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Stakeholders' perspectives on urban water management in Ghana- A case study of Greater Accra Metropolitan Area and Kumasi Metropolitan Area

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Dedication

Dedicated to Rejoice Amexo

Abstract

In urban areas of Ghana, there are numerous and complex challenges confronting residents, in terms of water access. This study sought to understand these challenges from the perspectives of stakeholders. The stakeholders were selected from Greater Accra Metropolitan Area (GAMA) and Kumasi Metropolitan Area (KMA), the most populous cities in the country and where Ghana Water Company Limited (GWCL) has the bulk of its customers. To achieve these objectives, a case study method was used. This method was particularly useful, as it provided an in-depth explanation of the situation. Also, it facilitated data collection and analysis of information from different sources such as water management personnel, consumers, private individuals in water distribution business and NGOs. Fundamentals of the public goods theory were used for the analysis. The research revealed that the country's urban water sector is entangled with the problem of low investment. This situation, coupled with bad management practices has rendered the water company incapable of fulfilling its mandate of providing water to urban residents in sufficient quantities. Consequently, there are many communities without water supply. Where the utility network is available, the rate of access varies, depending on socio-economic circumstances, location, and availability of infrastructure, among others. Where there is no supply at all, access depends on the economic strength of consumers because the further they are from the water source the more they spend to have it. Also, it came out that the difficult situation of water access has led to getting water from multiples sources such as wells, boreholes, rivers, which raises concerns about public health. The Ghanaian urban dwellers like any society need unlimited water access but it is yet to materialize and no one knows when this dream will be fulfilled.

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List of abbreviations

AGI	Association of Ghana Industries
AMA	Accra Metropolitan Area
AVRL	Aqua Vitens Rands Limited
CONIWAS	Coalition of NGOs in Water and Sanitation, Ghana
Get-Fund	Ghana Education Trust Fund
GIMPA	Ghana Institute of Management and Public Administration
GWCL	Ghana Water Company Limited
GAMA	Greater Accra Metropolitan Area
GDP	Gross Domestic Product
GH¢	Ghana cedi
GOG	Government of Ghana
GPRS	Ghana Poverty Reduction Strategy
GSS	Ghana Statistical Services
GUWL	Ghana Urban Water Limited
IFC	International Monetary Fund
MMDAs	Municipal, Metropolitan and District Assemblies
MWRWH	Ministry of Water Resources Works and Housing
NHIS	National Health Insurance Scheme
NGOs	Non-Governmental Organizations
NRW	Non Revenue Water

PURC	Public Utility Regulatory Commission
SOEs	State Own Enterprises
TUC	Trades Union Congress
WASH	Water Sanitation and Hygiene
WHO	World Health Organization
WB	World Bank
WRC	Water Resources Commission

Chapter One

1.1 Background

To save its water utility from collapse, Ghana in the 1990s started a wide range of reforms of its water and sanitation institutions, with the anticipation to transform the sector into an effective one, capable of providing quality, but affordable services to all Ghanaians. The process which was prompted by the country's development partners, especially the World Bank (WB) and the International Monetary Fund (IFC) were also part of a wider public sector reforms in the country to improve the performance of State Own Enterprises (SOEs)(Uddin & Tsamenyi 2005; Yeboah 2006).

In the water sector, they were primarily targeted at creating favourable conditions for more private sector involvement, with the eventual rollback of government's role from manager to facilitator to improving effectiveness in the development and management of water facilities and increasing water supply coverage (Fuest & Haffner 2007; Hall et al. 2005).

Consequently, the relevant legal frameworks and institutions were created, resulting in the formation of the Public Utilities Regulatory Commission (PURC), to oversee the proper $regulation of water and electricity supply whilst the Water Resources Commission (WRC) was to be in charge of water resources management. Also, the responsibility for the management of urban water was given to the Ghana Water Company (GWCL), whilst water supply and sanitation at the rural level were assigned to the Community Water and Sanitation Agency (CWSA). There was in addition the emphasis on greater community involvement, especially in rural water supply and sanitation and private sector participation in urban water supply and management(Amenga-Etego & Grusky 2005; Fuest & Haffner 2007; Whitfield 2006)

The highpoint of the reform process was the controversial five-year management contract arrangement with the private operator, Aqua Vitens Rands Limited (AVRL) in 2006. AVRL was responsible for the daily management of some 82 urban water systems, whilst GWCL was to handle assets investment. The contract has since expired and the Ghana Urban Water Company Limited (GWUL), a government created transitional company has been formed to take over the management responsibilities of AVRL (Whitfield 2006).

These reforms, in effect succeeded in creating a seemingly functioning institutions in the sector and with clear lines of responsibilities. In addition, the Ghana Water Policy, which outlines in clear terms the country's vision as far as water resources management was concerned instituted (GOG 2007). Notwithstanding these achievements, Ghana's urban water sector is still plagued by challenges and as a result not able to meet the water demand of many urban residents in the country. Today, the urban water sector is in the kind of a situation that many commentators have described as 'crises'.

As will be recognized later in the studies the situation of urban water crisis in Ghana is experienced in many forms. This includes intermittent flows and rationing, contamination and high cost in purchase from private vendors. Similar to the case in many countries in the Sub-Saharan African countries, the most affected population is the urban poor and those living in the peri-urban or fringe communities. In addition, women and children are the most burdened under this situation as by traditional household function they are responsible for fetching water for the household(Nyarko et al. 2006; Yeboah 2006).

Another form in which the harmful effect of inadequate water supply of water is felt is the high incidence of water-borne diseases such as cholera, typhoid and diarrhea in the country, particularly in urban areas. (The issue of cholera will be discussed in this thesis. Even though not directly raised in the research questions and as such was not covered in the fieldwork, the recent outbreak in parts of the country is of interest to the topic).

The inability of the GWCL, the only regulated urban water company in the country to supply water to customers, according to many commentators is as the result of a combination of several factors, some of which include: inadequate and over-aged pipe networks, an ever expanding urban population; inadequate investment into the system and non-corresponding tariffs; leadership inadequacies and high percentage of non-accounted for water (Fuest & Haffner 2007). However, the following statement by Kweku Botwe, a former Managing Director of the company perhaps best summarized the situation in the following statement: 'Investment had stagnated so much over the past 40 to 50 years that you are no more dealing with an urgent situation, but an emergency' (www.businessweek.com/articles/2013-04/11).

1.2 Problem statement and objectives

Globally, more attention is being shifted from the conventional mode of management, to participatory stakeholder approach. This is in response to the new challenges faced in urban water supply management. The participatory stakeholder approach emphasizes on technology as solutions to problems in the sector. However, critics are questioning the ability of the 'technology alone' solutions to the diverse and emerging water supply challenges as society advances (Pahl-Wostl 2005).

The argument is that the complicated issues of rapid urbanization, environmental degradation, rising cases of water related diseases, particularly in the developing world, pervading poverty, over-aged infrastructure, cash strapped water utilities, among others have made urban water supply a formidable task to managers. Therefore, for water systems to be sustainable, then science and technology solutions should be incorporated with social and economic factors (ibid). In the view of Spang (2007) the 'command and control' regulation and supply engineering method has given way to 'systems based, stakeholder participatory approach'.

The increasing use of the concept 'stakeholder' in the urban water development discourse is greatly influenced by what Warner (2006) termed the 'global voice' discourse, which stresses on the diversity of voices and values, in the management and use of water. To put it differently, it is the concept that recognizes the 'democratization' of water management (Spang 2007).

The growing realization of stakeholders as an important force in water resources management supply has also found expressions in several international conferences and documents. For example the Principle 2 of the United Nations International Conference on Water and the Environment (ICWE), held in Dublin, 1992 also known as Agenda 21, which addressed environmental and sustainable issues, stressed amongst other things that water development and management should be based on a participatory approach. Again, the International Decade for Action (2005-2015), also known as the 'Water for life', was adopted by the UN-General Assembly further recognizes the full participation of stakeholders, particularly women in water management and supply and related issues (ICWE 1992; UN-Water 2005).

In Ghana the stress on stakeholder participation is seen in many literatures, from forestry, agriculture, education, health, environmental to water resource management. A common theme

runs through all: that emerging developmental issues confronting the country are diverse and complex. Finding lasting solutions to these challenges needs a comprehensive strategy negotiated and acceptable to most of the concerned stakeholders. In the water sector, the emphasis on the involvement of stakeholders is expressed in important national documents. The National Water Policy of 2007 for instance mentioned the importance of contribution of stakeholders to the realization of the targeted goals of the policy (GOG 2007).

In the urban water sector in these GAMA and KMA there are various stakeholder groups, institutions, individuals and coalitions. These different stakeholders, who have evolved over the years, represent different interests and positions. What are their concerns about the water crisis raised above? One of the major controversies persisting in the country today is centered on the form of management system that the sector should operate. Some people feel that it should purely be a public entity, but others want it privatized. Another group wants a high breed system. What do stakeholders' say about this, particularly after the expiration of the AVRL management contract? There have been other lingering questions. Should urban water be devolved to the various Metropolitan, Municipal and District Assemblies (MMDAs)? Should there be independent water producers? And what form of financing will stakeholders recommend for the sector? What are the possible answers do they have to these issues?

Against this background, this thesis is interested in understanding how stakeholders' perspectives in the water sector can be applied in the Greater Accra Metropolitan Area (GAMA) and Kumasi Metropolitan Area (KMA). A review of the literature and policy papers in the water sector reveal the fact that the day to day management in the urban water sector is still dominated by people with background in engineering and natural sciences. Even though some of the stakeholders are recognized they are hardly consulted.

Of particular importance are the possible lessons that the case studies in Accra and Kumasi might offer in urban water management in the country.

The objectives of the study are to investigate:

The challenges people face in getting access to water.

The causes of these problems and make suggestion on how these problems be solved

Whether or the problems are as a result of management deficiency

The best water management policies for urban water supply

1.3 Research questions

What are the challenges that people face on daily basis in getting access to water?

What are the causes of these problems and how do we find answers to them?

Are these problems as a result of management deficiencies?

What are the best management policies for urban water supply in Ghana?

1.4 Thesis structure

The study is structured into five chapters. A brief overview of each chapter is outlined below.

Chapter one: Presents the introduction to the topic together with the problem statement research objectives and background information on the study area.

Chapter two (Literature Review): Presents a brief definition of the terms and concepts related to the chosen topic. In this chapter a general discussion is made of the concepts used in this study. The fundamental interactions between the various concepts are also discussed. In addition, the chapter presents a discussion on the trends of urbanization in the global context, the situation in Africa and that of Ghana and its impact on urban water supply and management. Further, this chapter discusses the stakeholder theory and its relevance to the study.

Chapter three (Methodology): This chapter describes the steps to achieve the objectives as set out in Chapter One of the thesis. Therefore, this chapter focuses on the data collection methods, sampling techniques, and method of data collection and analyses.

Chapter four (Findings and Presentation): This chapter focuses on data processing, analyses and presentation of the findings.

Chapter five (Conclusion): The findings of the study, the conclusions and recommendations are presented in this chapter.

Chapter two - Literature review and theoretical framework

2.0. Introduction

This chapter presents the relevant literature concerning the topic under study. It is divided into two sections. The first section discusses the issues relating to water management, particularly in the urban context. The second part introduces the country and the communities under study to the reader.

2.1 Conceptual perspectives and analytical framework

2.1.1 Factors affecting urban water use

In terms of volume, water is one of the most available natural resources. However, its demand and use, especially in the urban context is influenced by several factors. First, it is a finite resource abstracted, produced and sold to different customers. Secondly, water use among these customers is varied, and there is a competition amongst them for the available water. Finally, whenever there is water scarcity, its distribution is largely affected by the social and political forces available in that society. This section will highlight some of the basic social, economic and political conditions that influence water demand and supply, in the urban context.

2.1.2 Urban water use

Traditionally, there are three broad categories of water use: domestic, agricultural and industrial sectors, respectively (Hoekstra & Chapagain 2011). Another form is the usage in the recreational sector. This thesis uses are inter-related as well, as they have impact on environmental sustainability (Cai & Rosegrant 2002). This discussion however, will focus on residential uses of water.

2.1.3 Domestic use of water

Water for domestic use is needed in the right quantity and quality. The basic need for water is for the physical survival of the body i.e. drinking. Apart from this, water is needed for cooking,

hygiene and health purposes. Water quality for these needs when compromised has consequences on health such as diarrhea, typhoid and cholera. For that matter drinking water quality is seen as the most significant feature of water services as people need it as a basic necessity. For that matter, Bennett (1995) observed that urban residents who have water storage problems risk exposing themselves to such diseases as typhoid, giardiasis, parasitic or bacterial dysenteries as their water risk contamination.

Inadequate supply of clean water can be the cause of skin and eye malady (Bennett 1995). The domestic consumption of water for drinking, cooking, bathing and hygiene is known as water for 'essential usage' (Hanemann 2006). Beyond these uses domestic water is used for gardening and for recreational purposes. In addition, potable water availability in the right quantity is an important element in domestic production, employment and gender equity (Rijsberman 2006). In many poor urban households, it is difficult to distinguish between water use for cooking and domestic production (Howard & Bartram 2003). Water use in this situation, particularly for food production has become part of the coping strategies of these households. In this case, when it is available in the rightful quantity and quality it will have broader health gains.

Because of the multiple domestic uses of water, urban residents as part of their coping strategies will prefer making investments in water provisioning that they feel is of quality than risk their health. Consequently, in urban fringe communities and low income areas where water infrastructure is limited or does not exist families pay more for private and other second hand sources. Even in those areas where the infrastructure exists but supply is erratic consumers pay for alternatives. This situation not only affects the budget of poor residents but their health as well, as most of these families cannot afford alternatives. Therefore, to encourage the use of larger amounts of water for hygiene purposes it is recommended that access to water supply should be as close to the home as possible (Esrey et al. 1991). Highlighting this point is Bennett (1995), who argued that accessibility and availability of water affects water use of a family, in particular its well-being. In other words, the more accessible the water source, the more a family is likely to use until it reaches its limit of consumption. On the other hand, trading in water at the domestic level is an important source of livelihood to many households, especially in the developing world where water scarcity has forced residents to purchase water from secondary sources (Bennett 1995).

2.1.4 Basic water requirement

There are differences in literature regarding what constitutes the basic requirement for water for each person living across the globe. WHO/UNICEF for instance, in its estimation stressed on water for basic domestic health and hygiene needs. (Gleick 1998) also used these variables. In their study, Howard and Bartram (2003) in their study stressed on 'all domestic health and hygiene needs'. Shuval (1996), focused on water for 'non-agric requirement and water for essential food production. Finally, Falkenmark (1986) defined it to be water requirement to run a modern society. Meeting these varied needs of water is dependent on the availability of the water resource and how it is managed.

2.1.5 Water resources availability and supply

As the global water resources are finite, the same thing cannot be said about demand. The growth in human population is creating an increasing demand for water and the corresponding increase in standard of living also puts more demand for water. Increasing scarcity and competition for water also puts pressure on both the resource and the managers who allocate it (Rijsberman 2006). And Bennett (1995) argues that under conditions of scarcity, water becomes a commodity needed by different groups of people within society. Also, it becomes a commodity whose allocation reflects the social dynamics and political processes within society. Thus in her research in Latin America she made the following observation: '…varying quality of water infrastructure in different neighbourhoods in Latin American cities may be due to technical reasons, but a reflection of class biases in the planning bureaucracy or may reflect the varying abilities of different neighbourhoods to have their voices heard by the planning bureaucracy' (Bennett 1995:26). The recent debate is about the values that should be placed on water- should it be treated as a private or public good.

2.1.6 Water as public good

Among the concerns that emerged from the International Conference on Water and Environmental Conference in Dublin 1992, is the contested issue of whether to apply economic tools and principles to water management. One of the four principles adopted from the conference stresses that: 'Water has an economic value in its competing forms and as such should be recognized as an economic good'(ICWE 1992). Water in the broadest sense is an economic good, because apart from it being used directly by human beings, it is at the same time

an important element in production. And it satisfies the condition of 'alternative uses' (Perry et al. 1997). Agreeing with this view, scholars like (Baumann et al.). Baumann and Boland have equated water to any other economic good like food, clothing, or shelter and as such the market principles should be applied to its allocation. Against this backdrop, pricing policy is important if water is to be managed sustainably. Having water at higher prices will motivate all users to use the resource more judiciously. As well, it will generate more funds to maintain the existing infrastructure (Cai & Rosegrant 2002). Higher efficiency will result in reduction in withdrawal, and eventually help in saving the environment. Similarly, in the situation where public water supply bodies provide water at a subsidized cost is no longer sustainable. Particularly, against the challenge that the marginal cost of water provision as well as the environmental costs are increasing by the day (Grimble 1999). Therefore, users have to realize that water is no more abundant to be used anyhow, but has to be allocated between users and usages, by one mechanism or the other. 'When the price of water reflects its true cost, the resource will be put to its most valuable uses', Rogers et al. (2002), argued. Charging water rates will also be a sure way of promoting equity amongst users as it allows utility services to be extended to those not served, and are therefore, compelled to purchase from vendors at a higher cost. Low priced water leads to excessive consumption (ibid). To the proponents of this view it is only by adhering to the market forces that water can be managed in an efficient manner. Further, it tallies with the goals set out in the United Nations Agenda 21, which seeks to promote sustainable development by using resources judiciously.

Contrary to this view is the argument that water is a public good and therefore cannot be subjected to market principles. Barlow and Clarke (2002), for example argue that water should not be treated as a commodity to be bought, sold, and traded for profit. To them 'water is universal and indivisible.' Therefore, the earth's fresh water belongs to the earth and all species. It should be seen as a shared legacy, a public trust and a fundamental human right'. Once it is a public good everybody should have access, regardless of their ability or willingness to pay. As the private sector cannot be relied upon because of profit motives, market failures and the huge investment the state should take up that responsibility. This view is in line with the one held by international bodies such as the Water Supply and Sanitation Collaborative Council's Vision 21, the Cochabamba Declaration and the Group of Lisbon's Water Manifesto and the United Nations Committee on Economic, Social and Cultural Right's statement on the right to water to the effect

that water is a human right under international law. In her argument, Shiva (2002) has extended the debate to include nature. To this scholar, the water debate is about two conflicting cultures – one which observes water as sacred, and treats its provision as a duty for preservation of life, whilst the other treats it as a commodity. This debate according to some scholars should be extended beyond the private-public sector dichotomy. Thus, water carries the elements of both public and private good. However, the extent of *publicness* or *privateness* in consumption of water is an issue that needs further discussion and the next section throws more light on this debate (Allen et al. 2006)

2.1.7 Collective consumption

As water falls under the broad category of public services the theory of collective consumption will be used to explain the various conditions underpinning its supply. The term used by economist such as Samuelson (1954) to explain the underlying reasons for the state's intervention in the provision of services to the public such as education, defense, water, electricity, among others. Samuelson in his distinction referred to public goods as 'collectively consumed' by large groups of people, whilst private goods as those that are 'individually exchanged in the market'.

Others have since expounded on this position. For example, Pacione (2005) defined public goods as: 'all collectively organized and managed services consumed through non-market mechanisms and at least partly paid for from the public purse'. To this view, the avenue by which individuals especially the low income households can measure their living standards is by their level of access to public goods and services available to them locally. In the arguments of Pinch (2014) this theory can best be applied to goods and services that have such characteristics that they cannot be supplied through the private market. A classic example of such goods is defense. Other examples are healthcare, water infrastructure, education and highways which are essential services consumed individually but collectively provided. In stressing the point for the application of this theory in the water sector Bennett (1995) noted the following points:

'..., a school is built for a neighborhood, not for one family. A highway is built for all drivers, not for any particular vehicle owner. A water system is built for an entire section of the community and expanded neighborhood by neighborhood, not house by house (pp24)

The need for state provision of water supply services is also explained by this author, and it includes the following:

Capital intensive

Collective consumption services infrastructure is capital intensive and returns on such investments take a long period to recoup. It will therefore not be attractive for the private entrepreneur to undertake such investments.

Prudence and efficiency

Collective consumption services such as water are essential services whose supply needs efficiency, which can best be delivered by state institutions than competing private firms.

Basic necessities of life

Such services are considered as basic necessities of life whose attainment can best be guaranteed under state provision.

2.1.8 Features of consumptive goods

If water indeed is a consumptive good as outlined above, then it is important to look at the characteristics of public goods. In the definition of Pinch (2014) private consumption goods are those that could only be consumed by one private individual. An example of such goods is clothes. Public consumption goods on the other hand are those goods with features that made them impossible to provide through the private market. The properties that made the latter impossible to be supplied through the private sector is explained as follows:

First, they are *joint supply*, meaning; if it can be supplied to one person then it can be supplied to all others without extra cost. The second property is that once it is supplied it is impossible to prevent those who do not wish to pay from enjoying it. This property is termed *non-excludability*. It has benefits that cannot be confined to a single user or buyer. According to Ostrom and Ostrom (1999) where there is *exclusion*, potential users can be denied access to the goods and services, unless they meet the conditions of the vendor. In this case, if the two parties (consumer and supplier) agree then the goods and services can be supplied at a stipulated fee. In the exchange the consumer acquires the good and the vendor acquires the rate specified. The third property is *non-rejectability*, meaning once a good has been supplied it must be equally consumed by all, even those who do not wish to pay for.

Whilst this theory is relevant in explaining the situation of urban services such as water supply, its strict application is not practically possible in many ways because of issues such as location, cost and social standing. These shortcomings Pinch (2014) acknowledged as 'geographical facts' that makes it impossible for public goods and services to be provided universally and at an equal cost to consumers and providers. For example, in many jurisdictions governance have been devolved to local government units because of a number reasons, including economic, social and administrative reasons. This process Pinch referred to as '*jurisdictional portioning'*. The kind of goods and services enjoyed by residents in their respective administrative units may vary in the quality in and quantity. Indirectly, then, the quality of goods and services an individual enjoys is dependent on his or her geographical location. The second geographical fact that affects the availability and use of consumptive goods is what he termed *'tapering'*, meaning public services are theoretically available to all segments of society. However, in many cases issues of distance from the point of location may inhibit a resident from enjoying that facility; even if it is provided without charge. As the cost increases it will affect the quantity of the service consumed, as well as the quality. In other words distance-decay negatively affects the criterion of 'non-exclusion'. In addition distance affects the criterion of 'joint supply' as quality of the service may vary with distance. In addition, political, as well as socio-economic factors may also affect the use of a consumptive good or service, both at the individual and collective levels. The dynamics of politics is seen particularly in the situation of inadequacy in supply of the consumptive good. In such circumstances the affluent in society directly or indirectly work to skew supply in their favor as the poor may have little voice and influence in its allocation (Pinch 2014).

Some political decisions may also work to exclude a category of residents from enjoying urban services. For example, a political decision to privatize services hitherto provided directly by government agencies may affect poor residents that are not able to afford if the prices are higher than what they used to pay under previous provider (Pacione 2005). Also, for profit motives a private service provider may decide not to serve communities that it considers unprofitable. In addition, in what Pacione explained as the underclass hypothesis, economically disadvantaged groups and areas may be bypassed in the provision and allocation of services by bureaucrats. This assertion is confirmed by Adama (2012) in a study of inequalities in waste management in Abuja, Nigeria, adding that bad governance practices work to entrench this condition.

2.1.9 The extent of publicness or privateness of goods

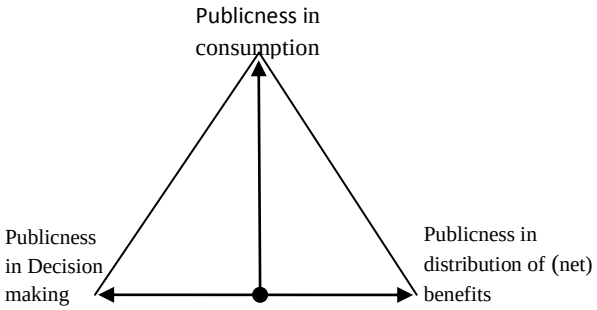
As discussed earlier the level at which public are available for one's is not uniform but affected by several factors. In other words, today's world of consumption is described by what (Kaul & Mendoza 2003) termed 'a multi-actor world'. In this sense, society can change these attributes of *(non) rivalry* in consumption and *(non) excludability* of benefits by policy. Thus, for a good having the properties of *(non) rivalry* in consumption and *(non) excludability* of benefits does not necessarily qualify it to be a 'private' or 'public' good. In most cases, it is a matter of policy, determined by the society that is affected. Therefore, the degree of publicness or privateness of a public good is a social construct (Kaul & Mendoza 2003). In relation to this argument a distinction can be made between goods that have the potential of being public and its being de facto public.

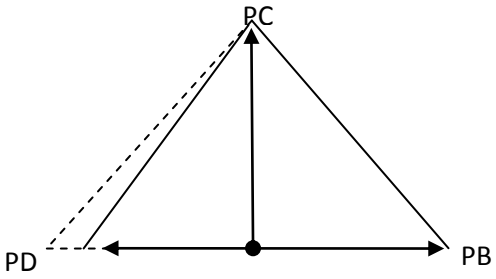
Against the issues raised above, these authors have suggested a review of the concept of public goods. The issues that matter to them in this debate is; whether the level of *publicness* in consumption equally matches the element of *publicness* in decision making, as well as with equity in the distribution of benefits. They have argued that even though not all public goods provide similar satisfaction yet decisions concerning their allocation should be fair and just, with wider public participation. Equally important is the view that there should be equity in the distribution of the benefits across all segments of society. This argument is better explained in the triangles of *publicness* below in figure 2.1

Figure 2.1: Triangles of publicness

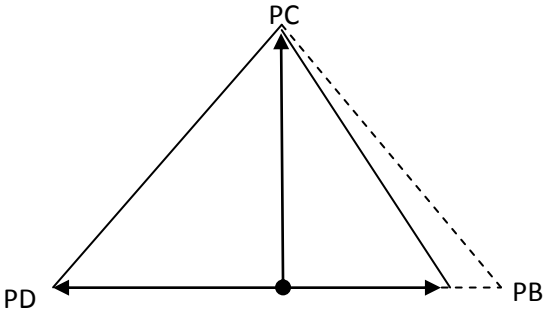
1. In case **A,** which is described as the ideal triangle of publicness the level of publicness in consumption equally matches the element of publicness in decision making and publicness in the distribution (net) benefits.

Case **A**

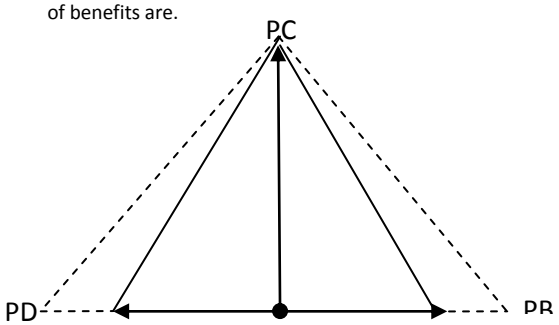




Case B: Decision-making is not completely public, but consumption and the distribution of benefits are.



Case C: Decision making is not completely public, but consumption and the distribution of benefits are.



Case D: The distribution of benefits and decision-making are not completely public but consumption is

PC=Publicness in consumption

PD=Publicness in decision making

PB=Publicness in distribution of benefits

Source: Kaul and Mendoza ,2003

The above theory is important in highlighting the issue of water sector supply governance and the extent to which control is shared among citizens, the state and other stakeholders, particularly the private sector, NGOs and donors. Kaul and Mendoza (2003) have given the standard definition that could be applied in the water sector. The main focus of the researcher at this point

is to use this yard stick to measure water supply in Accra and Kumasi to see whether they meet the standard and if not why and how to address the shortfalls.

2.1.10 Urban water management and supply

Against the above discussions the following section will discuss the various forms of urban water supply and management. This will be discussed under the broad topic of institutional and informal methods of water supply and the informal system of supply.

2.1.11 Institutional methods of urban water supply

From the previous discussions water has been recognized as having the special properties of non-excludability and non-rivalriness. Consequently, the management of most urban water systems was placed under government. The assumption was that it was only under state management that there can be guaranteed supply. For that matter, the state in most cases was directly engaged in the entire water supply chain of abstraction, production and transmission. In the situation where the state is not in the position to provide this service directly, it creates the enabling environment for other actors, especially the private sector to step in. The participation of the private sector may be in part or in the entire supply chain. In this case, the state is said to be involved in the service provision, but doing so 'indirectly' (Allen, 2006). Under the condition of private sector participation the state may be responsible for coordination, financing and enabling regulation. Different modes of supply can be distinguished under this system of institutional provision.

2.1.12 Public utilities

In literature they have been defined differently. According to Baietti et al. (2006) 'a public utility is an organization that is majority owned and controlled by government'. In this definition it is a utility that has not engaged a private operator in its operations. McDonald and Ruiters (2012) in their definition also distinguished between 'public' entities that are entirely state-owned and; 'non-state' organizations that operate independently of the state on a non –for – profit basis, whilst its orientation is on the principles of equality and social citizenship. The two groups according to these authors may operate independently of each other or may be in some form of partnership.

2.1.13 State utilities

In the case of purely state operated utilities there could be corporatized bodies with a corporate structure. There could also be a ministry or department, normally formed out of an executive order and normally incorporated and or without legal personality separate from that of the government. It is also nationally owned and operates under public law and in another form is a Company, registered under companies act and operates and has legal status. It usually owned by government and shareholders operating under companies' law.

2.1.14 Public Private Partnerships

There are many different options for the participation of the private sector, depending on the level of involvement of the private sector. Mandri-Perrott and Stiggers (2013), for instance categorized two groups: The first groups, where the assets remain in the hands of public ownership, include the following: Service and management contracts, Lease and Concessions. The second groups, where the assets are partially in private ownership, include: Build – Own – Operate transfer (BOOT), Build-Own -Operate (BOO) and reverse BOOT, Joint ownership or mixed companies, and outright sale, or partial divestiture (ibid).

Service contracts – These are the simplest forms of PSP, involving short-term contracts to provide limited services, such as reading meters, repairing leakages, and distribution bills for payment. In many instances these contracts involves undertaking specific functions and do not require any overall private sector responsibility for system operation (ibid).

Management contracts – This is similar is similar to service contracts but in a bigger dimension. Management contracts which require to some extent greater private sector responsibility with the private company assuming day-to-day responsibility for system operation and maintenance. Under the operation of this system however, operators of the contract are not required to do any private investment, neither company does it assume any commercial risk, and as well does not have any direct legal relationship with the consumer. For example the management contract between GWCL and AVRL saw the former retaining a limited role as asset holder and remained responsible for investment, development and expansion of the system whilst the latter, the operator was to operate the water supply systems to targets set in the contract and was paid a fixed fee for a period of five years.

Leases – By this model a private operator rents facilities from the public authority for a stipulated period of time. Ownership and responsibility for financing and expansion is done by the public authority but the private contractor is responsible for financing working capital and accepts some commercial risk in the day-to-day operation of the system. The private contractor is not responsible for any capital costs, and rental fees are often based upon the costs of debt service for capital costs. The Senegalaise de Eaux, contract which has been hailed by the World Bank operates on this model. An emerging form of lease contracts is 'enhanced leases' whereby the private operator is responsible for some level of investment in rehabilitation or extension of the distribution system to peri-urban areas (Nickson & Vargas 2002).

Concessions – This model which operates mostly in Latin America and East Asia are long-term contracts that require the private company to invest in the system. The concessionaire has overall responsibility for the system, including operations, maintenance, investment and expansion. The concessionaire receives payment directly from the consumer and accepts the risk that costs do not exceed revenues. This model is attractive to most governments as the arduous task of providing water to the urban population is off-loaded to the private sector. However, it has come under criticism, especially following the Cochabamba, Bolivia experience. Governments in this case have been accused of privatizing water, a basic need (Nickson & Vargas 2002). To overcome this constraint some governments prefer the BOOT, especially the BOT contract for the bulk supply of water because it involves no direct contact with customers, hardly notice private sector involvement.

BOOT contracts – As an alternative to the concession contract BOOT are mechanisms that allow a private contractor to build, own, operate, and transfer a specific capital investment such as a wastewater or potable water treatment plant. Usually, the investment is quite substantial and the contract period is long enough to allow for the recuperation of capital expenditure. Generally the public authority must guarantee a certain demand, such as a volume to be treated. The contractor accepts a risk if this demand is not met. There are numerous alternatives on this option, such as BOTs, "reverse BOOTs" (Marin).

Divestiture – This system operates in England and Chile. Though operates well in other utilities such as electricity and telecommunication it is the less favoured choice when it comes to urban water delivery. In operation the provider is normally a private company with the government serving as a regulator. It may also be partial, allowing for shared government and private

responsibility for service provision, through a separate corporate entity. Generally, a corporate agreement will stipulate private and public responsibilities, including representation on the board of directors and division of profits. Private finance may be facilitated by the establishment of a separate credit rating with support from the public authority.

2.1.15 Informal sector

The ideal situation is to have the formal sector in charge of water provisioning. However, in many cases, especially in the developing world situations such as governance failure, inefficiency; population growth, rapid urbanization and lack of investment hinder service provision. In many communities, particularly the poor segments and the peri-urban areas utility services are either erratic or are in non existence (Allen et al. 2006). To fill up the gap, there exist a variety of sources. These other sources when they operate with the support of formal state institutional arrangements, then they are referred to us 'formal-policy' driven mechanisms (ibid). In many instances, there is a wide variety of arrangements that operates on the basis of what (Allen et al. 2006) termed 'solidarity, reciprocity and needs driven'. This system operates with or without the support of government institutions or arrangements. Examples of the former include private water tanker operators who buy water from a government network such as water hydrants and resell to communities. The latter includes water supplied by members of a community from their wells, storage tanks or even from their taps to neighbours for a fee or in some cases to those in need as 'gift'. Water vendors also buy water from for example, tanker operators, power tillers or bore holes and resell to their neighbours. Furthermore, some urban dwellers depend on avenues referred to us 'free sources'(Jaglin 2002). According to (Allen et al. 2006) these are 'needs driven' put up by the as they depend on their own resources and innovation to substitute a need. From this system a number of actors can be identified.

2.1.16 Urban Water Finance

This section will therefore discuss the possible sources of finance for urban water in Ghana.

Surplus operations

The simplest and most viable source of finance for water systems is by its operations as it requires the water body raising enough money to cover its daily operations, as well as surplus for investments. This therefore, means that appropriate tariffs need to be charged in order to recoup

the cost of production finance, and times profit for future investments. The issue that bothers some utilities, particularly those in the developing world is whether consumers will be willing to pay the requisite tariff? Even, if they are willing what is their ability to pay? And, how much of the will government be willing to off-load to citizens? According to Kim (1997), with the exception of countries such as Cote d'Ivoire, all African countries charge low prices for water. In most of these countries because of political expediency governments are not willing to raise user fees. In other cases, tariffs are controlled by regulatory bodies are too weak to parry government interference.

2.1.17 Budgetary support

This a very reliable source of income for most utilities which comes in the form of direct budgetary allocation from government, intervention in specific projects or financing of projects such as rehabilitation or expansion.

2.1.18 Local capital and local government finance

Water utilities can borrow money or raise bonds from the local market within their debt carrying capacity. One advantage from this source is that there is no risk of currency devaluation. The money is lent and repaid in local currency. Secondly, it is not subject to conditionalities imposed by external lenders (Hall 2004). In this case borrowing can be done to fund a specific project. Funding can be sourced from the private sector through other arrangements such as BOO or BOT to built a water infrastructure for public use.

2.1.19 International finances and development banks

This is the main source of fund for public infrastructure investment. The advantage of this form of financing is that the IDFs can make available money for long term projects. The problem however, is that these banks may request for conditions that may eventually work to the disadvantage of the poor.

2.1.20 Taxes

Taxes can be in the form of income tax, property tax or Value Added Tax (VAT). These are the most dependent sources of revenue for governments and municipalities for daily expenditure as well as funding projects such as water and sanitation.

Other sources of finance are international bonds, international banks and water bodies, property rates and taxes.

2.2.1 Country Background

Ghana is located in the west coast of Africa, almost in the center of the countries along the Gulf of Guinea. It shares borders with the republics of Togo, La Cote d'Ivoire and Burkina Faso, on the eastern, western and northern sides, respectively. To the south is the Gulf of Guinea. Its southern coast extend between latitudes 4 degrees, North at Cape Three Point and 6 degrees North in the extreme east. From the coast, the country extends inland to about latitude 11 degrees north, covering a distance of 670 kilometers from South to North. The distance across the widest part from east to west measures 560 kilometers. The country predominantly has undulating topography and a low relief with slopes of less than 1 percent. The highest peak in the country is the Mountain Afadjato (880 metres, above sea level) on the Akwapim-Togo Ranges. The climate is tropical and it is largely influenced by the two pressure systems that dictate the climate conditions in the West African sub-region, Inter-Tropical Convergence Zone (ICTZ) and the North East Trade Wind, otherwise called the Tropical Continental Air mass(Ojo 1977). The annual mean temperature ranges between 26°- 29°. Though the country receives large amounts of rainfall during the year, between 1250mm to 2150mm, it varies according to time and space(Gyau-Boakye & Biney 2002). During the rainy (wet) season there is abundant rain whilst in the harmattan (dry) season; there is very little rain or no rain at all. In the northern sector, there is a single rainfall season, where majority of the rainfall is received within four months, between the months of April/May to October. The southern sector, on the hand experiences two rainy seasons or the double maxima with major season from March/April to mid-July and the minor season normally from September/October to November. This pattern of rainfall affects the run-off hydrology of the country. Therefore, the South Western part of the country is the wettest part as it receives the highest amount of rainfall of more than 2000mm per annum. There are six main agro-ecological zones; rain forest, deciduous forest, guinea svanna, sudan savanna and coastal savanna (ibid).

Figure2.1 Map of Ghana

Source: www.google.com

2.2.2 Governance and Administration

The country operates a hybrid of the Parliamentary and Cabinet forms of constitutional democracy. This system obliges the president to appoint majority of ministers from the legislature, even though it is not parliamentary democracy. Administratively, Ghana is made up of 10 regions which are sub-divided into 170 administrative districts, made up of 164 districts/municipalities and 6 metropolis. By a decentralization process power is devolved to regional, district, local and unit levels, respectively, across the country. The Metropolitan, Municipal and District Assemblies (MMDAs), are autonomous bodies with quasi-legislative and executive powers and are among other things, responsible for making of bye-laws, development of basic infrastructure, provision of municipal works and services and management of human settlements in their respective districts. The various regions are headed by politically appointed

regional ministers, whilst the MMDAs are have chief executives who are nominated and endorsed by their respective assembles. In Ghana the main population density is the main factor in the delineation of urban settlements. The 2010 Population and Housing Census therefore identifies two forms of localities; urban or rural, based on population size. Localities with 5,000 or more are classified as urban, while those with less than 5,000 are classified as rural.

2.2.3 Population

As the case in most African countries Ghana is experiencing a high population growth rate. The World Bank estimate of 2012 puts the country's current population at 25.4million. The Ghana Statistical Services (GSS) analysis of the 2010 PHC shows that in five decades the country's population has increased from 6,728,815 in 1960 to 24,658,823 in 2010. According to Ghana Statistical Service's latest estimates, the country population is around 27,043,093. (http://statsghana.gov.gh/pop stats.html/sourced01/10/2014)

Table 2.2: A glance at the population of Ghana from 1960 to present

Year	1960	1970	1984	1990	2000	2010	2014
Population in millions	6.7	8.6	12.2	12.2	18.8	24	27*

*Estimated

Source: Ghana Statistical Service

In other words, the population has expanded more than three and half times in 50 years and still has a high growth potentials, considering the fact that over 40 percent of the population recorded in the 2010 census are less than 15 years. The average life expectancy is 61 years. In terms of population distribution, the Ashanti Region with 19.4 percent of the population is the most inhabited, followed by the Greater Accra Region with 16.3 percent. The Upper East Region is the least populated with 4.2 percent of the country's population (GSS 2013). A corresponding feature of the high population growth rate is the increase in the number of people per square kilometer (the population density), which is presently estimated to be around 103 persons per square kilometer, from 79.3% in 2000. Between 1960 and 2010 the population density has more

than tripled, with the highest in the and lowest in the Greater Accra and Northern regions, respectively (ibid).

Another consequence is the huge growth in its urban population. Like many countries in Sub-Saharan Africa, the proportion of the population living in urban areas continues to expand rapidly, and more than the existing infrastructure can support. Available statistics indicates that in 1960, almost one quarter (23%) of the population lived in urban areas. However, by 2000, the urban growth climbed to about 44 percent. By the 2010 PHC records over half of the population now live in urban areas and projections are that by 2015 and 2020 it will be 55.4 and 59.2, respectively. The Greater Accra Region has the highest proportion of urban population of 90.5 percent, followed by the Ashanti Region which has 60.6 percent, while the Upper West Region has the lowest proportion of 16.3 percent. The concentration of industries and commercial activities may partly be the cause of the relatively high urban population. The remaining eight regions are predominantly rural, with levels of urbanization below the national average. With Tamale, the Northern capital being an exception many towns in the southern economic belt attracts more population than the savanna regions of the north.

2.2.4. Ghana's economy

For decades Ghana's economy has largely been an agrarian economy. In general terms, Ghana's economy with a GDP of 42.9 billion dollars and a GDP per capita of 1, 689 dollars can be described as small (IMF, 2012). However, compared to most economies in the Sub-Saharan African region, the country's economy can be said to be growing substantially. With a Gross Domestic Product (GDP) growth at 8%, 14%, and 7.1% in 2010, 2011, and 2012, respectively it was ranked among the six fastest growing economies of the world (www.worldbank.org- sourced 12/09/13). The local economy is largely driven by agriculture, manufacturing and service. The informal sector dominates the economy with almost 91% of the economically active population engaged in some form of informal activity. Agricultural production is by small holder farmers (5 acres or less), who mostly rely on rain fall, thereby making it unreliable (Obuobie & Barry Undated). However, the sector still holds much relevance to the economy because of its various contributions. Until recently it was the leading foreign exchange earner for the country. According various reports cited in the 2010 PHC (However, the sector still accounts for 41% of GDP and 61% of the country's labour force, whilst industry and the service provides 10% and 29%, respectively. Cocoa accounts for the largest volume of the country's exports, about 50% of

all exports. Also important is the mining industry, particularly diamond, bauxite, manganese and gold Ghana is the second largest exporter of gold on the continent, after the Republic of South Africa. Until the discovery and commencement of production of oil in commercial quantities, survival of the economy had been dependent on the export of these primary commodities, making the economy prone to external market shocks (http://www.gepcghana.com/economy.php- sourced 11/09/2013).

Generally, there has been a significant improvement in the country's wealth and development in recent times. However this has not trickled down to all segments of the population, especially the rural areas some sections of the population living in urban areas. Also, there is a gross disparity in the life conditions of the population living the three northern regions and the rest of the country. These three regions whose population is largely rural (70 to 84 per cent) continue to record high incidence of poverty, food insecurity and malnutrition.

2.2.5 Water resources

Ghana is heavily endowed with both surface and ground water resources. It also receives a high volume of rainfall, annually. The surface water sources are mainly from the three river systems of Volta, consisting of the Red, Black and White Volta Rivers. This drains about 70% of the total land mass of the country. Lake Bosomtwi is the only freshwater lake in the country. The country also has groundwater of various depth levels. However, some parts of the country, particularly the Upper Regions have been recording declining levels (Obuobie & Barry Undated). In these regions over half of the population relies on ground water sources for their potable water supply. Ground water sources have for decades been abstracted to provide potable water to many rural communities. Recently, with the shortfall in urban water provision, many individuals and communities in urban areas have resorted to the use of ground water sources as their main source of potable water. Ghana also, has three types of wetlands, marine or coastal, inland and artificial wetlands. Together they constitute about 10 percent of the country's landmass. Most of the wetlands are rich in natural resources and they have been a source of food, building materials, fishing and water for livestock and human consumption. The total water available from surface water sources is estimated to be around 39.4billion m^3 per year (GOG 2007). The main consumptive uses of water in the country are for domestic, industrial and

irrigation. The non consumptive use is for hydro-power generation (http://www.fao.org/nr/water/aquastat/countries_regions/GHA/index.stm).

2.2.6 Urban water reforms in Ghana and actors

Urban water supply in Ghana has gone through several reforms dating back to the pre-independence era. This section will look at the phases of urban water reform in Ghana. The first public water supply system in Ghana, then Gold Coast, was established in Accra just before World War I. Extensions were made exclusively to other urban areas among them the colonial capital of Cape Coast, Winneba and Kumasi in the1920s. During this period, the water supply systems were managed by the Hydraulic Division of Public Works Department. Subsequently, these responsibilities of were widened to include planning and development of water supply systems in other parts of the country. In 1948, the Department of Rural Water Development was established to engage in the development and management of rural water supply through the drilling of boreholes and construction of wells for rural communities. The Ghana Water and Sewerage Corporation (GWSC), was established in 1965 under an Act of Parliament (Act 310) as a legal public utility entity. It was responsible for water supply and sanitation services, both in rural and urban areas. The Corporation was also responsible for the construction and operation of water and sewerage works, and the setting of standards and tariffs and collection of revenues. Ghana started a reform of the water sector from 1983 under the sponsorship of the World Bank's Economic Recovery Programme. In 1999 GWSC was split into two with the GWCL, a limited liability company vested with the management of the country's urban water systems, whilst the CWSA was to collaborate with the various MMDAs to provide rural water (Whitfield 2006). In 2006, a management contract was signed with AVRL to management to manage the country's urban water system. The contract has since expired in 2011 and management has reverted to GWCL.

2.2.7 Actors in urban water supply sector in Ghana

GWCL

The main function of the company is to provide, distribute and conserve water for domestic, commercial and industrial uses. It was formed in 1999 to replace the hitherto Ghana Water and Sewerage Corporation. The realignment forms part of the reforms to make the sector more responsive to its challenges. The sewage responsibility of the corporation was also transferred to the MMDAs whilst rural water supply and sanitation was also placed under the newly formed CWSA. In addition, PURC took over the responsibility of regulation. Thus, GWCL was given the sole responsibility of providing potable water to urban residents in the country. Today, it is responsible for the planning, financing, construction, rehabilitation and management of some 82 urban water systems in the country. It is important to note that GWCL is responsible for the water needs of only households, institutions and industries that are connected to its network. However, it works to extend services to communities that are not served or underserved.

In 2006 it entered into a management contract with AVRL. AVRL remained the asset owner and was responsible among other things, for the construction, replacement and extension of the system. As part of the arrangement almost the entire workforce of GWSC was seconded to AVRL (a total of 3,027 out of a total 3,080 staff). These arrangements lead to the changes in the organizational function of GWCL. The contract expired in 2011 after which the government of Ghana refused to extend it largely because of the loud public voice against the renewal. After the departure of AVRL the company was managed by a caretaker company, GUWL before it was finally in June, 2013 reverted back to GWCL.

AVRL

The AVRL was given the contract to manage the country's urban water system from 2006 to 2011. The Dutch-South African public company was hired after a botched effort to secure a lease contract for the sector. At the time of the contract it was expected among other things that the company will improve upon the quantity and quality of water to urban households in the country; ensure financial sustainability of the company and improve upon customer service. The company could not extend its contract after it ended in 2011 because of opposition from the public

particularly, labour and a coalition of NGOs who initially protested the involvement of the private sector in the country's water management.

Private vendors

There are different categories of actors in this group. First, we have the water tanker operators who rely on the services of GWCL. They buy water at commercial rates from GWCL water hydrants and resell to customers who are who need the water for their personal use or to community water vendors. The tanker operators also supply water to institutions such as hotels, clinics and schools and in some cases industries. Also, there are water tanker service operators who do not rely on the services of GWCL but on private sources such as mechanised bore-holes, wells and even ponds for supply of water for their customers. Lastly there are those operators who have converted power-tillers and other motor carts into tankers. These small-scale tanker operators are locally referred to as *Tutu tutuu* serve communities around Adentan Municiplity and Madina.

The role of these various groups of private water services provided is important as they fill a void left by the inadequacy of supply by Ghana Water Company, the national utility provider. The problem with their operation is that they are not regulated. Apart from the fact that their services are expensive the quality of water provided cannot be guaranteed, thereby exposing the public water related diseases. PURC working in collaboration with the various tanker operators association drew guideline to streamline their activities. However, compliance with is voluntary. There are also itinerant vendors who do not belong to any association. Even though most

Community managed water supply systems

These are community managed water supply systems in operation in some communities such as Akokobi, Pantang and Oyibi in the Greater Accra Region. These small water systems are mainly dependent on mechanized bore-holes. Through the system water is provided to communities by stand-pipes and house hold connections. These systems are also not regulated by PURC. Prices and management is by Community Water Management Boards.

GUWL

This is the care-taker company formed by government to take over from AVRL the management of and operations of urban water supply in the country. The transition period under which

GUWL was to operate was one year with the term operations similar to its predecessor AVRL. After several months of operation government yielded under the repetitive pressure from the organised workers union of GWCL government finally amalgamated the two companies in June, 2013. The point of the workers was that the existence of the two companies amounted to duplication of functions, as well as a waste of resources. GUWL was in charge of operations, including revenue and salaries whilst GWCL was managing the assets of the company. With the merger there is one company under a single management and operating under the name GWCL.

MWRWH

This is the ministry concerned with water supply and sanitation issues. It is in-charge of policy formulation and planning, management and evaluation of programmes relating to the sector.

The Water Directorate of the ministry is the focal point for coordination of activities relating to the sector, including the GPRS and MDGs outcomes concerning.

WRC

It is an independent body formed under the MWRWH to regulate and manage the sustainable use of water resources in the country, particularly their consumptive and non-consumptive uses for socio-economic development. It is also to coordinates the development relevant government policies concerning WRM. The Commission is thus in-charge of regulation of water resources-licensing, registration, water abstraction and waste water discharges.

PURC

The Public Utility Regulatory Commission (PURC) is an independent body established in 1997, by Act of Parliament (Act 538). It is the body charged with the responsibility of regulating the economic and drinking quality of the water provided by GWCL to its customers. It is also responsible for the approval of water and electricity tariffs. It also receives and investigates complaints from ECG and GWCL customers. Administratively, PURC falls under the office of the President but it is constituted with representatives from diverse organizations, including TUC, Consumers' Association, and various utilities, among others. With its composition and powers it is expected that the commission will assert its independence but many Ghanaians doubts its effectiveness in protecting the rights of utility consumers.

Community water vendors

These are individuals who purchase water in bulk and re-sell to customers who are mainly from the neighborhood. The motive for this type of service is for profit and in some families it the main source of livelihood. Their sources of supply are diverse. It could be from the public system, and in this case they have large storage tanks to store water when the tap is opened and later resell to customers. In instances where the tap flows regularly they sell directly from the taps. Others also obtain their supplies from private water service providers and power-tiller operators (improvised small tankers on power tillers). Some vendors also serve their customers from their private wells or bore-holes.

Apart from these stationary joints there are mobile water vendors in the various communities. These vendors, usually unemployed youth supply water to neighbours by employing various modes of transport, such as wheel-barrows, carts or tricycles to supply water in jerry-cans. Depending on the community a jerry-can of water cost around 60 Ghana pesewas. In some instances female head porters (kayayoo) are engaged directly by families to fetch water from the vending point to their homes, using basins.

These vendors play an important role in the urban water supply chain as they serve as alternative sources for communities where there is limited supply from the national grid. In low income communities those who cannot afford the connection to the national grid also rely on this form of service.

2.2.8 Greater Accra Metropolitan Area (GAMA)

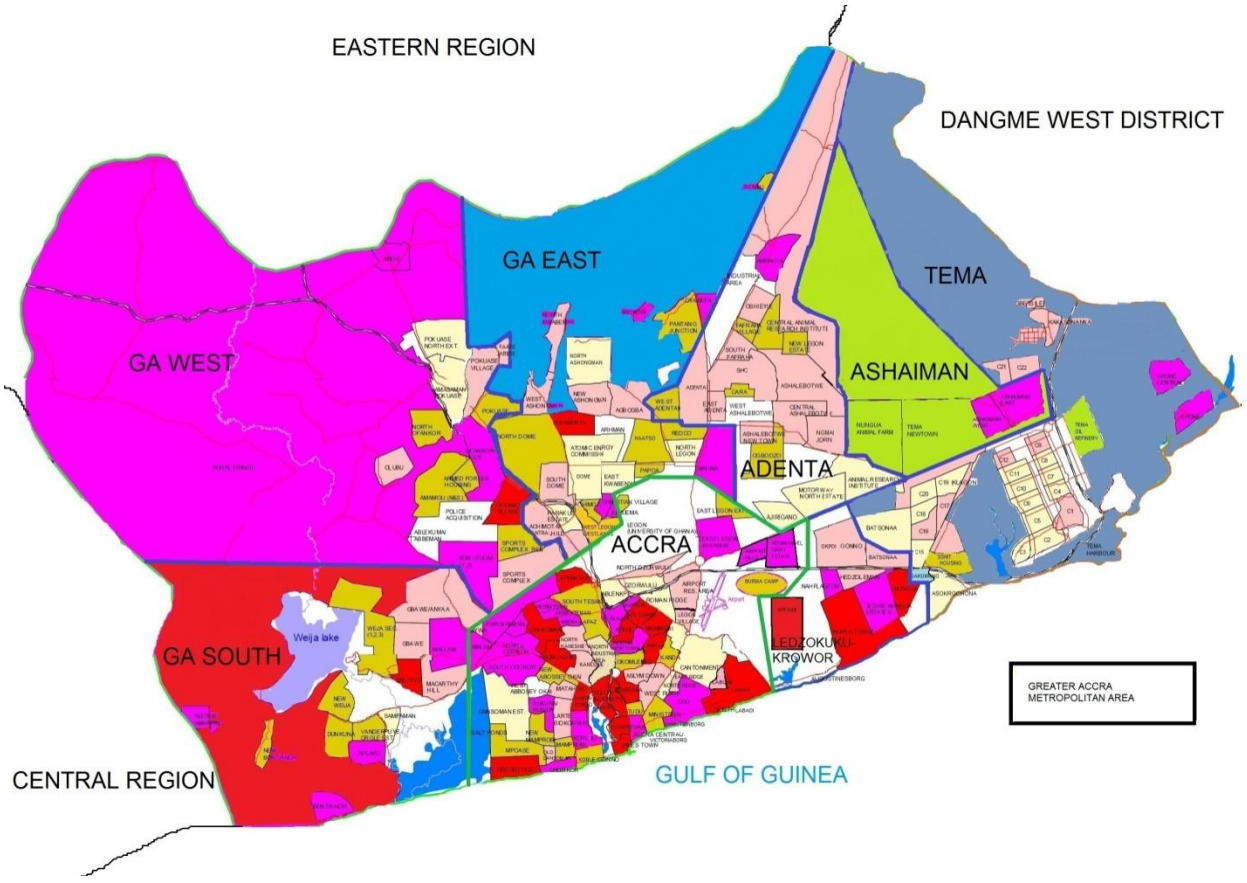
As mentioned earlier, one of the study areas is the Accra Metropolitan Area (GAMA), otherwise referred to as Accra. It is a coastal city with a land area of 1,079 km² and located in the Greater Accra Region, the smallest region in the country, in terms of land mass (only 1.4 percent of the total land area of the country).

Originally founded by the predominantly fishing *Ga* tribe, it started gaining prominence after the then colonial capital in Cape Coast was relocated here. Today, Accra is the largest cosmopolitan area and the most modernised city in the country. It has diverse activities and functions. It functions as the regional capital of the Greater Accra Region and Ghana's national capital. As well, it functions as the most important economic hub in the country, with influence across the

West African sub-region, and beyond. Apart from these functions, Accra holds the important status as an educational center with various public and private second cycle and tertiary educational facilities. With these functions it continually draws on migrants from the other regions of the country and across the sub-region.

Presently, Accra hosts over 4 million people. In terms of proportion, it accounts for over 16 and 90 percent of the national and regional population, respectively, according to the Ghana Statistical Service's analyses of the 2010 population census figures (GPHC). This population extends across some eleven Metropolitan and Municipal areas MMAs. As of 2010, the city's population density, the number of people per square kilometre stood at 1235. This compared with the 1960s figure of 167 persons per square kilometre. It is projected that with the current rate of urbanization the population of the city will grow over to 5 million by 2020 and 14 million by 2050. Besides these permanent residents there is a large number of floating populations who journey to the city daily for various trading activities, work or for other transactions.

Figure 2.2: Map of GAMA



Source: www.google.com

For administrative purposes the city is separated into two metropolitan assemblies, composed of the Accra and Tema Metropolitan Assemblies and nine municipal assemblies, comprising of Ga East, Ga West, Ga Central, Ga South, Ledzokuku/Krowor, La Dade Kotopon, Adentan, Ashaiman, and La Nkwatanang/Madina. The dominant economic activities in the city are in the private informal sector, which is a major source of livelihood for many households, even including those with a formal income as a supplementary income (Adaawen & Jorgensen 2012). And according to Pescina (Undated), close to 70 percent of all workers in Accra are in the informal sector.

Important economic activities in the city are manufacturing, transport, fishing, banking and services. Also, of much significance are the daily markets scattered all over the city. These markets, some of which include, Adabraka, Keneshie, Mokola, Madina and Agbogbloshie are also bulk breaking points for traders from other regions of the country, as well as those from other countries in the sub-region.

Figure 2.3: A section of the Makola Market: Source: Fieldwork, 2013

In addition, these market centers serve as anchor site for other economic activities such as street hawking and varied forms of transport and financial services. In addition, they impact on the daily flow of vehicular traffic in the city as most traders and shoppers reside in suburbs outside the city center. A recent phenomenon is the spread of trading activities beyond the market into adjoining residential communities. This situation is adding to the already precarious accommodation situation in the city as residential dwelling are being converted into shops.

In terms of living conditions, there are varied forms of residential settlements. In many parts, particularly the indigenous settlements, the slums and peri-urban areas buildings are put up haphazardly without any defined demarcation. Open drains that have been provided to serve as storm drains have in many instances been turned into receptacles for human excreta, liquid and solid waste and thereby, creating the conditions for mosquitoes breeding and for epidemics. A great proportion of households in live in sub-standard housing and crowding conditions (Songsore & McGranahan 2007; Songsore 2009). The common forms of housing are the

traditional compound houses. Generally, these housing facilities are without piped water, toilet facilities and ventilation. According to estimates of the 2010 Population and Housing Census, about 48 percent of residents in the city live in single rooms. Squatter conditions exist in some places with accommodation constructed mainly out of wooden boards and ply woods. Notable areas for the prevalence of such conditions include Timber Market, Old Fadama (Sodom and Gomorrah), Lavenda Hill, Ashaiman and Abuja. A family living in uncompleted structures is also not an uncommon feature, in all parts of the city. These are homes for migrants who are not able to afford the large rent deposits demanded by landlords. In some cases, families move into their uncompleted houses, even before completion. Songsore (2009), asserts that homelessness in the city is not visible because of family ties that bind residents to accommodate migrating relatives, despite the strain it puts on them. However, a noticeable phenomenon in recent times is the growing number of number of that sleep in front of market stalls, particularly in the busy market areas as Tudu, Makola, Mallam-Attah and Okaishie.

Similar to the situation in most parts of the developing world, fast paced urbanization has outstripped the capacity of existing amenities and Accra is no exception. Access to environmental services such as water, toilet and solid waste disposal facilities are limited and in many circumstances tend to favor more the rich (Songsore & McGranahan 2007). However, in terms of piped water access location also a factor. The two main intakes for water for the city are the Weija Dam and the Kpong intake on the Densu and Volta Rivers, respectively. The former serves communities found mostly in the western parts of the city. As a result, areas such as Abeka-Lapaz, Kwashieman, Awoshie, Odokor, among others, though are not 'rich' or affluent neighborhoods but have relatively good supply of water. The former serves a larger size of the city's populace, including the industrial city of Tema, Ashaiman, Teshie, Nungua, Burma Camp and Central part of Accra and the old communities of James Town, La and Osu. Other neighborhoods are Cantonments, East Legon also depend on the Kpong intake for their daily source of water supply. Customers in these parts of the city receive intermittent supply or no water supply from their taps at all.

Water access in the city is also affected by governance and policy actions. According to (Van-Rooijen et al. 2008), although GWCL technically claim to have more than 80 percent coverage of the city, in terms of water supply, more than half of residents do not have a house or yard connection and less than 10 percent have a reliable in house connection. Residents therefore rely

on vendors. Water is not only difficult to access but expensive as well. According to various estimates residents of Accra are already paying about four times per volume than what New Yorkers pay, and during the dry season slum residents pay as much as 20 percent (Talor et al. 2012).

In response to the void caused by undersupply of water residents have resorted to various strategies and mechanisms to cope with the situation. The common forms of the coping mechanisms include purchase from vendors, digging of wells or bore-holes private bore-holes with premises (self-supply) through bore-holes, wells, and fire hydrants and to a lesser extent rain water harvest. Those who can afford also purchase large storage tanks to store piped or purchased water. Tanker services are also common.

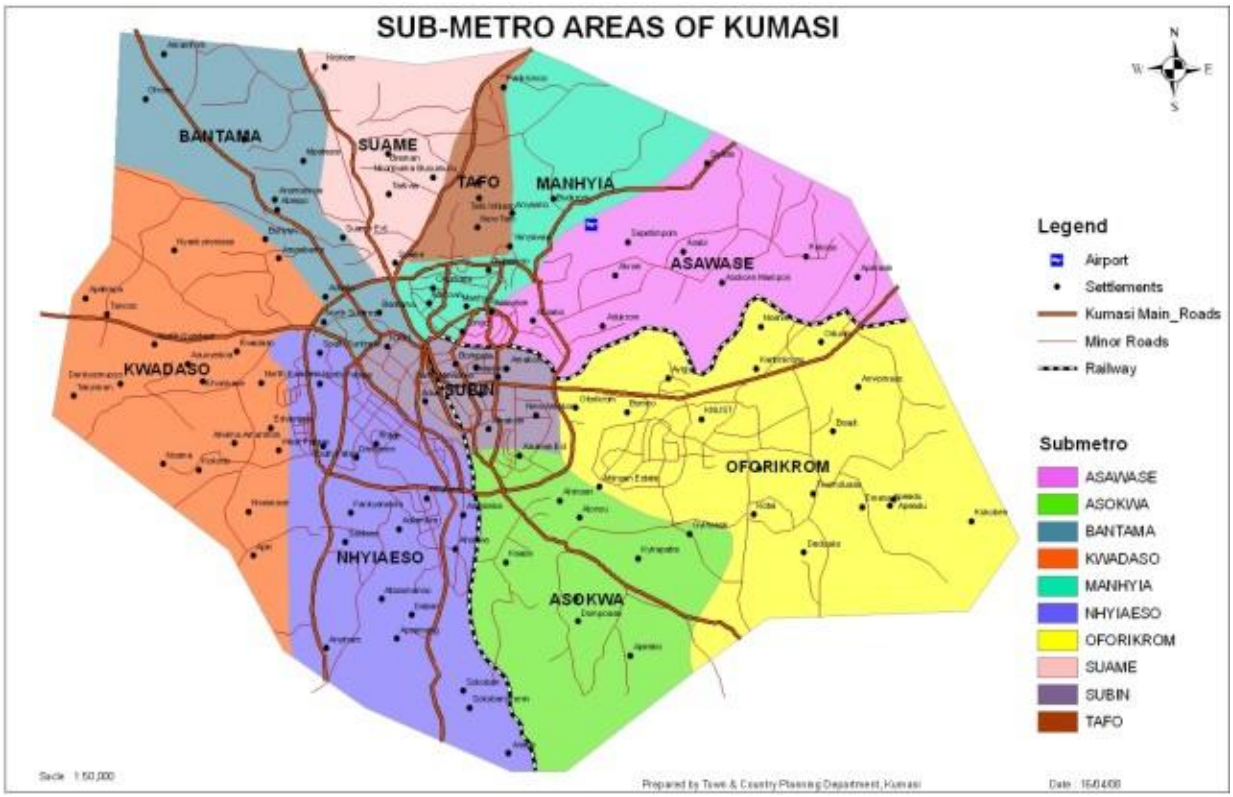
As far as healthcare is concerned, in spite of the presence of good health facilities such as the Korle/Bu Teaching Hospital, 37 Military Hospital, Ridge Hospital, Legon Hospital and the Police Hospital and some good private medical facilities many residents prefer self-medication and traditional healing centers and prayer camps. The seeming preference of these informal sources according may be because of poverty and ignorance (Songsore & McGranahan 2007).

2.2.8 Kumasi Metropolitan Area (KMA)

Located in the heart of the rain forest region of Ghana, about 270 kilometers north of Accra, Kumasi is an important city in Ghana. It is the second largest, after Accra. Alternatively, it is called the Garden City of West Africa, because of its beautiful lay-out and greenery. Apart from it being the cultural and traditional capital of the Ashanti Kingdom it serves as an important commercial hub, linking the northern and southern parts of the country with an airport, several roads and railway networks. Since it was founded by the legend King Osei Tutu I in 1860, Kumasi has gained prominence and has expanded rapidly. From its original settlements of Krobo, Adum and Bompata it has extended to over 90 suburbs, spanning an area of about 254 kilometers.

By political and administrative description, the Kumasi Metropolitan Area (KMA), the administrative district of Kumasi shares boundaries with Kwabre East District to the north, Atwima Distrct to the West, Ejisu Juabeng to the East and Bosomtwi to the South. However, as the result of the rapid growth of the city its functions extended beyond these boundaries to

encompass these afore mentioned districts. These four districts together with the KMA now constitute the Greater Kumasi City Region (Corubolo & Mattingly 1999).



Source: www.google.com

Figure 2.4 Map of KMA

The importance of Kumasi pre-dates the colonial era and it was the richest kingdom in West Africa, during the period. The kingdom was noted for its trade in gold with other kingdoms such as the Mossi. It also exchanged gold with weaponry from European traders and used gold for regalia (symbol of rank). In the colonial era, it increased in prominence by becoming the center around which railways, roads and other ancillary infrastructure was developed to aid the exploitation of important resources such as, cocoa, mineral resources and timber. Upon attainment of independence of Ghana it benefitted immensely from the massive infrastructural and industrial development programmes of the new government then (Arhin 1978; Suraj 2004).

Today, it has grown in prominence and functions as the administrative capital of the Ashanti Region, the most populated administrative region in the country. In Kumasi are located vital

educational, health and research institutions. Notable among these institutions are the Komfo Anokye Teaching Hospital, Kwame Nkrumah University of Science and Technology, University of Education, Winneba, Kumasi Campus and the Kumasi Polytechnic.

The major economic activities in the metropolis are trading and agriculture. All kinds of goods are traded in the major markets of Kejetia, Adum and Bantama. These markets are important trading centers for traders from other parts of the country and neighbouring countries from the sub-region. Cropping is done for staple foods such as maize, cassava, plantain, cocoyam and vegetables. Some residents are also engaged in aquaculture and necessary of cash/crop seedlings like orange and oil-palm. Located in the forest region, the wood sector is an important industry in the metropolis with several people engaged in employment directly in the several saw/mills dotted over the city and its immediate environs, and several others are in the furniture manufacturing business in Anloga and Sokobam. In addition, the transport sector is another source of employment. The location of a brewery and beverage industries and several other distilleries also serves as a source of employment. Further, apart from the government ministries, departments and agencies Kumasi also hosts many financial and other service institutions, which also serve as other sources of employment for residents.

In terms of the actual population of KMA there are conflicting figures, but the Ghana Statistical Services in the 2010 Population and Housing Census pegged it at 2,035, 064. By virtue of its varied functions as a traditional, regional, commercial and educational center it continues to be a major attraction for population across the country, and beyond. Officials of the metropolitan administration estimate the annual growth of the population to be around 5.47 percent and attract about 2 million visitors daily.

Like the situation in Accra living conditions vary according to community and even within communities. There are many communities, especially the old built-up areas and among some of the settler communities without adequate drainage and sanitation facilities. The common forms of dwelling for residents are the compound houses owned by individuals landlords, immediate or distance relatives. Some of these houses lack basic cooking and toilet facilities. Residents depend on public toilets in most cases. As far as water supply is concerned, the GWCL operates two dams, Owabi and Barekese, which serve as the main intake for water supply for the residents in

the metropolis. However, because of the rapid rate urbanization not all residents are served. Other sources of water supply are wells, boreholes and harvested rain.

2.2.9 Chapter summary

The chapter discussed the literature pertaining to the topic under study. The first part focused on the relevant issues on water use and management, particularly, the various uses of water in urban areas and the management options available. The second part of the chapter concentrated on the study communities.

Also, efficiency is needed in its management, and as well, it regarded as a basic necessity to life. However, the blanket application of the consumptive good theory is not application, in the opinion of other scholars. This is because of factors such as political partitioning, distance and cost. Another concept also determines the degree of publicness or privateness by level of participation in the management of the resource and the net distribution of the benefits. That last part of the section introduces the various water management types. The important point that this inter-related concepts emphasis is that resource management is a social dialogue.

The second part of the chapter provided information on study areas with detailed information on the Ghana as well as the assemblies which the research was conducted. It proceeded to introduce the various stakeholders in the urban water sector. The next chapter talked about the methods that were used in conducting the study.

Chapter Three - Methods

3.1 Introduction

This chapter describes the approach used in the research and the methods used in the field to collect the data, as well as in the analysis. The chapter consists of five sections: The first part gives a brief description of the approach used in the study; the second section explains the preparations prior to collection of the data from the field; the third part is about the fieldwork, the primary data collection experience in Accra and Kumasi. This section also talks about the secondary data collection process. The challenges in the field and how they were overcome are further discussed under this section; the fourth section gives information about the analysis, whilst the final part of the chapter gives background information about the case study area. It is important to note that there are sub-sections under these sections.

3.2 Research design

For a social research to be effective it needs to follow a logical structure, as well as a direction. It also tells the researcher what need to be done before the data is collected and during the analysis. According to (De Vaus & de Vaus 2001) it is the detail of the form and the direction of the study and in his definition emphasized that: 'the function of a research design is to ensure that the evidence obtained enables us to answer the initial questions as unambiguously as possible'. It detail for instance answers to the question and type of evidence that is needed to answer the question in a perfect manner.

There are different forms of research design and the one to use depends on the objective of the research and the questions that it seeks to answer and issue under study. For instance a researcher may use experiment or case study as a research strategy because the research seeks to answer the questions: 'How', 'why' and the issue at stake is a contemporary one. Other researches strategies include are longitudinal and cross sectional designs. Each of these methods involves various forms of data collection. Considering the objectives of this research, it employs the case study approach.

3.3 Case study approach

As this research sought to understand the persistent incidence of poor urban water supply in Ghana, from the perspectives of stakeholders it employed a case study approach. This approach was valuable in many ways: First, it was an appropriate tool that provided an in-depth explanation of the situation under study. Secondly, it enabled the data collection and analysis of information from multiple sources such as interviews, observations transcripts and existing documents. Thirdly, the approach was applicable when the research focused on some selected individuals from the GWCL who were engaged in in-depth interview about the phenomenon (e.g. a particular event, situation, programme, or activity) (Bryman 2012; Hancock & Algozzine 2006).

The attention of this research as mentioned earlier is on urban water scarcity in Ghana. The study was conducted in some selected communities in the Greater Accra Metropolitan Area (GAMA) and the Kumasi Metropolitan Area (KMA), the first and second largest cities in Ghana, respectively and has the highest consumer rate of the commodity in Ghana.

To understand the complexities in the urban water supply sector in the country, multiple methods and data sources were used including:

1) In-depth interviews
2) survey
3) Secondary data analysis (analysis of documents relating to the problem).

These methods will be discussed later under this chapter.

3.4 Preparation for the field work

Literature review to inform myself about the happenings in the water sector and possibly identify the actors. In this regard the following was used extensively: *Mapping the water sector of Ghana an inventory of institutions and actors* by (Fuest et al. undated).; *Informal water vendors and the urban poor, (Kjellén & McGranahan 2006)*; and the *Third Ghana Water Forum conference reports*. Also, consultation with friends and acquaintances provided useful information that aided in putting together an initial list of actors in the urban water sector. From this list contacts were made.

3.5 The field work

The first works after arrival in Ghana was to follow-up on the contacts made earlier and also introduce the research topic area and researcher to the prospective respondents. In addition, a recognizance visit was made to some of the communities in the chosen study area to make a visual impression of the situation on the ground.

3.6 Data collection (key informants)

The aim at this stage was to get a large number of views from key informants representing various identified interest groups. Two methods were used; first, purposive sampling was made from the list of initial contact made with the likely respondents. Secondly, the snowball method was used to select other stakeholders who were not previously identified but were likely to participate in the research (Bryman 2012; Denscombe 2010).

The key stakeholders that were interviewed were landlords, hostel owners, community leaders and Assembly Members. By their positions they influence decisions concerning water and sanitation in their respective communities. Other primary stakeholders that data was collected from were private tanker operators and power tiller operators, community water vendors and bore-hole drillers' Services Providers Association. They are stakeholders because they all have something to do in production and distribution of water.

The stakeholders that were interviewed were the Ghana Water Company Limited, Ghana Urban Water Company Limited (GUWL) and the Water Directorate of the Ministry of Water, Works and Housing (MWWH), Public Utilities Regulatory Commission (PURC) and Water Resources Commission (WRC). These are government agencies directly in charge of water provision, policy and regulation. Other stakeholders that the research identified were WaterAid, Ghana, ISODEC, Otumfuo Foundation and the Coalition of NGOs in Water and Sanitation (CONIWAS). They were selected for participation in the research because they are independent bodies (NGOs) that have influence on water and sanitation issues in the country and at times serve as link between government and the communities. Some in addition have undertaken intervention programmes that aid residents to acquire water services.

Another category of stakeholders that were interviews were the Students' Representative Council (SRC), University of Ghana and the Public Utilities Workers Union (PUWU) of the Trades

Union Congress (TUC). These are pressure groups that greatly influence policy in the country. Also interviewed was the World Bank, which also manipulates policies concerning the sector, as well as provides financial and technical support. The last category of actors identified were the MMDAs who were responsible for the development at the local level. The various categories of respondents have been presented in the table below.

Table 3.1: Classification of Actors and level of activity

Actors	**Activity**	**Level**
Landlords/ladies, hostel owners, community leaders, assembly member	Influence decisions at community level	Community
Community water vendors, power tiller operators, water tanker operators, bore-hole drillers and related services	Water and allied services providers	
MMDAs	Responsible for development at the local level	
GWCL, MWWH, GWUL, MPURC, WRC	Government agencies responsible for water provision, policy and regulation	Community, regional and national
CONIWAS, WaterAid, Otumfuo Foundation and ISODEC	NGOs in the water and sanitation sector	
SRC, University of Ghana, PUWU of TUC	Pressure groups representing members interest and that of the public	
World Bank	Policy, financial and technical support	

A pre-structured interview guide with open-ended questions was used. This was to ensure that there was some consistency in the interview process, whilst at the same time giving room to the respondents to express themselves freely on the issues raised in the question (Bryman 2012).

Also, in some cases, the questions could not be asked strictly by the order in which they have been arranged because the respondents were passionate on the matter and wanted to express themselves and they were allowed. This was to ensure that the session was as interactive as possible and also gain their confidence. Further, it is important to note that some of the questions were varied slightly with follow up questions in accordance with function of the organization or the field of knowledge of the respondents in relation to the problem.

The questions among other things, focused on capturing the respondents views on the current urban water situation in the country, the reform processes, management options, preference options, as well as financing of the sector.

In each interview notes were taken and the interactions were tape recorded, but with the permission from the respondents. These recordings were later transcribed and used as data for the research. Recordings were important to this kind of research because amongst other things, it helps to examine thoroughly what people said and also, correct the natural limitations of the researcher's memory (Bryman 2012).

3.7 Survey study

A household survey was also done to capture the view of urban water stakeholders on the water situation in their respective communities through the questionnaires administered to them. In this context, the household was considered as a unit of analysis and the questionnaire was designed to capture the perceptions of the households in the urban areas of Accra and Kumasi, the study area.

The questionnaire was structured to elicit the views of the respondent on a wide range of issues pertaining to the urban water sector in Ghana. Specifically questions sought to address the following questions:

1) Water use in the community and the household and the challenges faced in access and how they address these challenges
2) Their views on the causes of the water problems and how they prefer these problems addressed
3) What form of management they prefer
4) And issues on water finance in the country

There were other questions that focused on the personal data of the respondents, such as age, gender, household size and education.

3.8 Choice of residential communities for the survey

As it was practically impossible within the scope of the research to cover all parts of Accra and Kumasi a consensus had to be made between the geographical area and available resources. Purposive sampling method was used to identify the communities for the survey. However, two issues guided the choice; first, areas with constant supply of water and second areas with relatively unstable supply of water. The researcher also considered the socio-economic status of the respondents in these two areas. The researcher's knowledge of the water situation in some of the study area also influenced the choice of some of the communities. Information was drawn from literature, particularly the *2010 Population and Housing Census* report and other sources such as websites of the various Metropolitan, Municipal and District Assemblies (MMDAs) and (*ghanadistricts.com)*

3.9 Selection of the households

Initially, the research set out to collect data from 20 households in each of the communities selected for the survey using the systematic sampling method. By simple random method 20 balls were put into a bowl and when it was drawn the one with the 20 label was selected. Based on this at an interval of 20 houses, one house hold was selected until the 20 houses were all set for the survey. This method at first worked well, particularly in the planned communities. However, in other communities where the buildings were put up haphazardly this approach was difficult to apply because the counting was arduous. However, the selection was done. Another complication was the large number of compound and family houses. In these dwellings several households live in the same property. Further, in these areas some of the identified households were not willing to speak, even after the necessary introduction. One advantage observed with the compound houses was the fact that when one some people decline to speak to the researcher there was others who were willing to take part in the research. This situation was not the case high class residential areas. One problem identified had to do with illiteracy where some respondents were not able to complete the questionnaires. In such situation the researcher assisted those respondents by them complete the questionnaires. In all 160 households were surveyed with 100 and 60 from GAMA and Kumasi, respectively.

3.10 Analysis

The responses were coded and analyzed, according to the objectives set out in the research and presented in simple matrixes, diagrams.

3.11 Limitations of the study methods

The nature of limitations on this study started to manifest even before I embarked on to field to collect the data. Most of the challenges had to do with the broad scope of the chosen topic. Urban water is an evolving issue that had been widely studied. The challenge was which aspect should the research focus on? The second issue was the identification of the appropriate actors that could answer the questions raised in the research.

To overcome these issues I had to read extensively on the subject area and also, consulted with my supervisor who offered invaluable suggestions.

The second set of constraints was encountered during the field work. This was when I realized that there were was difficulty in applying the chosen method of selecting the households were becoming difficult because of the unplanned nature of communities. As mentioned earlier some of the respondents refused to cooperate in the household survey. In addition, getting all the key informants to answer the questionnaires was difficult. Even after several appointments by email, phone contact and personal visits they kept shifting the appointment. Though I managed to interview some within the last days of my departure, there were others whose inputs would have been essential for the study but could not make the appointment either because of their busy schedules or lack interest. Also important is my inability of obtained some secondary information from some of the offices where I conducted the interview because of official censorship. Lastly, some of the limitations emerged during the analysis after I have returned from the fieldwork. Also, upon reflection and reviewing of my data I realize there were specific questions that I should have asked, but did not ask.

Within these limitations the findings of the research have been presented in the next chapter.

Chapter Four - Data Presentation and analysis

4.1 Introduction

This section presents a summary of the findings of the research. It first provides information on the background of the respondents for the survey. It also covers issues bordering on residents access to water, particularly the challenges, as well as their coping strategies. Issues on management and solutions to the problems are also discussed here. The findings are summarized in tables, texts and figures.

4.2 Background of respondents

A total of 160 people were sampled for the household study and all of them fall within the age group of 15-64, which is considered the productive years in Ghana. Also, 96 of the sample size, representing 60% were male, while women constitute 40%. The dominance of the male sex group may be explained by the fact that interviews were granted to household heads, and in many Ghanaian societies there are more male headed households than female (GSS 2012). The information in table 4.1, explains the household size of the respondents. A significant proportion of respondents (45%) live in a large household of 5 to 8 persons, whilst 33% has a family size of 4, or less. A household size of more than 8 persons was 16%. The average household size in Ghana, according to the 2010 Population and Housing Census is 4.4 persons per household. Determining the household size is important to this study as it may have a bearing on the quantity and the quality it uses.

Table 4.1: Household size

SIZE OF HOUSEHOLD	FREQUENCY	PERCENTAGE
1 – 4	53	33
5 – 8	72	45
Above 8	26	16
No response	9	6
Total	**160**	**100**

Source: Fieldwork, 2013

Income level of respondents

Another important element in water consumption is the level of income of the household. Table 4.2, provides insights into the income level of the respondents. According to the table 34% of the respondents earn an income of less than GH¢ 250 per month. 18% earns between GH¢251-500, whilst 16% earns GH¢501-750. Another group (11%) makes GH¢751-100. It is important to note that only a small proportion (21%) earns an income of more than a GH¢1000. Income levels are important as it highlights the socio-economic status of a household, as well as its decision on the form of water use to use, as well as the form of coping strategy that the particular household is able to afford, in the absence of networked utility.

Table 4.2: Income level of households

INCOME OF HOUSEHOLD(GH¢)	FREQUENCY	PERCENTAGE
Less than 250	55	34
251 – 500	28	18
501 – 750	26	16
751 – 1000	18	11
1000 +	33	21
Total	**160**	**100**

Source: Fieldwork, 2013

4.3 Water Access

Access and availability of water is important to the household as it has tremendous impact on the health as well as the economic and social standing of the family. This section examines access to water in terms of source, quality, reliability and cost.

4.3.1 Water sources

The main sources of water used by respondents are summarized in table 4.3. As the table depicts the water sources are varied with 14% of the respondents saying they depend on water supply from the GWCL network, whilst 14% depend on communal wells and public bore-holes. Communal stand pipes account for 9%, whilst 27% had bore-holes and personal storage facilities constructed within their compounds. Other sources of water available in the study communities

include rain water, which accounts for 10%, tanker services 4%, communal wells and ponds account, streams and rivers is the source for 14 of the respondents.

Table 4.3: Water sources for households

TYPE OF WATER HOUSEHOLD USE	FREQUENCY	PERCENTAGE
GWCL	23	14
Communal Stand Pipe	14	9
Communal water vendors	21	13
Communal well / public bore – Hole	22	14
Private well/ storage	43	27
Ponds , river / streams	14	9
Rain water	16	10
Tanker	7	4
Total	**160**	**100**

Source: Fieldwork, 2013

The above situation could be an indication of the decline in the share of the population with access to piped water connection to their premises. Analysis of the 2014 UNICEF/WHO Joint Monitoring Programme's progress report on water and sanitation confirms this situation. This is explained further by table 4.4 below. As can be seen in tables 4.3 and 4.4 there could also be the likelihood that urban residents are finding alternative sources of water supply as the network supply seem not to be effective. The most form of alter natives that was observed during the fieldwork was the use bore-holes and wells and this will be discussed later in the subsequent sections of the study.

Table 4.5: Use of drinking water (percentage of population)

Year	Total improved	Piped	Other improved	Unimproved	Surface
1990	84	40	44	8	8
2000	88	38	50	8	4
2012	93	34	59	7	0

Source: 2014 UNICEF/WHO JPM report on water and sanitation

4.3.2 Cost of water

Cost and for that matter affordability are important elements in water access. During the household survey respondents were asked to indicate the amount (estimated) their households spend to purchase water per month. Mixed responses were given between and, even within communities. This is against the backdrop that there was no single source of water supply in the study communities. Factors that determined the cost were the water quality, mode of transport and distance. It must also be noted that the volume price of vended water was far higher than what is purchased from the GWCL network. Another important factor determining the cost of water was the frequent tariffs adjustment by PURC. This is particularly the case with network water from GWCL connected communal pipes and water tanker services using GWCL hydrants as their source.

Table 4.6: Cost of water in (in GH¢)

COST IN GH¢	FREQUENCY	PERCENTAGE
>10	15	5
10 – 20	21	14
20 – 50	27	19
50 – 100	27	19
100+	9	4
Do not know	61	39
Total	**160**	**100**

Source: Fieldwork, 2013

Table 4.6 summarizes the response on cost of water to the respondents. According to the responses only 5% of the study communities spend less than GH¢10 to purchase water per month. Another 4% said they spend more than GH¢ 100 on water monthly. The proportion of those who spend between GH¢20-50 and GH¢50-100 constitute 19% each. The most striking feature in the table is the proportion of respondents (39%) who could not tell how much they spend to purchase water per month. This situation can be explained by the large proportion of residents who source water from informal sources for their daily needs. Unlike customers of the water company who are given monthly bills to pay for the amount of water consumed, these residents buy their water based on need and, in some instances it is based on the availability money. As one respondent, who is a petty trader explained: *'I cannot tell you how much I pay for water because I don't have a budget for it'*. According to this respondent she buys water in buckets (depending on the size about 16 liters) and she pays GH¢.60 (.17USD) per bucket. Other modes of buying water are by jerry cans, popularly known as '*Kufuor gallons*' or by drums.

Source: Fieldwork 2013: 'In figure 4.1(left) a boy carries water in a 'Kufuor' gallon and in figure 4.2 (right) a pick-up loaded with gallons of water. These gallons are a popular means of fetching water in Ghana.

4.3.3 Quality of water sources

Another question that was put to the respondents was whether they trust their source of water supply. This question was asked because of the wide perception among the public that their water source was not fit for drinking directly.

Table 4.7: Quality of water sources

QUALITY OF WATER SOURCE	FREQUENCY	PERCENTAGE
Very good	16	13
Good	54	38
Neither good or bad	18	7
Bad	65	35
Very bad	7	7
Total	**160**	**100**

Source: Fieldwork, 2013

Table 4.7, presents the answers to this question. According to the table 13% and 38% of the respondents, respectively gave the indication that their water sources was very good and good, respectively. 7% of those interviewed said they could neither say their water was good nor bad. Another 35% and 7% said their water was bad and very bad respectively. The respondents, who do not believe in the quality of their water source, claimed that water from the taps have been contaminated with faucal matter, and even at times they can see strange particles in the water. Others also claimed that the water had an odd colour when their taps are opened. They suspected that the common and unattended broken pipes seen in the communities are the source of the contamination. Another accusation was that the water was not treated well before it is distributed to consumers.

Several residents who obtained water from informal sources also reiterated these sentiments as they raised the concern that they cannot trust the quality of the source of their water, particularly as they have little knowledge of the source of water supplied by vendors, particularly from tanker operators. As mentioned earlier, only the few tanker operators feed on GWCL hydrants. These drivers have a working relationship (informal) with the company and PURC. Other drivers have

various associations and these associations are able to check on the activities of members. Some However, the majority are itinerant operators who operate under no order.

For the above reasons, the respondents claimed that they are increasingly avoiding drinking water directly from their taps and also, from vendors for fear of contamination. Thus, depending on the kind of water system in the community, and also, socio-economic circumstances, various household in the study communities store acquire separately water for drinking and that of other household needs such as cooking, washing and bathing.

4.3.4 Reliability of water supply

In the literature review one of the issues raised was the irregularity of flow of water from the GWCL network. However, when this question was put to the respondents there were mixed responses. For example, in Accra, residents in areas such as Abeka/Lapaz and its environs said the water flow in their taps, though not every day. Residents in Bomso, Kumasi also said they do not have much problem, in terms reliability of the GWCL water system. However, residents in areas such as Nmai Dzon have complained not having water flowing in their taps for several months. Those in Kotobabi area also claimed that water does flow, but intermittently, and often during the night or when they had gone to work and thereby, preventing them from storing enough for subsequent use. In Adenta housing estates, residents said though they used to have water flowing once a week, that pattern has changed now. The taps are opened on the average once a week and at random.

Also, the low pressure prevents many residents, particularly those living on storey buildings and up-hill areas from getting access. In desperation some residents who are faced with this situation resort to the use of high pressure pumps to siphon the little water that is available from the pipelines. This practice however, denies others from the use of the water because it is not all but those with the financial strength are able afford these pumps. In many cases officials from the water company seize these pumps when discovered.

These responses confirms WaterAid, the UK based international water charity's report of 2005. According to this report only 25 percent of residents of Accra have access to 24 hour supply of water whilst 30 percent have average of 12 hours a day for five days a week. For another 35 percent of residents, water supply is estimated at two days a week.

Highlighting the situation above, a key informant said the company is not able to meet all demands because it is constrained in terms of capacity. He said for instance the daily demand for Accra alone stands at 150 million gallons. However, the company is able to produce only 90 million. This is because of limited capacity. Explaining further, he said apart from the pipelines the water treatment plants since they were built 50 years ago have not seen any major rehabilitation.

'Kpong treatment plant was built in 1967 by Dr Kwame Nkrumah and since that time we haven't expanded it. So, you get the point! The plant is about 47 years now and what it means is that, it is actually supplying water to a population far beyond its capacity'.

At the time it was built Accra's population was one million, but now it is over four million. He continued that by consultants' recommendation, the plant should have been rehabilitated every 20 years or a new one built altogether. However, this has always been postponed because of lack of finance.

On the issue of low pressure the key respondent blamed the situation on over-aged networks. According to him some of the pipelines are more than 50 years old, but have not been changed because of financial constraints. Also, because the pipelines are old there are frequent bursts, especially when the water pressure is high. This exposes the water to contamination. Further, residents in most cases do not consult the company before putting up their building and thereby, exposing the pipelines. In some instances, buildings are located on pipelines.

4.4 Institutional challenges

As mentioned earlier, the water sector has over the years undergone several reforms. However, many Ghanaians believe that the challenges that are confronted with it are institutionally embedded and that they are yet to see any transformation in the performance of the sector, particularly in the operations of GWCL. This section was to find out from the respondents their views on the challenges inhibiting the performance of sector. In the household interviews the respondent's views were sought on what they perceive to be the causes of the water supply challenges in their respective communities. The views were diverse with 9% blaming the situation on blocked water pipes, 28% said the situation was as the result of non-existent of water infrastructure in their communities. 19% also believed that the water supplied to the communities

by GWCL was less than demand and 4% and 1% attributed the problem to sabotage from tanker operators and politicians, respectively. Another 31% blamed the situation on efficient management from the company, whilst 8% also said the bad water situation is as a result inefficient funding. These responses are summarized in table 4.8 below:

Table 4.8: Causes of water problems

CAUSE OF BAD SERVICE	FREQUENCY	PERCENTAGE
Burst or blocked pipes	11	9
No water infrastructure	41	28
Demand in area more than supply	14	19
Sabotage from private operators	20	4
Sabotage from politicians	12	1
Bad management from company	52	31
Insufficient govt. funding	10	8
Total	**160**	**100**

Source: Fieldwork, 2013

A key informant from one of the unions expressing his opinion on the above matter was firm with the view that the problems of the sector is as the result of poor management practices, particularly from the company. According to him supervision was lax whilst workers had adopted a nonchalant in the performance their duties. Baffling him was the inability of management to install bulk meters to measure accurately the water that was being produced from the company's treatment plants. This he said was affecting the revenue generation capacity of the company.

'So you could see that if you are not billing well how can you have good revenue? And lack of good revenue also contributes to very bad salaries, and bad salaries continue to give way to illegal connections. So, it has now become a cycle.'

A respondent from GWCL agreed that even though these problems exist they should not blame entirely on the company. He expressed his thought in the following:

'...I know that people are bashing us for all the water shortages, illegal connections and leakages and non response to emergencies, complaints, and all of that. It is not like we are not doing anything, we need to do more though, but at the same time we don't have the resources.

He explained that the problems are of two levels and are inter-related. The first has to do with lack of funding which is impacting negatively on the performance of the company. '*We have lot problems because we are not getting enough money to undertake urgent rehabilitation, expansion and others.'*

The other problem he attributed to management short-falls. '*We ourselves, those of us here lack self discipline and the fact some of our workers connive with consumers to cheat the company is a problem'*, he added

These institutional challenges are not peculiar with only GWCL. Other institutions in the water sector interviewed admitted having their individual and collective challenges with regard to urban water delivery in the country. However, the number one of these challenges has to do with poor financing of the sector. According to the public institutional key stakeholders they have not been able to attend to important issues because of non availability of equipment such as vehicles and office furniture.

4.5 Government interference

Another problem that was raised the key informants was that government was unnecessarily interfering in the management of the company and in the following statements some of these sentiments are captured:

'Government is saying there should not be any increment, but how can this be, taking into consideration the rising cost of chemical and electricity. Government is also making it difficult for managers of the company to have confidence in themselves because everybody is virtually working acting position. What is if I take a decision and tomorrow am fired? Directors are appointed from Castle (the seat of government). Therefore, it has reached a point where everybody is lobbying now to be a managing director, the core business has been left somewhere and everybody is fighting for a post based on this premise'

According to some of the respondents they are at times puzzled by government's policy directions, which at times are conflicting with the realities on the ground.

4.6 Logistics

Most of the agencies are poorly resourced financially so they are not able to acquire the needed logistics for their jobs. As a result essential jobs that are supposed to be performed by the agencies are left undone because of lack technical equipment. In some cases where the equipment exists they are either out-dated or not functioning properly.

4.7 Personnel

The issue of personnel is common to all the government agencies in the country. As a result of poor working conditions most of the MDAs are unable to attract qualified personnel to man some of their specialized positions. Besides, those who take up those positions are not motivated to put their best because of low remuneration.

4.8 Finance

As discussed earlier a challenge to the urban water sector in Ghana has to do with inadequate financing. Budgetary allocations from government to these organizations most often are inadequate to meet their daily expenditure, let alone undertake expansion activities. According to WaterAid, Ghana's analysis of the WASH sector from 2007 to 2012 the government's budgetary allocation to the sector has only been 0.05% of the country's GDP. Again, IMANI, Ghana, an independent think tank in a report of 2013 accused government of reneging on its obligation to the sector. According to this report the GOG in 2010 pledged to allocate each year an amount 350 million US dollars to the WASH sector. However, in the same year it allocated only 107.5million dollars and the following year, allocated 132million dollars, translating into only 0.034% of GDP.

4.9 Weak collaboration

There is weak inter-institutional collaboration among the institutions charged with managing the urban water sector. Though the actors are assigned different responsibilities these roles at times overlap. Other tasks that are to be performed jointly are not done because of lack of resources.

The challenges identified above are reflected in the performance of the urban water sector. Some of these consequences are discussed below.

4.10 Coping strategies

As discussed in the literature review the important factors that affect access and use of water are location, socio-economic circumstances of residents, availability of infrastructure, among others. These conditions were evident during the household survey. In Oyibi a peri-urban community for instance, the main source of water supply for residents was from the Small Town Community Water Project. Aside, there were communal sources. However, in Ashaley/Botwe where the GWCL network hardly flows, residents rely largely on community vendors and other sources such as those from private tanker and power-tiller operators and within the Adenta Housing estates as water from the government network is not regular, residents who are mainly middle-income earners have installed Polyvinyl chloride (PVC) storage tanks (poly-tanks) and mechanized with high pressure pumps to capture as much water as possible when the taps are opened to be able to pump the water to their various flats as at when needed. These tanks are also used to store water purchased from private tanker operators. Again, within the same municipality is Adenta Housing Down and Commandos, whose supply is similar to that of Housing Estates but with a slight variation. Apart from the occasional flow of the GWCL network residents mainly depend on the private tanker and power tiller operators. Those who live in their own dwellings have storage tanks, and in some cases mechanized bore-holes or wells. Another important source in this locality is the purchase from community vendors.

In Abeka/Lapaz and its environs, even though the pipe network is available in most parts of the community, many households do not have direct access to piped water because of the type of housing unit they live in. In these communities the popular form of housing are the compound houses. In these dwellings access to water from the GWCL network is determined by one or more of the following factors:

- Landlord’s decision or ability to connect
- Landlord’s willingness to share the facility with tenants
- Tenants willingness to pay for cost of connection and usage
- The kind of metering used on the facility residents want to avoid shared meters (Ghana operates the block tariff system).

This situation is not typical to Lapaz alone, but evident in other parts of the study communities. Thus, in this case families cannot make independent decisions as far as piped water connection is concerned because they live in rented premises. According to the GSS's analysis of the 2010 Housing and Population Census compound houses are the most form of housing used across the country and it constitutes more than half of total housing stock of the country.

Source: Fieldwork, 2013
Figure 4.3 (above): Water storage tanks (poly-tanks) used by residents of Adenta Housing Estates.

Source: Fieldwork 2013 Left (figure 4.4): A mechanized bore-hole at a students' hostel at GIMPA, Accra and right (figure 4.5) a mechanized well for a students' hostel at Ayedesua, Kumasi

Source: Fieldwork 2013

Figure 4.6: A truck loading from a bulk water vendor at Medina Estates, Accra

Source Fieldwork, 2013
Figure 4.7: A power-tiller (tututuu) with water for delivery to a customer at Adenta Housing-Down

4.11Views on AVRL and other management contracts

As elucidated earlier, urban water management in the country has in recent times alternated under different forms of management. The most notable and controversial one had been the management contract between the government of Ghana and AVRL. After the AVRL contract expired there was a caretaker company, Ghana Urban Water Limited before finally reverting to the original company, GWCL. It was therefore necessary to ask respondents' views on these varied management forms and how it has contributed to efficiency, or otherwise in the sector. Interviews were held with key informants from GWCL, GWUL, CONIWAS, PURC, MWRWH and TUC. AVRL was no more operating in the country so no interview could be held with them.

The general perception among the respondents was that these policy directions of government had done nothing good to the sector, rather is has aided further the deterioration and thereby, worsening the condition of the urban dweller, in terms of potable water access. The respondent from GWCL for example, was of the view that there had not been any much difference in the management style of the various management companies as it was the same crop of managers that were being shuffled between the successive companies. 'With specific to these managers, I will say the value is the same. I think the current management is not doing anything extra-ordinary from what AVRL was doing. If we say that AVRL was not doing well, then they are also not doing well and that is because it is the same people, the same workers who were working for AVRL are the people working there'.

According to this respondent though workers, together with other groups protested the implementation of PSP policy in the water sector their expectations there were still some expectations among workers of the company that the fortunes of the company, in terms of performance. However, the skeptics were rather proved right. He was blunt in expressing his disappointment.

'*So, if you ask me I will say performance has not improved. It is the same,'*

And he was happy that the contract had not been renewed.

'They did not do well at all. Imagine it was elsewhere, they would have been chased out, but we were patient enough for the five year-period to end.'

The respondent was therefore surprised at government's decision to form a new company under the name, GUWL to perform the same functions as AVRL. To him it was just the same company with the same personnel, but operating under a pseudo name.

'*To me, it was just a change of name from AVIRL to GWUL because the same people are still around handing affairs. It is just a change of colour.'*

The respondent from CONIWAS also agreed with the position with the earlier assertion that it was good not to renew the contract with AVRL. To him it was a payment for no work done as there has been virtually no change in the urban water situation in the country, even after the five years that the company was at the helm management. However, AVRL could not entirely be

faulted for the non-performance. According to the key informant the issue should be discussed in a broader context than just being critical on the performance of AVRL; in his explanation much was expected from AVRL, especially as to the transformation of GWCL to deliver effectively on its mandate and in the long run to be able to attract investors. However, there was no performance contract to specify the terms and the conditions under which this mandate was to be executed. There was also, the issue of non availability of bulk meters to measure accurately the water that was produced from the company's treatment plants. Only estimates were used. According to WaterAid report of 2012, in 2009, three years into the implementation of the contract a mid-term technical report needed to assess the performance of the contract was left inconclusive because baseline-data could not be gathered because of the absence of bulk meters. One other accusation that was levelled against the managers was its inability to recruit its own management staff but rather, over relied on local personnel, particularly those on secondment from GWCL. In addition to the sentiments expressed above, there was bickering among the staff and as well, there was the issue of divided loyalty on the part of the 'borrowed' workers from GWCL. The company also had a lot of issues with the heavily unionised GWCL workforce, which was also all the time faulting management for almost every decision and action taken. These situations did not present the perfect harmony for work.

A GWCL worker in Kumasi however, believed that AVRL could not achieve its targets because time frame for the execution of the contract was too short. Nevertheless he believed did a lot in terms of revenue mobilization. *'It is unfortunate the whole process was politicised.'*

This last comment brings to the fore the entrenched positions held by some Ghanaians with regard to PSP in the country. Whilst there is a wide-ranging private enterprises engaged in all aspects production and services in the country many would not accept the idea of having foreign companies managing the country's utilities, especially water and electricity. The following comments of a student leader of the University of Ghana perhaps capture some of these sentiments.

'It is wrong to contract foreign companies to manage our water for us. It amounts to mortgaging our lives to them. If we can do that then it is better to privatise our military as well. I don't believe in privatization. Water should not be privatises at all. The history of privatization is not good in this country.'

4.12 Management preference

Considering the challenges in the urban water reform programmes, respondents were asked to indicate whether they prefer public or the private sector management of the country's urban water system**.** The view typically expressed by the key stakeholders was that though there should be some form of public-private collaboration in the sector government dominance should be greater. Their reasons for this preference are varied. These are some of the views:

- Potable water should supplied by the public sector because of public health implications
- The private sector is driven by profit motives than public interest
- Water is a right that every Ghanaian should enjoy
- Ghanaians are not ready for full private sector participation in the water sector

The views collected indicated many Ghanaians will like to pay more for a good source of water, but at the same time they want the sector to be managed by a government agency. Among the reasons given was that the private companies, particularly, the multi A GWCL respondent calling for greater public sector participation was insistent that in spite the current challenges water should be managed by the public sector, specifically, government and this is how he expressed it;

'I believe that the utility should be run by the public and there can be some private involvement anyway but it should not be now because if you look at Ghana now, we are not ready for things like the lease and service contracts.'

In his explanation he said the public still hold the belief that it is govern that can best provide services such as water at rates that is affordable. The fear is that private companies will charge exorbitant prices if they are allowed to run the sector, thereby making the government unpopular'.

Another reason why the respondents will prefer a public run water system is the health concern, which is borne out of two reasons. The first being that the private operator may compromise on the quality of water produced and secondly, it may over-charge for the services provided, compelling residents to turn cheaper alternatives. These two factors according the respondents may have negative health outcomes.

In spite of these sentiments some of the respondents welcome the participation of the private sector and this is how a respondent the company put it

'Despite these fears we welcome companies as well. If they have their own money and they want to invest they are welcome but not to come and take over the company. We want what will supplement our efforts. So, even if they have money they can produce and sell water through our pipe lines then you give them the guarantee that whatever water they produce you will buy so that will encourage more people to come on board.'

4.13 Health implications

As mentioned earlier, the non availability or inadequate supply of water has negative outcomes on public health. In Ghana, the annual out-break of cholera and the prevalence of other water borne diseases has been linked to poor domestic water supply and inadequate toilets. This year's outbreak, which has been declared as an epidemic in some parts of the country, especially the Greater Accra Region has been traced to the prevalence insanitary conditions and use of unimproved water sources. Since 1982, this has been the worst case, according to Ghana Health Service officials. Already, over 17,000 cases have been reported, with some 150 deaths. With the exception of the Northern Region, every region in the country has been affected, with the Greater Accra Region recording the highest number of cases (12,000 cases with 93 deaths). The GAMA, one of study areas is the most affected area in this region and according to health experts it is the epicenter of the pandemic in the country as most of victims contract it whilst on a visit or business to the city (http://www.myjoyonline.com/news/2014/October-1st/ghanas-cholera-outbreak-worse-in-30-years.php.

According to evidence provided by the Metropolitan Health Directorate of AMA the current cholera epidemic has been traced to the following:

Consumption of treated water contaminated mixed with sewage

Many of the recent cholera cases have been traced to incidents where pipe water comes into contact with sewage running through gutters. Residents in haste to connect to the pipe network pass pipelines through drains meant for sewage. These pipes at times get perforated or burst, thereby exposing treated water to sewage.

Consumption of water from tankers

Another source of the disease has been traced to water tankers. Apart from domestic usage, private water tanker operators serve other users who need for other uses such as construction. For this use, the water is fetched from unprotected sources, which may be possibly contaminated. The same tanker subsequently is also used to fetch water for domestic purposes. According to the health officials many people have contracted the diseases by drinking water supplied from water tanker services.

Unprotected wells

Unprotected wells have been identified as another possible source of the disease. This year, the early cases of the epidemic were traced to a particular well that serves as a source of drinking water for some residents.

Congested suburbs without toilet facilities

Earlier cases were reported in communities where there are no toilets. In most of these communities landlords have converted toilets into living rooms for rent to tenants.

(www.myjoyonline.com/.../public-latrinesnot-extensions-of-homes-prof-**akosa** .php)

4.14 Chapter summary

This chapter sought to analyze urban water management and use in Ghana through the perspectives of stakeholders and the following observations were made: In the first place, the view of the majority of the stakeholders was that underfunding of the water sector, coupled with bad management practices has rendered the water company incapable of fulfilling its mandate of proving water to urban residents. The situation is made worse by the increasing population of the cities as a result of migration and population growth. Secondly, from the analysis of the stakeholders' views the country's urban water system is caught up in what Bakker (undated) called the cycle of the 'three lows': low investment; low quality of services; and low revenue. In other words, water systems that receive low revenues, relative to cost have little or no money to invest. The consequence of low investment is poor service delivery, making it difficult to charge appropriate tariffs. Thirdly, applying the theory of consumptive goods in the analysis presents a lot of complexities because as mentioned earlier, there is no single source of water supply. Instead, there is a mix of sources for water for domestic consumption.

Chapter Five - Conclusion and recommendations

5.1 Findings

The study set out with the goal of understanding the how the various stakeholders in the urban water sector in Ghana will explain the situation of urban water management in the country. Empirically, it was found that one organization (GWCL) has been mandated to provide potable water to urban residents in the country. However, it is able to provide residents with just a fraction of the demand. This constraint on the public utility provider is as the result of a combination of factors. Among them are rapid urbanization, migration, poor planning, low investment and governmental interference. It was also discovered that as a result of the inadequacy many residents, especially the poor are not able to access potable water for household use. This however, has implications such as exposing them to sicknesses such as cholera. The situation has also given the opportunity to private enterprises in the water sector to thrive to the detriment of the poor. Their activities also raise questions about public safety as they are not regulated and the possibility of selling contaminated water. The issue of cost was also discussed and it was found that it is an impediment to many households' access to water.

Additionally, the study indicates that the respondents blame the problem of the sector on poor management and inability to source funding for vital infrastructural projects as well as maintenance of the existing facility. Despite these identified challenges they prefer public sector management than private sector. If there should be private sector involvement then it should be on a lesser scale like bulk water production and under the supervision of public sector managers. They also doubt the capacity of the MMDAs to manage urban water supply systems in their respective communities. Instead, there should be more collaborative work between the assemblies and the water company in the management of daily challenges concerning water provision at the local level, such as water theft detection and repair of burst pipes. Furthermore, they want devolution of water supply management chain (abstraction, production, transmission and distribution) in the urban sector to the regional level. Thus, there should be semi-autonomous water bodies in all the ten regions of the country to manage their respective water systems than the present situation where all the authority is vested one single company. However, the concern raised against this position was whether these disparate bodies will be financially viable as some of the regions are less endowed, in terms of population and industries.

The above findings are congruent with the theoretical framework of the study. That water is a public good and such should be enjoyed by all, once it is provided. However, the degree of its publicness varies and dependent on social, economic and political factors existing in a particular society. In other words, it is a social construct.

Importantly, the results of the study have enabled us to understand that urban water supply management is a complicated matter.

Against these findings and conclusions, this study will go ahead to make the following recommendations as a guide to improve upon the sector as well as for possible research activities.

5.2 Improving service delivery

By the testimony of the various public officials surveyed, the prospects of having bulk water supply in many parts of the country looks promising, particularly in the near future. This is against the backdrop of the various on-going expansion and rehabilitation projects across the country. In spite of these seemingly progress many urban dwellers may remain un-served. However, universal access to water goes beyond just the availability of bulk water supply. Issues such as cost, bureaucratic procedures, gender and locality of settlement may hinder access to water by low class residents. It is important therefore for the authorities managing the country's urban water supply to understand these complexities that restrict access to the poor and resolve them.

5.3 Funding

As funding is a major constraint in sustainable water provision in the country it is important for the country to establish a definite funding source for the sector. This can be achieved by; (1) charging a realistic tariff for water supplied to recover cost, as well make surplus for maintenance and future expansion projects. (2) Establish a fund for the Water Sanitation and Hygiene (WASH) sector. This fund could be modeled after the Ghana Education Trust Fund (Get-Fund) or the National Health Insurance Scheme (NHIS**).**

5.4 Regulation

It is important for Ghana to revise its regulation procedure as far as the water and sanitation sector in concerned. By the statutes of the country it is only water supplied by GWCL that is regulated. The implication of this is that many urban dwellers consume water from sources that are not regulated. It is the recommendation of this study that all water providers should be regulated to guarantee public safety.

5.5 Bore-holes regulation

With the increasing scarcity of networked water, many households and institutions that can afford the cost are sinking bore-holes and within their compounds. During the interview with the private water service providers it was revealed that there are over 100 contractors drilling between 50 - 100 bore-holes, per year. Looking at this figure it is important to regulate this industry in order to protect the underground water resources of the country.

5.6 Pollution

A new threat to urban water supply is the activities of illegal miners. According to experts, the activities of these miners, account for about 70% of pollution of water sources for urban water supply. The increased turbidity of the water through their actions increases the cost of water treatment and damages the treatment plants. It is important therefore to restrict their actitivities entirely or they should be regulated.

Above all it has also been identified that lack of proper management practice has been a problem to the water sector and that I recommend they adopt progressive ways of handling water issues especially taking example of successful and efficient water management practices from other jurisdictions Norway.

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Appendix A

Questionnaire for consumers

Community.....

Contact number.....

Section A:

1. Gender: (a) Male (b) Female

2. Age: (a) 15 – 19 (b) 20 – 29 (c) 30 – 39 (d) 40– 49 (e) 50 – 59 (f) 60+

3. Marital Status: (a) Married (b) Single (c) Divorced/Separated (d) widowed

4. What is the size of your household? .....

5. Which type of education do you have?

6. What is your occupation?

Section B:

1. What is the average income of your household per month (Ghana cedis)?
a) Less than 100-250 b)250-500 c) 500-750 d) 750-1000 e) 1000+

2. How many buckets/gallons of water does your household use per day?
a) Less than 5 b)5-10 c)10-15 d)15-20 e)20+

3. What type of water supply does your community use?
a) Public piping b) Communal stand-pipe c) Private stand-pipe
d) Communal well/ Public bore-bole e) Private well/ storage tank f) Pond, river/ stream
g) Private bore-hole h) Other (specify)....

4. Which of these sources does your household use?
a) Public piping b) Communal stand-pipe c) Private stand-pipe
d) Communal well/ Public bore-bole e) Private well/ storage tank f) Pond, river/ stream

g) Private bore-hole h) Other (specify)....

5. Is your water source reliable?
a) Yes b) No

6. Do you have an alternative?
a) Yes b) No

7. If yes, specify.....

8. If you are connected to the national grid does your tap flow regularly?
a) Yes b) No

9. If yes, how many times (per week)
a) 1-2 b) 3-4 c) 5-6 d) 7

10. If not, how far (in kilometres) is the water source from your house?
a) less that 1km b) 1-1.5km c) 1.5-2km d) 2km+

11. If you have pipe connected to your home, how much do you pay (on the average) as water bill per month? ¢.....

12. Do you buy water from private vendors/ tanker operators?
a) Yes b) No

13. In a month how much does it cost you (in GH¢) to buy water from these sources?
a) Less than 10 b) 10-20 c) 20-50 d) 50-100 e) 100+

14. What will you say about the quality of water source in your area?
a) Very good b) Good c) Neither good or bad d) Bad
e) Very bad f) Can't tell

15. If the water service in your area is not good what do you think is the cause?
a) Burst or blocked pipes
b) No water infrastructure
c) Demand in area more than what is supplied
d) Sabotage from private operators/tanker drivers or GWCL officials
e) Sabotage from politicians
f) Bad management from water company
g) Other.....

16. Do you think the problem(s) of urban water supply has something to do with management?

a) Yes b) No

17. If yes what kind of management will you recommend?....

18. What do you think is the best solution(s) to water problems in your area or the entire country

a) Tariff should be increased
b) Managers should be changed
c) Community should be involved in management of water
d) More investment in water sector
e) Water should be privatised
f) Government should solely manage water services
g) Private tankers should be banned
h) Other (specify)...

19. What will you say to the following issues of water management types? Please tick (√) as appropriate in the columns under: *Agree strongly, Agree, Neither agree* or *disagree*, *Disagree, Strongly disagree*

Management issue	Agree strongly	Agree	Neither agree or disagree	disagree	Strongly disagree
Management be decentralised to MMDAs					
Private sector should manage water in communities					
Production, transmissions, distribution be managed by different entities					
Independent water producers should be involved in urban water					
Public sector be sole manager of urban water					

Section C

1. In your opinion should water be free?

a) Yes b) No

2. Should water be subsidised?
a) Yes b) No

2. Thinking about quality will you be willing to pay more to guarantee water supply?
a) Yes b) No

3. Will you agree to the establishment of a water fund?
a) Yes b) No

4. How will you respond to the following suggestions regarding water financing in the country? Please tick (√) as appropriate in the columns under: *Agree strongly, Agree, Neither agree* or *disagre*e, *Disagree, Strongly disagree*

Water should be financed using.....	*Agree strongly*	*Agree*	*Neither agree nor disagree*	*Disagree*	*Disagree strongly*
Tariffs					
Tax (VAT, special levies)					
Insurance					
Property tax					
Government funding					
Donor Funding					

5. Briefly in your own words describe the best option for urban water management and finance in the country? .....

Appendix B

Interview guide for key informants

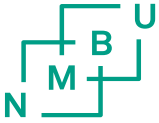
Section I

1. How would you assess the urban water situation in the country today?
2. What would you say about the performance of the new company established to provide water to urban dwellers in the country? And what are your expectations?
3. Do you think it was the best decision by government to disengage AVRL and establish a new water company? If not what do think would have been the best option?
4. Looking at the history of water management in the country and if you are asked to describe the decisions to alternate management between the public and private sector in a few words what will you say? Why?
5. What do you think are the underlying difficulties in providing urban households with a reliable source of water supply? What have the main hurdles been? Which is (are) the most significant?
6. From your experience, what do you think will be the best management option for urban water in Ghana? And why?
7. What is your opinion on decentralization?
8. Will you support the proposition that the responsibility of provision of urban water should be decentralized to the Metropolitan, Municipal and District Assemblies (MMDAs)? Why?
9. How will decentralization improve
   i) efficiency
   ii) finance
   iii) distribution
10. What do you think about the monopoly of GWCL/GWC in the production, transmission and distribution of urban water?
12. Will you recommend that these responsibilities should be given to different entities? Why?

13. What do you think about Independent Power Producers (IPP) in the country?
14. What do you think if this if this concept is imported into the water sector?
15. Do you support the engagement of bulk suppliers in urban water? Why?
16. In your opinion should there be private participation in urban water services? And what kind of role should that be?
17. Looking at effective management, accountability and transparency in urban water services what would you recommend as the respective roles of the following interest groups (stakeholders):
    a) Public sector stakeholders (GWCL, PURC, MWWH, MMDAs)
    b) Civil stakeholders (eg. NGOs, civil society and community based organisations)
    c) Private sector stakeholders (private companies, households)
    d) Donors or development partners (WB)

Section II

7. How do you want water to be financed in the country? What about urban water? Why?
8. Should water be free for domestic customers? Why? If they are to pay what will you consider being a fair price for a clean, safe and consistent supply of water?
9. Do you think that full cost should be recovered? Should it be profitable?
10. Should water be subsidized? And who should be subsidized and by who?
11. Do you think it is fair for government to interfere in the pricing of water?
12. Considering the following options of finance which one(s) do you think would fit the situation of Ghana? Why?
    a) Tariffs
    b) Taxes (eg. VAT)
    c) Property rates
    d) Insurance
    e) Donor funding
    f) Government funding
    g) Private sector funding (local and foreign banks, private companies)



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