidised tankers. This model was piloted in a number of neighbourhoods in Ghana's capital Accra: Osu, La, Dome, Taifa and Kwabenya.

8.1 Introduction to the case study area

Osu is largely a low income traditional Ga community surrounded by affluent working environments. The population of the area mainly consists of petty traders, fishermen, and government workers. The area is densely populated and poorly organised, depicting a poor outlook.

La is an indigenous Ga community. It is a community with a rapidly growing low-income population and it is one of the densely populated areas in Accra. Its population is engaged in fishing, carpentry, masonry and petty trading. Most of the houses are not connected to the utility network, while those which are, also hardly receive water services from the utility.

Dome, Taifa and Kwabenya are newly developing areas in the Greater Accra Region, where a lot of non-indigenes of Accra are settling. The Akans are the dominant ethnic groups in the areas, but Northerners and Ewes among others have been settling in these areas as well. The people in these areas are engaged in trading, artisanship, farming, services and government employments.

8.2 Water services, past and present

The model of providing water services though vendors supplied by subsidised tanker trucks, was developed in the first half of 2008 by the then operator of the utility network, AVRL, as a response to the acute water shortage in various parts of Accra during. The worst hit areas were the communities of La and Osu. In these areas supply through the utility network was virtually non-existent. Utility customers in these areas had to rely on alternative sources and walk long distances to other parts of Accra for their water supply.

[24] This chapter is largely based on a case study done by Benedict Tuffuor, within the framework of the TPP project (Tuffuor, 2010b)

In response to consumer and media outcries and the government's concern about the critical water challenges, the utility operator AVRL, in collaboration with Ghana Water Company Limited (GWCL) and the Ministry of Water Resources Works and Housing, started to provide interim solutions to improve the water situation in various deprived communities. In April 2008, with fair publicity[25], AVRL started a Tanker Services Project where private tankers were sourced and commissioned to supply water to selected water-poor areas of Accra and its environs as an interim and auxiliary measure.

The communities and assemblymen were to be involved in the selection of the locations for the selling points, the construction of the platforms and the selection of the vendors. During the whole process, a consultant was contracted to be responsible for facilitating community involvement and education and for building the necessary local structures for effective management of the facilities including orientation for vendors on how running the selling points. At the community level, local leaders (Assembly Members and Opinion Leaders) mobilized labour to install the selling points.

A total of 20 selling points were installed in the worst hit areas: 4 in Osu, 7 in La and 9 in Dome, Taifa and Kwabenya. With the introduction of additional water selling points, access to water was improved for some 5,000 people. However, there is no information available on the amount of water used before and after the introduction of the subsidised water selling points, nor on the number of people using each selling point and the distance people have to travel to access the selling point.

The initial intention of the project was to run this service for a period of about six months, by which time the challenge of supplying the areas through the utility network was expected to be solved. The tanker service would stop and the selling points would be connected to the main utility network. However, after one year of implementation (March 2008 - March 2009), the supply situation had not adequately improved and there was still high demand from most of the communities for the service.

8.3 The management model in theory

Under this model, water was supplied to storage tanks at selling points by subsidised tanker services. Coordinators, selected from the communities, were in charge of the management of the selling points. The Coordinators recruited and supervised vendors, and had the responsibility of financial management and arranging for supply of the water. The coordinators paid for the water directly at the AVRL Accra East District Office and were then issued with waybills, with which they could order for tanker services. The tanker drivers had to present the waybills before they were served at the filling point based on the quantities on the waybill. Proceeds realized from the sale of water at the selling points were meant to cover the commission to vendors and other operation and maintenance costs. The coordinators were allowed to keep the surplus.

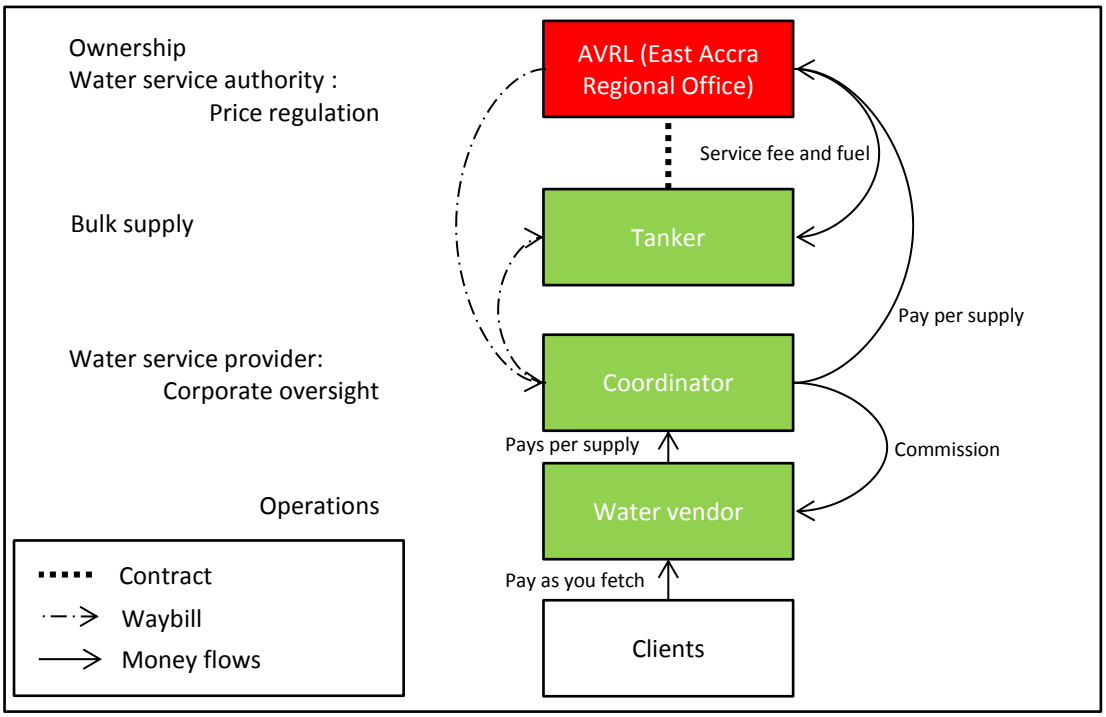
AVRL funded the provision of the storage tanks and the raising of the platforms with communities providing labour at the various selling points. The ownership of the storage tanks remained with AVRL and the tanks were labelled as such. During the time of the pilot

[25] Daily Graphic, Thursday, April 3, 2008 and Ghanaian Times, Thursday, April 3, 2008.

project, AVRL furthermore paid the tankers service charges, fuel for tankers and fees for software consultants.

Figure 24 gives an overview of the organisational arrangements under this model.

Figure 24: Organisational Arrangements for the supply of urban selling points through subsidized tanker services



8.4 The management model in practice

8.4.1 Corporate oversight and operations

Throughout the duration of the project under which this model was piloted, water was supplied by three tankers: two private tankers with the volume of 3,500 gallons (15.75m^3) each, hired by AVRL and one managed directly by AVRL (a truck fitted with 2 poly tanks). Before the tankers started operating, they were cleaned and disinfected by AVRL. The tankers were kept at the AVRL premises when they were not in use. This was to check abuse and ensure that they were readily available when needed. The tankers filled all locations depending on the request of the coordinators of the selling points, which was found to be daily or every other day.

The arrangement for corporate oversight and operations of the selling points varied from one area to the other. Four main arrangements were identified:

- The coordinator is an Assembly Member. All selling points at La and two at Osu areas were under the respective assembly members;
- The coordinator is an opinion leader who showed commitment to the project. This arrangement was identified at three selling points in Dome;

- The coordinator is the same as the vendor. This was found to be the case at three selling points in Taifa and two at Osu;
- Coordination is done by an identifiable local group or body. For example Kwabenya Residents Association.

Payment arrangements for vendors varied in two ways:

- Commission (average of GH₵4) on each consignment of 15.75m^3;
- Monthly fixed payments (average of GH₵60).

Customer-vendor relationships were cordial. Operation periods (hours) of vendors varied slightly among selling points and they were generally suitable for consumers. This was because vendors had over the period scheduled their operational hours according to the demand trends in their areas.

8.4.2 Tariff setting

The model intended to ensure that the consumer pay not more than GH₵ 0.05 per bucket (about GH₵ 2.50 per m^3) of water (AVRL, 2009). This is considerably more than the 'life line' tariff at the time of GH₵ 0.66/m^3 for those with house connections, but less that rates charged by other vendors, which tended to range between GH₵ 0.10 and GH₵ 0.20 per bucket (about GH₵ 5 to GH₵ 10 per m^3). The idea was that by ensuring lower prices at the AVRL selling point, other private vendors in the community would be forced to lower their water prices. The tariff of GH₵ 0.05 per bucket was fixed by AVRL and was maintained throughout the duration of the pilot project.

However, the difference in tariff charged per unit water between the subsidised and non-subsidised water vendors, was not reason enough for users to stop buying water from non-subsidised water vendors. The introduction of the subsidised vendors did therefore not have a major impact on water sales of non-subsidised vendors, who consequently did not see a need to lower their tariffs, as originally expected by the project.

8.4.3 Cost recovery

The investment costs of installing the selling points were taken up by AVRL. AVRL also took up the costs of transporting water to the selling points, by contracting and paying private tankers at daily rate of GH₵ 250 per truck from its own resources in addition to 180 litres of fuel per week for each tanker. These costs were estimated to amount to about GH₵ 14,000 per month (TREND, 2009). Given that the project benefited about 5,000 people, AVRL was providing a subsidy of GH₵ 2.80 per person per month. This amount equals the supply of about 20 lpcd from a vendor selling water at GH₵ 0.10 per bucket, or about 10 lpcd from a vendor selling water at GH₵ 0.20.

Coordinators of the selling points paid GH₵ 18.00 per bulk supply of 15.75m^3 of water, which is about GH₵ 1.14 per m^3, which is between the utility 'lifeline' tariff of GH₵ 0.80 per m^3 and the tariff for consumption above 20^3 per month of GH₵ 1.20 per m^3. Besides the costs of the bulk water supply, coordinators of the selling points had to cover the commission to the vendors, which was GH₵ 3.00 to GH₵ 4.00 per bulk unit sold. TREND (2009) estimated gross revenues from sales of one bulk supply unit to amount to GH₵ 26.50, which implies a non-

revenue water rate of about 33 percent. Per bulk supply unit, the coordinator could be able to safe about GH₵ 6.50. Monthly revenues depend on the amount of water sold in the month and expenditure of repairs and maintenance. Repairs and maintenance on the selling point were estimated to amount to GH₵ 3.00 to GH₵ 5.00 per month. At selling points where 157m^3 (10 bulk supply units) is sold in a month, the net revenues were estimated to amount to GH₵ 35, while this was estimated to be GH₵ 57 per month for selling points where 236m^3 (15 bulk supply units) of water is sold per month.

The net revenues from managing a single selling point under this subsidised model with tariffs with have been set considerably below the tariffs charged by non-subsidised private vendors, were not considered high enough by private entrepreneurs to cover for their time and effort of managing the selling points. This was found as a problem for engaging vendors and coordinators on a sustainable basis, especially in Kwabenya and Taifa. In La on the other hand, all seven selling points were under one single coordinator, the local assembly man, resulting in considerable profits on his side.

8.4.4 Record keeping, reporting and accountability

Besides the issuing of waybills, record keeping, reporting and accountability mechanisms do not seem to have been put in place under this model.

8.4.5 Direct support

Direct support arrangements are not in place under this model, except for the support that was provided in terms of training and mobilisation of the community at the beginning of the pilot project by the software consultant. Before operations started, all the selected vendors were given orientation and coaching on how to manage the selling points. This did not take a formal form and was delivered one-on-one at the selling points and therefore did not require training in the form of venue, materials, feeding, etc. The orientation included customer relations, communication, tariffs fixing and health and hygiene around the selling points among others.

8.5 Lessons learnt

High levels of subsidies needed to ensure lower tariffs: The main difference in water services provided by vendors under the model described in this chapter and by conventional private intermediate service providers (private water vendors), is the subsidised tariff. Under the model, consumers paid GH₵ 2.50 per m^3, which is considerable lower than the GH₵ 5 to GH₵ 10 per m^3 commonly charged by private water vendors, but still close to four times the utility 'lifeline' tariff at that time (GH₵ 0.66). The lower tariff could only be realised through high levels of subsidy from AVRL, amounting to about GH₵ 2.80 per person per month. In 'lifeline' tariff terms, this subsidy could pay for monthly consumption of about 4.2m^3 per person (about 140 litre per capita per day) or for about 20 litres per capita per day from a private vendor selling at the non-subsidised rate of GH₵ 0.10 per bucket.

Low impact of the introduction of subsidised vendors on tariffs charged by private vendors: Water tariffs of private intermediate water service provider (private vendors) did not drop as a result of the introduction of the subsidised selling points selling water at regulated, lower tariffs. The demand for services of the private vendors remained substantial, allowing them

to continue to charge high tariffs. The number of subsidised vendors did not seem to have reached the critical mass required for having influence on the patronage of the private water vendors and therefore on the tariff that they set. Also, consumers generally seem to prioritise access, reliability and convenience over price of services.

Lack of interest from private entrepreneur in the subsidised model: The perceived low level of profitability as a result of price control does not make the model attractive for entrepreneurs. The advantage of the subsidy which is provided in the form of the construction of the selling point and the subsidised water tanker supply, is perceived to be counterbalanced by the disadvantage of the regulated low tariff, which has been set at half, or even a quarter of the tariffs charged by private water vendors.

Summing-up: This model of selling points supplied by subsidised tanker services can be applied to provide water services to the urban poor, who are not served and are difficult to serve through conventional utility services. People making use of these subsidised water services pay less than people depending on non-subsidised private water vendors. However, the costs associated with providing subsided water services which enable considerable lower water tariffs than under fully private models, are considerable. The model is therefore not sustainable and replicable as a permanent model for water services delivery (unless there is substantial reliable source of funding for subsidy). However, in situations of acute water crisis, an organised tankers services model which subsidised selling points such as this could be implemented as an emergency measure on short-term basis, especially for the poor.

9 Emerging peri-urban water management models

In addition to the management models described in Chapters 3 to 8, a growing number of emerging (mostly informal) models can be found in Ghana, especially in the peri-urban areas not covered by the utility. This chapter does not focus on a specific case in detail, but gives a brief introduction to several of these emerging models and initiatives under which these were established.

9.1.1 Emerging TPP models for intermediate service provision

In the last few years, there has been growing interest in Ghana in service delivery models for poor peri-urban areas that includes some form of community and /or private management of distribution of utility provided bulk water. These models are seen as providing a potential intermediate option between household connections, which might not be commercially viable in some areas, and what are widely seen as unacceptably sub-standard and expensive informal services provided by private service providers, like water vendors and tanker services. In sector workshops and other forums, this is often presented as a hybrid between the COM model of CWSA and the utility model of GWCL/GUWC. However, this model is fairly new and not well developed yet.

Under the model, the ownership, management and operation of the bulk water supply are in the hands of the utility. If the selling points are funded by a donor on behalf of the community, the community exercises the ownership over the selling point and set the tariff at which the water will be sold. The operation of the water selling points is in the hands of a vendor, who is paid a commission. Water vendors either pay for the bulk water supply to GWCL/AVRL directly, or through a community management structure, like a Water Board or Water User Group, selected by the community.

An example of an intervention to stimulate the intermediate private provider model, can be found in the **Zabon Zongo** area in Accra, which is a poor area of Accra, with a population of about 19,000, mostly migrants from northern Ghana. Here, high capacity storage tanks have been implemented as part of a pro-poor integrated water supply and sanitation pilot under the Accra city project of the UN-HABITAT Water for African Cities Programme (2007-2009). This was a collaboration between Wateraid Ghana, GWCL, the Ghana Education Service and the Sub-Metropolitan Authority for the area. These tanks, connected to GWCL network, were located at vantage points in the community and are manned by private vendors, who deal directly with GWCL. An eleven-member Community Development Committee (CDC) was established, consisting of community and Assembly members. Its role was to ensure proper post construction operations and maintenance to ensure sustainability of the facilities and to draw relevant lessons to inform future similar projects (Osanjo and Ohayo, 2009).

A similar initiative can be found in **Old Ningo** in the Dangme West District, located about 25 Kilometres from Tema. Here, five 20 m^3 water storage facilities were constructed and connected to the utility scheme, with support from the French Embassy and WaterAid Ghana, working though ProNet Accra. This initiative was started in 2003 and was reported to

have reduced the time for fetching water and the price per bucket from more than GH₵ 5 per m^3 to GH₵ 1.11 per m^3 (WaterAid, 2005). A water and sanitation committee was set up to manage the water points, organise community meetings, organise hygiene promotion sessions, organise clean up exercises, prepare and implement the action plan and keep records of all financial and project activities. This committee was also supposed to render accounts and report to the steering committee, which was set-up with the mandate to, amongst other things, monitor the WATSAN committee activities and handle the financial transactions to ProNet Accra (Adisenu, n.d).

In another on-going initiative, PURC, in collaboration with GWCL/AVRL and WaterAid Ghana has been piloting supply and payment options to low income water-deprived communities, using a community management model, since 2010. Under this initiative, **Water User Groups / Boards** have been put in place in the beneficiary communities. These work in consultation with the communities to secure appropriate locations for the installation of water tanks and to contract vendors to operate these water selling points. The beneficiary communities include South Teshie, Glefe-Agege and Nima (see the inset of Figure 4).

Holding tanks have also been implemented as an initiative by AVRL in **Wa**, the Upper West Regional Capital, to provide water to areas distant from the distribution network. Under this initiative, consultations were held with residents and opinion leaders to identify appropriate locations for the construction of the tanks (Only one tank had been installed at the time of data collection for this study). AVRL water tankers regularly supplied water to the tank for redistribution to consumers. The vendor buys bulk water from the utility at the normal lifeline tariff, which he resells at a rate fixed by the utility, which includes a small profit margin for the vendor. The role played by the community under this arrangement includes the identification of the site for the erection of the tank and the selection of a vendor to sell the water and manage the tanks.

AVRL has implemented a pilot in a section of Teshie (see the inset of Figure 4), under which a **Water Management Board** has been established to oversee holding tanks with selling points connected to the GWCL mains.

9.1.2 Emerging independent service provision model

An interesting recent example of an organisation operating as a small scale independent provider, in partnership with the community, is WaterHealth International[26], which has implemented six Water Health Centres in Ghana (5 in Ga West District in Greater Accra Region and 1 in South Dayi in Volta Region). See Figure 4 for the location of these facilities and Figure 25 for a photograph of one of the facilities.

Water Health Centres are decentralized micro utilities that purify and disinfect water for household needs. The centres are designed to supply 20 lpcd of high quality water. The centres are accessible during operating hours when water can be fetched from these centres by bucket or basin. Based on the data from the Pukuase Health Centre, as presented by

[26] Water Health International is a health-centered US based company with the primary purpose of developing and marketing proprietary, decentralized water purification systems and services

Puplampu (2009), the average amount of water used was only about 3 lpcd in during the first half of 2009.

The Company manages the collection and accounting of the user fees. The company trains local residents for much of the routine operation and care of the Water Health Centre. The tariff level (which at present is GH₵ 5 per m^3) under this model, takes into account full cost recovery of operation and maintenance costs and profit for the company, although initial capital investment comes from a grant. Like schemes under Community Ownership and Management, ownership is officially supposed to be with the MMDA. The company's role is to facilitate the implementation of the facility, support the operation and maintenance to ensure efficient management and build local capacity for this. After this phase, trained community members are supposed to be fully in charge of the scheme. However, under the current local government arrangement (Act 462), it is unclear whether communities can legally own the scheme, without reference to the respective MMDA. The communities are assumed to take up the responsibility for major rehabilitation and replacement but, again, the mechanism by which this might happen is currently not defined.

Figure 25: Water Health Centre (photo: Water Health Ghana)

10 Comparing management models

In the previous chapters, a variety of models for providing water services to the urban areas and small towns in Ghana has been introduced, described and analysed. These include well-established and formalised models, like the utility model and Community Ownership and Management model with WSDB management, as well as emerging and less formal models, like private management models and urban water boards. In this chapter, we compare these different models in terms of the level of service they provide, the price people pay to make use of the services, the (financial) sustainability of the models and the strengths and weaknesses of the models regarding institutional arrangements.

10.1 Water services provided

People in peri-urban areas and in small towns in Ghana rely on water service providers, which operate under different management models. Access to the services provided under these management models depends to a large extent on availability and accessibility of the service and on the willingness and ability of users to pay for it.

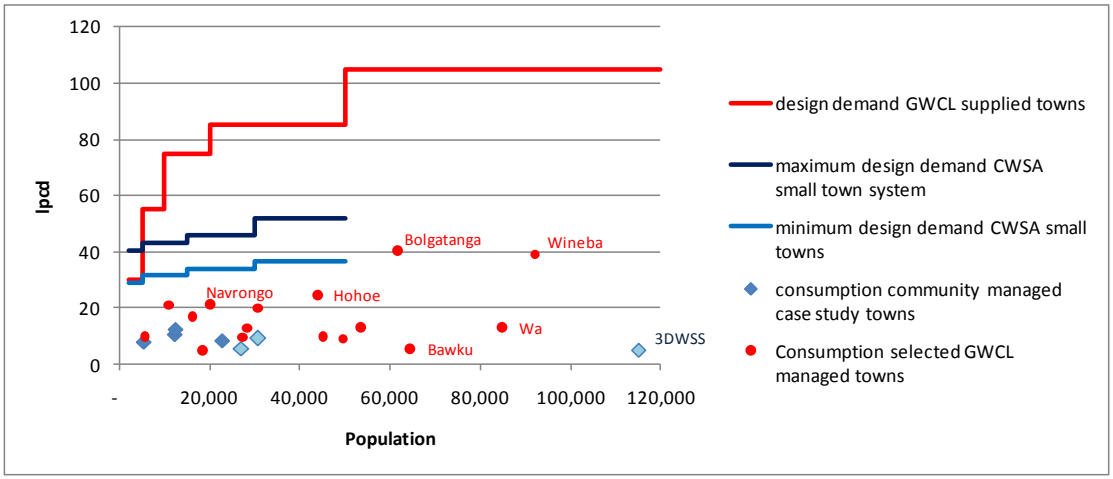
As mentioned in Chapter 1, utility management is the common formal management model in urban areas. However, as the poor are often located in places which are difficult to connect to the utility scheme, they tend to rely on private service providers which often provide lower levels of service at higher costs. Different innovative models which are being piloted on a small scale, like the ones presented in Chapters 8 and 9, try to address these challenges. Under these models, arrangements are put into place, which are meant to improve service level and lower prices. The price people pay for these services is indeed generally lower than for (informal) privately managed services. However, scalability and sustainability of these models is an issue.

People in small towns with a population of less than 50,000 get water either from the utility, a WSDB (with or without private operator) or a private entrepreneur.

Figure 26 presents the per capita design water demand of community managed schemes (according to the CWSA guidelines) and the GWCL schemes (according to the 2005 water demand as presented in the Urban Strategic Investment Plan). It clearly shows that for small towns, especially those with a population of more than 5,000, the design demand is far higher for utility managed schemes than for community managed schemes, resulting at least in theory, in higher level services. This is to a large extent due to the fact that under the utility model, focus is on service provision through household connections, while under community management models focus is more on service provision through standpipes, with lower per capita water demands.

However, Figure 26 also gives an indication of actual consumption levels, which are far lower than the design demand, both in GWCL managed as well as in community managed schemes, and in many cases even below the basic water supply standard of 20 litres per capita per day. This is due both to under-performance of the schemes, as well as to low demand.

Figure 26: Design demand and actual consumption



Under utility management, profitable schemes cross-subsidise less profitable schemes. In this way, the tariff for utility managed services can be kept the same for all utility managed schemes throughout the country, regardless of location, size and type of scheme. Community and privately managed schemes do not benefit from such cross-subsidies and hence the tariff for community and privately managed services vary widely, as can be seen in Figure 27. These tariffs are set by community members or private entrepreneurs themselves, based on the production costs, but also depend heavily on the perspective of the community, private entrepreneur and local government (which has to approve tariffs in case of community management) on what constitutes a fair and affordable tariff. Figure **Error! Reference source not found.**27 also shows that people who are not connected to the tility scheme, especially the urban poor who fail to connect to the utility scheme, and the (often poor) people living in small towns, pay considerably more per unit water than people who are connected to the utility.

Figure 27: Overview of 2008 water tariffs under different management models

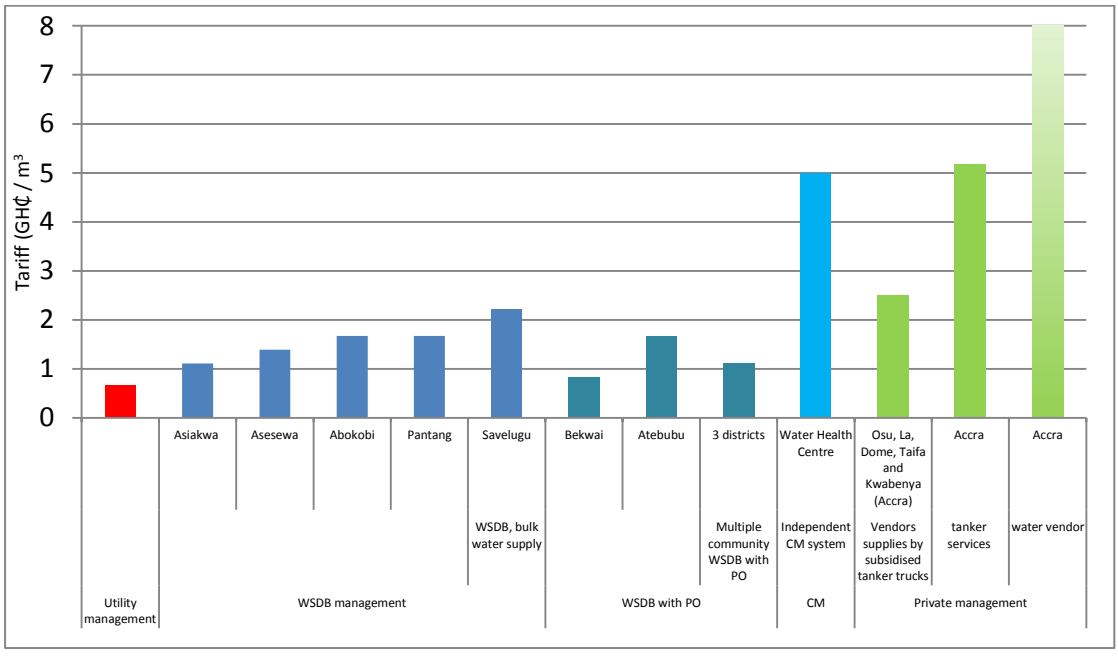
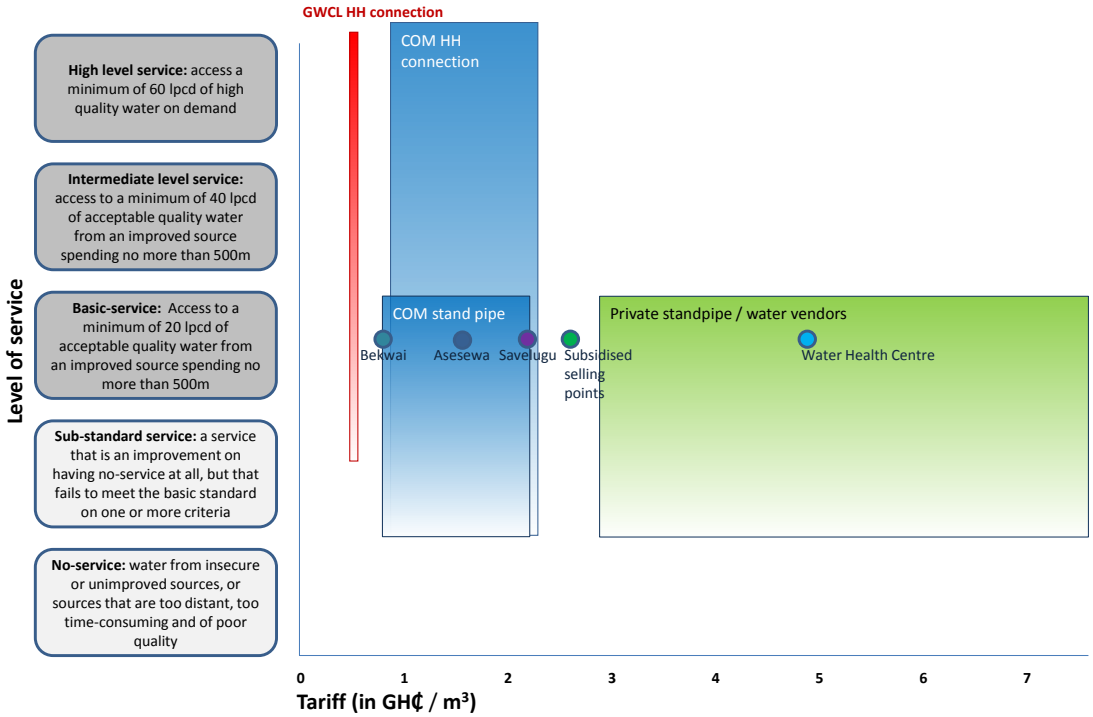


Figure 28 presents an overview of the level of service provided under the main management models and the variation of tariffs related to these services. It also gives an indication of service levels and tariffs from some selected cases presented in the document. It clearly shows that, depending on the management model under which the services have been provided, people pay different tariffs for similarly poor levels of service.

Figure 28: Overview of service level and tariffs



Summing up, users pay far more for services provided under 'pro-poor focussed' community management models than under the 'non-pro-poor focused' utility model. Non-regulated privately management services on which many people, especially the urban poor, depend, have the highest tariffs. This emphasises the need for affordable innovative management models for water provision in peri-urban areas, the formalisation and regulation of existing privately managed services, and new thinking about the use of subsidy to reduce the huge and inequitable range in the tariffs paid by the poor.

10.2 Cost recovery and financial sustainability

Under all studied management models for small town and peri-urban water supply in Ghana, clients, both individual households as well as institutions, are required to pay for the provision of water services. The revenues are, under all models, used to cover the expenditure on operation and maintenance, and in some cases contribute to the investment costs (as was the case in the 3DWSS) and / or costs of major repairs, rehabilitation and expansion.

As can be seen in Table 20, in the cases studied that had WSDB management, the annual revenues outweigh expenditure on operations and minor maintenance (Opex) more than in the studied cases of WSDB management with private operator. In the Atebubu case, this was to a large extent due to the high operational costs associated with high diesel prices.

Furthermore, the low bill collection ratio in the case of Atebubu, mainly caused by a lack of payment of institutional water bills, seems to have contributed to this.

Table 20: Overview of factors influencing financial sustainability

Management Model	Utility management	Direct WSDB management				WSDB with Private operator		
Case study town		Asiakwa	Asesewa	Abokobi	Pantang	Bekwai	Atebubu	3DWSS
% of revenues that was spent on operation and maintenance	Unknown	80%	81%	57%	61%	94%	147%	69%
Bill collection ratio	Unknown	94%	97%	85%	87%	?	74%	
Non-revenue water	54%	24%	15%	42%	40%	Unknown	23%	unknown

High rates of non-revenue water are a big challenge effecting financial sustainability. As shown in Table 20, the percentage of non-revenue water is especially high under utility management. In the Asiakwa and Asesewa cases, where rigorous record keeping systems and procedure had been introduced under the EVORAP Project, the rate of bill collection is highest and rate of non-revenue water is lowest.

Non-payment of institutional water bills also poses a big challenge for cost recovery and financial sustainability for the community management models. This is especially the case in the somewhat bigger towns, like Bekwai and Savelugu, where a larger part of the total water bill has to be recovered from institutions.

A common challenge to cost recovery and financial sustainability in all models, is the low consumption level. Especially in the models where private sector plays a crucial role, like the WSDB with Private Operator model and the AVRL model in which urban vendors are supplied by water tankers, projected water use is far higher than actual water use, leading to reduced revenue.

In the Savelugu case, with WSDB management with bulk water supply from GWCL, the main challenge related to cost recovery was that the WSDB had to pay the full tariff to the GWCL, in addition to the costs of operating the scheme from the bulk water point, while in the past they had been given a concession to only pay 30 percent of the GWCL tariff.

In order to ensure financial sustainability in the long run, WSDBs are required to establish a capital account to cover rehabilitation and expansion. In addition, WSDBs are required to open a sanitation account. In most of the studied community management cases, capital accounts were found to be in place. However, different rates of allocation to capital and sanitation account have been set under different management models, which are not necessarily in line with the model by-laws, which recommend that no less that 20 percent of the net revenues should be deposited into the capital account and no less than 10 percent

should be deposited into the sanitation account. Under the 'WSDB with Private Operator' model, the allocation to the capital and sanitation account is formalised in the Private Operator contract. According to the contract in the studied cases, 25 percent of the total revenues (rather than the net revenues) are to be paid into the capital (15 percent) and sanitation (10 percent) account of the WSDB and the MA. In the 3-DWSS case, allocation to the capital and sanitation account was set at only 3 percent and 2 percent of the total revenues respectively.

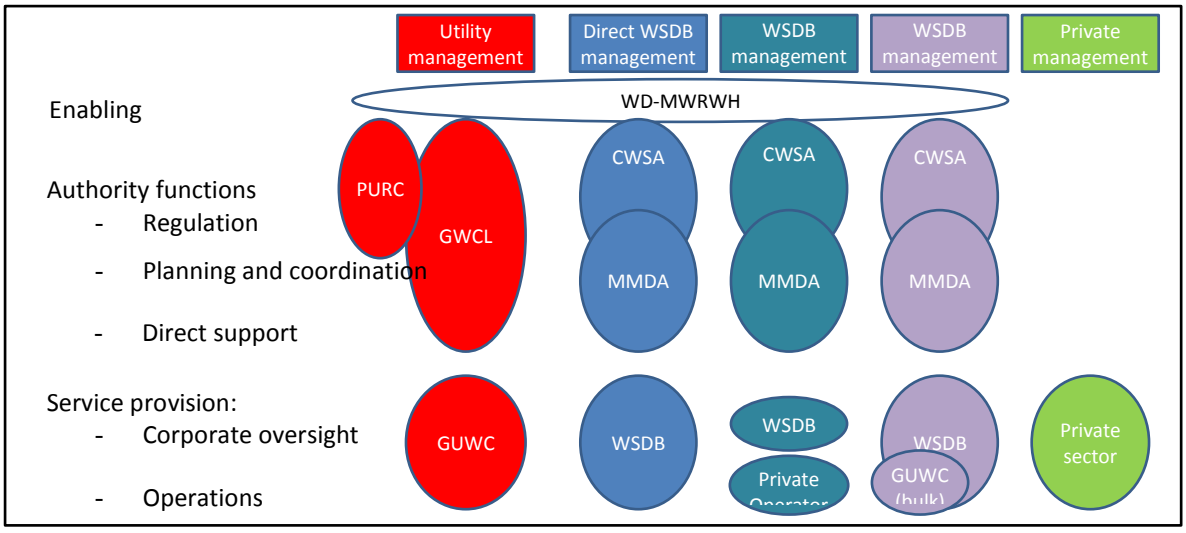
In the towns under direct WSDB management, revenues outweighed expenditure sufficiently, in most cases, to ensure a sizable deposit into the capital and sanitation account. In Asesewa and Asiakwa, deposits of 18 percent and 22 percent of the revenues were made into a replacements (capital) account over the period 2004-2008. The same was the case in Bekwai and 3-DWSS, under the 'WSDB with Private Operator' model. In Atebubu, only 2 percent of the 2007 revenues was deposited into the replacement account, while 1 percent was allocated to the extension account and 3 percent to the sanitation account. However, as mentioned in chapter 6, the Atebubu WSDB and Private operator were considered to be functioning badly and the WSDB was dissolved by the District Assemblies by the end of that year.

Under private management models, emerging urban community management models and the model under which water vendors are supplied by private tankers, no standards or arrangements have been put into place to ensure sufficient financial resources to cover future capital maintenance expenditure (major repairs, replacement of parts and rehabilitation), costs of expansion and sanitation. Rather, this is left to the discretion of the service provider.

10.3 Institutional arrangements under different management models

Figure 29 presents an overview of the responsibilities related to service provision (corporate oversight and operations), authority functions and the enabling environment under the different main management models in Ghana.

Figure 29: Overview of roles and responsibilities



10.3.1 Service provision functions: corporate oversight and operations

The broad roles and responsibilities of service provision functions are more or less clear under the different management models studied. Under the **utility model**, the Ghana Urban Water Company is responsible for providing services, while under **(informal) private management models**, the private sector is fully responsible for the provision of services. When going into detail of the roles and responsibilities of different stakeholders under the WSDB management models, there are still issues that remain unclear.

Under **WSDB management** (either direct or with private operator), WATSANs are supposed to be established around each water point. However, their roles and functions are not clearly defined in policy, legislation or guidelines. In several cases, like the Asesewa and Asiakwa cases, described in Chapter 4, WATSANs have not been set-up. The decision not to establish WATSANs was taken by the implementation project EVORAP, which instead put in place vendors and health volunteers to take up the roles and functions of the WATSAN committees. Where WATSANs have been put in place, there are often challenges of communication and money transfers between the vendor, the WATSAN treasurer and the WSDB, as was the case is Pantang and Abokobi (Chapter 4). In the 3-DWSS (see chapter 6), WATSANs had been put in place and trained. However, five months after the scheme became functional, the Private Operator decided to bypass the WATSANs and to collect revenues straight from the vendors, because of huge losses in revenue collected and the inability of the WATSANs to pay for water consumed. Furthermore, the lack of legal framework for the establishment of WATSANs makes them impossible to effectively hold accountable, and vulnerable to political interference and take-over. In the 3-DWSS for example, Assembly members took over the accounts of the WATSANs for purposes other than operation and maintenance of the pipelines and standpipes within the communities, after the last change of government.

So, there is lack of clarity on the formal roles and responsibilities of WATSAN Committees in small town water management, while in practice their existence and roles seem to vary from case to case, often influenced by the implementing project. WATSAN committees do not seem to be truly anchored in Ghana's legal and political setting, which explains why they are sometimes in conflict with more formalised sub-structures, like the elected unit-committees. There is, thus, an urgent need to determine whether WATSAN committees should have a role to play in small town water management in the future, and if so, what this role should be and how to legalise and regulate it.

Under the direct WSDB management model, there is also a lack of clarity on the division of roles and responsibilities related to corporate oversight and operations; or, between the WSDB and the operational staff. This has led to deteriorating relationships and conflicts between WSDB members and operational staff, as presented in Chapter 4.

Lack of capacity of WSDB members to oversee the management of small town piped schemes is a big challenge, as WSDB members generally lack knowledge and skills in the area of water management. This is especially an issue in predominantly rural areas, where water is supplied by a complex scheme, operated by a private operator (under the 'WSDB

management with private operator' model), like the 3DWSS. WSDB and WATSAN members are usually trained during the implementation or rehabilitation of the scheme, but there is no structural re-training beyond timespan of the implementation project.

In the case of **WSDB management with bulk water supply**, the division of roles and responsibilities related to water service provision between the GUWC and the WSDB have not been clearly defined.

The CWSA guidelines (CWSA, forthcoming) recommend that schemes under community management serving more than 10,000 people, should be managed by a Private Operator, supervised by a WSDB. However, in reality only a few schemes of this size have private operators involved in the operation. In a few of these cases, operation by a private operator has been abolished as a result of technical challenges that faced their operations (see chapter 5). In the case of Atebubu for example, the District Assembly did not renew the contract with the PO and put in place interim arrangements for the management of the schemes.

10.3.2 Service authority functions

Roles and responsibilities related to authority functions within the **utility model** are more or less clearly defined, with GUWC providing direct support to the decentralised GUWC operations, GWCL as the asset holder and PURC as the (performance) regulator.

For the **WSDB management models**, MMDAs are officially the asset holders, but are often – at best - only partially aware of this. Also, there is a clear and poorly defined overlap in roles and responsibility between the CWSA and local government (municipal and District Assemblies) related to authority functions, such as with direct support and regulation.

Direct support to WSDBs is very weak. Although Municipal and District Assemblies are required to play an important role in supporting community managed small town water supply, they have hardly been fulfilling this role. Capacity (in terms of human resources, structures, logistics, etc) to take up these roles and responsibilities is lacking, as is sufficient back-up support from CWSA to the MMDAs to undertake these functions.

Regulation of the performance of the WSDB by Municipal or District Assemblies is also weak. Municipal or District Assemblies (especially the chief executives) tend to often interfere in rather than regulate and support the WSDBs, for example by dissolving the WSDBs after national elections.

Final responsibility for the major maintenance, extension, rehabilitation or replacement of the scheme under community management models is poorly defined, although from a legal and policy perspective it seems to clearly lie with the district, as owner of community managed schemes. In practice, few districts or WSDBs have access to the necessary financial resources to undertake major repairs and these tend to be addressed in rehabilitation undertaken by new externally financed projects.

Authority functions like direct support, performance regulation and planning and coordination related to **(inform) private management models** and **emerging community management models** for peri-urban and small town water supply, are none existing.

10.3.3 Enabling environment: Policy making, legislation and regulation

There is a rather well-defined policy, legislative and regulatory framework for **utility water supply** in Ghana, with the PURC as the regulator. PURC approves tariffs, monitors and enforces standards of performance for provision of utility and is responsible for mitigating in disputes between the utility and its customers, although this is hardly or not at all applied.

Regulation of tariffs and water quality for **community managed small town water supply** is not done centrally, but is the task of local government (the Municipal and District Assemblies). Therefore, as described above, there is no uniformity in tariffs charges for small town water supply and prices tend to differ from location to location. Political interference in setting the tariffs is common. As shown in several of the cases discussed in the previous chapters, the Municipal and District Assemblies rarely have the courage to approve an increase in tariffs recommended by WSDBs or Private Operators out of fear of loss of support from the community.

As mentioned in Chapter 3, according to CWSA guidelines (CWSA, forthcoming) and in the draft WSDB by-laws (MLGRD, 2008), the MMDAs are responsible for developing and enacting **by-laws** for each small town to legalise the WSDB. Furthermore, a constitution should be developed to govern the WSDB. However, in reality, the document containing the model by-laws is not well disseminated amongst MMDAs and hardly know at that level. Local by-laws and constitutions are therefore often not in place, and when they are, they are hardly enforced.

While the formal community and utility management models are to some or lesser extent governed and regulated by guidelines, by-laws etc, this is not the case for **emerging peri-urban management models,** described in Chapter 9, **the informal (private) management models**, introduced in Chapter 3 and the **model of vendors supplied by subsidised tankers under the AVRL Project** described in chapter 8. For example, tariffs charged by private water providers in peri-urban areas are set by the private operators themselves and are not regulated. The tariff for the subsidised water vendors under the AVRL project described in chapter 8, was set by the implementing organisation of the Project (AVRL).

The effect of the extent to which tariffs are regulated, is reflected in the range of different tariffs under the same management model, as was illustrated in Figure 27, which showed a fixed, uniform tariff for water supply under the utility model, a range of tariffs for water supply under the community managed models and an even wider range of tariffs charges for water provided under private management models.

10.4 Who is responsible for serving the unserved?

The fact that in Ghana the ‘urban sector’ and ‘small town sector’ are defined by whether services are provided under utility or community management, raises the question of who is responsible for ensuring that the unserved are served. These unserved include:

- Small town and (peri-) urban communities where the water supply scheme has broken down and is no longer delivering services;

- Communities in newly developed expanding urban areas and small towns, which have not been served yet;
- Urban communities (and households) in areas which are technically, administratively or financially difficult to connect to the utility scheme, including informal urban communities.

There is not much clarity as to who is supposed to be responsible for ensuring that these unserved will be served and what management model should be employed to achieve that (and on who actually decides on this). Although officially local government is supposed to play an important role in making this kind of decision, in reality, the selected model, and with that the price people have to pay to access the water services, seems to be mostly determined by infrastructure implementation projects, without or with limited involvement of local government.

11 Conclusions and recommendations

This report has given a comprehensive overview of existing (peri-)urban and small town service delivery models in Ghana, including a description of the services provided under these models, and of the applied management models, in theory and in practice. It has shown that under the utility management model, which is the main model for urban water supply, there is a clear institutional and regulatory framework. Under this model, focus is on the provision of high level water services through household connections. The tariff related to accessing these water services is relatively low.

However, the poor face many challenges in trying to access the relatively cheap utility managed services. Rather, they rely on a variety of informal, private water service providers, which provide lower levels of water services against a higher tariff. These have mostly emerged as the result of the efforts of individuals, organisations and projects to supply water to the urban un-served and are generally not part of a regulatory framework. There is thus an urgent need for the further development of well structured, formalised and regulated models for reaching the urban poor, who are not connected to the utility network.

In addition to its application in urban areas, the utility model is also applied in a number of small towns in Ghana. Small towns not supplied by the utility, generally fall under community managed small town models, which have mainly emerged from small town projects facilitated by the Community Water and Sanitation Agency (CWSA) in the 1990s and 2000s. As such, project-related variations to the main models can be identified.

These models focus on the provision of a basic level of water services through public standpipes, rather than through household connections. As tariffs are not regulated centrally, a range of tariffs is applied under these models, as set by the water service provider and the service authority.

With the development of the CWSA guidelines and model by-law, steps have been taken to define, formalise and standardise these models. However, actual institutional arrangements and practices differ significantly from the prescribed models, as shown in this report, especially in the area of setting of tariffs and the provision of direct support by the MMDAs. Also, there is still a lack of clarity on the division of corporate oversight and operations roles and responsibilities, the role of WATSANs in community managed small town water supply and on who is responsible for major repairs, rehabilitations and expansion.

Inclusion of the private sector in the management of small town water supply, although (moderately) successful in a number of cases (e.g. Bekwai and the 3-DWSS), has not really caught on at a large scale, even though it is the recommended model for small towns with a population size beyond 10,000.

Community management of bulk water supplied by the utility, as for example practised in Savelugu, is an interesting hybrid of utility management and community management. However, roles and responsibilities under this model need to be defined clearer, in order to

prevent it from falling between the cracks of utility (GWCL) management and (CWSA facilitated) community management.

There is a lack of clarity of who is responsible for authority functions related to the provision of water services in small towns, such as providing direct support to service providers and performance regulation. At the moment, there seems to be an overlap in functions between the (relatively weak) local government and the (relatively strong) CWSA. This should not come as a big surprise, when considering the historic development of the sector and the stage of the decentralisation process, but is something that will need to be addressed in order to improve the provision of and support to water services in small towns in Ghana.

With increasing urbanisation, the demand for sufficient, safe, reliable, accessible and affordable water services in (peri-) urban areas and small towns is on the rise. But who is responsible for responding to this demand? And who determines which models should be applied where? These are crucial questions, which urgently need to be discussed and answered in the water sector in Ghana.

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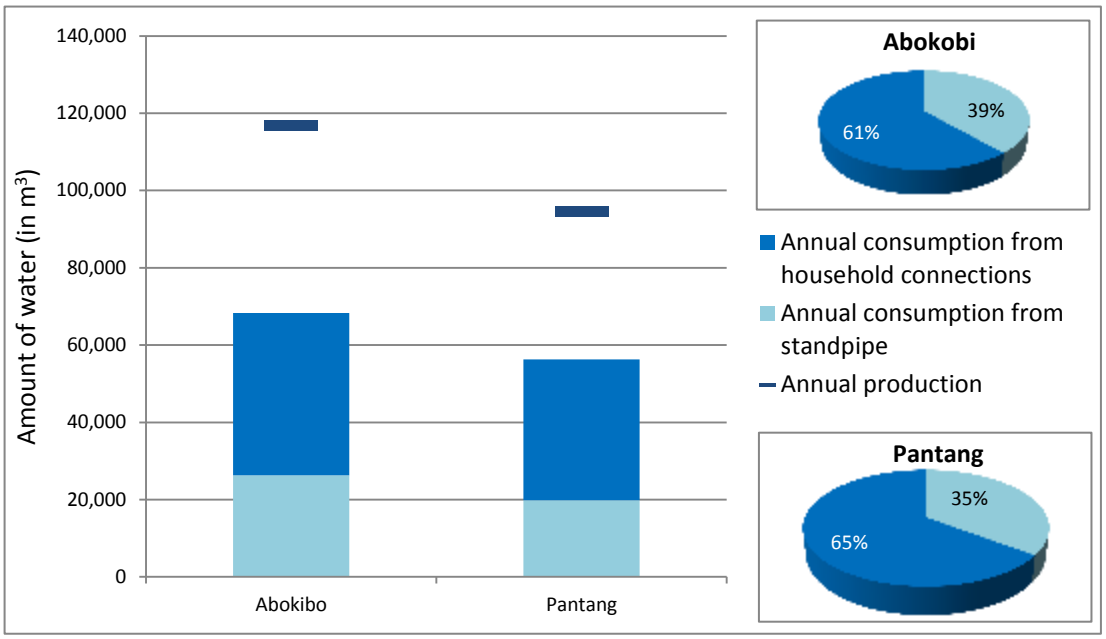
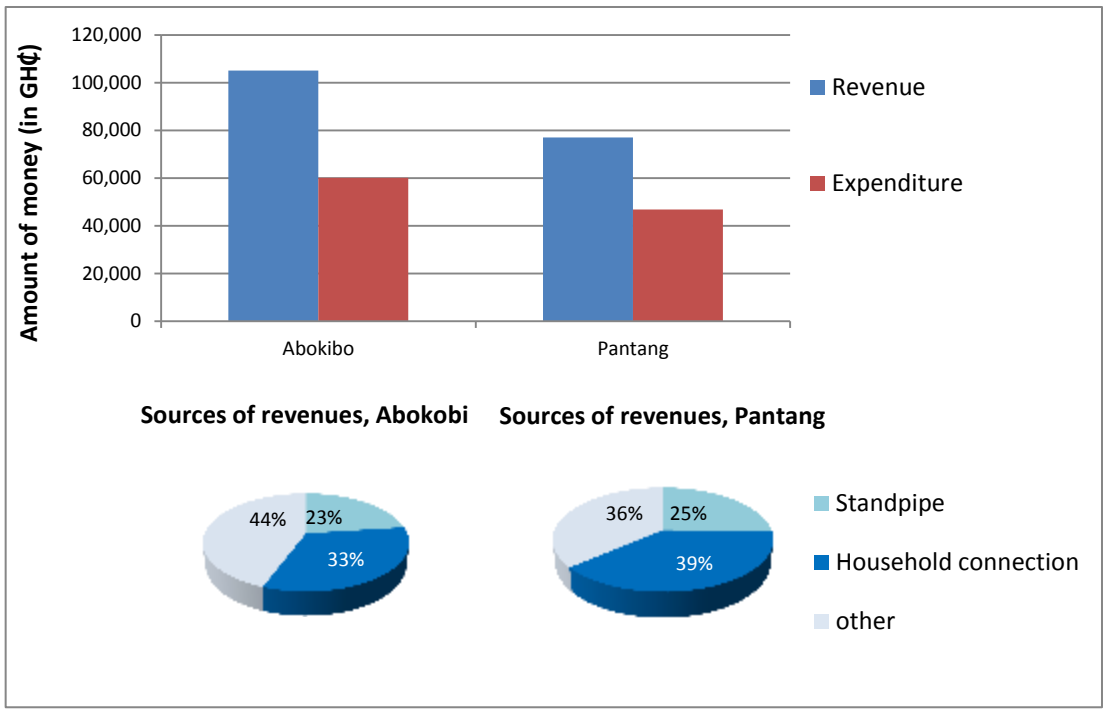
Annex 1: Abokobi and Pantang details

Annual consumption and production, Abokobi and Pantang



Source: Compiled from data from WSDB

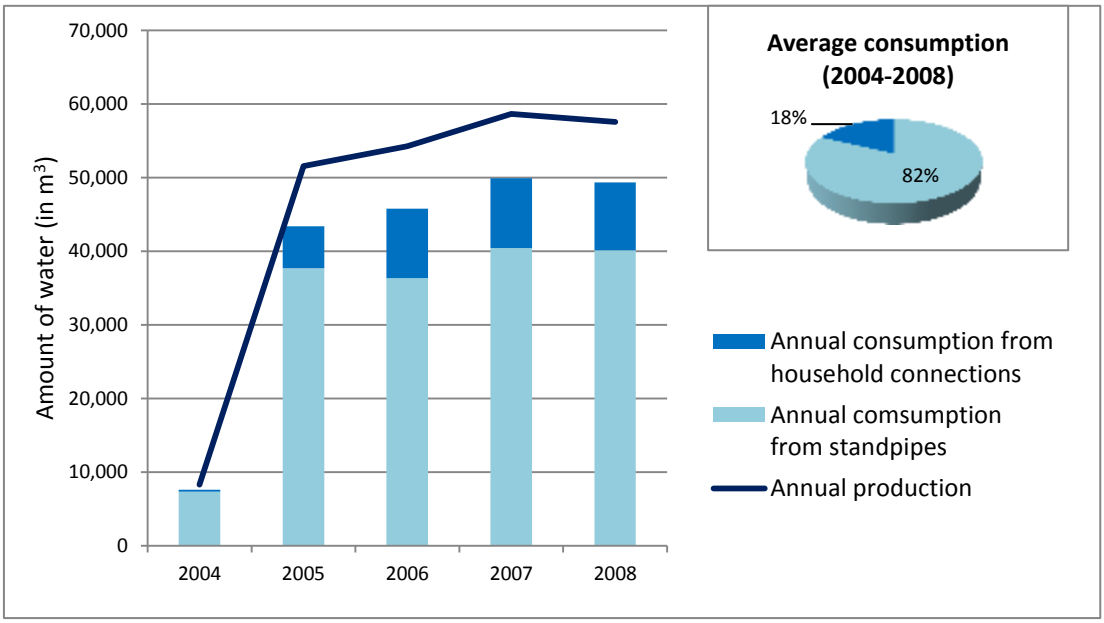
Annual revenue and expenditure, Abokobi and Pantang



Source: Compiled from data from WSDB

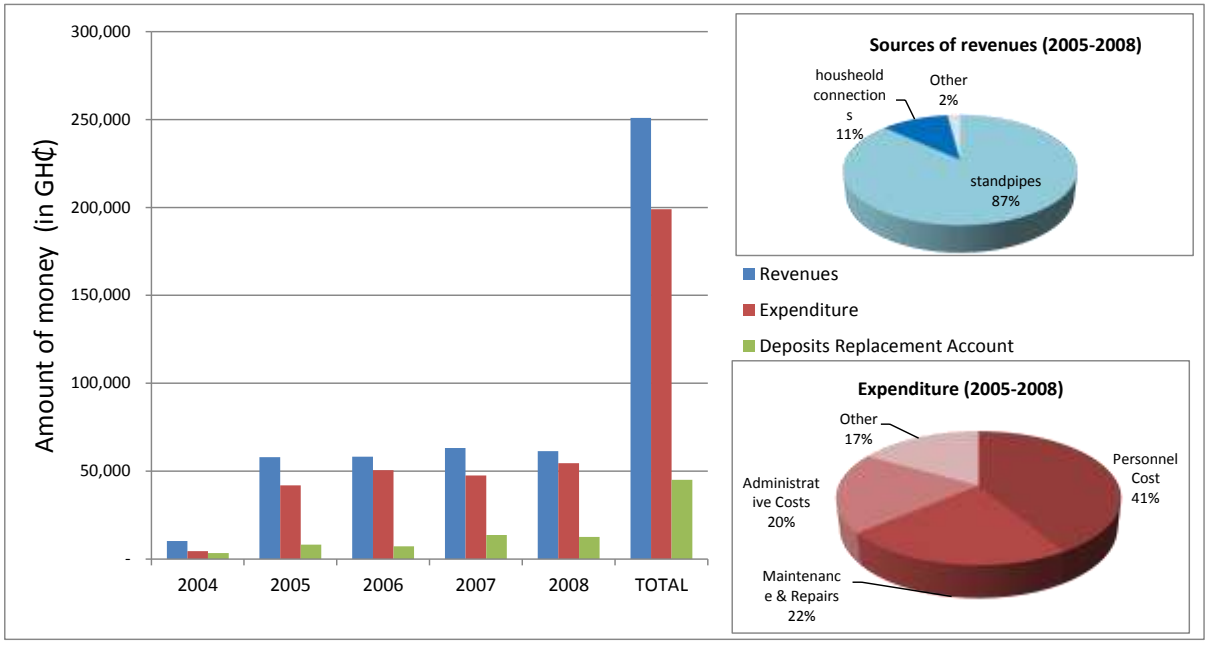
Annex 2: Asesewa details

Water production and consumption, Asesewa (2004-2008)



Source: Compiled from data from WSDB

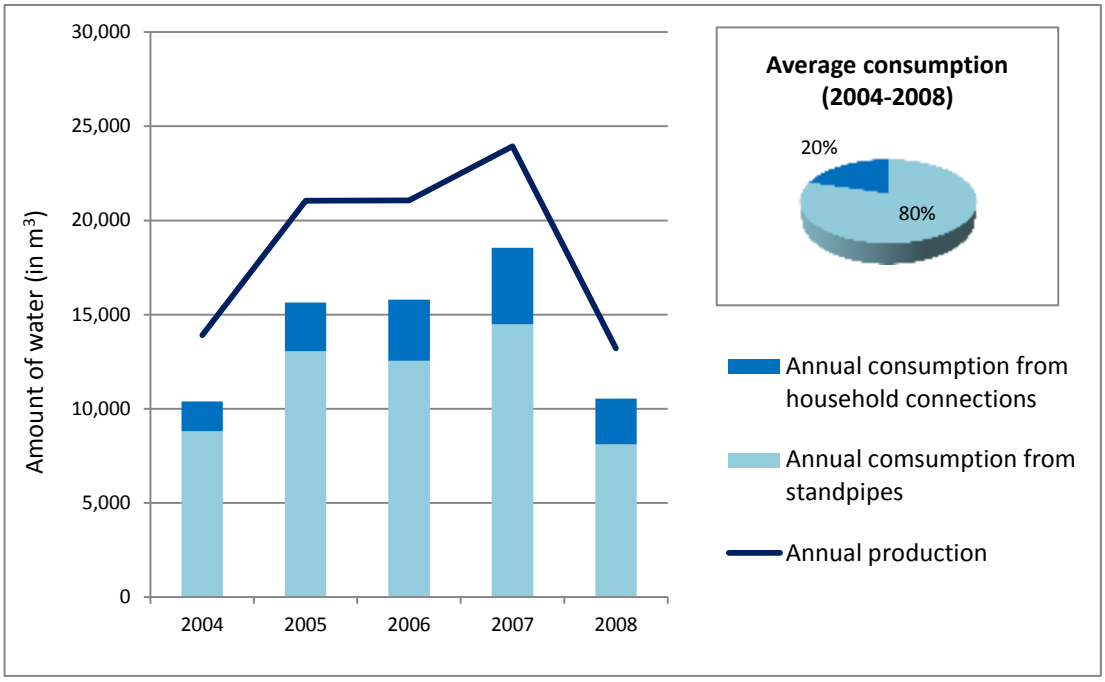
Annual revenue and expenditure, Asesewa (2005-2008)



Source: Compiled from data from WSBD

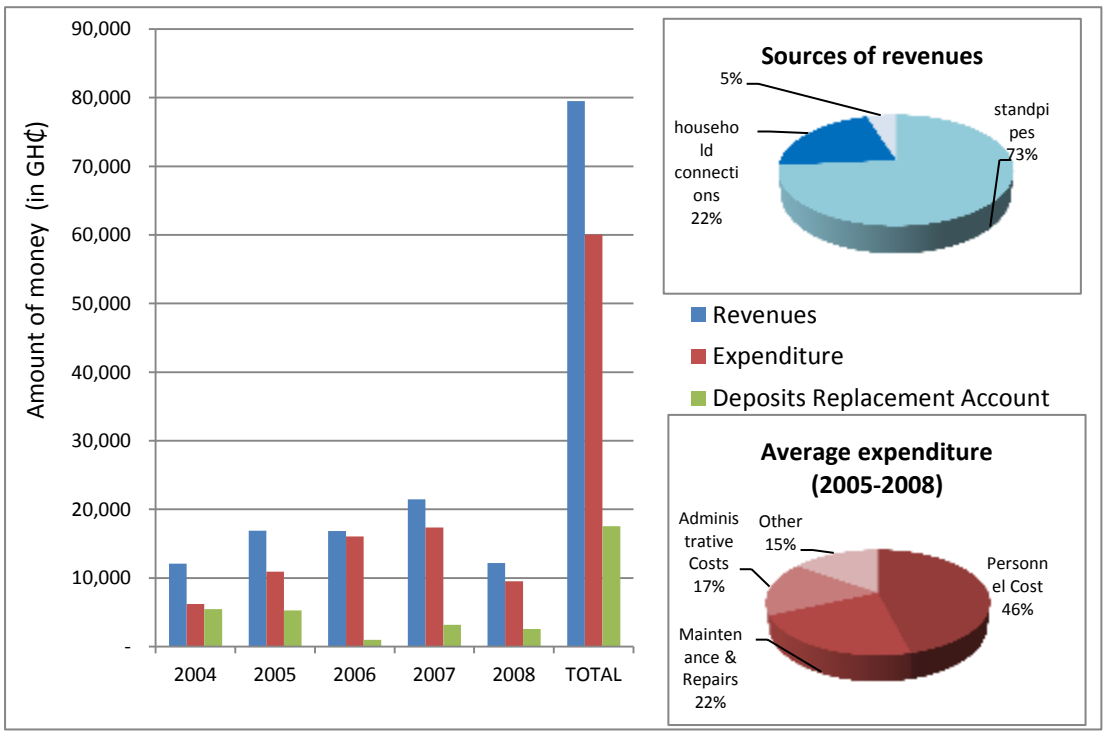
Annex 3: Asiakwa data

Water production and consumption, Asiakwa (2004-2008)



Source: Compiled from data from WSDB

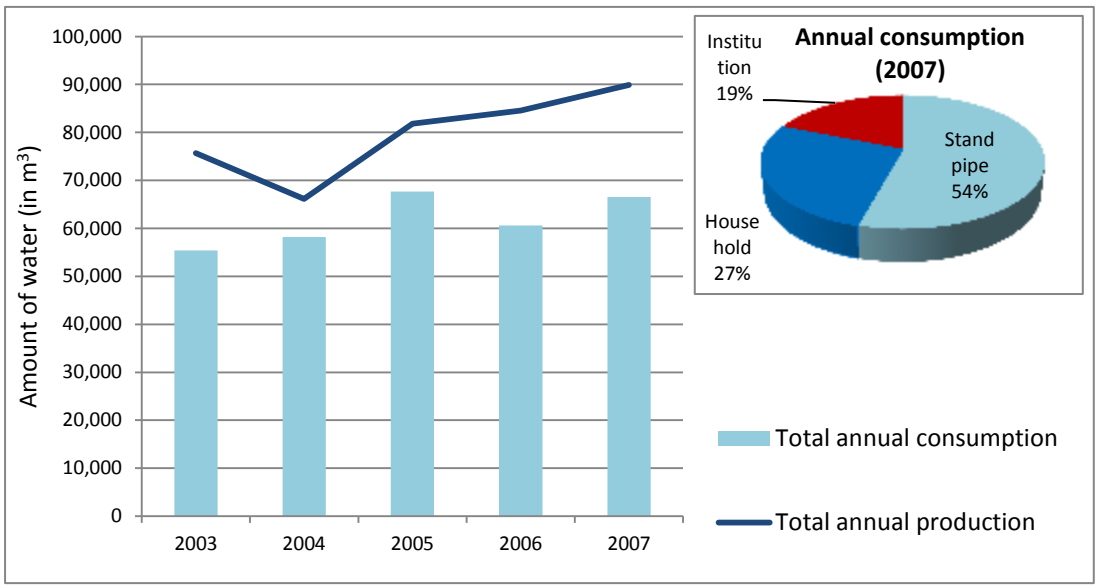
Annual revenue and expenditure, Asiakwa (2005-2008)



Source: Compiled from data from WSDB

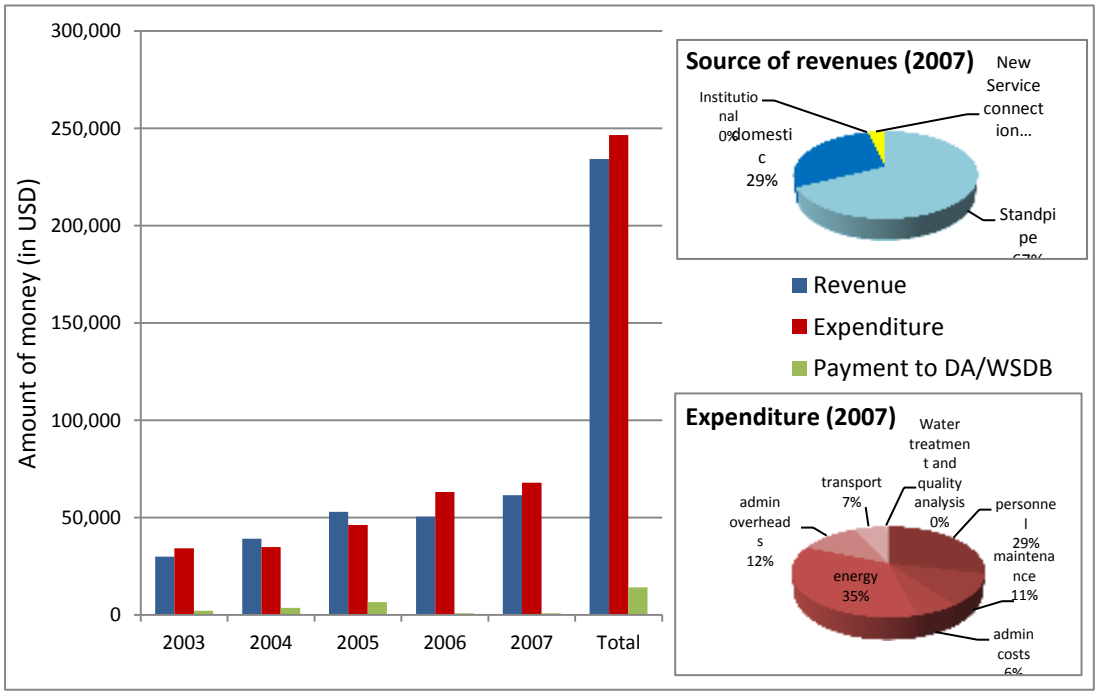
Annex 4: Atebubu data

Amount of water produced and consumed, Atebubu



Source: Compiled from data from the 2007 annual report (ARMCO Water Company Limited, 2008)

Annual revenues and expenditure, Atebubu



Source: Compiled from data from the 2007 annual report (ARMCO Water Company Limited, 2008)

Annex 5: Overview of service levels under different models

Management model	Utility management	WSDB management					WSDB with PO			CM	Private management
Variant		EVORAP		multi-community		WSDB, bulk water supply			Multiple community WSDB with PO	Independent CM system	Vendors supplies by subsidised tanker trucks
Case		Asiakwa	Asesewa	Abokobi	Pantang	Savelugu	Bekwai	Atebubu	3 districts	Water Health Centre	Osu, La, Dome, Taifa and Kwabenya (Accra)
Average quantity produced (lpcd)	102	10	12	14	21	unknown	unknown	10	unknown	unknown	unknown
Average quantity used (lpcd)	47	8	10	8	12	unknown	6	8	5	3	unknown (estimated to be les than 20 lpcs)
Non-revenue water	54%	24%	15%	42%	40%	unknown	unknown	23%	unknown	unknown	unknown
crowding at standpipe	unknown	no	no	yes	no	no	no	no	no	unknown	unknown
reliability	unknown	unknown	unknown	unknown	unknown	unknown	reliable	not reliable	not reliable	reliable	unknown
2008 Tariff (GH₵ /m3)	0.66	1.11	1.39	1.67	1.67	2.22	0.83	1.67	1.11	5	2.5

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