UNIVERSITY OF CAPE COAST

PUBLIC-PRIVATE PARTNERSHIP AND URBAN WATER DELIVERY: A CASE OF GA EAST MUNICIPALITY

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DECLARATION

Candidate's Declaration

I hereby declare that this thesis is the result of my own original work and that no part of it has been presented for another degree in this university or elsewhere.

Candidate's Signature: ..... Date:.....

Name: Michael Ekow Aikins

Supervisors' Declaration

We hereby declare that the preparation and presentation of the thesis were supervised in accordance with the guidelines on supervision of thesis laid down by the University of Cape Coast.

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ABSTRACT

The challenge in providing adequate drinking water has driven many governments in developing countries to either privatised their water systems entirely or engaged in partnership with the private sector.

The study was undertaken to examine public-private partnership with reference to GWCL/AVRL in urban water supply in the Ga East Municipal. The International Benchmarking Network for Water and sanitation (IBNNET) was used to assess the performance ratios of GWCL/AVRL. Data was collected using semi-structured questionnaire from 246 households who were randomly selected using the systematic sampling method and purposive sampling method to select 4 key respondents. The data was presented in percentages, frequencies charts and graphs.

The research showed that urban water supply is faced with financial constraints, level of unaccounted for water remains high (50%) despite a target of 26 percent operating cost recovery ratio is still low as well as bill collection rate. Thus urban water supply is no financially sustainable. Also respondent perception on water supply was poor, making them buy water at a higher cost from small scale water providers of which the source of water is unknown.

This indicates that the involvement of private sector does not necessarily improve the water supply service as it has been professed by neo-liberalism. It is recommended that government must show political commitment, opt for public-public partnerships (PUP) and support for community driven initiative in the provision of adequate water supply.

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DEDICATION

To my loving mother

Faith Tsotsoo Solomon

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LIST OF ACRONYMS

ADB	Asian Development Bank
AVRL	Aqua Vittens Rand Limited
BOT	Build Operate Transfer
BOOT	Build Operate Own Transfer
CAWP	Coalition Against Water Privatisation
CWSA	Community Water and Sanitation Agency
DA	District Assembly
DFID	Department for International Development
DPCU	District Planning Coordinating Unit
EPA	Environmental Protection Agency
ESA	External Support Agencies
GESAP	Ghana's Enhanced Structural Adjustment Policy
GLSS	Ghana Living Standards Survey
GSB	Ghana Standard Board
GWCL	Ghana Water Company Limited
GWSC	Ghana Water and Sewerage Corporation
IBNET	International Benchmarking Network
ICWE	International Conference Water Environment
IFIs	International Financial Institutions
IMF	International Monetary Fund
IRC	International Water and Sanitation Centre
IWRM	Integrated Water Resource Management
LVWC	Lyonnaise Vietnam Water Company
MDG	Millennium Development Goals

MWRWH	Ministry of Water Resource Works and Housing
NCWSP	National Community Water and Sanitation Programme
NGO	Non-Governmental Organisation
NPM	New Public Management
NWP	National Water policy
OECD	Organisation for Economic Co-operation and Development
ONEA	National Office of Water and Sanitation
PLC	Public Liability company
PPP	Public Private Partnership
PSP	Private Sector Participation
PUP	Public-public partnership
PURC	Public Utilities Regulatory Commission
PWD	Public Works Department
PWU	Public Sector Water Undertaking
SAUR	Société d'Amenagement Urbain et Rural
SDE	Senegalese Water (Sénégalaise des Eaux),
SODECI	Société des Eaux de Côte d'Ivoire
SOE	State Owned Enterprise
SONEES	Société National des Eaux du Sénégal
SPSS	Statistical Product and Service Solution
UN	United Nations
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNICEF	United Nations International Children's Education Fund

UWP	Urban Water Project
WHO	World Health Organisation
WRC	Water Resources Commission
WSDB	Water Sanitation and Development Board
WSRS	Water Sector Restructuring Secretariat
WSS	Water Supply and Sanitation

CHAPTER ONE

INTRODUCTION

Background to the study

Water is a resource that is essential for life and forms the sustenance of every society; hence the supply, improvement and sound management are key elements in relation to urbanisation and development policy of every country (Organisation for Economic Co-operation and Development [OECD], 2000).

During the nineteenth century, water supply emerged as a major public policy in the industrialising cities of Europe and North America. The first water service delivery systems was financed, built, owned, and operated by private firms and was restricted to the wealthier social groups who were able and willing to pay for the service. Many of these private water operators abused their monopolistic position, often by restricting investment and disregarding service quality. This necessitated governments to assume the task of installing and managing piped water systems for the purpose of achieving universal water provision for all since quality drinking water was important for both public health and national economic development (Budds & McGranahan, 2003).

Subsequently, there was a reduction in private ownership of water systems except for a small portion of the markets in the United Kingdom and the United States. However, in some European countries, especially, France and Spain, a different form of management style emerged. This involved a

partnership between the public sector and a private operator with shared responsibility. This paved way for the private operator to manage the water utility company, while the assets of the water utility company remained as public property (Marin, 2009).

The inception of international drinking water and sanitation decade (1981-1990) informed many governments to embark on a series of reforms in urban water supply services, with support from international financial institutions. By the end of the decade there was a remarkable increase in water supply coverage from 75 percent in 1980 to 85 percent in 1990. However this achievement fell short of attaining universal water coverage. The failure was attributed to mismanagement and poor maintenance of infrastructure, fast urban population growth, and huge investment needs which coexisted with artificially low tariffs, and scarce fiscal resources. Efforts to strengthen publicly managed utilities proved difficult in addressing the water sector's mounting challenges (Marin, 2009).

Harris (2003) posits that governments lacked the needed capital to offset the financial losses of public utilities and to invest in infrastructure rehabilitation and expansion; hence partnerships for water utilities seemed to be an attractive solution. There were high hopes that with their expertise and financial resources, private operators would provide better services for a large number of consumers. The basis was that a private operator would operate more efficiently because of its profit motive and the fact that its contract contained clear consistent objectives as compared to contracts related to state-owned utilities.

Advocates of public-private partnerships suggest an impressive list of possible benefits and advantages. For instance the private operator would be motivated by profits; hence will deliver quality service to the consuming public. Aryee and Crook (2003) asserts that public-private partnership (PPP) creates an expansion in the quantity and quality of public goods and services and the addition of extra financial, human, technical and other resources from businesses, Non Governmental Organisation (NGOs) and from service beneficiaries themselves beyond the levels possible under pure private or pure public arrangements. It also imparts creativity and innovation through the combination of inputs and insights from both individuals and organisations of different background (Fiszbein, 2000).

Many developing countries are exploring innovative options for increasing overall drinking water coverage, as well as economic efficiency and cost recovery. The trend in these countries is to view water as an economic as well as a social good: one capable of paying for itself in a demand-driven market. This initiative will support increased participation of the private sector in urban water systems. Twenty-four out of fifty water utilities surveyed by the Asian Development Bank in 1997 involved some form of private sector participation in urban water supply systems (ADB, 1997).

Since 1990, governments in developing countries have signed more than 260 PPP contracts in the water sector. It is estimated that the number of people served by private water operators in developing and emerging countries has steadily increased from 94 million in 2000 to more than 160 million people in developing countries by 2007 and only 9 percent had been terminated in both Sub-Saharan Africa and Latin America respectively. Also

the market share of PPP projects in water supply in developing and emerging countries stood at only about 7 percent of the total urban population (Marin, 2009).

Straub (2009) asserts that 87 percent of the world's population uses drinking water from improved sources as of 2006. Of these, 54 percent have in-house pipe connection, and 33 percent get drinking water from other improved sources. This implies that about 5.7 billion people worldwide get their drinking water from improved sources, an increase of 1.6 billion since 1990. This indicates that most countries are on track to meet the MDG's drinking water target. However in sub-Saharan Africa, coverage is still considerably lower than other regions although there has been an increase from 49 percent in 1990 to 58 percent in 2006.

Many African countries and developing countries will need to provide access to safe drinking water for 210 to 211 million additional residents over the next 15 years (WHO & UNICEF, 2000). Moreover, African governments face increasing critical resource constraint in their efforts to extend water services of acceptable quality and quantity to majority of its people. The inefficiency of water utilities is often identified as one of the major factors in explaining the slow process and many setbacks in improving access to water and water distribution (Estache & Kouassi, 2002).

Despite the widespread investment in infrastructure services, billions of people in the developing world did not have access to improved water services. Two out of every 10 people, lack access to water supply. These statistics translate to an estimated 1.1billion people without safe water. Access to water services varies widely across regions and between urban and rural

areas. The regions with a substantial share of middle income tend to have improved access than regions where low incomes predominate. There is the existent of regional differences in service levels, example in Asia and sub-Saharan Africa, many of the urban households estimated to have access to safe water do not have private water connections but instead use other improved sources (WHO & UNICEF, 2000).

The provision of adequate water supply also improves health benefits, reduces poverty and improves standard of living in several ways. Moreover the absence of adequate water supply accounts for a considerable incidence of water related diseases in developing countries contributing to high cost in terms of death, malnutrition, and reduced productivity. Improving water supply will reduce these costs (Galiani, Gertler, & Schargrodsky, 2005).

The poor state of water facilities can also work against educational outcomes especially for girls who absent themselves from school because of the demand on their time in collecting water from distant neighbourhoods. When pipe connections are available, household members, particularly women and children engage in more productive activities and leisure. Expansion and improvement in the quality of utility services can also lower cost and expand market opportunities for business and thereby, increase productivity and investment that drives economic growth (de la Fuente, 2005).

Similarly the absence of safe water inhibits productivity in household members, especially women and children who have to fetch water from distant neighbourhoods suffer the opportunity cost of time and lost educational prospects (Banerjee, Skilling, Foster, Briceño-Garmendia, Morella, & Chfadi, 2008). For instance, Blackden and Wodon (2006) as (cited in Banerjee et al,

2008) estimate that out of 6 million hours spent fetching water in Ghana in 1992, more than two-thirds was spent by women. Hence bringing water closer to households will be an immense contribution to time spent in collecting water, although reaching a water source is a struggle for urban households in many countries.

In urban Mauritania, 66 percent of households live more than 2 kilometres from their water sources, and in urban Ghana and Sierra Leone, 53 percent of households live more than 2 kilometres from their water kilometres of their primary water sources. In contrast all urban households in South Africa and Nigeria are located within 2 kilometres of their primary source.

The efficient delivery of public services is central to achieving the Millennium Development Goal (MDG) 7 which lay emphasis on the importance of improved coverage of water and sanitation services, with a global target to reduce the proportion of people without access to water and basic sanitation by half by the year 2015 (Khan, 2003).

Ghana has made considerable progress in improving governance, developing policy and institutional frameworks and building capacity in the water sector. However, water supply and sanitation (WSS) financing in the past has been about a third of required investments, implying that Ghana could be on track to achieve the MDGs if more funding is made available and reform efforts are continued (UNDP, 2006).

In 2004, Ghana's water supply coverage was 56 percent (52 percent for rural and small towns and 61 percent for urban areas). Furthermore, Ghana aims to achieve 75 percent coverage for both water supply and sanitation by 2015, a higher coverage ratio than the MDGs targets. In order to attain a target

of 75 percent, Ghana will need a capacity increase of about four and five times the current rate of water supply and sanitation respectively. The total cost to achieve 85 percent coverage is estimated at US$1.5 billion an annual US$68 million for the rural and small towns WSS, and US$81 million for urban water supply. In total, 12 million and 15 million more people will need to be provided with potable water and improved sanitation respectively, leaving a population of 4.1 million and 4.8 million for water and sanitation respectively without services (UNDP, 2006).

The Ghana Water Company Limited and Aqua Vittens Rand Limited (GWCL-AVRL) is responsible for urban water supply in Ghana; however it only meets 60 percent of urban water demand (Ofosu, 2004). The water supply in Accra is inadequate, only 9.8 percent of inhabitants have in house-connection with indoor plumbing, house connection with inside stand pipe or yard connection accounts for 38.7 percent whilst tanker services, water resellers, wells account for 51.3 percent and public stand pipe accounts for 0.2 percent (Ghana Statistical Service [GSS], 2000).

During the last two decades, rapid urban population increase and expansion in the urban areas without commensurate expansion in urban water supply infrastructure have contributed to a decrease in the percentage of urban households supplied by piped water. The GWCL is constrained by a lack of financial resources to expand its water supply systems, many of which have existed for half a century. A growing population and subsidies have further contributed to a deteriorating urban water service delivery. High levels of non-revenue water, about 54 percent, and inadequate billing and collection systems compound the problems (Apoya, 2003).

The provision of good quality water to household in adequate quantity, efficient, equitable and sustainable manner has become a major issue of development policy in developing countries today. To overcome the problem of institutional provision of water supply, many government and donor agencies are promoting public-private partnerships in the urban water supply (Venkatachalam, 2006).

However, Marin (2009) indicates that public-private partnership in urban water delivery has been controversial, particularly in recent years, after a series of highly publicised contract terminations raised doubts about the suitability of the approach for developing countries. Contracting out the provision of such essential services is inherently fraught with conflicts given the monopolistic nature of these services. The success of PPP projects have been questioned due to the diversity of arrangement in developing countries, weak institutional capacities, poor governance and gaps in the rule of law and enforcement of contracts.

This presents a difficult challenge due to the huge capital requirement in infrastructure development in the water supply sector. Governments must look beyond their national budget to seek financial, technical and managerial resources from the private sector to augment the public sector. For this reason, developing countries such as Ghana have come under enormous pressure from International Financial Institutions (IFIs) and donor agencies to consider alternative strategies such as building of partnership and privatisation of its water supply sector (Grusky, 2001).

Statement of the problem

The provision of adequate water supply is critical for coping with everyday life. However public water supply has been characterised by low-quality service and inadequate coverage as well as inability to cope with a rapid increase in population. Often the public utilities charged with the provision of water have inefficient operational practices and poor maintenance which results in high incidence unaccounted for water which is estimated to be in the range of 50 percent to 60 percent, low operating cost ratio as well as low bill collection rate in Ghana compared to 10 and 20 percent of unaccounted for water in Burkina Faso and Senegal respectively who have well managed systems (OECD, 2007). GWCL/AVRL produces 360,000m^3 of water per day from its Headworks at Weija and Kpong to Accra and with a demand of 540,000m^3 there is a shortfall of 180,000m^3 per day. Also the expansion of new communities in the municipality has exerted undue pressure on existing network system thereby worsening the water flow situation.

Hence a management contract was signed in 2006 between GWCL and AVRL to improve the water supply situation in Ghana. However water supply situation in Ga East Municipal has not improved; residents do not have water flowing through their taps for months and have to rely on water services from small scale water providers such as tanker supply, private wells and private water resellers which are expensive and the source of water is not known. This may have a serious health implication for the residents. It is therefore necessary to examine the performance of the partnership arrangement between GWCL and AVRL in urban water delivery in the Ga East Municipality.

Objectives of the study

The main objective of the study was to examine public-private partnership in urban water delivery. The specific objectives of the research were to:

- Assess the performance of PPP in urban water delivery in the Ga East Municipal.
- Examine the constraints affecting public-private partnership in urban water delivery in the Ga East municipal.
- Examine households' perception of urban water delivery in the Ga East Municipal.
- Make recommendation for an effective approach to improve urban water delivery.

Research questions

- What is the performance of PPP in urban water delivery?
- How have the constraints of water supply affected urban water delivery?
- What is households' perception of PPP on urban water supply?
- What strategies can be put forward to improve urban water delivery?

Significance of the study

The concept of PPP in urban water supply was introduced to improve the urban water system in Ghana. However, in spite of the introduction of PPP the problems associated with water delivery system still persist. Hence this study is expected to increase the knowledge and up to date information on

urban water delivery in the municipality. It will also highlight some of the challenges facing urban water supply, and suggests other options of improving urban water supply.

The results of the study could serve as useful reference material and source of information to agencies such as The Ministry of Water Resources Works and Housing (MWRWH), GWCL/AVRL, CSWA and NGOs and other stakeholders who are involved in the provision of water. It will also contribute to policy debates and research on ways to improve urban water delivery and promote water sustainability and its attendant socio-economic benefits.

Scope of the study

The research focuses on urban water delivery by Ghana Water Company Limited (GWCL) and Aqua Vittens Rand Limited (AVRL), small scale water service providers and does not consider the activities of the rural water supply systems.

Organisation of the study

The thesis is presented in five chapters. Chapter One comprises introduction, definition of public-private partnership, transition of the water sector in Ghana, statement of the problem, objectives of the study, research questions, justification of the study and the scope of the study. Chapter Two focuses on related literature, theoretical foundation and conceptual framework of the study. Chapter Three comprises the methodology adopted for the study; it includes research design, the study area, sample and sampling procedure, data collection technique fieldwork and data analysis. Chapter Four consists of

the analysis of data collected for the study and chapter five focuses on the summary, conclusion and recommendations of the study. It also outlines areas for further research.

CHAPTER TWO

LITERATURE REVIEW

Introduction

This chapter focuses on reviewing literature related to the study; the main purpose of the review is to develop a framework within which the findings of the study can be examined. It describes the institutional framework for water sector delivery in Ghana, urban water project, rural water project, public-private partnership options, modes of water service provision, public-public partnership, public-private partnership and water governance, water as economic good or public good and theoretical grounding and conceptual framework of the study.

Theoretical grounding of the study

The study is grounded by neoliberal ideological changes in the water supply sector which advocates for competition and more private sector involvement. Schouten (2009) presumes that neo-liberalism manifest itself in the water sector through a shift in ownership of water services supplier, enhanced competition and the involvement of private entities through partnership arrangement with a public entity.

Neo-liberalism is a market-driven approach to economic and social policy based on neoclassical theories of economics that encourages the adoption of the private business sector in determining the political and economic priorities of the state. The term "neo-liberalism" has also come into

wide use in cultural studies to describe an internationally prevailing ideological paradigm that leads to social, cultural, political practices and policies that use the language of markets, efficiency, consumer choice, transactional thinking and individual autonomy to shift risk from governments and corporations onto individuals and to extend this kind of market logic into the realm of social and affective relationships (Ahiwa, 2006).

Harvey (2005) also explains that neoliberal ideology is the freeing up of individual entrepreneurial skills through a well established institutional framework characterised by strong private property rights, free market and free trade. The state creates the enabling legal structures and functions required to protect private rights. The role of the government is thus minimised since it is presumed to be characterised by corruption and inefficiency in delivery of services (Budds & McGranahan, 2003). This section addresses the supporting theories and analyses the degree of relevance of these theories to the water supply sector.

- Contract theory
- Welfare economics
- Property rights theory
- Public Choice theory
- Principal-Agent theory

Contract theory

Contract theory studies how economic actors engage in contractual arrangements, generally in the presence of asymmetric information. It has become fundamental in supporting neo-liberal ideologies in the water supply

sector (Walsh, 1995). The theory proposes that contracted party will pay more attention to human resource development and draws the best out of their employees in terms of productivity, welfare and creativity. The contracted party will be able to access additional funds and make better use of available funds. Also contracts may specify the use of cutting edge technological innovation and research.

According to Njiru and Sansom (2003), entrusting water provision by contract to private parties may lead to more transparency, since a contract will specify detailed performance indicators, reporting and monitoring mechanisms. A last benefit of contracting is that the contracted party would enhance customer satisfaction, from quality and service control to reliability and rapid expansion of services to the consumers.

However, the potential to realise these ascribed benefits in the water supply sector is relatively small. Rivalry for getting a delegation contract is often muted or absent, either because governments find negotiated contracts more convenient or because bidders engage in collusive behaviour. Also the long duration of delegation contracts in the water supply sector constitutes another source of uncertainty and risk. Bidders must be able to eliminate uncertainty and make risk manageable over sometimes very long contracting periods (Braadbaart, 2005).

Welfare economics

The central element in liberalisation is the introduction of competition which forms one of the roots of economics. Adam Smith's book, 'The Wealth of Nations', dated 1776, provided one of the best-known intellectual rationales

for free trade, capitalism and libertarianism. It suggests that under specific conditions, market mechanisms will yield accurate incentives, enhance efficient resource use and encourage consumer sovereignty (Vickers, 1995).

However, analysing these benefits, it can be concluded that they are only partly relevant to the water supply sector. Consumer sovereignty maximises consumer welfare since it creates avenue for the individual to make an informed choice on the goods and services they are willing to pay. Unfortunately, in the water supply sector only in rare cases does consumers have the possibility to select alternative suppliers. Hence, the essential element of competition is often lacking (van Dijk, 2003).

The willingness of consumers to pay induces the efficient allocation of scarce resources through their buying preferences. In a situation where there is competition in the water supply sector, supply of water services will be determined by effective demand. Hence, the part of the population that is able to pay for the service will steer the allocation of the scarce resources. This would likely create inequality in service provision by serving only those who can afford the services (Schouten, 2009).

Property rights theory

Property rights theory states that private sector principals, have more clearly defined incentives to push for decision making and improvements of social services (Rezenti, 2003). The property rights theory also makes a fundamental distinction between private and public enterprises. Managers of public water providers have greater opportunity to increase their own welfare at the expense of the employer (Braadbaart, 2005).

The reason is that they undoubtedly own the property and are capable of claiming all its worth at any particular time. The bureaucrats, politicians and the tax-payers have marginal benefit to public-sector agency performance since the gains in property value is being spread over the entire community. They therefore have diminished incentives to push for improvements (Renzetti & Dupont, 2003).

Sawkins (2001) emphasises that the transfer of ownership through takeovers and mergers in the United Kingdom water industry resulted in better performance of the water providers. For example, the threat of a takeover by another company is enough to push management to increase the efficiency in water provision. Empirical evidence shows that the threat of takeover by Severn Trent and Wessex Water Company was enough to induce South West Water Company in England to put its management under considerable pressure to improve efficiency.

Public choice theory

The public choice theorist central argument is that politicians pursue their own interest rather than the public interest. Accordingly, they impose goals on public water providers that can lead them to gain votes but can conflict with efficiency. Furthermore, inefficiency will lead to higher cost and therefore, high tariffs for the households. Hence a sound argument for private provision of social services (Renzetti & Dupont 2003).

Furthermore, the governmental involvement in the water supply sector is often considered to be one of the main causes of inadequate service provision. Nickson (1997) posits that government control over water systems

have degraded due to chronic under-investment, inadequate maintenance, and subsidised services resulting in excessive water loss through leakage, poor water quality and unreliable flow. Also Spiller and Savedoff (1999) concurs with Nickson (1997) analysis of government control in the provision of public utilities citing studies undertaken in government control water services infrastructure in Latin America, as inherent with mismanagement coupled with inadequate service provision.

The benefit of private sector involvement according to the World Bank (2004) is that, the private water provider would concentrate on providing improved service delivery to consumers, whilst the state would concentrate on the policy-framework within which service provision will be enhanced. Also it would allow for greater clarity and accountability for the various organisations executing the different functions

Principal-Agent theory

The Property rights theory has a link to Principal-Agent theory. Renzetti and Dupont (2003) defines the Principal-Agent (PA) as a relationship where the principal (owner of the water utility) has the task to form a contract that gives the manager the incentive to maximise the owner's wealth. The challenge for the owner is the fact that he does not have full transparency of information leading to an asymmetry of information distribution amongst both parties. Lobina and Hall (2003) confirms that asymmetry of information reduces the effectiveness of regulation and policy implementation.

Principal – Agent theory is relevant to the water sector in the sense that the government (Principal) engage the private (Agent) to deliver services at an

agreed fee. However the principal does not have total influence over the activities of the agent. Despite the ascribed benefits of limiting political influence in water services provision, it should be noted that the idea of stringent separation of the political realm from the management of water service provision is impossible (Schwartz & Schouten, 2007). Even if the task of policy formulation, service provision and regulation were allocated to private agencies, politicians would still be held accountable by the general public with respect to the provision of social services (Schouten, 2009). For this reason politicians are always drawn into the provision of social services.

Consequently Brown (2002) argues that private investments in the water sector usually needs political backing to institute the necessary framework and legal backing to get return on their investments in the water supply sector. When there is no governmental regulation in the water supply sector consumers may be exploited due to the profit motive of private operators.

The argument for the use of private parties and market mechanisms fits within the neoliberal reform agenda which originated from a reaction against Keynesianism (state intervention into markets) adopted during the 1970s. However it was perceived that these state interventions were counterproductive because markets are complex and governmental intervention may destabilise the market (McCarthy & Prudham, 2004).

The neo-classical theory of Keynesianism advocates for the role of the state in the provision of social services as a means of facilitating economic development. Although a free market is necessary and desirable, its internal mechanism is bound to market failure hence it requires state intervention to

establish a state of equilibrium. Keynesian theory therefore advocates that full employment, reduction in inflation and growth stimulation, public expenditure particularly on social works and services must be significantly increased (Keynes, 1936).

Furthermore Sleeman (1979) opines that there are three main reasons for state involvement in social services provision in the modern society. The first reason is the essence of preventing the populace from falling below the poverty line. This can be assured when basic social services like pipe-borne water, health care services and electricity are made available. Secondly, there is the need to bridge income inequalities or promote income redistribution in society through equal opportunities. Thirdly, there is the need to facilitate a process of socioeconomic empowerment in society, by which and through those services, the people are assisted to provide effectively for their own basic needs.

Concept of Public-Private Partnership

Public Private Partnerships (PPPs) have become widely accepted in public sector management. The 1990's has seen the inception of PPP as a key tool of public policy across the world (Osborne, 2000). Neo-liberal ideology has also shaped public policy by emphasising market efficiency and the government's role as an enabler. The basis of New Public Management (NPM) was a reduction of public sector expenditure, and delegation of responsibilities to the private sector to provide public goods (Mitchell-Weaver & Manning, 1991). The ideals of NPM encouraged the establishment of PPP as a new management tool. Thus PPP has become a favourite tool for

providing services in developing society in both developed and developing countries.

The Asian Development Bank (ADB) describes PPP as a framework that engages the private sector as an important role for government in ensuring that social obligations and successful reforms are achieved. A strong PPP allocates the tasks, obligations and risks among the public and private partners in an optimal way (ADB, 2007).

The government also provides social responsibility, environmental awareness, local knowledge, and ability to mobilise political support whilst the private sector's role in the partnership is to make use of its expertise in commerce, management, operations and innovation in order to efficiently run the business. This definition states the entities involved in the partnership and obligations assigned to each partner (ADB, 2007). Grimsey and Lewis (2002), however see PPP as long term involvement of the public sector with a private entity for the construction or management of the public sector's facilities or the provision of services by a private entity to the community on behalf of the public sector.

Public-private partnership is also seen as a contractual arrangements involving a private entity and the public sector for the purpose of providing traditional public goods and services such as health, water, education and sanitation (Batley 1996; Fiszbein & Lowden 1999). Also Angeles and Walker, (2000); Akintoye, Beck and Hardcastle, (2003) contends that PPP simply implies a partnership arrangement between the public and private sector with the aim of providing improved and sustainable social services for its citizens.

Public-private partnership (PPP) describes the relationship in which government works directly with private firms in formal or informal relationships through collaboration and cooperation to pursue common goals. Privatisation has become an instrument for institutional reform by which economic activity is transferred from the public to the private sector thereby reducing excessive government spending (Wettenhall, 2003).

Rennie (2003) is of the view that issues facing PPP seem to be similar across countries and its success factor, like advantages and disadvantages also do not differ significantly, but the regulatory framework in the practicing country appear to be the turning point that creates success. There are mixed feelings worldwide about adopting PPP as a mechanism to improve efficiency and effectiveness in the utility delivery sector. It is argued that PPPs are complex and that the different cultures of public and private sectors weaken accountability structures.

Public-private partnership options in water delivery

The substantial element of public-private partnerships is establishing a relationship between an authorised government body and a private company. Like any establish relation, each of the partners tries to derive benefit from the partnership. The negotiation and decision of establishing a partnership structure is based on the risk distribution. Depending on these risks distribution and allocation of key responsibilities, some sort of the public-private partnership agreement is signed. The contractual arrangement may range from service contracts, management contracts, leases operation and

maintenance concession, as well as capital investments to divestiture and asset ownership.

Service contract

Service contracts are usually short-term agreements whereby a private contractor takes responsibility for a specific task, such as installing meters, repairing pipes or collecting bills. Payment is usually a fixed or per-unit fee agreed in advance. This type of contract allocates the least responsibility to the private sector. National Office of Water and Sanitation (ONEA) have made significant advance in the use of service contracts for the provision of water and sanitation services to the urban population in Burkina Faso (Kauffman & Pérard, 2007).

Management contract

This type of contract enables public authorities to transfer the responsibility of operating and maintaining the service to a private operator for a period of three to five years. A team of managers, seconded by private enterprise, is placed in leadership position in the public entity to support in managing the utility service. In this contract, the contractor has no legal relationship with the consumer and the operator has no investments to pay, this remains the responsibility of public authorities. This type of contract can improve the effectiveness of the service management. The private operator transfers the technical know-how and operational methods to enhance the efficient management of infrastructure and existing resources (Gwénola, 2008).

The remuneration of the operator may be linked to performance criteria (improving recovery rates, reducing the volume unaccounted-for-water), previously stipulated in the contract. However, defining clear and realistic performance targets is often difficult, especially when the information on the state of the network is limited. Indeed, some goals are not dependent only on the private operator's performance. For example, the volume of unaccounted-for-water is a good indicator of the service performance, but it depends both on the ability of the operator to reduce leaks and public authorities to make the investments for renewal (Gwénola, 2008).

This form of contract is mainly used in situations where the objective is to rapidly increase the technical capacity of service and establish more efficient management. It can also be a first step for greater involvement of the private sector in the service delivery. Example is the management contract signed between AVRL and GWCL in 2006 for a period of five years in Ghana (GWCL, 2004) and twenty-five years management contract for Queenstown and Stutterheim since 1991 in South Africa.

Affermage contract

This arrangement is similar to lease contract, but in this scenario, the private operator takes responsibility for all operation and maintenance functions (technical and commercial). Although the private contractor collects the tariffs, and pays the public contractor an agreed-upon affermage fee for each unit of water produced and distributed, there is a risk of commercial loss to the private contractor if its operation and maintenance costs are higher than the affermage fee. On the other hand, the private contractor does not need to

be directly concerned with the water tariff, provided the government can guarantee that the fund will cover the affermage fee (Budds & McGranhan, 2003).

In 1997, a 10-year affermage contract governing operations of the system was signed between three parties: the Republic of Senegal, represented by the Ministry of Water (Ministère de l'Hydraulique), (SONEES), and a private operating company formed specially for this purpose, Senegalese Water (Sénégalaise des Eaux), (SDE). SDE also signed a performance contract with SONEES for the same duration. The contract outlined SONEES responsibilities with respect to making infrastructure available to the operator and prompt execution of work relating to system investment. The contract was further extended in 2006 (Kauffman & Pérard, 2007).

Lease contract

The lease contract is similar to the affermage contract. The difference is that the revenue is determined solely by tariffs. The private contractor collects tariffs in the same way as the affermage contract, pays the lease fee to the public sector, and retains the difference. Examples can be found in Central African Republic, Sutterheim (South Africa), Niger, Maputo and Matola (Mozambique), and Windhoek (Namibia) (Kauffman and Pérard, 2007).

Concession contract

The concession contracts, enables the private contractor to manage the whole utility service at its own commercial risk. It is also required to invest in the maintenance and expansion of the system. The key difference is that the company takes commercial risk in operational and investment activities, although many studies point to the fact that risks are minimised as much as possible, both in the contracts and in subsequent renegotiations once the contract is underway. Such contracts have terms of between 25 and 30 years, to allow the operator to recoup expended capital, and, at the end of the contract, the assets are transferred back to the state or a further concession is granted. The role of government in concession contract is predominantly regulatory (Budds & McGranahan, 2003).

This form of contract has been adopted in Côte d'Ivoire, where Société des Eaux de Côte d'Ivoire (SODECI) provides water in all the cities including 600 small towns with populations of 1,000 to 20,000 each under a concession contract since 1957. SODECI works under a concession contract, managed by the government's Water Directorate, which provides regulation and is responsible for tariff setting and negotiation (Gwenola, 2008).

Build Operate Transfer (BOT)

These contracts are similar to concession contracts, with the difference being that the private contractor is responsible for constructing the infrastructure from scratch. They are usually used for projects such as water purification and sewage treatment plants, rather than distribution networks. The private partner then manages the infrastructure, with the government purchasing the supply. At the end of the contract, the assets may either remain

indefinitely with the private company or be transferred back to the government, sometimes at a pre-determined fee (Budds & McGranahan, 2003). In 1997, Suez subsidiary Lyonnaise Vietnam Water Company (LVWC) was awarded a 25-year contract to build and operate Thu Duc water treatment plant in Vietnam. LVWC would provide bulk supplies of drinking water to Ho Chi Minh City Water Supply Company (Lippens & Dang, 2001).

Divestiture

In this arrangement, the government transfers the water utility services to the private company, including the assets (infrastructure), on a permanent basis. This model has only been adopted in a small number of cases. In England and Wales, full divestiture was implemented in 1989, whereby the regional water authorities were converted into public limited companies with the sale of 100 per cent of the shares to the private sector and the general public. These private water companies are run under strict commercial rules and are subject to additional regulations than other public limited companies. For instance, they are very unlikely to be allowed to file for bankruptcy (Rees, 1998). The government only maintains a regulatory role, which, in England, is very strong. In Chile, partial divestiture was carried out for five regional water authorities in 1998, in which a controlling stake of shares in the newly created companies were sold to private sector and the rest remained with government (Bitran & Valenzuela, 2003).

Joint ventures, public limited company and co-operative models

A joint venture is not a contract but, rather, an arrangement whereby a private company forms a company with the public sector, with the participation of private investors, which then takes a contract for utility management. Examples can be found in: Barranquilla and Cartagena (Colombia), Havana (Cuba). Similarly, the public water model is an arrangement whereby a public limited company (PLC) is formed, subject to the same rules and regulations as other PLCs, and run on a commercial profit-making basis, but whose shares are wholly owned by local, provincial and national government which are non-tradable. This model then combines operation in accordance with business principles, with a degree of public control through government shareholding (Blokland, Braadbart, & Schwatz, 1999).

Water co-operatives are set up as limited companies, domestic customers are members who elect the administrative board, which in turn appoints the general manager and approve tariffs. Customers also elect a separate supervisory board that monitors the performance of the administrative board. The co-operative model is however uncommon in larger cities. It is practiced in Santa Cruz, Tarija and Trinidad (Bolivia), rural water supply in villages and towns in Chile (Blokland, Braadbart, & Schwatz, 1999).

Public-public partnership in water delivery

The majority (90%) of water operators in the world are managed by the public sector. It is estimated that about 90 percent of all major cities are served by public operators. Hence meeting MDG targets in the water sector will depend on improving public-sector services, it will be beneficial if public operators of

water supply in different countries engage in partnership to exchange technical expertise in a bid to improve the performance of public sector provision of water delivery (Marin, 2009; Miranda, 2007).

The public-public partnership is a partnership between a public sector provider of social services and another or a non-profit organisation with the aim of providing social services and transfer of technical skills. There are two broad categories of PUP; international PUP in which the partnership is between different countries and national PUP, where partnership exists within same country. The international PUP includes partnerships between water operators in different countries. For instance public water operators in Sweden and Finland support the municipalities of neighbouring countries in transition such as Latvia Estonia and Lithuania. Some international PUPs are south-south partnership, such as the support given to Huancayo in Peruvia by Argentinian water operator Aguas Bonaerense SA (Hall, Lobina, Corral, Hoedeman, Terhorst, Pigeon & Kishimoto, 2009).

A PUP is based on solidarity to improve the capacity and effectiveness of one partner in providing public water or sanitation services. It is based on the idea of common values and objectives and not for profit. A public- public partnership differs from PPP which have being promoted by the World Bank and donor agencies as the panacea to the problems of public sector management. PUPs are a good demonstration of the flexibility of the public sector to manage its utility services efficiently. It is easier and cheaper for partnerships to develop among public sectors, as compared to the costly and cumbersome takeover processes experienced by the private sector (Hall et al, 2009)

It is quite common in Europe, for example, for towns and cities to merge their water operations through inter-municipal associations. The same strength is a feature of the associations between public operators, such as Association of Dutch Water companies in the Netherlands, which provide a way of exchanging information and mutual benchmarking at low cost in a collaborative effort to strengthen operational performance of other public water operators in different countries. Also in Ghana CWSA has implemented a number of water projects in the rural communities with support from donor agencies and international not for profit organisations to improve water delivery.

The public-public partnership arrangement with Severn Trent water company in United Kingdom to improve the water and sanitation services in Malawi, brought about tremendous transformation in the water and sanitation sector and provided a model for a national approach to managing water in some cities and larger towns. The project which was funded by the World Bank led to the expansion of the distribution system and strengthened the capacity of the water board. Access to water improved significantly; the project helped develop an effective management support and training programme; the efficiency of operations increased considerably and the level of unaccounted-for water fell to about 16 percent (Hall, 2001).

Public-private partnership and water governance

The concept of water governance broadly refers to the way water supply services are managed and delivered. That is whether the efficiency and equity of distribution are ensured, whether the delivery process is transparent,

accountable, participatory and responsive, and whether the citizens are empowered and powers are delegated to enhance their welfare (Ballabh, 2002). Thus good governance in water supply systems thrives when there are good institutions, good policies, good legal and regulatory framework and community participation.

A public-private partnership can also be seen as an appropriate institutional means which deals with particular sources of market failure by establishing a perception of equity and mutual accountability in transactions between public and private organisations through co-operative behaviour. The relative merit of the idea of public-private partnership is grounded mainly around mutual benefit. As the roles of government in public-private partnerships are not only to provide services, but also to monitor the marketplace, a well-defined regulation framework is essential (Pongsiri, 2002).

A sound regulatory framework will increase benefits to the government by ensuring that essential partnerships operate efficiently and optimise the resources available in line with broader policy objectives, ranging from social policy to environmental protection. In turn, it provides assurance to the private sector that the regulatory system includes protection from expropriation, arbitration of commercial disputes, respect for contract agreements, and legitimate recovery of costs and profit proportional to the risks undertaken (Jamali, 2004). A public-private partnership also necessitates an effective government regulation; a clear legislative framework indicating the roles of the public and private sectors, their relationships and the areas for

cooperation which is essential for building a sustainable partnership (Wang, 2000).

The theory of PPPs in the water sector does not only rely on competition and risk allocation for the private sector to unleash its efficiency and deliver the expected social and environmental benefits but also relies on the reform of governance through the introduction of regulatory institutions to ensure that governments retain its shareholding in the operating company. The rationale for regulation in the water service sector is to control the monopoly structure of the industry (Franceys, 2000). Regulation is thus viewed as an imperfect substitute for competition, aiming at safeguarding consumers' interests while providing private companies with the incentives to invest and operate efficiently (Klein, 1996; Rees, 1998).

Rees (1998) describes regulation as a bargaining process between the parties involved, whose outcome is expected to depend on the resources and needs of the various players. Government departments responsible for the water sector and private companies, including financial institutions are not the only players involved in the successful regulation of the water sector, other government agencies and consumer organisations are among the stakeholders keen to ensure that private sector involvement will be beneficial to both parties.

According to Harris (2003), the lack of capacity and the absence of independent public institutions in developing countries are factors limiting the sustained engagement by the private sector in the water supply and other service delivery sectors. Independence of the regulatory function is considered an unachievable idea in developing countries (Rivera, 1996). Similarly,

Leonard (1987) concurs that the political and social constraints on policy making management in many African countries is different, hence attempts to transfer western style managerial concepts are likely to end in failure.

There are many examples of the difficulties that have been encountered with regulation in developing countries: In Cartagena, Colombia the independence of the regulatory body appears to have been jeopardised by a joint venture arrangement that was designed to overcome political resistance to Private Sector Participation (PSP) (Nickson, 2001a). Nickson and Vargas (2002) attribute the collapse of a water supply concession in Bolivia to regulatory failure although political and social factors were also significant. One of the constraints of private participation is the asymmetry of information between the regulator and the regulated operator that is to say that the regulator is less informed about the operations of the regulated company (Klein, 1996).

Lobina and Hall (2003) confirm that asymmetry of information is a problem which reduces the effectiveness of regulation. There is also evidence that asymmetry of capacity is also a problem, since regulators may simply lack the resources of the private companies in addressing areas of conflicting interests. Furthermore, beyond regulatory weakness, there is evidence that PPPs create problems of transparency and accountability, and also provide incentives for corruption. These questions are usually avoided in the literature of PPP, but have a significant effect in reality. The relationship is altered by the lack of public accountability mechanisms, which reduces the role of public political inputs and the opportunities for corruption which creates obvious distortion in the goals sought by the partnership. The possibility that private

sector operators might be tempted for financial reasons and ignore low income users has resulted in efforts to ensure that Public-Private Partnership (PPP) contracts set down minimum standards for all customers and also institute regulatory requirements to protect the interest of lower income group (DFID, 1999).

Evidence from Kenya, South Africa, Argentina and other developing countries suggest that PPP arrangement are likely to succeed if there are shared vision that takes into account the needs and preferences of the poor, has effective communication channels, and includes formally agreed roles and responsibilities between the various partners (Sohail & Cotton, 2001).

According to Kauffman and Pérard (2007), the success of urban water supply is attributed to efficient regulatory mechanism, appropriate design of the contract and clear allocations of responsibility amongst the three actors involved. The state is responsible for defining the sector policy (example integrated Water Resource Management [IWRM]), the legal framework and approval of tariffs. For example, SONES, the state water company of Senegal is responsible for asset management, securing financial resources, public awareness and controls operations and maintenance whilst SDE the private entity is responsible for operation and maintenance, billing and revenue collection and customer management. This partnership has made SDE more efficient and has increased the customer base to 69 percent between 1996 and 2005, had a volume of production to sale ratio of 80.5 percent and has balanced its accounts since 2003. The government makes sure it pays its bills and a bill collection rate of 98.3 percent has being achieved.

Nickson and Franceys (2003) confirm that introducing the private sector in water supply to remedy existing capacity constraints gives rise to a requirement for even greater government capacity to enable it deal with the more complex tasks of regulation. Larbi (1998) also indicates that appropriate organisational and institutional conditions must exist for partnerships to be effective.

Water as an economic good or public good

The argument over public and private roles in water resource use and governance is often dependent on the way water is defined within a particular socio-political context. Proponents of water as an economic good or commodity argues that water is not different from other essential goods and utilities and private companies can run these services more efficiently and profitably than government owned enterprises because they are responsive to both customers and shareholders. Market pricing of water would encourage efficient use, for example, users will tend to conserve water as scarcity drives up prices (Bakker, 2003a).

The economic value of water is embedded in the fourth principle set out during the International Conference of Water and Environment (ICWE) held in Dublin in1992. The declaration sets out recommendations for action at local, national and international levels to reduce the scarcity of water through the following four guiding principles:

- Fresh water is a finite and vulnerable resource, essential to sustain life, development and the environment;

- Water development and management should be based on a participatory approach, involving users, planners and policy-makers at all levels;
- Women play a central part in the provision, management and safeguarding of water; and
- Water has an economic value in all its competing uses and should be recognised as an economic good.

The fourth principle which assumes that water has economic value in all its competing use has been accepted by advocates of IRWM as an important element in the management of water resources (Rahman & Varis, 2005). Based on this principle, many multilateral and bilateral agencies such as the World Bank and ADB sees water as an economic good hence should be privatised (Bakker 2003b).

Adejumobi (1999) opines that the idea of introducing the principle of exclusion to social services is misleading. Although some of the social services may appear nominally private in nature, they are essentially public goods in terms of its necessity, national value and importance. For example, the provision of pipe-borne water may be a private good, since its consumption may depend on people's ability to pay. However, the importance of pipe-borne water to the good health and vitality of the population makes it essentially a public good, which merits the attention of the state in its provision and other social services like health care and education to meet human needs. When the above services are not subjected to appropriate pricing, it will have severe consequences for the society since many people will be denied of access.

Furthermore, between these two views is an increasingly mainstream view of water as an economic good, a social and environmental good, and a human right in the context of both service and resource management. On the other hand proponents of this view suggest that these use values need to be balanced and where conflict arises, priority should be given to human and environmental requirements without cost recovery or profit becoming a barrier to meeting basic human needs (Hill 2003).

In The Netherlands and Uruguay, the privatisation of water supply is illegal. In 2004 The Netherlands parliament passed a law which precluded any private company from operating a public water supply. The law affirms that drinking water services to consumers may only be provided by entities which are fully publicly owned and also in the same year a constitutional amendment on water was approved in Uruguay. The Article 47 of the Uruguay Constitution emphasises that access to pipe water and sanitation are fundamental human rights and that social considerations take priority over economic consideration in water policies. The water reform also included the management and control of water sources. Hence these services will be provided exclusively by the state.

Modes of water service provision

This section reviews the mode of operation of water service providers in the public and private sectors. It discusses public sector provision, large scale formal private sector provision and small scale informal private sector provision.

Public sector water provision

This mode of management arrangement facilitates the public sector to take full ownership of the State's water supply infrastructure and distribution. Public sector ownership is not in itself a cause of inefficiency or an inferior basis for providing water and sanitation. About 90 percent of the worlds' population in developed and developing countries, have water supplied by public sector undertakings. Historically, water and sanitation was brought into the public sector over the last century because of the perceived inefficiencies of the private sector (Budds & McGranahan, 2003; Hall, 2001).

Nevertheless in developing countries, most of the urban water provided by the public utilities performs poorly. Serageldin (1994) asserts that various performance reviews by the World Bank intimates that the services provided by public water sector are of high cost and low quality coupled with low recovery mechanisms. Estache and Kouassi (2002) in their assessment of the performance of 21 sampled public water utilities in Africa between 1995 and 1997 also found that public utilities in sub-Saharan Africa have poor cost recovering mechanisms and are not able to meet the demands of their target populations.

Similarly, consumers do not pay for water services either because of services levels are low (operations and maintenance, unaccounted for water, unreliable water supply) or because cost recovery mechanisms are inadequate. Water agencies therefore, have insufficient revenue for network development and improvement leading to a deplorable state of infrastructure and a decline in performance (Department for International Development [DFID], 2001).

The debate on provision of water supply has been centred on the dichotomy between the public and private, and which ownership would improve services to the urban population. Estache and Rossi (2002) confirms that there is no firm evidence of a systematic superiority of one form of utility ownership over the other in developed countries, whereas similar studies in Chile by Bitran and Valenzuela (2003) and in Africa by Estache and Kouassi (2002) showed inferior performance by public providers.

Nickson (1997) contends that public water utilities in a number of Southern African countries were improving their performance by employing private sector best practice as the benchmark against which to measure improvements. Nonetheless, Hall (2001), Amenga-Etego and Grusky (2005) asserts that the public sector has been able to operate successful Public Sector Water Undertakings (PWU) in transition and developing countries, as well as in developed countries. They maintain that private operators are also faced with problems irrespective of the form of partnership they engage in.

The public sector water company of Burkina Faso went through some major reorganisations in the early 1990s. Part of this was computerisation of its systems, which included creating and maintaining an up-to-date customer database. This initiative improved the provision of water supply in Ouagadougou. The leakage rate have been reduced, leading to low levels of unaccounted for water of about 20 percent and improved financial base as result of increase bill collection rate. Also in Uganda, the National Water and Sewage Corporation (NWSC) has being able to reduce unaccounted for water and improved bill collection rate and engaged staff in the water sector reforms (OECD, 2007).

Large scale formal private sector provision

The private involvement in water supply is the need to mobilise new resources for investment and increase efficiency in service delivery while reducing cost for the public sector. Large-scale private sector also brings with it a wealth of skills and experience in water supply: quality network distribution, efficiency in cost recovery mechanism and improved tariff regimes. Due to superior management practices, technologies and investment, improvements in bulk water supply, treatment processes and better overall operation of the distribution systems, there have been considerable reductions in unaccounted for water and improvements in the reliability, quantity and quality of water supplied (Menard & Clarke, 2000).

The introduction of a private sector operator in the water sector in Abidjan, Cote d'Ivoire since 1959 under a mixture of concession, lease and management contract has seen a tremendous improvement in the water supply sector. These include an increase in the proportion of the population with access to safe water partly due to improved rehabilitation, maintenance and compliance with the World Health Organisation (WHO) drinking water norms. There has also been an increase in the number of household connections, increased metering for private and government customers and improved customer services (Menard & Clarke, 2000).

However, private investments in the water sector in developing countries are very low. The OECD (2003) attributes this to huge investment requirements which are significantly higher than those of other infrastructure services. Private water services provision in the urban areas is characterised by relatively low return on investment. Because of this, operators are particularly

sensitive to the quality of the investment climate and the risk level, which constitute a major obstacle to public-private partnership in many parts of the developing world.

The World Bank (2004) estimates that only 5 percent of investment associated with private sector initiatives in infrastructure in developing countries from 1990 to 2001 went to the water sector and of this, a substantial proportion relates to large transactions in three countries outside the low-income bracket (Brazil, Chile & Argentina). The distribution of the total investment between low, lower middle and upper middle-income countries was roughly 10 percent, 30 percent, and 60 percent respectively during this period.

Small-scale informal private sector provision

The informal water service provision has no formal provision of water by a utility company and no regulation. The vendors in this sector have emerged due to the deplorable state of water supply in developing countries. They have been instrumental in extending water to areas where the formal water network services are not available though they sell water at exorbitant prices. For instance, in Ghana about 40 percent of urban population who rely on their services pay between 5 and 14 times beyond the GWCL/AVRL lifeline tariffs per cubic meter of water (Nyarko, 2007; Doe, 2007).

Community managed vending kiosks is also a category of informal water supply, in which water is distributed by community groups from a common water source. Water is sold in buckets by the local utility, or the local utility gives the vending right to concession holders in the private sector. In

Dosso, Niger, neighbourhoods elect a committee which then employs kiosk holders to sell water at a fixed tariff. The maintenance of the facilities and the water is paid from the sales (van Wijk, 1997). This mode of water supply is practiced in the rural areas of Ghana by the CWSA where community members contribute towards the construction of boreholes within their communities.

Cost recovery and sustainability

The basic argument for the introduction of private sector participation in urban water supply centres on the view that public sector provision of urban water delivery is inefficient and cannot supply adequate water to meet the demands of the growing urban population. Moreover, inefficient cost recovery mechanism threatens the sustainability of water supply systems. When cost recovery mechanisms are efficient, it will lead to improvement of service delivery and generate enough revenue to meet the expected expenditure. Also inappropriate pricing affects cost recovery initiatives resulting in inefficient operation and maintenance of water systems.

Cardone and Fonseca (2003) postulate that cost recovery deals with recovering all of the costs associated with a water system, programme or service to ensure long term sustainability. In other for the water sector to ensure sustainability in the provision of water services, revenue collected should be able to cater for operations and maintenance as well as replacement of old infrastructure.

Savenije and van der Zaag (2002) also assert that when cost recovery is low, maintenance and operation of infrastructure will be hindered. This

results in deterioration of services and ultimate collapse of the water supply system. They contend that consumers will resort to drinking unsafe water or pay more to vendors while the rich receive more water at subsidised rates. This assertion is supported by Cardone and Fonseca (2003) which indicates that if a utility service provider is unable to recover its operating cost, it will be incapable of providing funds for network expansion in urban areas or maintain the existing services adequately. Where cost recovery is not fully achieved, utility fails to maintain the infrastructure resulting in the deterioration of network systems to and this pose health risks for communities as they resort to drawing water from unsafe sources thereby being affected by the outbreak of diarrhoea diseases.

Empirical evidence of public-private partnership in urban water supply

Cases of failed public-private partnership in water supply

The World Bank and other international donor agencies has led the arguments for the introduction and development of policies to develop water systems in developing countries through privatisation since the 1990's. They presumed that increase investment; more efficient operation, improved service coverage and better governance can be achieved through privatisation of water systems (World Bank, 1995). Kessides (2004) concludes that in the past the policy reform in the public sector has been oversold and misunderstood. In future, reforms cannot be applied blindly as has been the case in the past. There is no universal reform model and PPP must come only after restructuring and introducing competition.

Hall (2001) opines that private sector participation have failed to deliver investments and new infrastructure as proclaimed. The number of household that have been connected as result of the private water operators in developing countries represents less than (1%) of the people who need to be connected to meet the MDG target for water. He intimated that when funds were provided to the public sector during the water decade (1981-1990) which is usually referred to as a failure, the overall percentage of people living without water supply reduced from 56 percent to 31 percent.

According to Hall (2001), there have been difficulty with privatised management of water systems irrespective of the option adopted whether concessions, leases, management contracts, or build-operate-transfer (BOTs). These include:

- a lack of competition
- higher prices, often caused by privatisations used to make debt reductions
- difficulty in terminating unsatisfactory concessions
- poor results from private management
- private sector reluctance to extend water and sanitation access to the poor
- multinationals use of water profits to subsidise other global investments
- difficulty in regulation, lack of transparency, secrecy and cases of corruption

Public authorities have been able to operate successful Public Sector Water Undertakings (PWU) in transition and developing countries as well as

in developed countries. Amenga-Etego and Grusky (2005) confirms that PPP is faced with a lot of problems and maintains that the public sector can operate PWUs in developing countries successfully.

The private sectors operators have also failed to show greater efficiency than public sector operations. Empirical evidence from studies by Estache, Perelman and Trujillo (2005) in all continents show that ownership does not appear to make any significant difference to efficiency and there is also no significant difference between the efficiency performance of public and private operators. Hence it is assumed that with respect to utilities, ownership does not matter as it is sometimes argued.

Kirkpatrick, Parker and Zhang (2004) also undertook a study covering 110 African water utilities, including 14 private operators, and found that there was no significant difference between public and private operators in terms of cost. Estache and Kouassi (2002) in their assessment of the performance of 21 sampled public water utilities in Africa and two private operators for the period 1995 to 1997 found that public utilities in many sub-Saharan Africa have poor cost recovering mechanisms and are not able to meet the demands of their target populations. Hence establishing efficient institutional structure is more important than private ownership in explaining differences in efficiency.

In September 1999 the water privatisation to Aguas del Tunari a subsidiary International Water Limited (IWL) Cochabamba, Bolivia led to price hikes of up to 200 percent in Cochabamba, Bolivia. The average water bill was estimated to equal 22 percent of the monthly pay. The concession was however terminated in April 2000, following social unrest and military

repression which left one person dead, two blinded and several injured in 2004. Another uprising in El Alto, a poor suburb of LaPaz in Bolivia, led to the termination of Suez concession. There have also been similar rejections and reversals in developed countries: in the USA, Suez concession contract was terminated because a public sector operation was preferred (Lobina, 2000).

In Africa, the water supply contract between Gambia and Veolia was terminated in 1995 on the grounds of poor performance. Also in Bamako, Mali a 20 year concession contract with Société d'Amenagement Urbain et Rural (SAUR) for the provision water and electricity in 1999 was terminated in 2005 on the grounds of poor performance. Biwater's 10 year lease contract signed in 2003 to supply water for Dar-es-Salam and Bagamoyo, in Tanzania was terminated in 2005 on the grounds of poor performance (OECD, 2007). In Ghana for instance, the partnership between GWCL and AVRL has come under numerous criticism from consumers and workers belonging to GWCL/AVRL on the grounds of poor performance. Hence the contract was not renewed after the first term (2006-2012). The banner in plate 1 shows workers discontent of the partnership.

Plate: 1. A banner at GWCL/AVRL headquarters showing workers displeasure of the partnership Credit: Author

Cases of successful public-public partnership in urban water supply

Although the inception of the PPP in urban water supply has not seen much success in the developing countries, there have being some success in some African countries, with respect to SODECI in Côte d'Ivoire SDE in Senegal and Severn Trent Water Company in Lilongwe, Malawi.

Marin, Ouayoro, Fall, and Verspyck (2009), opines that PPP for the provision of water in Côte d'Ivoire was the first and largest in the developing world. It has being in existence since 1959, serving more than 7 million people. Since 1990 SODECI sustained its good operational performance and even improved on several key indicators. While the share of non revenue water remained in the 14–18 percent range, water losses per connection were further reduced between 1988 and 2001, from 0.18 cubic meters a day to 0.13. Labour productivity improved significantly, with the number of staff per

thousand connections dropping from 6.2 to 3.0, even though there were no layoffs and the total number of employees rose from 1,320 to 1,600. The bill collection rate remained at about 98 percent for residential customers, though there were recur-rent problems in collecting bills from government agencies. The most notable achievement was the expansion of access to piped water.

However, since 2002, SODECI has faced exceptional circumstances as the de facto partition of the country between government and rebel-held areas led to unprecedented operational and financial challenges. Though the share of nonrevenue water has risen from 18 percent to 23 percent, and losses per connection have returned to the pre-1988 level (0.19 cubic meters) a day, it is better compared to the standards in the in the sub region (Marin, Ouayoro, Fall & Verspyck, 2009).

The public-public partnership with Severn Trent Water Company of United Kingdom to improve the water and sanitation services in Lilongwe, Malawi, was a success, from the point of view of institution building, and provided the model for a national approach to managing water in cities and larger towns. The project which was by funded by the World Bank, expanded the distribution system and strengthened the capacity of the water board. Access to water improved significantly; the project helped develop an effective management support and training programme; the efficiency of operations increased considerably and the level of unaccounted-for water fell to 16 percent (Hall, 2001).

In 1997, a 10-year affermage contract governing operations of the system was signed between three parties: the Republic of Senegal, represented by the Ministry of Water (Ministère de l'Hydraulique), (SONEES), and a

private operating company formed especially for this purpose, Senegalese Water (Sénégalaise des Eaux), (SDE). SDE also signed a performance contract with SONEES for the same duration. Senegalese Water has been able to improve access to connection and more than one million new service lines, also water supplied 24 hours in most areas of Darkar and unaccounted for water has being reduced from 35% to 20%. Moreover the government agencies pay their bills promptly and the sector is financed through tariffs collected from users (Kauffman & Pérard, 2007; OECD, 2007).

Issues on water sector in Ghana

Institutional structure of the water sector in Ghana

Institutions represent established ways of behaving, representing the beliefs, practices and roles of a part of the structure of society. In another sense, an institution is the structure or organisation rather than just the behaviour. According to Mitchell (1979), institutions are the organs that perform the functions of societies. In the light of the expressed views on institutions, it is pertinent to note that the institutional framework within which water projects operate can contribute to their success or failure. The institutional structure of the water sector in Ghana is shown in Figure 1.

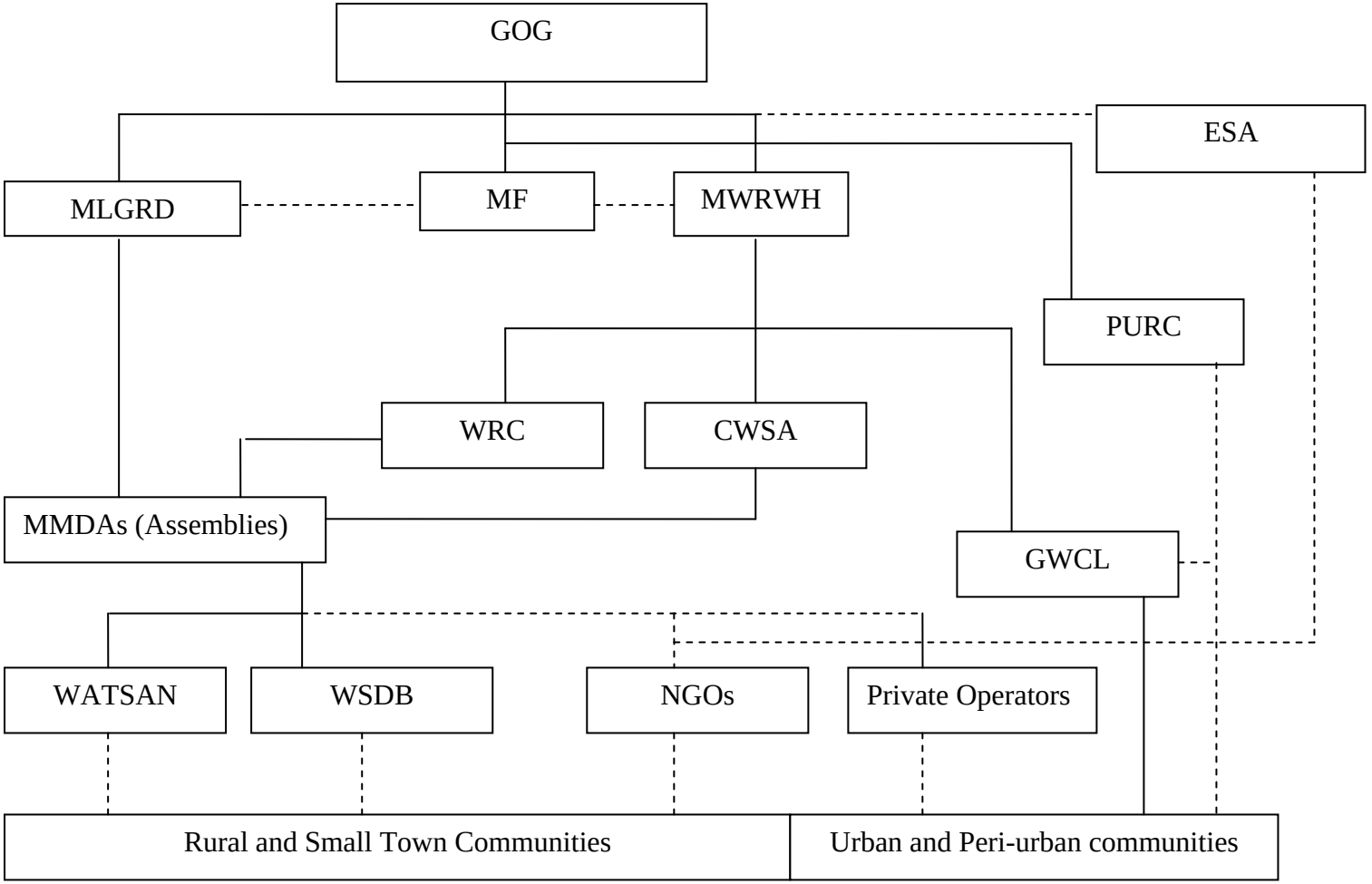


Figure 1: Institutional structure of the water sector in Ghana

Source: Awuah, Nyarko & Owusu, 2010

The Ministry of Water Resources Works and Housing (MWRWH) is responsible for policy formulation and coordination as well as soliciting for funds from external support agencies (ESA) through the Ministry of Finance (MF). Also the Water Resource Commission (WRC) was set up under Article 269 of the 1992 constitution and Act 522 of 1996 to be the sole agency responsible for coordinating water policy in Ghana. The Act 522 of 1996 empowers WRC to propose comprehensive plans for the utilisation, conservation, development and improvement of water resources in Ghana. It has the mandate to initiate and coordinate activities connected with the development of water resources. It grants water rights and can also require water user agencies to conduct research into water resources. It has authority to monitor and evaluate programmes for the operation and maintenance of water resources. It also advises government on the issues that are likely to affect water resources.

Furthermore the Ghana Standard Board (GSB) is responsible for setting drinking water standards in the country while the Public Utility Regulatory Commission (PURC) was set up in 1997 by the Government as an independent body to provide guidelines on rates to be charged by utility companies, promoting fair competition, protect consumers and work towards full cost recovery.

The District Assembly (DA) amongst its activities regulates tariffs of the community managed water systems. The enforcement of environmental quality laws including control of polluting available water resources is supervised by Environmental Protection Agency (EPA). The Community Water and Sanitation Agency (CWSA) facilitate the provision of water in rural

communities and small towns with a population ranging between 2000 and 5000. The District Water Sanitation Team (DWST) manages the implementation of projects in rural and small towns. The Water Sanitation Development Board (WSDB) and Water and Sanitation Committee (WATSAN) represent the community in the management of these projects in small towns and rural communities respectively. The GWCL-AVRL concentrates on providing, distribution and management of water for the urban population.

Organisational structure of GWCL/AVRL

The organisational structure of GWCL has changed following the implementation of the public-private partnership. The private partner; AVRL has assume the management of all urban water delivery systems as well as human resources. The restructuring was meant to reinforce work ethic in the urban water delivery sector. The company is managed by the managing director and his two deputies, Director of Finance and Director of Operations.

They are assisted by chief managers at the head office and ten chief managers responsible for all the regions in Ghana. The regional chief managers and AVRL manages the head offices in the regions and are responsible for running and development, water quality assurance, operations and maintenance, finance, commercial operations, administration, corporate planning, internal audit, legal services, procurement and public relations. The organisational structure of the GWCL/AVRL is shown in Figure 2.

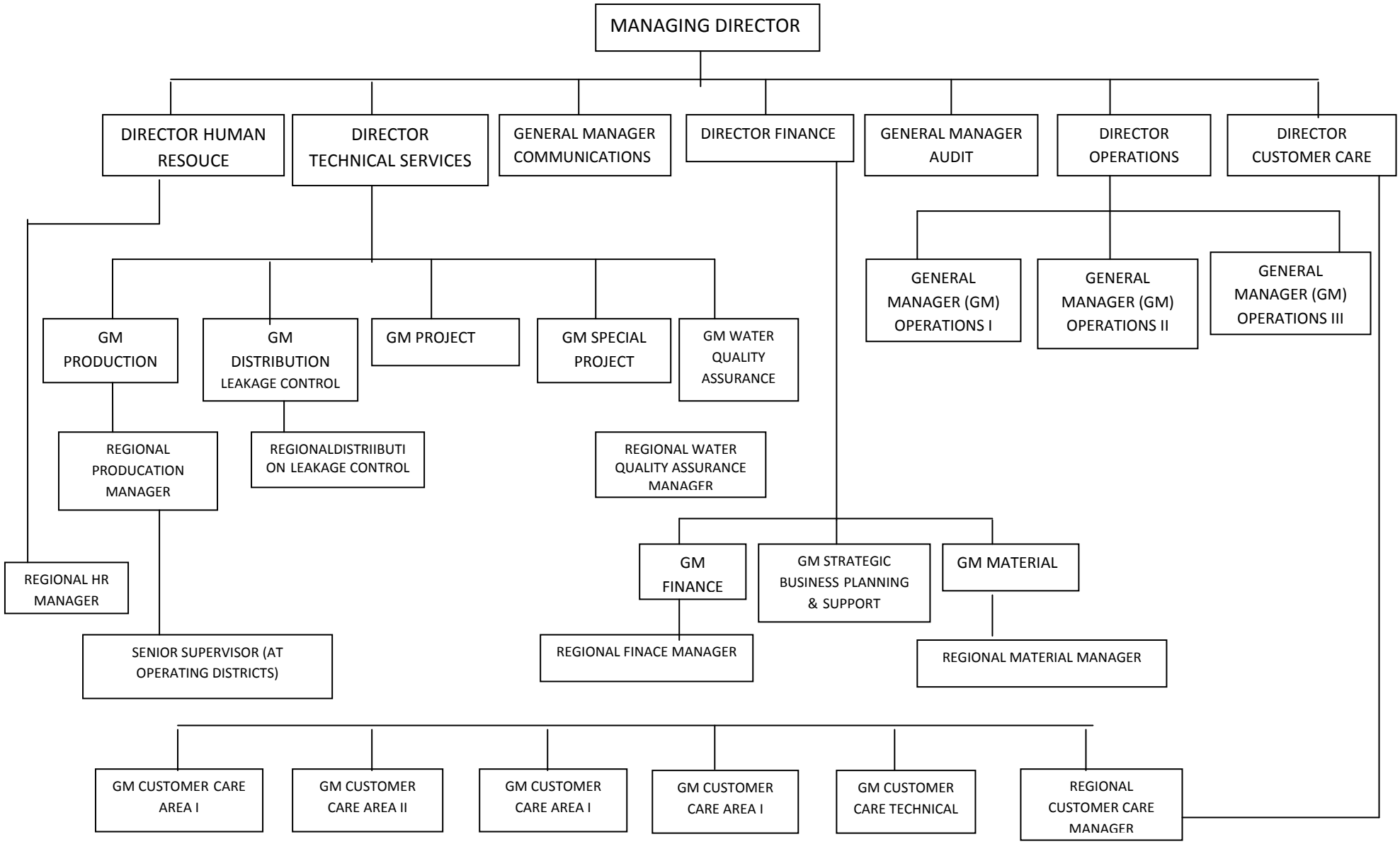


Figure 2: Organisational structure of GWCL/AVRL

Source: GWCL/AVRL, 2006

Transition of the water sector in Ghana

The provision of public water supplies in Ghana began in 1928 with a pilot pipe-born system managed by the hydraulic division of Public Works Department (PWD) in Cape Coast. The scope of operation of the hydraulic division was further widened making it responsible for the planning, design, construction, operation and maintenance of water supply systems in both urban and rural areas (MWRWH, 2009).

After Ghana's Independence in 1957, the division was separated from the Public Works Department and placed under the Ministry of Works and Housing with responsibility for both rural and urban water supplies. In 1965 Ghana Water and Sewerage Corporation (GWSC) was duly established under an Act of Parliament (Act 310) as a legal public utility entity responsible for the provision of urban and rural water supply for public, domestic and industrial purpose as well as the establishment, operation and control of sewerage system (MWRWH, 2009).

The corporation had the power under the general authority of the Ministry of Works and Housing to plan, construct and operate water supply and sewerage schemes and to collect rates and charges for the water and sewerage services provided. The GWSC as a statutory corporation, remained in operation from 1966 until 1stJuly,1999 when it was converted into a Limited Liability Company known as Ghana Water Company Limited (GWCL) under Act 461, as amended under Statutory corporation LI. 1648 (MWRWH, 2009).

Since the beginning of the 1990s, comprehensive reforms of the Ghanaian water sector has been initiated by the Bretton Woods Institutions.

The Government of Ghana was obliged to restructure the water sector by establishing regulatory bodies, opening the sector to private sector participation and separating responsibilities for urban water supply from rural water supply. Ghana Water Company Limited (GWCL) was created to be solely in charge of urban water supply. In spite of external assistance, GWCL continued to suffer from massive financial, managerial and technical problems. The gap between supply and demand widened and whilst demand for potable water in the cities was on the rise, water systems were deteriorating (Fuest & Haffner, 2007).

In order to introduce greater efficiency in the operations of GWCL a 10-year lease contract was envisaged between GWCL and Azurix of United States of America. However in the year 2000, the lease contract failed due to public opposition and accusations of corruption which led to the formation of the Coalition Against Water Privatisation (CAWP). Unfavourable private investment, particularly in the water sector caused a comprehensive revision of the policy and the modification of the PPP programme from lease to short-term management contract with an ensuing concession in 2004. This process was to be supported by external donor agencies substantially upgrading the water supply infrastructure (Fuest & Haffner, 2007; Rahaman & Varis 2005).

The conversion of GWSC in to GWCL resulted in the separation of the water supply sector from sanitation as part of Ghana's Enhanced Structural Adjustment Policy (1999) in collaboration with the IMF and the World Bank. This was done with the objective of increasing the role of private sector participation in urban water supply. The change was also to enable GWCL to

concentrate exclusively on the provision of water to urban communities (Fuest & Haffner, 2007).

The management contract for Ghana's urban water supply

The contract for urban water supply in Ghana is a five year management contract signed in October 2006 and expires in September, 2011 between GWCL and Vitens Rand water services BV from Holland and Aqua Vitra Limited from Ghana. The private entity had a joint name of Aqua Vittens Rand Limited (AVRL). It is the intention of the GWCL to opt for an affermage contract when the management contract expires. The objectives of the management contract were to:

- Expand reliable supply of safe water in the urban areas
- To ensure that low income consumers have access to potable water at affordable prices.
- Ensure sustainability through cost recovery.
- Support further involvement of the private sector in to management and operation of the sector under this management contract.
- Ensure an adequate and steady flow of investment funds with an emphasis on low cost and concession financing.

The system expansion and rehabilitation section was designed to support the increment of the amount of treated water for sale, extension of water to low income areas, rehabilitating existing infrastructure to reduce unaccounted for water and dam safety upgrades as well as installation of

meters, provision of engineering services, vehicles and equipment for grantor's regional and district offices.

The project was funded by one hundred three million (103,000,000) United States Dollars from the World Bank, five million (5,000,000) United States Dollars from Nordic Development Fund and twelve million (12,000,000) United States Dollars from the Republic of Ghana (GWCL, 2004).

Urban water supply project

The GWC –AVRL manages about 82 urban water systems for the provision of water for domestic use, the public sector and industrial sector in locations with more than 5,000 inhabitants throughout the country. The total installed capacity of all the systems is about 737,000 cubic metres per day. However, potable water demand in the urban areas was estimated to be about 939,070 cubic metres per day whilst supply of water is about 551,451cubic metres per day, resulting in effective urban supply coverage of about 59 percent (Fuest & Haffner, 2007).

The Urban Water Project (UWP) is part of an overall process to restructure the water sector. Since it began in 1994, the restructuring process has been implemented in three phases. The goal of the government is to at least create 50,000 new connections and standpipe with low income household being the majority.

In phase one, rural water sector was separated from urban water sector. GWCL became responsible for urban water supply and CWSA was to facilitate the provision of water supply in rural communities and small towns.

The WSDB and WATSAN were to represent the community in the management of water projects under the supervision of the District Assemblies (GWCL, 2005).

Regulatory institutions were established in phase two comprising of PURC and WRC. The PURC was set up to regulate tariffs, monitor operational performance, protect consumers from high tariff and also seek service providers' interests whilst WRC was established to regulate and enhance sustainable use of water resources in the country. The PURC has initiated pro poor programmes to charge lifeline tariff for low income households living in compound houses, make water affordable and accessible for the poor living in areas served by vendors and ensure quality tanker supply of water to consumers at affordable price.

Phase three of the UWP, expects that GWCL-AVRL would be efficient in water supply operations; expand the supply of safe water and ensure that poor households have access to potable water at affordable prices. It was also to ensure that the urban water sector as a whole become financially sustainable to enable credit facilitation for the expansion and improvement of the urban water system. It was agreed with the World Bank that as much as $91.8 million or 74 percent of the $120 million dollars for the project would be used to rehabilitate and expand the network to make water available to all, especially people in un-served or under-served urban areas (GWCL, 2005).

The UWP is expected to expand water supply to low income consumers, thus reducing the need for residents to rely on tanker supplies. Increased supplies of water and continued good quality water will mean that residents will spend less money on water and less time in searching for water.

This frees up more of one's household income to pay school fees, house rent and good meals.

Rural water supply project

The CWSA supports the District Assemblies (DAs) to build the institutional and organisational structures for management systems and implementation of the National Community Water and Sanitation Programme (NCWSP) in rural areas. The devolution of functions in the Water and Sanitation Sector to local government bodies has made the DAs the statutory owners of the water in small towns and rural communities. This has provided impetus for community-driven development. The community provides 5 percent financial contribution for the capital costs and in some cases a corresponding 5 percent contribution from the DA is required for development of these small town schemes (Nyarko, 2004).

Challenges of urban water supply: Ghana Water Company Limited

Urban water supply system needs huge capital investment to enhance efficient delivery of services. The absence of capital investment makes provision of water supply difficult for countries where low incomes predominate. The threat of urbanisation is significantly increasing the demand for water of which supplies do not meet. Even where water is available, systems have been severely degraded due to low investment and inadequate maintenance resulting in high unaccounted water due to leakages in exposed pipelines, poor water quality and unreliable water flow (Nickson, 1997).

A report by Nii Consult (2003) indicated that unaccounted for water continued to remain high around 50 percent resulting from leakages of old and badly installed piped network systems, illegal connections, understatement of consumption as well as inappropriate categorisation of customers. According to the UN, by 2030 one in two Africans will be living in an urban area. In Ghana the population living in urban areas increased from 26 percent in 1965 to 46 percent in 2005 and is projected to increase to 58 percent within the next twenty years (UNEP, 2005). Hence huge investments are needed especially in the drinking water sector to meet the demands of the growing population.

The GWCL is faced with many challenges; efforts at restructuring the company and raising its efficiency seem to have had little success. The financial position of the GWCL remained weak; it is survived only by means of considerable government subventions. For example, for the fiscal year 2002 the GWCL recorded a net deficit of GH¢ 78 million. This resulted not only from inadequate tariffs to recover costs and inability to collect revenue, but also from a severe burden of debt and externalities such as inflation and exchange losses caused by the depreciation in the local currency (Nii Consult, 2003). Also Maame (2002) reports that household meters were not read hence water consumed by households and other government agencies were not regularly billed. The amount owed to GWCL by households and commercial companies which is estimated to be around GH¢ 16 million and GH¢ 100 million respectively is lost through leakages and illegal connections.

This assertion is confirmed by Fuest and Haffner (2007) which contend that bills and payment of fines were often a matter of discretion and negotiation. Sanctions (disconnecting the customer) were irregularly applied

and when private offenders are caught, it was possible to either bribe the collectors or to negotiate for postponement of payment. Some consumers connive with GWCL staff to bill them on flat rates when in fact they should be metered and billed for actual amounts consumed. When consumers were disconnected from the network some could find ways of reconnecting the lines themselves without paying the appropriate fine.

In addition, there are severe constraints in recovering costs from public actors such as ministries, government departments and agencies. Throughout the country, hospitals under the Ministry of Health, the Police Service and government schools habitually do not pay bills for water consumed. The GWCL were practically cross-subsidising the government agencies. For reasons of political loyalty it was difficult to impose sanctions (Bayliss, 2001).

The GWCL, like all public corporations in Ghana, has been put under the oversight of different government organs in an attempt to improve efficiency. Like private enterprises, they have boards of directors, the members of which are appointed based not necessarily on their competence, but on their loyalty and contributions to the ruling party. Since they have no personal stake in the businesses of which they are directors, the motivation to work towards a viable business is mostly absent (Suglo Alidu, 2005).

Opoku Agyemang (2003) affirms that well qualified staffs were hard to find in large numbers in the public services. Consequently, GWCL was labelled as an overstaffed state enterprise with underemployed employees that were recruited according to patronage principles. Also there were many drivers with no cars to drive and pay points were also over staffed.

Furthermore, there was no motivation to work because of low salaries and the absence of effective internal sanctioning mechanisms led to high absenteeism. Negotiations to introduce PPP in urban water supply under a lease or a management contract involves plans to downsize the staff of the company considerably. The retrenched staffs would be given severance award and be assisted to form small-scale companies to enter into subcontracts with private operators for maintenance jobs and other work. The district assemblies were to be encouraged to employ some of the redundant staff for community water sanitation services (GWCL, 2004).

In 2004, the World Bank was obliged to assist the government to finance a severance programme. Estimates concerning the number of workers likely to be retrenched varied between 1,400 and 1,600. Not surprisingly, this caused considerable anxiety among the workforce and further worsened the morale of the staff (GWCL, 2004).

The tariffs set by the PURC were not able to recover the cost of the GWCL. In 2003 the average tariff was 31 cents per m^3 as against estimated 70 cents for cost to be recovered (Nii Consult, 2003). Official reasons were:

- the tariff increases remained below the proposals of the provider in order to create incentives for the reduction of inefficiencies; and
- the new tariff regime was reported to have reduced the income of the GWCL at the level of billing.

The tariff system introduced in 2001 was vehemently criticised by the public since it affected the poor in cases where compound households share a singular domestic meter (Nii Consult, 2003). An increase in abstraction from

one meter source beyond the level of 10,000 cubic meters moved the unit price to a higher category. In effect, the PURC decided to expand the metered domestic category from 0–10,000 cubic meter or consumption to 0–20,000 cubic meter of consumption without compensating the loss of income by sufficient tariff increases.

The public reluctantly rejected the adjustment of water tariffs that was introduced by the PURC. Three reasons were given by the PURC for this rejection. These were: failure to understand the problems brought about by previous under-funding and over-subsidisation, the perception that the quality of the service delivery had not improved, and enforcement of the PURC regulations proved to be difficult owing to the weak accountability. The public blamed GWCL on the grounds of mismanagement, lack of maintenance of infrastructure, unreliable flow of water, cheating by GWCL staff members, fraudulent deals, embezzlements, and other related factors (Ohene, 2002; Akuaku, 2004).

Some of the company's meter readers and other staff were said to take advantage of consumers' ignorance and inflated their bills. Consumers who were reported to have been cheated by GWCL staff reportedly could not complain because they did not understand the billing system (Akuaku, 2004).

Srinivas (2008) posits that for a public utility to be sustainable, its operations must be financially viable. This can be done through expansion of network, reduction in the incidence of high unaccounted for water and improved cost recovery mechanism. However public utilities often have difficulty in getting approval for increasing their charges to levels that are financially and economically adequate. Sometimes this is for political reasons

but often it is also because the requests are poorly prepared and their urgency is not well perceived. Increase in charges must be justified not only to the parent entity but also to consumers. Public relations campaigns can used a tool to encourage consumers to pay their bills, however the provision of quality service is central to securing consumers' acceptance of increase in tariffs

Conceptual framework

The conceptual framework for the study in Figure 4 was adapted from the conceptual framework in Figure 3 by Institute of Urban Economics, Moscow (2003). The choice of the conceptual framework is informed by the definition of partnership by Fiszbein (2000) as the pooling of resources (financial, human, technical and intangibles such as information and political support) from public and private sources to achieve a commonly agreed social goal. The conceptual framework also seeks to establish the relationship between the public and private sector and highlights the role each sector plays in achieving their purpose for which the partnership was engaged.

The roles of the public sector and private partner are complementary. The public sector ensures the availability of legal and regulatory institution. The partnership therefore involves the efficiency of the private partner and the public sector which is more accountable to the society (Jamali, 2004).

The conceptual framework shown in Figure 4 also depicts how the public-private partnership shifts the domineering role of the public sector from the provision of utility services to an administrative and supervisory role. This paves way for market forces to determine the management and provision of utility services. It is assumed that public sector management is exposed to

political interference, corruption, bureaucracy, lower rates due to subsidies which lead to the deterioration of the utility sector resulting in low quality of service, loss of revenue and constraint on government expenditure.

Conversely, it is assumed that with introduction of partnership between the public sector and the private sector, the provision of service delivery would improved because of innovation and improved technology, capital injection, improved billing system, transfer of skills and expansion of pipeline introduced by the private sector. However, according to Figure 4, the involvement of the private sector in urban water provision requires some form of state regulation such as technical control, tariff regulation and legal and regulatory framework which is provided by the government.

This partnership, as shown in Figure 4, will consequently lead to high quality of service, increased revenue, financial independence, improved water and reduce unaccounted for water. The reason for government intervention stems from the fact that the objectives of the partnership are accomplished; protect consumers from monopoly abuse as well as funds protection (Cook, Kirkpatrick, Minogue, & Parker, 2004).

However, private participation in urban water may not necessarily improve urban water supply. This is because; due to their profit motive most consumers who are not able to afford water services will be denied access. This will eventually widen the water parity gap.

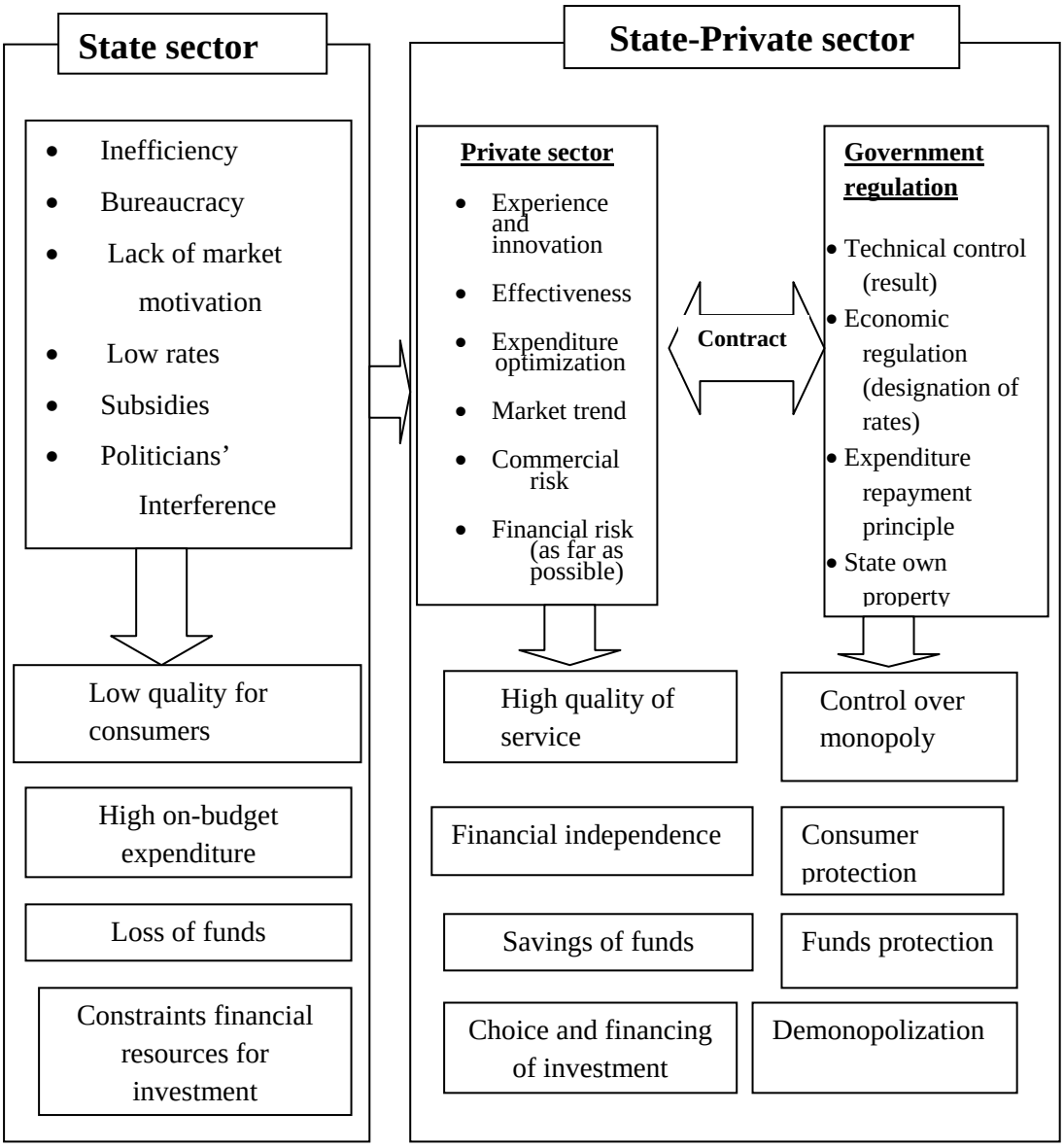


Figure 3: Transition to the public-private partnership

Source: Institute of Urban Economics, 2003

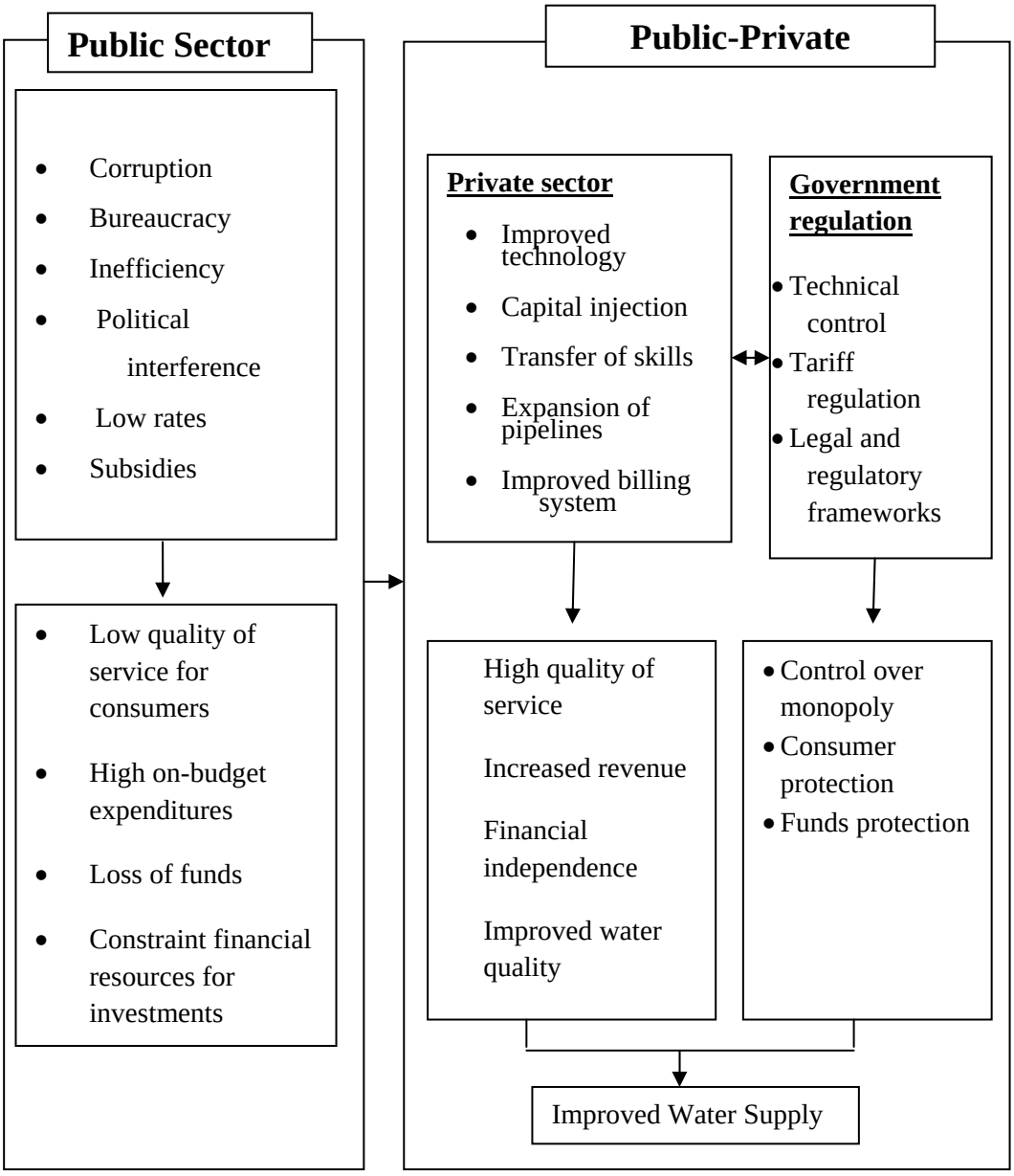


Figure 4: Conceptual framework for public-private-partnership

Source: Adapted from Institute of Urban Economics, 2003

CHAPTER THREE

METHODOLOGY

Introduction

This chapter focuses on the methodological approach that was used for the study. It focuses on the research design, study area, sample size and sampling technique, instruments for data collection and data analysis.

Research design

The study employed a case study approach to research (Yin, 2003) by using available secondary and collecting primary information from respondents. Qualitative research is adequate in this research because there is a need for in-depth understanding of cases for explaining a phenomenon (urban water supply). The case study design provides an in-depth understanding of the interactions between the various entities within the management arrangement and provides a basis for contributing to existing knowledge on public-private partnership in urban water supply.

However, according to Hamel, Dufour, and Fortin (1993), case study design has often been faulted on the grounds of lack of representativeness and the extent of its conclusions cannot be generalised. The problem of bias introduced by subjectivity of the researcher and informants on whom the researcher relies has been linked to lack of rigour in the collection and analysis of data.

Study area

The Ga East Municipal was established in 2004 by an Act of Parliament (Legislative Instrument 1989). It used to be part of the then Ga District which was split into Ga East and Ga West Municipal. It is located at the northern part of Greater Accra Region and covers a land area of 166sqkm. (Longitude 0^0 15^1 West and 0^0 10^1 East and latitude 5^0 50^1 North and 5^0 40^1 South). It is boarded on the west by the Ga West Municipal, on the east by Adenta Municipal Assembly (ADMA), the south by Accra Metropolitan Assembly and the north by the Akuapim South District Assembly.

The national population and housing census in 2000 estimates the district's population at 201,542 with a growth of about 2.3 percent The projected population for the year 2009 is estimated at 247,312. The growth of population is mainly due to the influx of migrants from rural areas. The 2000 population census Figure yields a density of 1,214 persons per sq km much higher than the national density of 70.3 persons per sq km and the regional density of 895.5 persons per sq km. This indicates a great pressure of population on land and resources in the district.

The Ga East Municipal has over 60 settlements with about 82 percent of the population in urban areas and the remaining 18 percent residing in the rural portion towards the Akwapim Hills. The district can therefore be described as urban. Indeed the level of urbanisation is above the national average of 43.4 percent. It is however important to note that the urban population resides in about 65 percent of the total land area of the municipal. The urban communities in the municipal with reference to the population

census in the year 2000 are Madina Dome, Taifa, Haatso, and some of the rural communities are Ayimensah, Adenkrebi, Akporman and Otinibi.

The Municipal falls in the savannah agro-ecological zone. Rainfall pattern is bi-modal with the average annual temperature ranging between 25.1^{o}C in August and 28.4^{o}C in February and March. The municipal has two main vegetation namely shrub lands and grassland. The shrub lands occurs mostly in the western outskirts and in the north towards the Aburi hills and consist of dense cluster of small trees and shrubs that grow to an average height of about five metres. The grassland which occurs to the southern parts of the district has now been encroached upon by human activities including settlements.

The relief of the Municipal is gently sloping and interspersed with plains in the west. The Akwapim range rises steeply above the Western end and lies generally at 375metres to 420metres North of Aburi and falls 300metres southward. There are a few rivers and seasonal streams, most of which are threatened by human activities. This includes the Sesemi stream at Sesemi and the Dakubi at Ajako. Other small ponds exist at Ablaadjei, Sesemi, Danfa, Otinibi and Old Ashongman. Most of these ponds are also threatened by human activities and the Assembly has to make conscious efforts to preserve them for agriculture use. The District has a lot of ground water for the rural communities and small towns (District Planning Coordinating Unit, 2006).

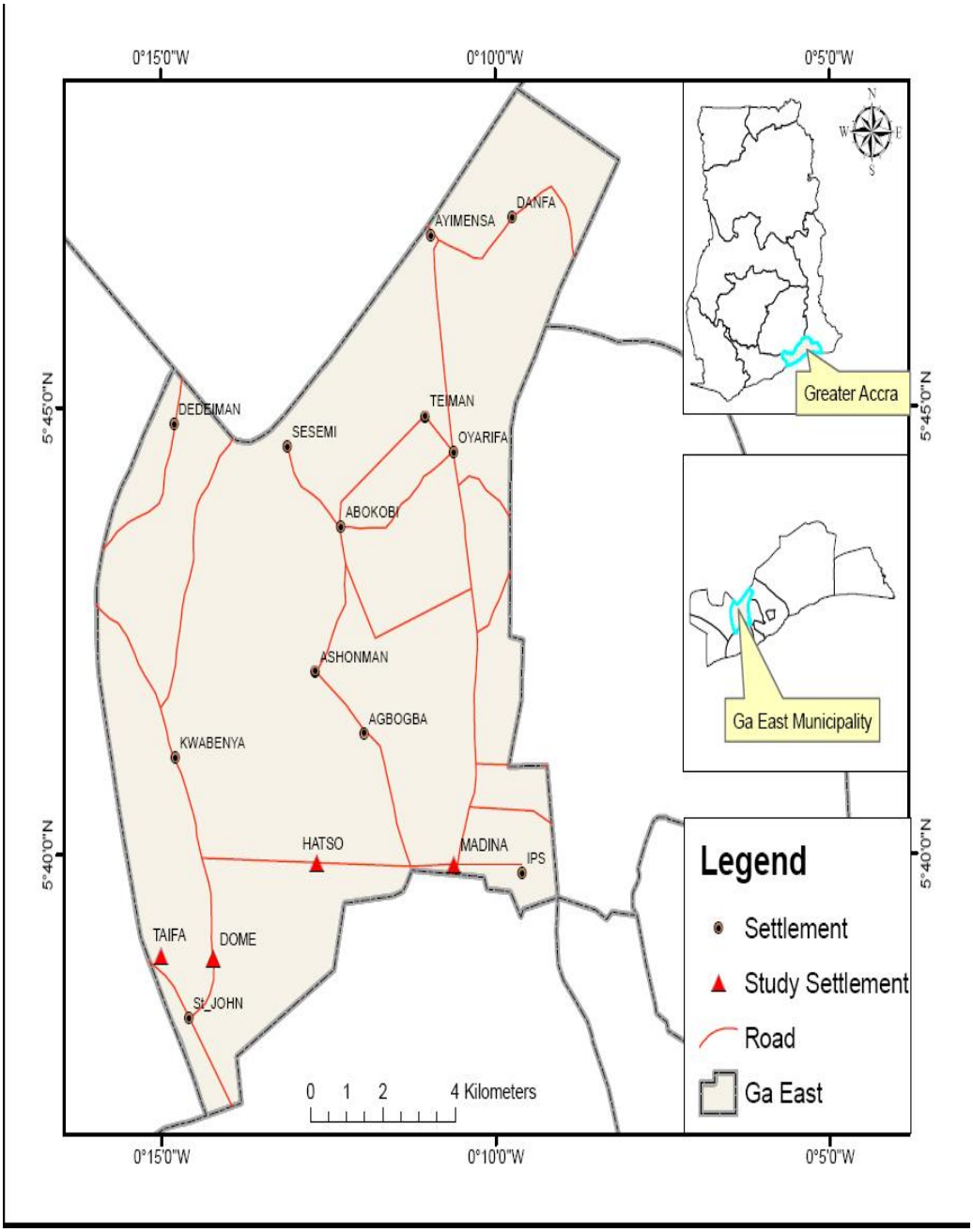


Figure 5: Map of Ga East Municipalilty

Source: Department of Geography and Regional Planning (UCC), 2011.

Water supply in Ga East Municipality

The water supply in the urban areas of the Municipal has been a major challenge. This is because the Assembly has no direct control over urban water supply in the Municipal. The urban communities such as Madina,

Dome, Taifa and Haatso have limited or no access to pipe-born water, hence have to depend on tanker services and a few hand dug wells; therefore the cost of accessing water is very high in these urban communities (DPCU, 2006).

Moreover, the Ghana Living Standard Survey (GLSS) fifth round report (2008) asserts that even though access to pipe-borne water has increased many consumers rely on intermediary water providers (tanker services, water resellers, wells and boreholes) for their water supply. The high incidence of tanker supply services is the reflection of GWCL/AVRL inability to extend potable water supply to new urban communities.

In the rural areas and small towns however, the District Assembly is responsible for water supply. The Assembly is currently managing three small towns' piped schemes through Water and Sanitation Development Boards (WSDB). These are Abokobi-Oyarifa-Teiman-Sesemi scheme, Kweiman-Danfa scheme and Pantang area pipe scheme. The three schemes cover twenty-three communities. This places an obligation on the Assembly to ensure that facilities are managed in a sustainable manner.

Study population

The study population comprised of key respondents from GWCL/ AVRL, (Communication Manager, Accra North District Director, Business and Planning Report Unit) and the Managing Director of Public Utility Regulatory Commission (PURC). The urban communities in the district were selected with reference to urban town classification by the National Population Census in the year 2000. The communities which were classified

as urban communities in the Municipality were Madina, Dome, Taifa and Haatso.

Table 1: Population of urban communities in Ga East Municipalilty

Towns	Population	No. of Houses	No. of Household	Average household size
Madina	79,697	6,878	16,032	4.8
Dome	29,618	3,419	6,539	4.5
Taifa	26,145	3,264	5,445	4.8
Haatso	7,093	1,176	1,461	4.9
Total	142,553	14,737	29,477	19.0

Source: GSS, 2000

Sampling procedures

Probability and non-probability sampling methods were used in the selection of respondents for the study. The non-probability sampling method particularly, purposive sampling technique was used to select the key respondents from two institutions/company namely GWCL/AVRL, PURC. The key respondents were selected from GWCL/AVRL because they are the institutions involved in the public-private partnership and responsible for urban water delivery in the country. Also the PURC was selected because of its regulatory role over utility services in the country and fair knowledge in the activities, operations and the constraints of public-private partnership in urban water supply.

The systematic random sampling method was used to select the households in each community. The usage of the systematic random method ensured that each household was given an equal, calculable and non-zero probability chance for selection for the study. The fraction method was followed in selecting the household respondents. In this approach, different sampling fraction that is K was calculated based on the number of household divided by the sample chosen in each community (K=N/n).

That is in each community a certain random number ranging from between zero and the average sampling fraction calculated from that community (K) and (N) which is the total number of household in the community divided by the number of selected household in the community (n) was used to as a base for which every K^{th} household was selected in each case until the total number of household needed in that particular community was arrived at. Since no sampling frame was available, the Chief Palaces' in each community served as the reference point. For instance in Madina the total number of household 16,032 divided by 137 gives K (117). Hence, the subsequent household chosen was the 117^{th} household from the Chiefs palace.

Determination of sample size

Based on the population of household in the selected urban towns (29,477) to the total population in the selected urban towns (142,554), the formula for proportions by Fisher, Laing, Stoeckel and Townsend (1995) was used to determine the estimated sample size of 246 at confidence level of 95 percent and error margin of 5 percent for households.

Formula: $n = \frac{Z^2 pq}{E^2}$

Where:

n = sample size (when population is greater than 10,000)

z = the standard normal deviation set at 1.96 which corresponds to the 95 percent confidence interval.

p = proportion in the target population estimated to have a particular characteristics.

q =1-p

E = degree of accuracy set at 0.05.

$$n = \frac{1.96^2 0.20(0.80)}{0.05^2} \quad =246$$

The estimated sample size of 246 was distributed proportionately among the four urban towns in order to ensure fairness in the distribution of the sample among the four urban towns. The formula: k= t/p*s, where *k* was the sample size, *t* represented the population for the respective urban town, *p* represented the total population for all the four urban towns, *s* represented the required estimated sample of 246.

For instance, calculating the required sample for Madina the total population of Madina (79,697) was divided by the total urban population of Ga East Municipal (142,552) multiplied by the estimated sample size (246) to arrive at 137 households for Madina. The proportionate distributions of sample chosen from the selected communities are shown in Table 2.

Table 2: Selected sample from urban communities

Towns	Sample selected
Madina	137
Dome	51
Taifa	45
Haatso	13
Total	246

Source: Fieldwork, 2010

Table 3: Category of respondents

Category of respondents	Number	Percentage
Household respondents	246	98.4
Key respondents	4	1.6
Total	250	100

Source: Fieldwork, 2010

Data collection technique

The data collection instrument used was two semi-structured questionnaire one household respondents and one for key respondents who were considered to have adequate knowledge on public private partnership in urban water supply This was used because the study wanted to have in-depth information about the water supply situation in the Ga East Municipality and moreover most of the respondents in the communities were assume to be

literate. The questionnaire was administered to household respondents and selected key respondents from stakeholder institutions. It contained both closed and open ended questions. The closed ended questions was meant to solicit direct answers from household respondents as well as key respondents whilst the open ended questions was meant to capture information that could not be obtained by the close ended questions. Secondary information was obtained from institutions such as GSS, GWCL/AVRL, journals, reports and other unpublished documents.

Fieldwork

The commencement of fieldwork was scheduled between July and August 2010. The relevant primary data was collected by visiting all the selected towns, institutions and office of GWCL/AVRL. Copies of the questionnaire for respondents in the study settlement, PURC and GWCL/AVRL have been presented as Appendices A, B and C.

Research assistant were trained pertaining to key issues covering urban water supply and the ethical relation between researcher and respondent were considered.

Data processing and analysis

The data collected was edited and coded and analysed with the Statistical Product and Service Solution (SPSS version 16). The method of analysis was presented in the form of frequency tables, and bar graphs. Inferences and calculations were made from these measures and compared with the existing literature to arrive at the conclusion of the study.

CHAPTER FOUR

RESULTS AND DISCUSSION

Introduction

This chapter presented the results and discussion from the data analysis in relation to the research objectives. The results were presented in five parts. The first part focuses on household piped, whilst the second part discusses households' source of water supply. The third part also presents an assessment of GWCL/AVRL performance in urban water supply, followed by the constraints of urban water supply. Finally, the fifth part presents the results and discussion of households' perception on urban water delivery in the study area.

Households' piped water connection distribution

The reliable and efficient supply of water is considered to be a priority for urban communities. However, the introduction of PPP has not been able to extend water services to meet consumers demand. The services provided usually favour already connected household leaving the areas without pipe network access to water. This has contributed to the low in-house pipe water connection in urban areas. The distribution of household pipe connection in the urban areas of Ga East Municipality is shown in Table 4. About 57.3 percent of households had in-house piped water connection and 42.7 percent were without in-house piped water connection.

Table 4: Households piped water connection distribution

Household respondent	Frequency	Percentage
In-house piped water connection	141	57.3
Without in-house piped water connection	105	42.7
Total	246	100.0

Source: Fieldwork, 2010

The respondents (42.7%) attributed the low household pipe connection to the cost involved in connecting to the main water supply network, few service lines that cannot support the population expansion in the Municipality.

Moreover paying high connection fees to get connected to the water network is unnecessary because the water flow is poor and unreliable. This is consistent with GSS (2000) report which asserts that even though most urban households have pipe connection they depend on water tankers, water resellers and neighbours for their water supply due to unreliable flow of pipe borne water.

The distribution of household pipe water connection is supported by the theory of welfare economics. For instance, the study revealed that Ayigbe town, a locality in Dome which is predominantly a low income area have low pipe connection and experienced severe water shortage than Haatso apparently a high income area. This is because high income areas are able to pay for services hence the allocation of water supply would be steered in their favour thus denying access to low income areas. This further widens the inequality gap in the water supply sector. This is because the theory of welfare economics does not consider the economic and social impact of the varied consumption patterns in urban water.

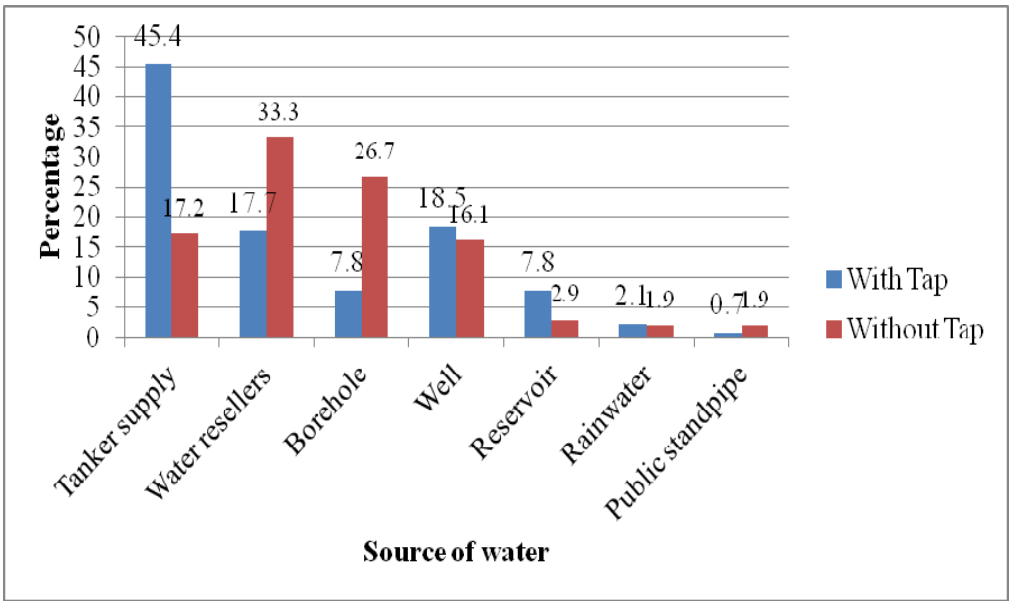
Source of water for respondents with taps (when taps are not flowing) and respondents without taps

Respondents were asked about their source of water supply. This was to know when households' get their water from in the municipality. The responses are indicated in Figure 6. It shows the source of water for households irrespective of having in-house pipe connection or not. The study revealed that amongst the household who had in-house pipe connection 45.4 percent of them depended on water tanker supplies. They attributed this to the unreliable flow of water. However, though tanker water services were expensive it releases burden on household members who have walk distances to fetch water every day. The 18.5 percent who depend on wells have hand dug wells in their homes and the 17.7 percent who buy water from water resellers claimed the taker services are expensive so they prefer to buy water when it is needed.

However, though water resellers account for 33.3 percent which is the major source of water supply amongst households without in-house pipe connection. The respondents in this category claim it is cheaper to buy water from water resellers than tanker water supply as well as getting connected to water network in the Municipality. This is followed by 25.7 percent and 17.2 percent for borehole and tanker supply respectively, well water accounted for 16.1 percent. Public standpipe accounted the least (1.9%) and (0.7%) respectively of water source for both category of household. It is also shown in Figure 6 that the dependence on tanker water supply is the highest and the least being standpipe for household with in-house pipe connection. The low usage of public stand pipe is due to the fact that most of the standpipes in the

area do not function and the few ones available do not have water flowing from them most of the time.

This confirms the Ghana Living Standard Survey (GLSS) fifth round report (2008) which asserts that even though access to pipe-borne water has increased many consumers rely on intermediary water providers (tanker services, water resellers), boreholes and other improved sources for their water supply. The high dependence on intermediary water providers in the study area indicates that the partnership with of AVRL and GWCL has not been able to improve piped water supply in the Ga East Municipality. The plates below, thus Plate 1, 2, and 3, show some of the water sources households' depended on in the Ga East Municipality.



Source: Fieldwork, 2010

Figure 6: Source of water for respondents with taps (when taps are not flowing) and respondents without taps

Plate: 2 Water supply by truck to a resident, Credit: Author

Plate: 3. A water reselling point Credit: Author

Plate 4: A Well used by some households' in Dome Credit: Author

Assessment of the performance of GWCL/AVRL in urban water supply in the Ga East Municipality

The indicator used to access the operational performance of GWCL/AVRL was adapted from the International Benchmarking Network (IBNET) for Water and Sanitation Utilities. They are estimated unaccounted for water, operating cost coverage ratio, bill collection rate, continuity of service and the number of employees per 1000 connection. The data is shown in Table 5.

Table 5: Performance ratio of GWCL/ AVRL (2003-2010)

Indicators	2003	2004	2005	2006	2007	2008	2009	2010
Unaccounted for water	52	51	52	48.8	51.5	50.1	51.5	49.8
Operating cost recovery ratio	75.3	74.5	76	76.2	84.1	87.3	84.1	74
Bill collection rate	80	80.2	100	110	89	93	97	85.3

Source: GWCL/AVRL, 2010

Unaccounted for water

This basically occurs as result of high leakages during water transmission, poor categorisation of metered water, tampering of meters by consumers and high incidence of illegal connections. The level of unaccounted for water is very high among sub-Saharan African countries. In extreme cases of Nigeria and Tanzania, up to 83 percent and 86 percent is lost through leakages and illegal connection (water theft) respectively. Conversely Burkina Faso, South Africa and Senegal have performed relatively well in lowering the levels of unaccounted for water to be in line with some high income countries (Kauffman & Pérard, 2007).

One of the objectives for opting for public-private partnership in urban water supply in Ghana in 2006 was to reduce the level of unaccounted for water. However, since the engagement with the private sector, available data on unaccounted for water indicates that the partnership between GWCL and AVRL has not performed well as shown in Table 5. In 2003 unaccounted for water was 52 percent and in 2010 it was 49.8 percent hence the average unaccounted for water during this period is above 50 percent despite a target of 26 percent set during the management contract.

This level of unaccounted for water (50%) experienced in the water supply sector in Ghana is higher than the African utility average of 30.5 percent (IBNET, 2006). This level is very poor compared to 15 percent and 20 percent in Burkina Faso and Senegal respectively. Response from respondent also perceived that unaccounted for water was very high citing high incidence of broken down pipes in their communities. In the conceptual

framework (Figure 4), it argued that unaccounted for water will reduce under the partnership.

In its bid to reduce the level of unaccounted for water (physical losses) the Ghana Water Company Limited (GWCL) has invested GH¢4.2 million to acquire and install bulk water meters at all main stations across the country. The will closely monitor the revenue from treated water produced and determine the actual non-revenue water, the causes and take appropriate measures to rectify them. However these meters were acquired in the fourth year of the management contract and are yet to be installed (Ghana News Agency, 24th February, 2010).

Operating cost recovery ratio

In the water supply sector, sound financing is very important in ensuring long term sustainability of water delivery. Hence income generated from the sale of water should be able to cover operational cost and recover sufficient revenue to finance the cost of replacement and maintenance of old and leaking pipes as well as infrastructure.

The operating cost recovery ratio represents total annual operational revenue divided by total annual operating costs. It measures the extent to which user fees with other contributions can meet service cost and contribute to financial sustainability. If a service provider record below 100 percent, it implies that operating cost is not covered and therefore the water system is not financially sustainable (IBNET, 2006). The average operating cost ratio between 2003 and 2010 is 80 percent in Ghana.

However, in 2008 it recorded an improved ratio of 87.3 percent which is still poor compared to 130 percent and 158 percent in Burkina Faso and Senegal respectively. It can be deduced that the partnership has not met the objective of ensuring financial sustainability in the water sector. This can be attributed to the unwillingness of consumers to pay for services due to unreliable water flow, high levels of unaccounted for water, illegal connections and low bill collection rate.

The low operating cost recovery ratio eventually leads to decline in expansion and maintenance of existing water systems. This assertion is supported by Cardone and Fonseca (2003) which indicates that if a utility service provider is unable to recover its operating cost, it will be incapable of providing funds for network expansion in urban areas or maintain the existing services adequately. Where cost recovery is not fully achieved water is wasted, utility fails to maintain the infrastructure and this pose health risks for the community as they resort to drawing water from unsafe sources thereby being affected by the outbreak of diarrhoea diseases.

Bill collection rate

The bill collection rate is another performance indicator and presents the income as a percentage of billed revenue. A low percentage may lead to vicious cycle of underfunding (Kauffman & Pérard, 2007). It is shown in Table 5 that in 2003, the bill collection rate was 75 percent it however increased to 110 percent in 2006; however, it decreased to 85.3 percent in 2010. This gives an average bill collection rate is 92 percent. This low rate (92%) in bill collection has affected the revenue base of GWCL/AVRL. This

was attributed to consumers' unwillingness to pay for services because water delivery is poor and unreliable. Amongst the 141 respondents who have in-house pipe connection 69 percent said they do not see the need to pay water bill because water flow is unreliable and even though there is rationing of water supply, they hardly get water when it is their turn and sometimes have to stay awake for many hours. The Communication Manager of GWCL/AVRL confirmed that they hardly send bills to residents in the municipality because the water flow situation is not appreciable. Even though it is indicated in the conceptual framework (Figure 4) that the private will improve the billing system, the partnership in the water sector in Ghana was not able to improve the bill collection rate. This is indicated by a low bill collection rate of 85.3 percent as in 2010.

Continuity of water service

There was no available secondary data on continuity of water service. However, respondents with in-house pipe connection revealed that continuity of water services in the study area was also poor and there was appropriate rationing procedure. The reason given for this by occurrence by GWCL/AVRL was that the area is in a high pressure zone hence the pressure of water flow in the area is low. Thus pumping water to municipality has been a challenge. This has culminated in poor quality of water service delivery.

Marin (2009) is of the view that the ability of a water utility provider to provide uninterrupted supply of pipe water is also a good indicator of quality service. When service continuity is poor the pipes risk external infiltration and contamination. Once rationing becomes an established

operating pattern, a network deteriorates faster because of repeated pressure surges and any attempt to restore continuous services often fails because any temporary gain in average pressure cause more ruptures and seal failures resulting in more water loss through leaks. Because of this utilities with deteriorated networks often adopt the short term solution of reducing the number of hours of services to limit leaks even though this practice contributes to poor service delivery to consumers.

The performance of the private sector in water sector overlooks the importance of the use of principal agent theory in the water sector. The existence of asymmetry of information prevents the principal (government) from having access to information about the activities of the agent (private operator). This limits regulation and policy decision of the principal. Hence when it comes to the water sector principal-agent arrangement must be such that the principal gets a full disclosure of the activities of the agent and must prevent the agent (private operator) from assuming a monopoly status. This is because if the utility provider assumes a monopoly status it will be less motivated to deliver efficiently in the absence of competition.

Constraints of urban water supply

The impact of rapid urban population growth and the growth of unplanned settlements coupled with low investments in the water sector has been a constraint in the provision of urban water to consumers (Fuest & Haffner, 2007). There has also been a rise in unpaid water bills, high incidence of unaccounted for water and illegal connections by consumers who are not able to pay for water connection. Hence this objective seeks to find

how these constraints affect urban water supply. The constraints are presented in Table 6.

Table 6: Households' response to the constraints of urban water Supply.

Constraining factors	No.	C (%)	NC (%/)	NA (%)	Total
Unpaid water bills	246	84.0	14.6	1.4	100
Unaccounted for water	246	73.2	20.3	6.5	100
Population expansion	246	78.0	22.0	0.0	100
Illegal connection	246	80.5	14.2	5.3	100
Financial constraint	246	84.7	10.5	4.8	100

Source: Fieldwork, 2010 C= Contraint, NC= Not Constraint, NA= Not Aware

Unpaid water bills

The bane of urban water supply in Ghana is inadequate cost recovery from the water supplied to consumers. In Ghana the bill collection rate has been poor, falling from 110 percent in 2006 to 85.3 percent in 2010. Some consumers have intentionally refused to pay water bills, citing unreliable flow of water as the main reason. Also 141 respondents (57.3%) had in house pipe connection as shown in Table 4. However, 31.7 percent of these respondents indicated that they do not pay water bills as shown in Table 7. The reason being that water hardly flows through their pipes so they rely on other sources for their water supply. Thus the absence of willingness to pay for water

service may compromise the financial sustainability of the urban water systems in the Municipality.

Table 7: Households' with taps bill payment distribution

Household respondent	Frequency	Percentage
Do not pay bills	78	31.7
Do pay bills	63	25.6
Total	141	57.3

Source: Fieldwork, 2010

Response from the households' also indicated that 84 percent of the saw unpaid water bill is a constraint to urban water supply. They argued that the high incidence of unpaid bill was major contributing factor to the deteriorating systems in urban water supply. Furthermore, 14.6 percent of the respondents indicated that it was not a constraint and blamed the GWCL/AVRL for not being able to collect bills for water they produce and 1.2 percent of the respondents did not know.

This confirms the study by Fuest and Haffner (2007), which found that consumers could connive with GWCL/AVRL staff to bill them on flat rates when in fact they are consuming more. Also consumers find ways of reconnecting to water systems themselves without paying penalties by bribing water officials. Bayliss (2001) also contends that it was difficult to recover bills from public agencies, such as ministries, government department and agencies. He further opines that, government hospitals, police service, and government schools habitually do not pay bills for water consumed. The high incidence of unpaid bills has culminated in low revenue mobilisation,

inadequate funds for expansion and deteriorating urban water systems. Hence there is the need for strong commitment from government, users, and operators to implement appropriate cost recovery mechanism to ensure that consumers pay for water they consume.

Unaccounted for water

GWCL/AVRL is faced with a challenging task of providing water to urban settlements; this is further worsened by high incidence of unaccounted for water resulting from inadequate maintenance and repair of old and leaking pipes, poor categorisation of metered consumers and lack of efficient operational control. This situation has denied many households from enjoying regular supply of water and has made rationing a norm in the municipal. As was shown in Table 6, 73.2 percent of the respondents claimed that UFW was a constraint to urban water supply.

However 20.3 percent of the respondents indicated that UFW is not a constraint citing that GWCL/AVRL need to adopt improved billing system and change old pipes which have been corroded and rife with leakages. Also 6.5 percent of the respondents indicated that they were not aware of the effect of UWF. The high response (73.2%) from the respondent is consistent with the report by Nii Consult (2003) which found that unaccounted for water continues to remain high at around 50 percent resulting from leakages of old and badly installed piped water system, illegal connection, understatement of consumption, low metering ratio, tampering with meters and wrong categorisation of customers.

The GWCL/AVRL in its attempt to reduce the high incidence of unaccounted for water, has invested GH¢ 4.2 million to acquire and install three hundred and seventy three (373) bulk water meters at all main stations across the country to closely monitor revenue from treated water produced. The installation of bulk meters would help to access the amount of water supplied and revenue generated to know the specific amount of non revenue water. It is estimated that about 50 percent of treated water produced nationwide valued at about GH¢ 100 million is not accounted for due to leakages and illegal connections. This indicates that the supply of water would not be able to meet the demand resulting in high cost of assessing water for household use. Aqua Vittens Rand Limited was contracted to reduce unaccounted for water by 25 percent in five years to enable the sector to become commercially viable. .

The high incidence of water losses experienced is similar to that of India where only about 50 percent (140 million) of urban population is directly connected to the distribution network (World Bank, 2006). However, the existing infrastructure suffers high degree of operational inefficiency. Unaccounted for water is about 40 to 50 percent due to transmission losses and water theft coupled with poor collection practices by water utilities have resulted in low cost recovery at 20 to 30 percent of operation and maintenance cost (ADB, 2007).

Unplanned settlements

Extending water supplies to individual households in a densely and unplanned settlements present a daunting challenge to the urban water sector.

This is because households may not have a permanent status which makes it difficult to collect bills from consumers.

Respondent views were sought on whether unplanned settlements are a constraint to urban water supply. The response in Table 6 showed that 80 percent of the respondents were of the opinion that unplanned settlements inhibit pipe network expansion. Residents in these neighbourhoods have to rely on tanker water services or water resellers who sell their water at exorbitant prices. The research revealed that households in Ayigbe Town, Dome spend twice more on the same quantity of water than planned settlements in the Municipal. That is 20 litres of water is sold at GH 30 pesewas in Ayigbe Town whilst the same quantity is sold at GH 1.5 pesewas in Haatso. The high cost of water has also had severe impact on household incomes and more time is also used in collecting water.

The water extension and pricing in Ayigbe Town, Dome is consistent with Nyarko, Odai and Fosuhene (2006), which opined that unplanned nature of some settlements makes extension difficult physically, moreover utilities are not authorised to connect residents in unplanned settlement where actions to recover bills could be a problem moreover these areas have low ability to pay for connection and water charges. These areas rely on water services from vendors who sell water at 3 to 15 times higher than GWCL/AVRL lifeline charges.

Plate 5: Aerial view of Ayigbe Town, Dome (Unplanned settlement)

Credit: Author

Population expansion

The population in the Municipality stood at 161,873 with a growth rate of 4.2%. This yields a population density of 1,214 persons square kilometre. This is much higher than the national density of 79.3 and the regional density of 895.5 persons per square kilometre. With a projected population of 244,226 in 2010, the estimated population density is 1,391 persons per square kilometre. This indicates a great pressure of population on the land and resources (GSS, 2000).

The Table 6 also shows the respondents response on the effect of population expansion on urban water supply, 78 percent of the respondents attribute constraint on urban water supply to population expansion, 22 percent of the respondent indicated that it was not a constraint and have no effect on urban water supply respondents in this group claimed that there is an abundance of freshwater and that GWCL/AVRL should adopt improved

technology in raw water process to enable it meet the increasing urban water demand. Also the GWCL/AVRL should work towards reducing unaccounted for water and curb illegal connection.

This response confirms the NWP document which asserts that the rate of urbanisation in Ghana outstrips the current levels of water supply and therefore drinking water has become a scarce resource in most urban homes in Ghana. Many densely populated settlements who have in house pipe connection receive rationed water supplies or none at all.

It is in this vein that PURC cautioned the GWCL/ AVRL to provide the public adequate notice of its water rationing programme and ensure that the rationing programme, especially in the dry season is reliable and effective to mitigate consumers' hardship. The executive secretary of PURC acknowledge that due to the state of GWCL/AVRL the issue of water rationing cannot be eliminated completely, however GWCL/AVRL must do well to alleviate consumers hardships (Ghana News Agency, 2011).

Nsiah-Gyabaah (2007) affirms that rapid population growth and urbanisation have contributed gravely to the current peri-urban water crisis in the country. Similarly, rapid increase in population and urbanisation and particularly the conversion of watersheds into residential facilities and farmlands has lead to the depletion of water resources.

Financial constraint

Many African countries face increasing resource constraint in their efforts to extend water service of acceptable quality and quantity to majority of its people (Estache & Koussi, 2002). According to UNDP (2006), Ghana

will need investments to the tune of US$81 million in urban water supply to achieve 85 percent coverage set by 2015. In total 12 million more people will need to be provided with potable water leaving a population of 4.1 million people without access to water supply services. Grusky (2001) posits that developing countries such as Ghana have come under enormous pressure from international financial institutions and donor agencies to consider alternative strategies such as building of partnership and privatisation of its water supply sector.

This presents a difficult challenge due to the huge capital requirement in infrastructure development in the water supply sector. Governments must look beyond their national budget to seek financial, technical and managerial resources from the private sector to augment the public sector. Ghana' s water deficit, among other factors, has led the government to estimate that it will need to invest about $1.6 billion a year over 10 years in infrastructure development to attain the level of services appropriate for a middle-income country.

With reference to Table 6, 84.7 percent of the respondents indicated that financial constraint has hindered the improvement of urban water supply, 8.5 percent did not see financial constraint as a challenge and 4.1 percent of the respondent had no idea. The communication manager of GWCL/AVRL also alluded to the fact that even though there are abundant water bodies in the country, the chronic low investment of infrastructure in the water sector has affected expansion works and contributed to the deteriorating urban water systems in the country.

The inadequate funds for operation and maintenance can also be attributed to weak pricing, poor cost recovery mechanisms, high incidence of non revenue water which accounts for about 50 percent of the water produced and unwillingness to pay for water consumed. The government's inability to pay for water consumed by its ministries, department and agencies has worsened the financial sustainability of the urban water sector. The chronic low investments in the water sector will deny Ghana of achieving the 85 percent coverage target by 2015.

On the other hand if tariffs are increased towards the levels of cost recovery, a lot of consumers would be deprived of water supply. Foster and Yepes (2005) indicate that in most developing countries the issue of affordability should not be ignored. For instance in India and Africa, about 70 percent of household could face difficulties in accessing water if full cost recovery tariffs were applied. The introduction of full cost recovery tariffs will also engender affordability problems in around half of the population in predominantly low income countries in Latin America.

Illegal connection

The response given by the respondents in Table 6 indicated that the incidence of illegal connection affects urban water delivery. The response shows that 80.5 percent of the respondent sees illegal water connection as a constraint. This because it increases the demand for water and exerts pressure on urban water supply systems and moreover deny access to consumers who have paid for water supplies.

However, 14.2 percent did not see it as a constraint. The reason being that, if GWCL/AVRL had efficient monitoring mechanism, illegal

connections would be curbed. The rest, 5.3 percent had no idea. According to the Deputy Director of the Ghana Water Company Limited (GWCL), only few consumers pay for services provided by the GWCL also that the rate of illegal connection is very high, affecting revenue mobilisation of GWCL/AVRL.

Households' perception on urban water supply in the Ga East Municipality

The deteriorating state of urban water supply and inadequate funds for expansion in developing countries paved way for the adoption of PPP in the provision of urban water supply. It was envisaged that the wealth of expertise and financial resource coupled with the profit motive of private operators will help improve the urban water supply sector. In Ghana, a management contract was signed between GWCL and AVRL in 2006 to help improve the urban water supply. This objective would seek households' perception of PPP in urban water delivery in the Ga East Municipality of Ghana. The response is shown in Table 8.

Table 8: Households' perception on urban water delivery in the Ga East Municipality

Statement	No.	D	NA/D (%)	A (%)	Total
Cost of assessing water has reduced	246	81.0	8.5	10.5	100
Water flow is regular	246	69.0	11.0	19.0	100
Illegal connection has reduced	246	59.8	23.2	17.0	100
Connection coat has reduced	246	69.2	20.0	10.8	100
Bill collection rate has improved	141	64.0	9.0	27.0	100

Source: Fieldwork, 2010

D= Disagree, NA/D= Neither Agree nor Disagree, A= Agree

Households' perception on the cost of water

The respondents interviewed perceived that cost of water has increased following the adoption of public-private partnership. It is shown in Table 7 that 81 percent of the respondents which constitute the majority did not agree to the statement that cost of water has reduced only 10.5 percent agree to the statement and 8.5 percent neither agree nor disagree to the statement. The high cost of water can be attributed to the rising block tariff structure adopted by PURC which has confirmed that though the structure is an inefficient mechanism for delivering affordable water supply services to the poor, it is however retained for the benefit of the small portion of the population who currently benefit from such a structure (PURC, 2005).

Nonetheless the high cost of water within the study settlement results from the dependence on water from intermediary providers such as tanker supply services, water resellers, private wells and borehole operators. This is because water supplied by GWCL/AVRL is unreliable. The study revealed that 141 (57.3%) of the respondent had in-house pipe borne water connection and 105 (42.7%) of the respondents did not have in-house pipe borne water connection.

Similarly, the study revealed that the mean expenditure on water per month for respondents who buy water from intermediary providers (tanker supply services, water resellers), private wells and borehole operators was GH¢ 33.3 as compared to GH¢ 9.0 for respondents with in-house pipe connection if their taps were to be flowing. If GWCL/AVRL were providing water on regularly basis, it would have eased the burden on cost of accessing water in the municipality. Because the activities of the intermediary providers (tanker supplies, water resellers), private wells and borehole operators were not regulated, they sold water at exorbitant prices which affects households' income.

Also, in a similar instance the WHO and UNICEF (2000), confirmed that purchasing three buckets a day may cost between GH 6 pesewas and GH 15 pesewas or between 10 percent and 20 percent of average daily income. Hence three buckets a day which is 18 litres is just below the daily minimum requirement of 20 to 40 litres approved by the World Health Organisation.

Furthermore, amongst the respondents with in-house pipe borne water connection, 26 percent depended on water tanker supplies, 10.6 percent fetch water from wells, and 10.2 percent buy from water resellers, also respondents

who depended on borehole and rainwater when their taps were not flowing were 9 percent 1.2 percent respectively. Amongst the respondents who did not have in house water connection, 11.4 percent depended on borehole, 11 percent get their source from water resellers, 10.6 percent from tanker supplies, 6.9 percent get water from wells, and also 2.4 percent and 1.2 percent depended on public stand pipes and rainwater respectively.

This is consistent with the report by Water Sector Restructuring Secretariat (2002) which indicated that between 60 and 70 percent of urban population had access to potable water supply. However, many of those who have access to potable water buy from intermediary providers at a higher cost because water does not flow from their taps regularly.

Foster and Yepes (2005) opine that in most developing countries, the effect of the cost of water should not be overlooked. For example, in India and Africa, approximately 70 percent of households would face difficulties if full cost recovery tariffs were applied. In Latin America's lower income countries (Bolivia, Honduras, Nicaragua, Paraguay), cost recovery tariffs would similarly generate affordability problem for around half of the population. As a result, water subsidies, in one form or another, are very prevalent around the developing world, where most tariffs are well below full cost recovery levels.

Although the private sector is motivated by profits, in Ghana tariffs are set by PURC in consultation with the service provider and the government. Hence consumers are not over burdened with increase in tariffs. The regulatory role of the public sector is shown in the conceptual framework (Figure 4). This does not concur with the idea of the public choice theory which assumes that the public sector's role in the provision of social services

is inherent with mismanagement. The importance and uses of water prevents competition to be introduced in the water supply sector hence government regulatory role is mandated to control the monopoly of private operators.

Furthermore, Sleeman (1979) affirms that government provides regulatory role to prevent consumers from falling below the poverty line, bridging income inequality and facilitate socioeconomic empowerment. The public choice theory fails to recognise the role of the public sector in providing the necessary regulatory framework for the private sector to operate.

Households' perception on regularity of water flow

Potable water supply in the urban areas of the Ga East Municipality has been a major challenge. Areas such as Madina, Dome, Taifa, Haatso and other communities within the municipality have limited or no access to pipe borne water. Hence most residents depend on tanker supply services, water resellers, boreholes, and a few hand dug well which is sold at a higher cost to consumers (DPCU, 2006).

Respondents' perception was sought on the current situation of water flow. The study revealed that whereas 69 percent of the respondents disagreed to the statement that water flow is regular, 19 percent agreed to the statement that water flow regularly and 11 percent neither agreed nor disagreed. Majority (69%) were of the view that the water flow situation has not improved since the partnership. For example, the study revealed that the entire Taifa community did not have pipe borne water. Their main source of water was boreholes, wells and truck water supplies. This might have deteriorating

health implication on the residents. A study conducted by Nyarko (2008) on water quality in Taifa found that there were high levels of salt in their drinking water and about 30 percent of the population were possibly exposed to faecal contaminated water. Thus the population may be at risk of developing heart and kidney related diseases from saline water and diarrhoea from contaminated water respectively. The International Fact-Find Mission on Water Sector Reform (2002) also reports that inadequate water and sanitation contribute 70 percent of diseases in Ghana. The report also indicates that inadequate access to water supply has increased the incidence of cholera while the rate of decline for guinea worm has worsened.

Furthermore, the study revealed that water flow average is twice a month for respondent with in-house water connection. Respondent complained that due to the rationing exercise they had to keep wake to get water from their taps when it is their turn or keep their taps open all the time so they would be alerted when the taps start to flow. The intermittent water flow in the municipal is explained by the location of the district which is in a high pressure zone area. Hence pumping water to communities in these zones is a very challenging for the water company.

This finding concurs with the assertion made by WaterAid (2005) which indicates that only about 25 percent of the residents in Accra enjoy 24-hour water supply and about 30 percent have water for an average of 12-hours for five days a week. Another 35 percent have water for two days each week, and remaining 10 percent on the outskirts of Accra are absolutely without access to pipe water even though they have in-house pipe connection. McIntosh (2003) asserts that household who do not have 24-hour supply of

water tend to use water more because they have developed the habit of replacing fresh supplies when the taps are flowing.

Plate 6: Residents receiving water from tanker supply in Dome

Credit: Author

Households' perception on illegal connection

Respondents were asked about their perception on the incidence of illegal connection. The results revealed that 59.8 percent disagreed to the statement that illegal connection has reduced, 17.1 percent agreed to the statement that illegal connection has reduced and 23.2 percent neither agreed nor disagreed. It is estimated that about US$100 million is lost through illegal connection depriving consumers of benefiting from water they have paid for.

Also response from the Business Planning and Reports Unit of GWCL/AVRL indicated that illegal connection was very high due to the fact that the urban population in the Municipal has increased beyond the available service lines. Hence consumers who put up new buildings connect to service lines without the permission from GWCL/AVRL. This has placed pressure on

existing pipelines in the Municipality leading to low pressure of water flow in the service lines when taps are opened.

Households' perception on connection cost

The cost of connecting to the piped water system has been a significant barrier for many household in gaining access to water. Responses from the respondents indicated that 69.2 percent disagreed to the statement that cost of connecting to piped system has reduced. Twenty percent neither agreed nor disagreed to the statement and 10.8 percent agreed to the statement that connection cost is low. This has prevented many households' from getting in-house pipe connection. The study also revealed that (57.3%) of the respondent have in-house pipe connection and the rest (42.7%) of the respondent do not have pipe connections in their homes. This indicates that access to pipe borne water for households' in the municipal has not improved. This contradicts the assertion in the conceptual framework (Figure 4).

Households' perception on the rate of bill collection

The inclusion of private operators in the urban water supply sector is widely assumed that efficiency is improved especially in the area of bill collection. Hence the study sought to find households with in-house piped water perception on bill collection rate. From the Table 7 it can deduced that 64 percent of households said bill collection rate has not improved, 27 percent said it has improved and 9 percent were undecided. The respondents were of the view that the water company knows that water flow is poor so they hardly send their field officer to some parts of the municipality.

Furthermore, the Communication Manager of GWCL/AVRL confirmed that bill collection rate has worsened due to the inability of GWCL/AVRL to provide regular water supply. *"With respect to Ga East Municipality, it has become very difficult to serve the with water bill to residents because water flow is very poor. This has resulted in consumers' unwillingness to pay for water services. For this reason, the Government of Ghana is seeking funds to expand the existing water treatment plant to increase water supply to these parts of the Accra".* (personal communication, 23, 2010)

The study also revealed that majority the (52%) of residential respondents prefers full government ownership of the water sector. These respondents were of the view that involvement of the private sector would mean higher water charges and the poor would be deprived of adequate water supply. Also 32.1 percent preferred private participation, they claim since the private operator is profit oriented, it would extend the services to many consumers as possible to get returns on the other hand 15.9 percent of respondents preferred a partnership between the public sector and a private entity. All the key respondents were of the opinion that private participation in the water sector should be encouraged because it will bring the investment needed in the water sector. However it would depend on the type of private participation option the government would opt for. They also raised concerns over the water supply situation such as unreliable flow of water, low pressure, prevalence of illegal connection and high connection cost.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Introduction

The study set out to examine whether the introduction of public private partnership in urban water supply has improved the water supply in the Ga East Municipalilty? The objectives were to assess the performance of GWCL/AVRL in urban water supply in the Ga East Municipality; examine the constraints of urban water supply and examine household perception of urban water delivery since the partnership in the Ga East Municipality.

The systematic and purposive sampling method was employed to select 246 and 4 key respondents for the study. The sample comprised of 246 respondents from the selected towns and 4 key informants 3 from GWCL/AVRL and 1 from PURC. Three sets of semi-structured questionnaire were employed to collect data from each category of respondent. The study also made use of available secondary information relating to the study. The Statistical Product and Service Solution software (SPSS Version 16) was used to analyse the data.

This chapter presents the summary, conclusions and recommendations from the study in three parts. The first part presents summary and findings from the analysis; the second part covers the conclusion drawn from the results, whilst the final part presents the recommendations made from the study.

Summary and findings

- The study revealed that unaccounted for water still remained high at about (50%). These losses are very high compared to the Africa utility average of 31 percent. This is attributed to both physical and commercial losses. The physical losses results from uninstalled bulk and zonal metres at head works to monitor flow of water. Also, some of the main transmission lines are old and rife with leakages. Furthermore, commercial losses are attributed to wrong categorisation of meters, tampering of meters by consumers' and under metering.

- The study also revealed that the average operating cost recovery ratio for GWCL/AVRL for the period 2003 to 2010 was 87.3 percent. Since the recovery ratio was below 100 percent, it implies that the management of urban water system is not financially sustainable. Also the bill collection rate has reduced by 25 percent since 2006. That is from 110 percent to 85 percent in 2010. This is confirmed by the majority of the respondent with in-house pipe connection (69%) who said they do not pay water bill. The communication manager of GWCL/AVRL alluded to the fact that it has become ineffectual to bill the consumers because the water flow in the municipal has not improved.
- The research revealed that consumers were dissatisfied with the level of services provided by GWCL/AVRL. Amongst the respondents, majority (84%) agreed to the statement that unpaid water bills are constraints to urban water supply. Also 78 percent of the respondents contend that increase in population in the municipal is a constraint to

urban water supply and 80.5 percent of the respondent saw illegal connection as a constraint to urban water supply.

- Households' perception on water supply revealed that 81 percent of the respondent claimed that cost of accessing water has increased, and also 74 percent indicated that the GWCL/AVRL lack the technical expertise in urban water supply.
- It also found that 45.4 percent of households' with in-house pipe connection depend on tanker water supply when their taps are not flowing and 33.3 percent of household without pipe water connection depend on water resellers. Although tanker supplies get their water from GWCL/AVRL water points, GWCL/AVRL does not have the authority to regulate the price at which water is sold by the tanker suppliers to consumers. This affects consumers financially since they will be paying less if water were to be flowing through their taps.
- The study also found that the entire Taifa community do not have a functioning water network and have to depend on tanker water supply, boreholes and hand dug wells as their main source of water supply.

Conclusions

The argument for the introduction of public private partnership is attributed to the low investment, inadequate maintenance resulting in low coverage, high unaccounted for water through leakage and unreliable water flow in the water delivery system when it is controlled by the public sector. The proponents of PPP in water supply suggest that the private entity would inject capital for the regeneration of the water supply sector, improve cost

recovery, reduce non revenue water, and extend potable water to low income areas at affordable price. However, the data gathered coupled with analysis made in the study reveals that water supply situation in the Ga East Municipality has not improved.

The factors inhibiting water supply in the Ga East Municipality has been attributed to population expansion, inadequate service lines. Also the housing population has expanded beyond the available service lines. The municipal is also in a high pressure zone area hence pumping water regularly to the municipal is beyond the available capacity of GWCL/AVRL.

Hence the neo-liberal theory which has been used as a basis for private sector participation or public-private partnership in the water sector is not relevant. For example the element of competition proposed by the welfare economic theory cannot be applied in the water sector. This is because competition will drive private operators to allocate water to high income areas and deny access to water in low income areas. Also property right theory will create a monopoly status for the private operator and principal-agent theory will also prevent the government from establishing appropriate regulatory policies. Due to these examples, the public sector should be made to manage the water supply sector because it will not introduce competition in the water sector since it sees the provision of water as a social service. Government could also opt for public-public partnerships to enhance the efficient delivery of social services.

Furthermore since small scale water providers (SSWP) are the main source of water provision in the municipal, it will be prudent for GWCL/AVRL to engage their services in extending water to areas where

service lines are not available. Moreover, the prices at which they sell water to prospective buyers should be regulated as well as the quality of water.

Recommendations

With reference to the research findings and conclusions, the following policy recommendations are made:

- The PURC tanker guidelines must be extended to small scale water providers to enhance the delivery of potable water to residents who rely on their services and also enforce water quality laws. Also a nationwide licensing of water resellers must be undertaken to help enforce water quality regulations.
- The MWRWH in collaboration with GWCL/AVRL must undertake a nationwide upgrading and replacement of ageing and leaking pipelines with efficient models to reduce non revenue water to appreciable rate of about 15 to 20 percent. Also regular monitoring of water systems by GWCL/AVRL must be encouraged to control the rate of illegal connection.
- The PURC should encourage GWCL/AVRL to abolish flat rate billing system and introduce a nationwide metering of water use. This will help ascertain the actual water consumption levels of households in order to be billed appropriately.
- The MWRWH and GWCL/AVRL must initiate extensive drilling of boreholes in areas where there are no service lines for residents to get water at a fee. Establish community taps or community managed vending water kiosk where GWCL/AVRL would supply

water regularly to be sold in areas where it is difficult to set up new connections, maintenance of the facilities and the water would be paid from the sale of water.

- To enhance efficient delivery, MWRWH must have the commitment and political will to curb the mushrooming of illegal settlement and also allow stakeholder institutions to function independently.
- The Electricity Company of Ghana (ECG) should have dedicated lines for the water treatment plant to enable improve efficiency in production and distribution since the power outages affect water distribution severely.
- The government should engage both consumers and civil societies in decision making and implementation of policies. Civil societies have opposed private sector participation in water supply because consumers must have right to water and privatising it will exclude other consumers from benefiting and moreover the process of privatisation is concealed. If civil societies and consumers are engaged, opposition to policies would be ascertained and ironed out before the implementation of the policy.
- MWRWH should advocate for the construction of rain harvesting systems in new buildings before permits are approved in the municipal. This will encourage households' to use rain water as a viable option.

Areas for further research

Further research in urban water pricing, willingness to pay if services are available and urban water conservation strategies should be undertaken. Different forms of PPP options are available as well as different objectives. It will be essential to study an appropriate option that can improve the current urban water situation.

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APPENDIX A

UNIVERSITY OF CAPECOAST

INSTITUTE FOR DEVELOPMENT STUDIES

PUBLIC-PRIVATE PARTNERSHIP AND THE DELIVERY OF URBAN WATER SUPPLY: A CASE STUDY OF GA EAST MUNICIPALITY

Dear Sir / Madam

This study is in partial fulfilment for the requirements for award of a Master of Philosophy in Development Studies. The data is thus needed purely for academic purposes. This survey contains a number of questions concerning public-private partnership and the delivery of urban water. Please answer each question to the best of your ability by providing the response that best reflects your opinion. The information you provide would be confidential.

QUESTIONNAIRE FOR GWCL/ AVRL

Position in organisation.…….....

SECTION A: SOCIO- DEMOGRAPHIC CHARACTERISTICS

1. Sex: i. Male [ ] ii. Female [ ]
2. Age of Respondent .....
3. What is level of your educational attainment?

   i. No formal education [ ] iv. Tertiary [ ]

   ii. Basic [ ]

   iii. Secondary / Technical [ ]

SECTION B: Urban Water supply

4. What role does your organisation play in delivery of urban water?

   ……

   .....

5. How does your role ensure sustainability of urban water supply?

   .....

6. What has been your technical strength in performing these roles?

   .....

7. Are there environmental legislation governing urban water supply in Ghana ?

   a. Yes [ ] b. No [ ] c. Do not know [ ]

8. Is public-private partnership approach the best option to improve urban water delivery?

   a. Yes [ ] b. No [ ] c. Do not know [ ] d. other (specify)

9. Give reasons to your answer in Q. 8

   .....
   .....

10. What is your opinion on the use of PPP by the government for delivery of urban water supply?

    ……
    ……

11. What do you think were the factors taken into consideration before opting for PPP?

    .....
    .....

12. What is the contribution of small scale water providers (SSWP) in urban water delivery?

    a. Excellent [ ]b. Very Good [ ] c. Good [ ] d. Fair [ ] e. Poor[ ]

13. Does GWCL/AVRL regulate the activities of SSWP?

    a. Yes b. No c. Not sure

14. How would you rate access to pipe-borne since the partnership?

    a. Excellent b. Very good c. Good d. Fair e. Poor

Section C: Legal Framework

15. Is there a stable and comprehensive legal framework for implementation of PPP in delivery of urban water?

    a. Yes [ ] b. No [ ] c. Do not know [ ]

16. If yes what does the law say?

    …….....

17. Is the legislation sufficient and transparent to support the management and supervisory role of the public sector in a PPP approach?

    a. Yes [ ] b. No [ ] c. Do not know [ ] d. other (specify)

18. Are there enforced laws and regulation governing urban water supply in the country?

    a. Yes [ ] b. No [ ] c. Do not know [ ]

19. How does these laws and regulatory framework ensure sustained urban water delivery?

    .....

    .....

20. Do regulatory institutions governing urban water supply function independently?

    a. Yes [ ] b. No [ ] c. Do not know [ ] d. other (specify)

21. Do you involve consumers in designing and implementation of policies in the District?

a. Yes [ ] b. No [ ] c. Do not know [ ] d. other (specify)

……

22. What mechanisms has your organisation instituted to ensure sustainability of a public-private partnership in urban water delivery?

23. State some of the initiatives.

.....
.....

24. What informs your institution in setting tariffs in the urban water delivery sector?

……
……

25. Is the PPP approach compatible with current statutory and institutional arrangements?

a. Yes [ ] b. No [ ] c. Do not know [ ] d. Other (specify)

.....

26. Does the tariff charge reflect the cost of water delivery?

a. Yes [ ] b. No [ ] c. Do not know [ ] d. other (specify)

…….

27. Is partnering with a foreign private entity the only solution to managing urban water delivery?

a. Yes [ ] b. No [ ] c. Do not know [ ] d. other (specify)

28. State reasons for your response to question 27.

.....
.....

Section D: Constraint to urban water delivery

29. Please Tick (√) as appropriate in the columns under: Major challenge, Minor challenge, Not a challenge and Do not know in the table below.

Factors	Major constraint	Minor constraint	Not a constraint	Don't Know
Illegal connections				
AVRL-GWCL inadequate technical expertise to handle the pumps				
AVRL-GWCL inadequate financial support for maintenance works				
Few pipe lines cannot support fast expansion of township				
Unplanned community, People build on pipe lines				
Electricity power outage				
Broken down of pipe lines				
Unaccounted for water				
Inadequate funding				
Accumulation of unpaid water bills				

Section E: Financial sustainability

30. Has there been any innovative approach introduced to finance urban water supply particularly in low income areas since the partnership?

a. Yes [ ] b. No [ ] c. Do not know [ ] d. Other (specify)

…….

31. Has the tariff policy changed since the partnership?

a. Yes [ ] b. No [ ] c. Do not know [ ] d. Other (specify)

32. If yes how will this tariff policy generate revenue?

.....

33. Does this tariff system ensure equity amongst consumers?

a. Yes [ ] b. No [ ] c. Do not know [ ] d. Other (specify)

……..

34. Do you think the tariff charged is sufficient to recover cost on operations and maintenance?

a. Yes [ ] b. No [ ] c. Do not know [ ] d. Other (specify)

35. State your reasons to your answer in Q.34

.....
.....

36. What is the default rate in paying bills for water consumed in the district?

a. Very high [ ] b. High [ ] c. Low [ ] d. Do not know [ ]

37. What do you do you think account for this default rate?

…….....
.....

38. Has bill collection rate improve under the partnership?

a. Yes [ ] b. No [ ] c. Do not know [ ] d. Other (specify)

39. What is the biggest challenge related to collecting water tariffs from water consumers?

……
……

40. What measures have been implemented to ensure consumers pay for water consumed under the partnership?

.....

.....

41. Are there alternative sources of funds available for covering costs not recovered from users?

a. Yes [ ] b. No [ ] c. Do not know [ ] d. Other (specify)

42. If Yes, what is the source of these funds?

.....

.....

43. Is the source of fund sustainable for a PPP approach in urban water supply? Skip if you answered No in question 42.

a. Yes [ ] b. No [ ] c. Do not know [ ] d. Other (specify)

44. What initiatives have been taken to reduce the high incidence of unaccounted for water in urban water delivery?

.....

.....

Section E: Urban water supply in the Ga East Municipal

45. How would you rate the current situation of urban water supply in the Ga East Municipal?

a. Excellent [ ] b. Very good[ ] c. Good[ ] d. Fair[ ] e. Poor[ ]

46. What is the bill collection rate in the Ga East Municipal?

a. Excellent [ ] b. Very good [ ] c. Good[ ] d. Fair[ ] e. Poor[ ]

47. Please give reasons to your answer in Question 46.

……

48. What has hindered the GWCL/AVRL from extending pipe water supplies to Ga East Municipal?

……

……

49. What accounts for the intermittent flow of water supply in the Ga East Municipal?

……

……

50. What do you think has accounted for the rise in small scale water providers?

……

……

Section: F : Accessing the performance of GWCL/AVRL using the IBNET performance indicator since the partnership.

Performance ratio of GWCL from 2003-2010

Indicators	2003	2004	2005	2006	2007	2008	2009	2010
Ratio of collection to billing (efficiency)								
Ratio of collection to production								
Ratio of UWF to production								
Continuity of water flow								

Performance in Ga East Municipal 2003-2010

	2003	2004	2005	2006	2007	2008	2009	2010
Ratio of collection to billing (efficiency)								
Ratio of collection to production								
Ratio of UWF to production								
Pipeline extension (in metres)								

APPENDIX B

UNIVERSITY OF CAPECOAST

INSTITUTE FOR DEVELOPMENT STUDIES

TOPIC: PUBLIC-PRIVATE PARTNERSHIP AND THE DELIVERY OF URBAN WATER SUPPLY: A CASE STUDY OF GA EAST MUNICIPAL

Dear Sir / Madam

This study is in partial fulfilment for the requirements for award of a Master of Philosophy in Development Studies. The data is thus needed purely for academic purposes. This survey contains a number of questions concerning public-private partnership and the delivery of urban water. Please answer each question to the best of your ability by providing the response that best reflects your opinion. The information you provide would be confidential.

QUESTIONNAIRE FOR PURC

Position in company …….....

SECTION A: SOCIO- DEMOGRAPHIC CHARACTERISTICS

1. Sex: i. Male [ ] ii. Female [ ]
2. Age of Respondent .....
3. What is level of your educational attainment?

   i. No formal education [ ] iv. Tertiary [ ]

   ii. Basic [ ]

iii. Secondary / Technical [ ]

SECTION B: Urban Water supply

4. What role does your organisation play in delivery of urban water?

   ……

   …….....

5. How does your role ensure sustainability of urban water supply?

   .....

6. How does PURC regulate the activities of GWCL/AVRL?

   .....

7. Are there environmental legislation governing urban water supply in Ghana ?

   b. Yes [ ] b. No [ ] c. Do not know [ ]

8. Is public-private partnership approach the best option to improve urban water delivery?

   a. Yes [ ] b. No [ ] c. Do not know [ ] d. other (specify)

9. Give reasons to your answer in Q. 8

   .....

   .....

10. What is your opinion on the use of PPP by the government for delivery of urban water supply?

    ……

    …….....

11. What do you think were the factors taken into consideration before opting for PPP?

    .....

    .....

12. How would you rate access to pipe-borne since the partnership?

    b. Excellent b. Very good c. Good d. Fair e. Poor

13. Are there enforced laws and regulation governing urban water supply in the country?

    b. Yes [ ] b. No [ ] c. Do not know [ ]

14. How does these laws and regulatory framework ensure sustained urban water delivery?

    .....

    .....

15. Do regulatory institutions governing urban water supply function independently?

    b. Yes [ ] b. No [ ] c. Do not know [ ] d. other (specify)

16. What is the contribution of small scale water providers (SSWP) in urban water delivery?

    b. Excellent [ ]b. Very Good [ ] c. Good [ ] d. Fair [ ] e. Poor[ ]

17. What do you think has accounted for the rise in small scale water providers?

    ……

    …….....

18. Does PURC regulate the activities of small scale water providers (SSWP)?

    a. Yes b. No c. Not sure

19. Is partnering with a foreign private entity the only solution to managing urban water delivery?

    a. Yes [ ] b. No [ ] c. Do not know [ ] d. other (specify)

20. State reasons for your response to question 19.

.....

.....

21. What policies have PURC implemented since the in introduction on PPP?

.....

……

Section D: Constraint to urban water delivery

22. Please Tick (√) as appropriate in the columns under: Major challenge, Minor challenge, Not a challenge and Do not know in the table below.

Factors	Major constraint	Minor constraint	Not a constraint	Don't Know
Illegal connections				
AVRL-GWCL inadequate technical expertise to handle the pumps				
AVRL-GWCL inadequate financial support for maintenance works				
Few pipe lines cannot support fast expansion of township				
Unplanned community, People build on pipe lines				
Electricity power outage				

Broken down of pipe lines				
Unaccounted for water				
Inadequate funding				
Accumulation of unpaid water bills				

Section E: Financial sustainability

23. Has there been any innovative approach introduced to finance urban water supply particularly in low income areas since the partnership?

b. Yes [ ] b. No [ ] c. Do not know [ ] d. Other (specify)

…….

24. What informs PURC in setting tariffs in the urban water delivery sector?

……

……

25. Do you involve consumers in setting these tariffs?

a. Yes [ ] b. No [ ] c. Do not know [ ] d. Others (specify)

……

…….....

26. Do you think the tariff charged is sufficient to recover cost of operations and maintenance?

b. Yes [ ] b. No [ ] c. Do not know [ ] d. Other (specify)

27. If Yes, how will this tariff policy generate revenue?

.....

28. Does this tariff system ensure equity amongst consumers?

b. Yes [ ] b. No [ ] c. Do not know [ ] d. Other (specify)

……..

29. State your reasons to your answer in Q.28

.....

.....

30. What is the default rate in paying bills for water consumed in the district?

b. Very high [ ] b. High [ ] c. Low [ ] d. Do not know [ ]

31. What do you do you think account for this default rate?

…….....

.....

32. What is the biggest challenge related to collecting water tariffs from water consumers?

……

……

33. What measures have been implemented to ensure consumers pay for water consumed under the partnership?

.....

.....

34. Are there alternative sources of funds available for covering costs not recovered from users?

b. Yes [ ] b. No [ ] c. Do not know [ ] d. Other (specify)

35. If Yes, what is the source of these funds?

.....

.....

36. Is the source of fund sustainable for a PPP approach in urban water supply?

b. Yes [ ] b. No [ ] c. Do not know [ ] d. Other (specify)

.....

.....

37. How would you rate the current situation of urban water supply in the Ga East Municipal?

a. Excellent [ ] b. Very good[ ] c. Good[ ] d. Fair[ ] e. Poor[ ]

APPENDIX B

UNIVERSITY OF CAPECOAST

INSTITUTE FOR DEVELOPMENT STUDIES

PUBLIC-PRIVATE PARTNERSHIP AND THE DELIVERY OF URBAN WATER SUPPLY: A CASE STUDY OF GA EAST MUNICIPAL

Dear Sir / Madam

This study is in partial fulfilment for the requirements for award of a Master of Philosophy in Development Studies. The data is thus needed purely for academic purposes. This survey contains a number of questions concerning public-private partnership and the delivery of urban water. Please answer each question to the best of your ability by providing the response that best reflects your opinion. The information you provide would be confidential.

HOUSEHOLD QUESTIONAIRE

HOUSE NUMBER: ……

SECTION A: SOCIO- DEMOGRAPHIC CHARACTERISTICS

1. Sex: i. Male [ ] ii. Female [ ]
2. Age of Respondent .....
3. Name of community.....

4. Marital Status (Please tick)

   a. Single [ ] b. Married [ ] c. Separated [ ] d. Divorced [ ]

   e.Widowed [ ]

5. What form of occupation are you engage in?

   a. Self employed b. Pensioner c. Civil Servant [ ] d. Unemployed [ ]

6. What is the level of educational attainment?

   a. No formal education [ ] b. Basic [ ] c. Secondary / Technical [ ] d. Tertiary [ ]

SECTION B: OPINION ON WATER SUPPLY SERVICES

7. Do you have piped water connection in your home? (a) Yes [ ] (b) No []. If yes skip question 9 and if No skip question 10.

8. If Yes, how many time does your tap flow does your tap flow in a month?.....

9. If No, where do you get your water from?

   (a). Borehole [ ] (b). Public standpipe [ ] (c). Well [ ] (d) Rainwater [ ] (e) Water resellers [ ] (f). Tanker truck supply

10. When your tap is not flowing where do you get water from? Choose the prominent one.
    a. Water tanker supply [ ] (b). Public stand pipe [ ] (c). Boreholes [ ] (d). Well [ ] (e). Water resellers (f). Rainwater

11. What is water availability situation in your house if you have pipe connection? (Please tick)

    i. Not applicable [ ] iv. Scarce [ ]

    ii. Do not know [ ] v. Frequent shortages[ ]

    iii. All year round [ ] vi. Other (Specify) [ ]

12. How far (in kilometres) do you walk to get your water?

    a. Within two kilometres [ ] b. Beyond two kilometres [ ]

13. Is the water you get sufficient to meet your household requirements?

    (a).Yes [ ] (b). No [ ] (c). Do not know [ ]

14. Are you billed for the water you consume from your tap?

    (a). Yes [ ] (b). No [ ]

15. If Yes, how, much do you pay as water bill per month? GH¢.....

16. If No, Why?

    ……

    …….....

17. If you buy water from outside your home, how much do you spend in a month? GH¢.....

18. How much do you think an average urban dweller in Accra should pay for a bucket (34cm size) of water?
    GH¢.....

19. If you buy water from water vendors (400-500 gallons), how much do you pay per trip? GH¢.....

20. What do you have to say about the price of water purchased from water vendors?

    (a). Expensive [ ] (b). Affordable [ ] (c). Do not know [ ]

21. How would you rate the importance of the services provided by small scale water providers?

    a. Extremely important [ ] Very important [ ] (b). Somewhat important (c). Not very important d. Other (specify)

22. Do you know the source of their water? (a).Yes (b). No

23. How would you rate the current state of urban water delivery in your community?

(a). Excellent [ ] (b). Very good [ ] (c). Good [ ] (d.) Fair (e).Poor

24. Give reasons for your answer to question 23

.....
.....
.....

25. Would you attribute illegal connection to the cost of connecting to water systems?

a. Yes [ ] b. No [ ] c. Do not know [ ]

26. How long does it take to repair cases of broken pipes reported?

.....
.....

SECTION C: KNOWLEDGE OF PUBLIC-PRIVATE PARTNERSHIP

27. What is your opinion on the use of PPP by the government for delivery of urban water supply?

……
……

28. What do you think were the factors taken into consideration before opting for PPP in urban water delivery?

.....
.....

29. Do you think the partnership between AVRL and GWCL has improved water delivery?

i. Yes [ ] (ii) No [ ] (iii) Do not know

30. Is there an anti-privatisation sentiment in the water delivery sector?

a. Yes [ ] b. No [ ] c. Do not know [ ]

Please give reasons for your answer.

.....

.....

31. Households' perception of urban water supply in the Ga East municipal. Please tick as appropriate.

Statements	SA	A	N	SD	D
Cost of access water has reduced					
Water flow is regular					
Illegal connection has reduced					
Connection cost has reduced					
Bill collection rate has improved					
Households' uses less time in collecting water					

SECTION C: CHALLENGES TO URBAN WATER DELIVERY.

32. Please Tick (√) as appropriate in the columns under: Major challenge, Minor challenge, Not a challenge and Do not know in the table below.

Factors	Major challenge	Minor challenge	Not a challenge	Don't Know
Illegal connections				
AVRL-GWCL inadequate technical expertise to handle the pumps				
AVRL-GWCL inadequate financial support for expansion and rehabilitation				
Springing up of industries that use a lot of water				
Few pipe lines that cannot support fast expansion of population				
Land owners do not want new pipe lines to pass their lands				
Unplanned community, People build on pipe lines				
Electricity power outage				
Broken down of pipe lines				
Unaccounted for water				
Size of PVC pipes used in transmission of water				
Accumulation of unpaid water bills				
Obsolete state of pumping machines				

33. In your view what do you think can be done to improve the water delivery situation in the Ga East District?

GWCL/AVRL

……

……

Household

……

……

THANK YOU