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Mapping pro-poor water supply services in Accra City, Ghana

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Master of Science Thesis

by

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The findings, interpretations and conclusions expressed in this study do neither necessarily reflect the views of the UNESCO-IHE Institute for Water Education, nor of the individual members of the MSc committee, nor of their respective employers.

Dedicated to

Bokap & Nyokap Almh.,

Neng & Cita

Abstract

Providing water for the poor is one of agenda in target of reducing halve poverty and proportion of people without access to water and sanitation. Although the world is doing well with drinking water services, 884 million inhabitants still rely on unimproved water sources for their basic needs such as drinking, bathing, cooking, etc. Improvement in water sector will speed up achieving the MDG's target.

Mapping can be used to give more visualization of existing data on water supply and to evaluate the water service coverage so as it would valuable input for policy makers to evaluate previous policies and to formulate new policies and directions.

This study aims to develop mapping of water supply services and especially pro-poor services in an urban area. The mapping includes characteristics of the poor and inventory of different ways how the poor access water. The research focuses on the poor in the urban areas in Accra, the capital city of Ghana, particularly in two neighbourhoods, West Nima and North Teshie.

The research found that the poor in both West Nima and North Teshie could be characterized as people who spent less than GH¢ 2,884,700 per adult per year (extreme poverty line) or GH¢ 3,708,900 per adult per year (upper poverty line). The poor in both areas basically still depend on Ghana Water Company Limited (GWCL) to access water, either using water networks or getting it from alternative providers such as water kiosks, water tankers, etc. The research proposes standpipes in West Nima and North Teshie as an alternative. Policies and regulation should be arranged to formalize the practice of this alternative. Partnerships between water utility and SSASP could be an option to explore.

Keywords: mapping the poor, water supply services, Accra

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Introduction

Providing water for the poor is one of the MDGs. The target is to reduce the number of people living in poverty and the proportion of people without access to water and sanitation. The world is doing well with the services in drinking water (UN, 2009). Although it is ahead of the schedule in meeting the target in 2015, still, 884 million inhabitants rely on unimproved water sources for their basic needs such as drinking, bathing, cooking, etc (see figure 1-1).

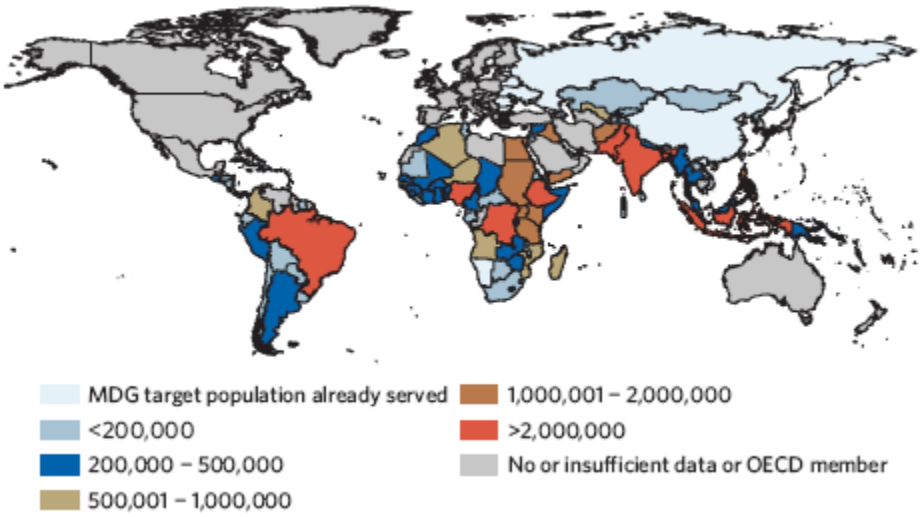

Figure 0-1*:* Population that require access to an improved drinking water sources to meet the MDG target 2006-2015 (number of people per year)
[*Source*: UN, 2009]

In general, around 10% of water in the world use for domestic purposes, 20% for industries, and 70% for agricultures. Compared to the water available around the globe, there should be enough water for all users. The problem is that the distribution of water is not even. There are countries with abundant resources, while there are also some with scarce resources, and most of this inadequate supply takes place in poor areas, where people with low income cannot have access to water properly. In 2005, about 1 billion people live in slum are with lack of land tenure, poor water, sanitation, and health services (Sharma et al., 2009).

1.1 Water supply services in developing countries nowadays

Poverty is an important challenge for almost every developing country in the world. Countries have been developing and implementing policies and strategies in order to reduce the poverty. An increase in economic activity is considered to boost the poor from their current position up to the border of the poverty line. On one hand, there are some people who escaped from the poverty (Krishna, 2003). They successfully had benefited from the economic growth. On the other hand, there are some who failed to escape and also fell from non poor into being poor. Those who still live below the

poverty line and fall into poverty, unfortunately, could not obtain benefit from this growth.

Poor households do not have as many advantages as the non poor households. For instance, they have limitations in public services, such as water and sanitation, health and public services. Having access to these services is very essential for life. According to Krishna (2003), one of the impacts of not having access to water and sanitation services is high level of health-related expenses. They have to pay a lot of money to cure the illness, because the medication and the treatment are so expensive. For example Indonesia loses 2.3% of its GDP because of poor sanitation and hygiene (Colin et al., 2009). Poor households also have to spend a lot of energy and time to fetch water from resources that are located far away from their houses; most of them are women and children. The children do not have time to go to school, because they have to help their parents to collect water. One of the ways to get access to water is by having a connection from the water supply utilities. Unfortunately, there are still a lot of people who do not have access to these services. In Indonesia, although half of the population lives in the urban areas, access to public water supply is only 42% of the households, only 30% of urban residents have house connection, and coverage area for sewerage service is only about 1%, not to mention lack of sewerage collection in most of the cities (Colin et al., 2009). There are several possible reasons why poor people do not have access to water supply services. First, it is probably because there is no available access or distribution network in their living areas. Second, probably there is available access around their livelihood, but they do not have enough money to pay for the initial fee. There are still more explanations why poor people do not have access to services. In Indonesia for instance, one of the reasons of poor access to the services is the top-down delivery system in the past which only answerable to government agencies compare to users (*Indonesia contextual analysis in water supply and sanitation sector*, 2009).

Water and sanitation services in developing countries are poor and highly priced (Kurian, 2009). The reason could be from technical point of view, such as low operation and maintenance will cause burst pipes, low pressure, etc. Another reason is the deteriorating of the water resources in quantity and quality because of overexploited and contamination of groundwater. Moreover, some people still argue that water is for free and they should not pay for it (Loftus et al., 2006). In Namibia, those who are very far below the poverty line, could not pay for their water, even though the total cost for their water is still below 5% of their income which is the maximum level of expenditure on water (Falk et al., 2009). In other words, there is challenge in how to ensure that the services are delivered to the customer, especially the poor.

1.2 Mapping as an input for decision making in water supply services

Mapping can be defined broadly from different perspectives, but most of mapping is connected into making maps as it is usually used in cartography. However, mapping also can be used in social aspect to give more visualization. In poverty alleviation, for example, mapping the poor is significant for policy makers and researcher because it is an easy format to understand for non-technical users, could facilitate targeting programs in reducing poverty and for further studies in investigating the relation between geographic condition and poverty (Benson et al., 2007).

Mapping becomes more useful in correspond to benchmarking in water supply sector. It presents what have been already done, so that it will be more straightforward to benchmark the performance of a water utility. In relation to pro-poor services, mapping is even more useful, not only to identify the existence of poor households, but also to improve the services to the poor. In short, mapping indeed supports the decision making process for water supply and sanitation services, as it is also important to promote the pro-poor services.

This study is intended to map the poor by analyzing how the people in Accra (West Nima and North Teshie) solve their access to water problem, which can be used as valuable input for policy makers to evaluate previous policies and to formulate new policies and directions.

1.3 The research objective and research questions

The objective of this research is to develop mapping of water supply services under pro-poor services framework in urban area. Thus, the research questions are:

1. Who are the poor in urban area?
2. What are the indicators for identifying the poor?
3. How the poor can get access to water?
4. What lessons can be drawn regarding the programs/projects for the poor?

1.4 The research outline

The writing consists of five parts, as described below:

Chapter 1 will introduce the research problems, followed by research objective and research questions.

Chapter 2 will describe the poor in Accra, condition of water supply in Accra, and the knowledge gaps of this research.

Chapter 3 will describe about theoretical and analytical framework of the research and methods used to obtain the research objective.

Chapter 4 will describe and discuss findings of the research. It will include description of the poor characteristics and how the poor can access water in Accra, more focus in two study areas (Nima and Teshie).

Chapter 5 will conclude the research findings and will propose further recommendation.

Background

The Republic of Ghana is one of the West African countries bordered with Burkina Faso in north and northwest, Gulf of Guinea in the south, Togo in the east and Ivory Coast in the west. The area of Ghana is more than 238,000 km^2 and is consist of low land area and a range of hills on its eastern border. Ghana is a member of Commonwealth and the Economic Community of West African States (ECOWAS) and is basically an agricultural country.

Ghana is divided into 10 administrative regions which are Northern, Upper West, Upper East, Volta, Ashanti, Western, Eastern, Central, Brong – Ahafo and Greater Accra. Accra, the largest city in Ghana, functioned as capital city and centre of government services.

Total population in Greater Accra in 2005/2006 is about 2.6 million people or 796 thousand households (GSS, 2008). The average annual household's income for Greater Accra is the highest among other regions. It is around GH¢ 1,529 which is higher than the average national income of GH¢ 1,217. For annual per capita income, Greater Accra has GH¢ 544 while the national average per capita income is GH¢ is 397.

Figure 0-1: Administrative regions of Ghana
[*Source*: Travel, 1995]

1.5 The poor in Accra

There are different types of social-economic zones in Accra as described in Figure 2-2 (Adank et al., 2009). For the purpose of the research, two locations were chosen for the field survey: Nima and Thesie.

Nima, is located on the north direction of central Accra, bordered with Maamobi (north), Kanda (east), Asylum Down (south) and Accra New Town and Kokomlemle (west). It is categorized as urban high density and low income area. Most of population in Nima are migrants who came from the northern part of Ghana. In 2008, population in Nima is 82,329 people with growth rate of 2.2% in 1984 – 2000. With area of 156 ha, the population density of Nima is 527.8 pp/ha (CIHSD, 2008). Water supply in Nima is served by Accra North District of Ghana Water Company Limited (GWCL).

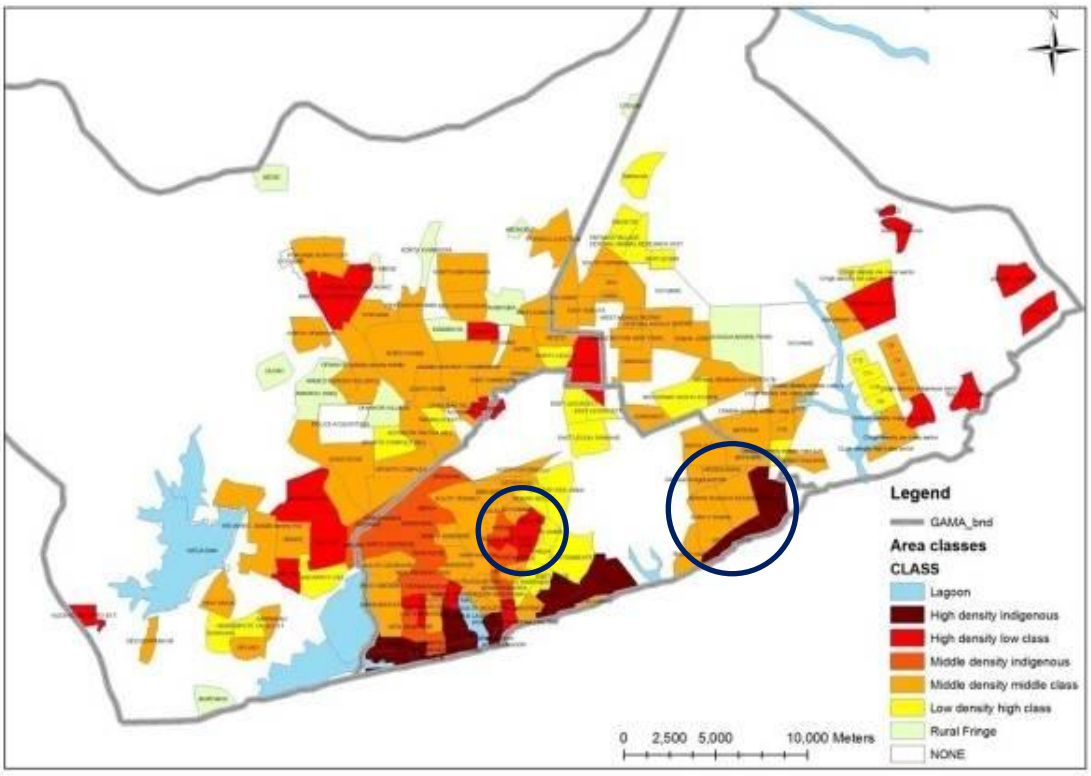

Figure 0-2: Socio-economic zones in Accra City
[*Source*: Adank et al., 2009]

Teshie is located 14 km to the east direction of central Accra, bordered with Nungua (east) and Gulf of Guinea (south). It is categorized as urban as well with high density of indigenous people. Population in Teshie is 145,930 people (LEKMA, 2008). The water supply service in this area is provided by Accra East District of GWCL.

1.6 Water supply in Accra

1.6.1 National policy in water supply

Pro-poor water supply and sanitation services have been put as an important issue in the National Water Policy 2007 of Ghana. The service provision distinguishes between water supply and sanitation since 1998 (Nyarko, 2007). Pro-poor water supply services aims to ensure improved and sustainable access to water by the poor for their basic needs, through (MWRWH, 2007):

1) adopting tariff structure benefited for all consumers;
2) encouraging cooperation between private operators and small-scale independent providers;
3) establishing program to support connection to low-income consumers;
4) facilitating identification of un-served zones; and
5) defining roles of small-scale water supply provider.

The implementation of this policy is on the burden of Ghana Water Company Limited as the public utility together with Aqua Vitens Rand Limited (AVRL) as the private operator for GWCL. Public Utility Regulatory Commission (PURC) monitors and evaluates their performance and also has the responsiblility to regulate the tariff for

water and electricity in Ghana. This independent regulatory body is the manifestation of the New Public Management approach in public sector.

Regarding tariff setting, based on the explanation from an officer of PURC, there is a specific procedure involving the representatives from the utility, consumers, industries and the trade union congress. They consider the inflation rate, Non-Revenue Water (NRW), interest of the poor, utility's financial statement, etc. When they reached an agreement, they bring it in front of the so called 'parliament' to get public's opinion before they issued the new tariff. Currently, PURC is developing an automatic water tariff rate guideline which automatically adjusted based on changes in several parameters: replacement of equipment, maintenance of the system, NRW, etc.

As mentioned before, PURC itself consists of several stakeholders represent different interest. However, these representatives are approved by the president or, in other words, they are appointed by the president. This situation may cause imbalance of interest in making regulatory decisions regarding the tariff (Perker and Kirkpatrick, 2002 in Sanz, 2008), and the regulatory process may be subjective to particular interests, in particular case when most of the member are appointed by the president himself.

1.6.2 Ghana Water Company Limited (GWCL)

Ghana Water Company Limited (GWCL) is responsible for delivering water in Ghana. It works under general direction of the Ministry of Works and Housing. It has eight members in Board of Directors as head of the company and daily is managed by the managing director and two deputies. There are ten regional offices in Ghana with chief managers as the leader (Figure 2-3).

In 2006, Aqua Vitens Rand Limited (AVRL) signed a 5 years contract management with GWCL to increase a reliable supply of safe water in the urban areas as well as to ensure access of potable water to low income consumers at affordable prices. Hence, development projects has been conducted, including rehabilitation of existing water supply, provision of operational support equipment, improving the existing schemes and constructing new water schemes.

GWCL operates 86 urban pipe-borne water supply systems for the entire Ghana. Especially in Accra, there are three regional offices: Accra East, Accra West and Tema. Each region consist of several districts, for instance Accra East has four districts: Accra North, Accra North East, Accra East and Accra Central. Nima and Teshie is served by the Accra East Region but under different district. Nima is served by Accra North while Teshie is served by Accra East (Figure 2-4).

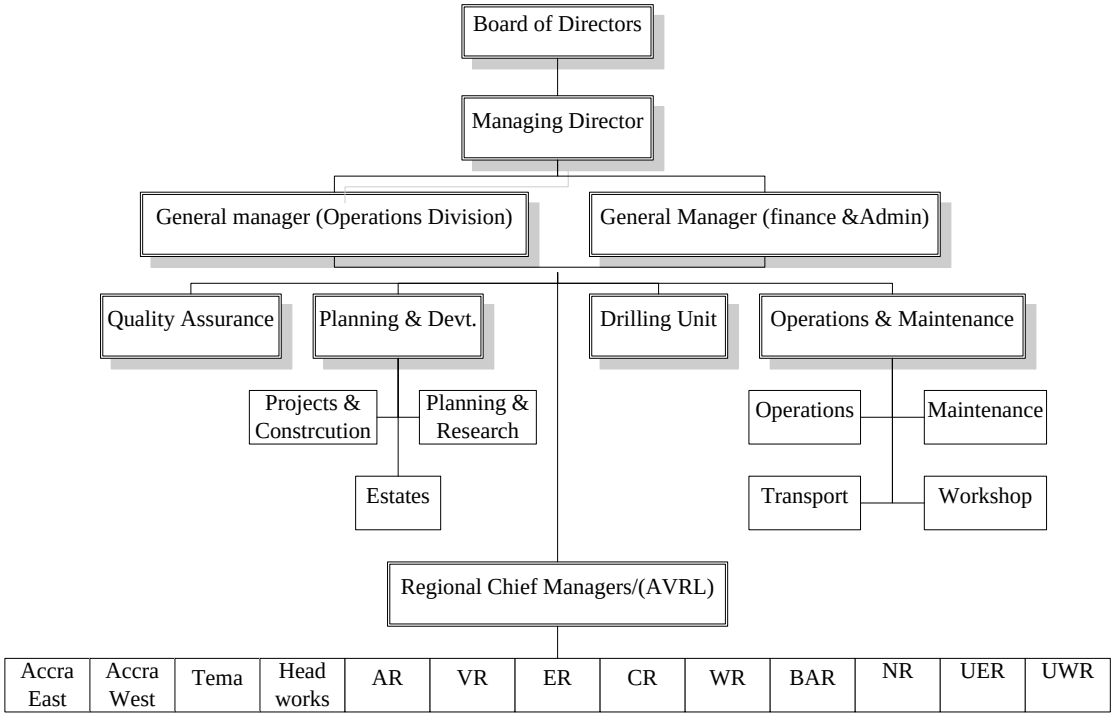

Figure 0-3: Organisational chart of the GWCL
[*Source*: Doe, 2007]

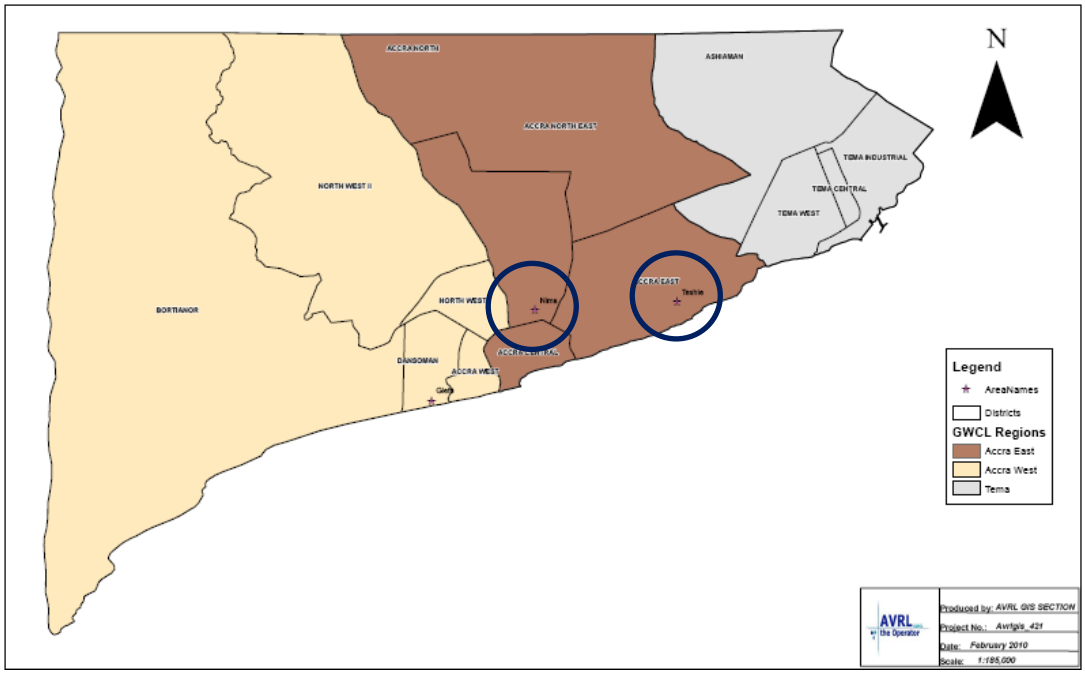

Figure 0-4: Map of GWCL service area in GAMA
[*Source*: AVRL, 2010]

1.6.3 Water resources

Population in Accra mostly depend on surface water for their need (Adank et al., 2009). There are eight catchments that are partly or fully located in Greater Accra Metropolitan Area (GAMA): Densu River (the largest), Lafa Basin, Chemu Basin, Korle, Osu Basin, Kpeshie Drainage Basin, Songo-Mokwe and Sakumo II (Figure 2-5). The catchment of Densu River is about 2,500 km^2 where Weija dam is located. It is 20 km from central of Accra and was built in 1952 for supplying potable water to Accra and reconstructed in 1978. The surface area and volume of the impoundment is 33.59 km^2 and 212,546 m^3.

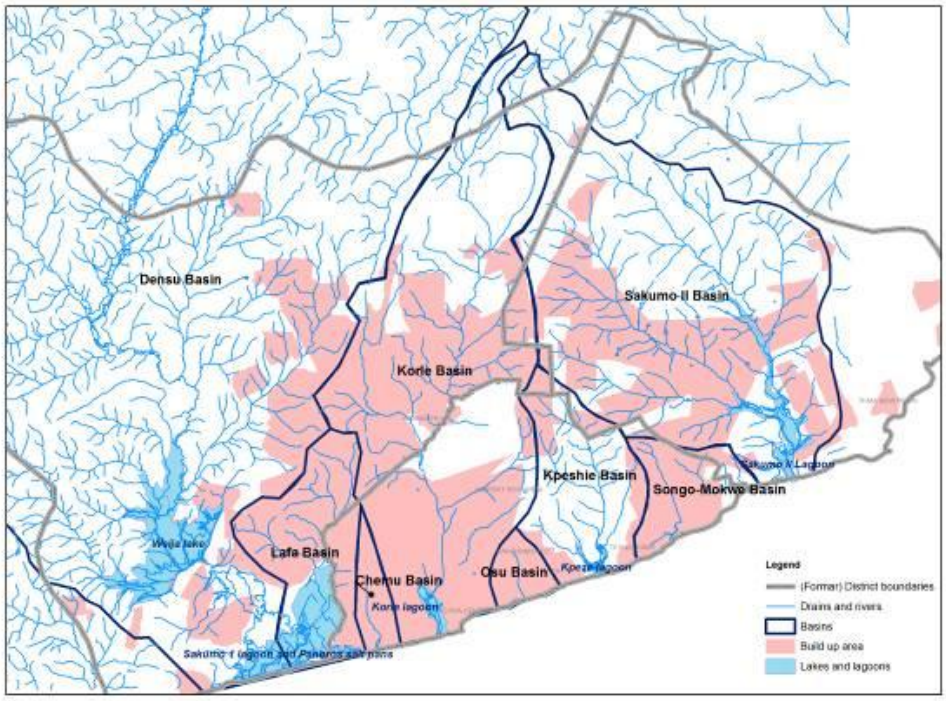

Figure 0-5: Available water resources for GAMA
[*Source*: Adank et al., 2009]

Another central source of surface water for consumption in Accra is Volta Basin. It covers 6 neighbouring countries around Ghana with total area 400,000 km^2. Three big rivers flow into this river; they are Black Volta, White Volta and Oti, and end up at the biggest artificial lake called Akosombo Reservoir. This reservoir was formed by the construction of Akosombo Dam in 1961 – 1964. The storage capacity is 148 km3 and it was built for hydro electricity generation.

People do not depend on ground water because it is too saline and difficult to estimate how much suitable groundwater that could be used. The overview of water resources can be followed in Figure 2.7.

Figure 0-6: Surface water for Accra
[*Source*: Adank et al., 2009]

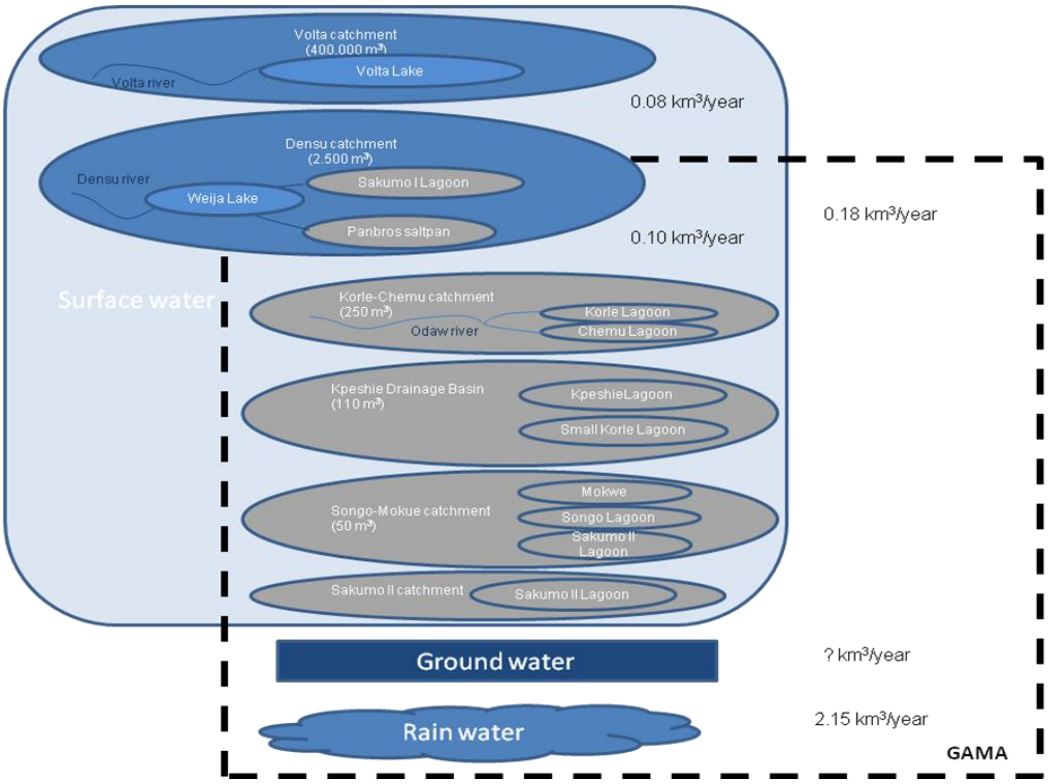

Figure 0-7: Overiew of water resources
[*Source*: Adank et al., 2009]

1.6.4 Water supply infrastructure

The water supply infrastructure in GAMA is divided into three main systems: Kpong, Weija, and Anum (Table 2-1). Kpong system has the biggest water production and plant capacity. The total raw water production in Accra is 142 million m^3/ year.

Table 0-1 Capacity of water supply systems

System name	Production of raw water (m^3/year)	Production of treated water (m^3/year)	Plant capacity, design (m^3/day)	Average plant capacity, actual (m^3/day)	% Average plant capacity of design capacity
Kpong New	61,369,489	58,136,665	181,818	159,280 (164,400*)	88%
Kpong Old	13,131,091	12,464,845	38,636 (36,400*)	34,150 (15,900*)	88%
Total Kpong	**74,500,580**	**70,601,510**	**220,454 (218,218*)**	**193,430 (180,300*)**	88%
Weija -Adam Clark	48,117,071	44,746,911	134,000	122,580	91%
Weija Candy	6,926,738	8,598,451	39,440	23,555	60%
Weija –Bamag	12,330,064	8,650,654	30,240	23,852	79%
Total Weija	**67,373,873**	**61,996,016**	**203,680 (204,544*)**	**169,987 (185,000*)**	83%
Anum Boso	**139,478**	**92,055**	**100**	**252**	**252%**
Total ATMA	**142,013,931**	**132,689,581**	**424,234 (422,762*)**	**363,669 (365,300*)**	86%

[*Source*: Adank et al., 2009]

From those three main systems, raw water transferred to the treatment facilities and delivered through the distribution network or systems to the costumers. Water distribution system in Accra is divided into three pressure zones:

1. The Low Pressure Zone covers area with ground elevations between 0 and 30.5 m.
2. The Medium Pressure Zone covers area with ground elevations between 30.5 and 61 m.
3. The High Pressure Zone covers area with ground elevations above 61m.

Access to water services

There are two purposes of accessing water: for drinking and for general use (incl. bathing, washing, etc). For drinking water, about 40% of population in Ghana have access to piped water supply, almost 41% get their water from the well, 15.7% have access to water from the natural sources and more than 4% depends their access to other sources such as water tankers, water vendors, etc. In Accra, nearly 85% of the population in Accra have access to piped water, few of them are using well (1.2%) and natural sources (0.1%) and more than 14% rely on other providers (Table 2-2).

Table 0-2 Main source of water supply for drinking (percent)

Source of water supply	Urban Areas			Ghana
	Accra (GAMA)	Other Urban	All	
Pipe-borne	**84.3**	**67.5**	**73.1**	**39.5**
Indoor plumbing	10.9	7.3	8.5	3.8
Inside standpipe	31.3	17.2	21.9	10.7
Pipe in neighbouring household	28.7	15.2	19.7	9.3
Private Outside standpipe/tap	9.0	6.7	7.4	5.0
Public standpipe	4.5	21.1	15.6	10.7
Well	**1.2**	**23.4**	**16.0**	**40.7**
Borehole	0.1	9.0	6.1	30.4
Protected well	1.1	11.4	8.0	6.2
Unprotected well	0.0	2.9	2.0	4.1
Natural sources	**0.1**	**3.7**	**2.5**	**15.7**
River/stream	0.1	2.6	1.8	11.4
Rain water/spring	0.0	0.6	0.4	0.7
Dugout/pond/lake/dam	0.0	0.4	0.3	3.5
Other	**14.3**	**5.4**	**8.4**	**4.1**
Water truck/tanker service	1.3	0.8	0.9	0.4
Water vendor	4.5	2.9	3.4	1.8
Sachet/bottled water	8.6	1.6	4.0	1.8
Other	0.0	0.1	0.0	0.1
All	100.0	100.0	100.0	100.0

[*Source*: GSS, 2008]

For general use, people in Ghana use water from well (40.8%), from pipe-borne (37%), and from natural and other sources (20%) (Table 2-3). In Accra, 89.7% of its population use pipe borne, 7.3% use other source and 1.9% use well.

Table 0-3 Main source of water supply for general use (percent)

Source of water supply	Urban Areas			Ghana
	Accra (GAMA)	Other Urban	All	
Pipe-borne	**89.7**	**62.6**	**71.6**	**37.4**
Indoor plumbing	11.3	7.5	8.7	3.9
Inside standpipe	35.4	16.7	22.9	11.1
Pipe in neighbouring household	29.3	12.6	18.1	8.5
Private Outside standpipe/tap	9.2	5.7	6.9	4.4
Public standpipe	4.5	20.2	15.0	9.4
Well	**1.9**	**28.4**	**19.6**	**40.8**
Borehole	0.2	7.1	4.8	27.3
Protected well	1.6	16.8	11.8	8.2
Unprotected well	0.1	4.5	3.0	5.3
Natural sources	**1.1**	**5.5**	**4.0**	**19.3**
River/stream	1.1	4.4	3.3	14.8
Rain water/spring	0.0	0.6	0.4	0.7
Dugout/pond/lake/dam	0.0	0.4	0.3	3.9
Other	**7.3**	**3.5**	**4.8**	**2.4**
Water truck/tanker service	2.0	0.8	1.2	0.5
Water vendor	4.7	2.7	3.4	1.8
Sachet/bottled water	0.7	0.0	0.3	0.1
Other	0.0	0.0	0.0	0.0
All	100.0	100.0	100.0	100.0

[*Source*: GSS, 2008]

However, what access people use, most of the population in GAMA basically depends on GWCL for the water, either directly or indirectly. Indirectly means that people get water through informal water supply chain, such as: cart operators, domestic vendors, neighbourhood sellers, sachet water vendors, private storage tanks, and tanker services (Figure 2-8).

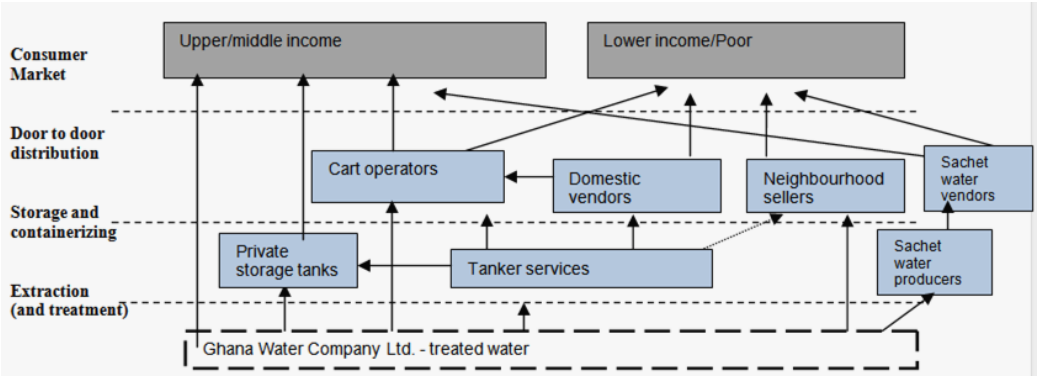

Figure 0-8: Formal and informal urban water supply chain in Accra
[*Source*: Adank et al., 2009]

1.7 Water demand in Accra

Adank et al. (2009) presents four water demand estimations in 2007 based on different assumptions (Table 2.4). It varies from 447 thousands to 500 thousands m^3/day. Compared to the capacity of water supply system in Accra (365,300m^3/day), it indicates a water shortage of around 144,685m^3/day. Improvement of water supply system capacity is urgently required, either increase the existing system or build a new system.

Table 0-4 Optimal water demand estimation for GAMA/ATMA (m^3/day)

Calculation assumptions	2007
Total GAMA water demand (based on 1984-2000 district growth rates)	509,985
Total GAMA water demand (based on total growth rate of 4,4%)	479,478
Total GAMA water demand (based on total growth rate of 3.4%)	447,062
Total GAMA water demand (according to Strategic Investment Plan)	474,465

[*Source:* Adank et al., 2009]

1.8 Knowledge gap

Realizing that there are still many people, especially the poor, who still do not have access to safe water, it is necessary to collect real data from the field. This information is important for the policymakers and utilities in order to formulate and target their next policy, program or projects. It is also important for the utilities to know how well they have done with the service in low income areas or for poor households as the vulnerable one. In addition, this information could be an improvement for benchmarking exercise within and between the utilities in the future, since the current benchmarking exercise can not tell exactly the performance of each utility regarding their service to the poor.

This study is trying to describe the real situation at the field regarding the access to water supply in West Nima and North Teshie. How the household get their access to water, whether there is available alternative options for them to have access to water beside the main network also described and analyzed;.

Methodology

1.9 Theoretical Approach

1.9.1 Poverty has multiple dimensions

Defining the poor is not easy task; many define with different point of view and purposes. There is no universal agreement on which method is better to explain poverty. For instance, Sri Lanka Department of Census and Statistics (DCS) defines poverty line by using household food ratio (food expenditures as a percentage of total expenditures) and per capita caloric intake (Pattanayak et al., 2006). They found that poor households are those who spend less than or equal to SL Rs 3,356 per capita per month. Additional to defining poverty, a study was carried out to measure poverty by using economic, social and enabling environment factors (Henninger, 1998). Another method for analysing poverty is using quantitative spatial data analysis to examine the spatial correlates of meso-, or community-level poverty incidence (Kristjanson et al., 2005). They argued that poverty is influenced by pasture potential, livestock density, distance to a major town, road density, by access to education, access to security, soil fertility and agricultural potential. They concluded that people who are living in the greener area has more position to utilize the natural sources therefore less poor than the people who lives in the area with small vegetation; locations with lower livestock density tend to have higher poverty level; locations with less road access are poorer; etc.

Table 0-1 Various way to define poverty

No	Location	Parameter to define poverty	Definition
1	Sri Lanka	Food expenditures as a percentage of total expenditures and per capita caloric intake.	Poor households are those who spend less than or equal to SL Rs 3,356 per capita per month
2	Kenya	Poverty is influenced by pasture potential, livestock density, distance to a major town, road density, by access to education, access to security, soil fertility and agricultural potential.	People lives in greener less poor than people lives in the area with small vegetation; more live stocks, and fewer roads.
3	-	Water poverty	A nation or region cannot afford the cost of sustainable clean water to all people at all times.
4	-	Water poverty index based on resources, access, capacity, use and environment	Score of 0-100.

Another measurement in poverty is water poverty. According to Feitelson & Chenoweth (2002), water poverty is defined as a "situation where a nation or region cannot afford the cost of sustainable clean water to all people at all times" (Molle et al., 2003). They estimated affordability index of a country by calculating the cost of developing adequate

water supply and sanitation and compare it to the GNP. In addition, there is also a Water Poverty Index (WPI), developed as a holistic tool for measuring the water stress at households and community levels. It was intended for helping the decision makers at community, central government and donor agencies in making priority in interventions in the water sector (Sullivan et al., 2003). They indentified five components considered in measuring the index: resources, access, capacity, use and environment. By giving score for each component, it can give a country's relative position compare to other countries in the provision of water (the total score ranges from 0 – 100). For instance, out of 147 countries, Ghana was scored 6.9 (resources), 8.1 (access), 12.7 (capacity), 7.2 (use) and 10.4 (environment). In total, Ghana has 45.3 points and was placed at no. 123, compare to Finland with the highest score (78) and to Haiti with the lowest score (35.1) (Lawrence et al., 2002).

Understanding different parameter used to define poverty is considered in this research to have a better understanding about the poor in urban area (Accra City). This research is using the official poverty line in Ghana which is based on the nutritional requirements and is trying to apply it in the field.

1.9.2 New Public Management

As one of key services, water service is often fail to serve people, especially the poor, either in access, quantity, or quality point of view (van Dijk, 2006). He also listed five key words for assessing and improving the quality of service delivery, mainly in urban area, which are specificity of the services, private sector involvement, gain experience from small projects, comparison study to analyze existing experiences, and benchmarking. It is a challenge to have the service improved so that people can have access to better water and sanitation. To cope with the challenge, reform of water service management is urgently needed (Schwartz, 2008).

Public service management reform has been introduced as the reaction of failure in traditional bureaucratic model or public administration. It has been years that public services, including water and sanitation services, were domain of the government as it was called as traditional bureaucratic or public administration model. It had received some critics, especially from efficiency and accountability point of view. There are four criticisms on the traditional bureaucratic model (Schwartz, 2009). First, there is no separation between policy and service provision. This means politician often interfere the processes of services provision. Second, the decision making processes are often resulted from negotiation and exchange between internal and external interests of the organization. Third, there are delay, inefficiency, inflexibility, unresponsiveness in procedures, which disregard the interest and concerns of citizens. The last one, bureaucratic as a top-down approach usually produces improper policies and insufficient results. In order to address these problems, reformation becomes an essential step.

Schwartz (2008) stated two approaches in reforming the water sector, which are increasing private sector involvement and the New Public Management approaches. The latest approach, as Hood (1995) and also Peters (1996) and Kettl (2000) which cited in Schwartz (2008), becomes popular since 1980s in many developing countries. This approach is more market-oriented and output based (Schwartz, 2008). It is considered as a way to increase the level of performance of public servants in public services. It is believed as a mean for multiple ends such as reducing public expenditures, increasing the quality of public services, making the operation of government more effective and improving the implementation of policies. Apart from that, it is also believed could

support other objectives such as freeing officials from bureaucratic influences and increasing the accountability of government. In other words, public management reform is considered as a way to reach the desirable situation from the less desirable situation before. There are five principles of the New Public Management stated by (van Dijk, 2006) namely autonomy, accountability, customer orientation, corporate culture, and market orientation.

To increase efficiency in service provision, public management reform also point out the need of creating quasi-competition through benchmarking (Schwartz, 2009). It could be developed in spaces, levels and time dimension, for instance service level between households (rich, medium and poor), between utilities, between service level from different district (big and small district), etc.

By imitating the private sector in water services, Schwartz (2008) said that the public sector will gain benefit of effectiveness, efficiency, and flexibility; which often associated with private sector organizations. Unfortunately this approach is not always giving the best result, depend on the implementation. It may also take years to bring in result of reforms process. The advantages even take longer time than the implementation. Furthermore, Schwartz also mentioned some points should be concerned, such as: the impact that still being questioned; the cost of reformation should be compared to the efficiency will be gained; the need of a set of preconditions; applicability of elements; and the weakened of traditional public sector values. In applying this new approach in water sector, Schwartz noted important components that must be highlighted, i.e. separating the regulatory task from the service provision, creating quasi-competition among utilities, increasing the level of autonomy of the utilities, increasing the level of costumer orientation and increasing the level of accountability of the result produced by the utilities and employees.

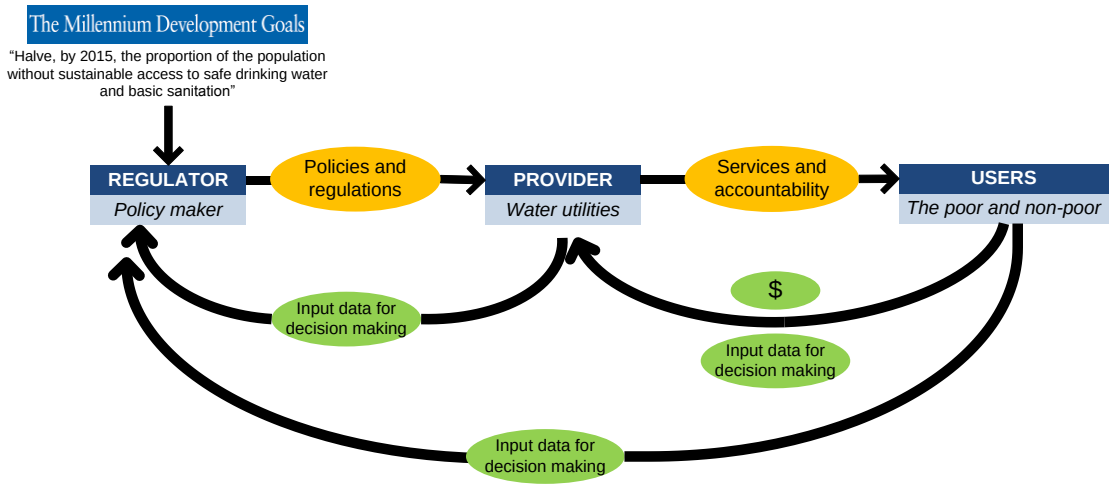

Figure 0-1: The framework of relationship between actors

[*Source*: after WB, 2004]

Understanding of NPM used in this study to elaborate the role of public utilities and other parties in providing water services to the poor in urban area. In bureaucratic or public administration model, the Government used to be a finance actor who responsible to prepare budget for water and sanitation services. The Government gave the money to the utilities to deliver the services to customers. As a feedback, the utilities

gave the accountability to the Government. In this model, customers only had limited influence to the Government.

In the New Public Management, the Government is responsible for formulating policies and strategies. They are no longer liable to provide budget for utilities. The utilities generate money for themselves from customers. By giving services to customers, the utilities are able to have money to fund their operational, maintenance, investment, administrative, etc. Here, not only services, the utilities also deliver accountability to the customers.

In the case of pro-poor services, the Government is responsible for formulating policies regarding the achievement of the Millennium Development Goals. The water utilities are responsible to interpret and to implement the policies into their service providing. In order to tailor the services, the poor as end users shall provide valid data and information. This data and information will be used by the water utilities to identify distribution of the poor spatially and further will be forwarded to the Government as input in decision making processes. This process, called as short route, where the information flows from users to the provider. On the other hand, the users could also communicate data and information directly to the decision makers, so as it is called as the long route of information flows (WB, 2004).

As mentioned before, that NPM is market and costumer oriented, which means the public utility shall improve their response to the market and consumers. Since the traditional way (connecting all consumers through piped network) is not feasible anymore, the utility must find another way to improve their service, for instance by engaging with private sector and even the small scale alternative service providers. In other words, the notion of partnership is emerging as an alternative approach to improve the performance of the utility in delivering the service especially to the poor. The next section will go deeper into the types of partnerships, including partnerships in Ghana.

1.9.3 Partnership/involvement/participation

The failure of public utilities in delivering services to people has shifted water service approach into new paradigm. Individual connection is often not a feasible option for supplying water, especially for the poor in urban areas. The emerging small scale private service providers seem to be a promising opportunity to increase access to water for this group. Partnering with these providers will be studied as a new approach for the water utility to serve the poor.

Partnership/involvement/participation at different level

According to the second principle of the Dublin Statement, "Water development and management should be based on participatory approach: involving users, planners and policy-makers at all levels" (UN, 1992). Community involvement is likely occurring in upper, middle and lower level. Upper level means that community could also involve in the regulatory, tariff setting and decision making phase. Participation occurs when the costumer (stakeholders) get involved (Sanz, 2008). This will result quality enhancement of the regulatory decisions and level of acceptance and commitment of the community to the regulatory decisions. According to Espulga and Subirats (2007) in Sanz (2008), involving community in decision making process is essential since currently the society has multiplicity values, objectives and preferences. They tend to actively react to the public issues and not stay behind passively and waiting for the public authorities to

manage and find solutions for the issues. Thus recognizing different interests and accommodating those interests in a form of involvement in decision making is required.

Partnership also occurs at different level, which is between the public utility and the private sector. There are some common explanations why involving private sector is considered: to avoid the impending political risk of full privatization, introducing new technologies brought by expertises, risks sharing among the parties and opportunity to have more access to capital investment and finally to increase the sector responsiveness to the costumer needs (UN, 2005). The UNDP (2008) in Rusca (2009) added that partnership enable both public and private sectors to put all their resources together in order to improve services to community. To increase efficiency was one of the reasons for the Government of Ghana to invite the private sector involvement in 2004 (Fuest et al., 2007). The types of contracts were lease contract and affermage. However, she also explained that the government received some critique from civil society members and NGOs regarding the flaws in the stakeholder's participation, the role of the regulator and the poorly designed policy that might has negative impact to the poor. Another example of partnership with private sector in Ghana is the desalination plant which is going to be built in 2010 at Nungua. The contract scheme is Build Operate Own Transfer (BOOT) and the contract period is 25 years.

Another community involvement also occurs at lower level, which means this participation is basically happen at the community or consumer level. Water services could be improved through partnership between public utilities and community (Rusca, 2009). Pugh et al. (1987) in Rusca (2009) defined the partnership as a "working relationship by a shared sense of purpose, mutual respect and the willingness to negotiate". She defined partnership, for the purpose of her study, as working together between different actors to achieved collective goals by putting all their resources and also by responding individual interests (Rusca, 2009). Thus, this study noted some principles of partnership: working together between actors; share of purpose and responsibilities; invest of individual resources; and respect of individual interests. Her study found although partnership could only bring modest service improvement, it was benefited for all partners. However, there are some constraints in terms of sustainability of this approach. First, partnership could not address the weaknesses and ineffectiveness of the utility in delivering the service. Secondly, further arrangements and efforts are needed to have better impacts on the low income communities. GWCL also see that partnership with small scale alternative providers is an approach to reach the poor consumers. In this research the possibility for this partnerships, for instance with the water tanker operators, will be studied for this purpose.

Partnership assessment

Partnership consists of parties who are gathered and collaborating in pursuing mutual benefit. This might includes collaboration between formal utility and informal utility, such as small scale providers. An example of management for small scale provider is community based management. However, this system faces several major obstacles: lack of local capacity (unskilled labours), finance (low level of investments), equipment, technical expertise, organizational skills and knowledge of commercial market (van Dijk, 2008). Thus, before engaging into any type of partnership, there are several factors that need to be considered in order to have a successful partnership. There are external and internal success factors for partnership in the international setting (van Dijk et al., 2010):

Table 0-2 Internal and external (enabling environment) success factors for partnerships

Internal factors	External factors for partnerships
• Partnership building • Commitment • Relations • Governance arrangements in the partnership: consultative structures • Level of ownership • Transparency • Horizontal and vertical accountability • Inclusiveness of stakeholders • Trust • Clear roles and complimentary • Good planning • Clear drivers: a champion in the Public & Private sector • Relevant knowledge & experience • Clear distribution of tasks • Win-win solution	• Legal framework • Institutional framework • Development of the private sector • Level of development of the economy • Sector specific factors • Policy context • Willingness to participate • Time horizon • A real need for the partnership • A sense of urgency • An active private sector • Available finance • Political commitment • Cultural factors • Social conditions

[*Source*: van Dijk, et al., 2010]

United Nations also mentioned that to have successful PPPs, it requires strong political commitment, clear legislation and regulatory systems, evolution of authority and responsibilities, qualified enterprises to compete for PPPs and tariff levels and structure should benefitting all consumers (UN, 2005). In addition, some lessons learnt from urban water sector in China assured that it is necessary to balance the tariff levels, profit for the investor and subsidies from the government, to select the most suitable form of PPP in local context, to have systematic and comprehensive governmental regulatory framework and to fully understand the risk allocation for each different forms of PPPs (Zhong et al., 2008). In other words, it is necessary to engaged with several stakeholders in the process of construction, operation and financing the required facilities (van Dijk, 2008).

The notion of partnership principles was applied in this study to deliver more comprehensive analysis. Public utilities were no longer the only enabler in improving water services. The 'top-down' approach, if it could be said so, should be complemented with the 'bottom-up' approach, where community as users were encouraged to enable the services.

1.9.4 Small scale alternative service provider (SSASP)

The population is growing rapidly in urban areas, as the consequence, the city expanding towards unpredictable areas. Most of the areas occupied by immigrants who came from rural and any places close to the city to find a better life. Sometimes they even live in the illegal settlement or improper designed places. Unfortunately, the expansion does not followed by the public services network, such as electricity, water, gas, sewerage, etc. There are several explanations about the lack of public services especially for the poor (Sansom et al., 2008): the direct provider does not have the

mandate to serve the poor; low level of creativity and innovativeness of service providers; no regulation by the government; no separation between regulator and operator and very low tariff. This occasion will lead to the shortage of some public services.

In urban areas, usually, there are two types of water service provider operating parallel. First is the institutional sector which is represented by the formal utility or water Service Company. Basically they provide the service through several methods: individual connection, collective connection and home delivery. The other type is the informal sector such as neighbour seller, private vendor, water tanker, etc. Sometimes they are complementing each other and conflicting as well (Eaux, 1998). Complementing in the sense that they operate in the areas where the network can not reach or in other words, they are trying to help the community, in informal way, to get access to water. In some countries, alternative providers are partnered with the public utility to deliver the service to customers. In Port au Prince, Haiti, for instance local commission appointed individuals to manage standpipes. The success of this project depends on the collaborative actions between Water Services Company (CAMEP), NGO (GRET) and local committees (appointed by CAMEP) (Eaux, 1998). Conflicting means that sometimes there are irresponsible individuals who want to earn some benefits by abstracting the water from the main in an illegal way. This action will cause disadvantages for the piped borne costumer at the end of the main, for instance insufficient amount of water, unstable pressure in the pipe because sometimes they use booster pump and contamination of the water inside the pipe.

Types of SSASP

In order to meet water demand, public utility use different approaches (e.g. standpipes, water kiosk, water tankers). In the case that there is no network in place, people have to be innovative to search and manage their own need of water. This condition leads to the formation of individual water enterprises as alternative provider. As mentioned before, there is possibility for water selling points or other type of small scale providers to serve the population who does not get their access from the network. Unfortunately, the price of water is higher and even much higher than the regular rate from the water utility. This is the result of there is no access to subsidies for the small scale providers and they can not gain benefit from the economies of scale (van Dijk, 2008).

There are many types of alternative provider. In delivering water service, Rusca described that there are three types of Small Scale Independent Provider (SSIP): informal private providers, civil society's organization, and private operators or small enterprises. Further more, Kariuki and Schwartz (2005), as cited in Rusca (2009), summarized these types of providers into two major categories: independent provider (those with their own sources, such as well, boreholes, etc.) and dependent provider (those who supplied by the formal utility) (Table 3-2). They also defined three major supply systems to deliver the water (see table above): fixed systems (national network), point sources (standpipes, water kiosk) and mobile distributors (water tanker). Another authors differentiated water providers based on their activities: informal private providers, civil society organisations supporting community-based management and private operators as part of PPP (Sansom et al., 2008).

Table 0-3 Overview of Source and Technology Related Parameters

		Relationship to source	
		Independent (develop own source)	Dependent (source supplied by large utility)
Technology Employed	Grid or network	Integrated production and distribution	Purchasing water and on-selling through mini-grid/network
	Point source	Own source, fixed location vendors	Connected to utility fixed location vendors
	Mobile distribution	Own source, mobile vendor	Purchase from utility mobile vendor

[*Source*: Kariuki and Schwartz, 2005 in Rusca, 2009]

Standpipes

Usually consist of one or more taps, supplied and built by the public utility. Costumers come and collect the water from these taps by using water bottles, jerry-cans, or any other types of container. The installation cost of standpipes is usually low and does not require high technology, only need to construct the standpipe and to connect to the main system. However, there are limitations for this approach such as number of household being served, the distance from the point to the targeted community and fee collection. There is also a question on how to manage this facility. Shall the public utility place an employee to run and collect the fee or shall it be transferred to the community to manage it by themselves. There is also a system called "collective distribution post". This system is built around a public square and each household equipped with taps. Every household can watch their own tap and there is no need to assign a person to take care the standpipe.

Water kiosk

These facilities usually equipped with storage tank which connected to the main system or to their own source of water or even from water tanker. They usually buy water in bulk with special price or at household price. There is possibility for license to abstract water or from the utility. It does not really depend on the continuity of the supply since the storage can provide water even when the flow is intermittent. The management methods are the same as standpipes since both of them are collective supply points. If they have a contract with the utility, performance incentives is applied. The price of water from this point is between 3 – 20 times higher than the normal price. The same price applied for standpipe as well. According to Eaux (1998), the disadvantages of this system are fatigue from carrying water, limited operational hours and waiting time. There is also possibility of contamination during filling and transporting the water. The investment cost for water kiosk is between US$ 100 – US$ 2,000 (Kariuki et al., 2005).

Mobile provider

Usually the mobile providers collect the water from collective point or available network and selling it on the street or delivering it door to door. They usually use or rent handcart, wooden yokes or mobile tanker with limited quantity of water. Sometimes they are part of a bigger association. The advantages of this system is avoid water carrying fatigue and time for waiting at the supply points; the supply relatively regular.

However, according to Eaux (1998), the price is quite depending on the market laws. Sometimes the costumer has to pay 30 – 50 times the regular price per cubic meter. They usually use this water for food and drinking. This system requires license and quality monitoring to ensure the water quality. The average investment cost to buy a second hand tanker is US$ 10,000 – 15,000 (Kariuki et al., 2005) and the cost per cubic meter between $ 0.17 - $ 11,000 for vendor-carters. This option was carried out by GWCL several years ago, by hiring several water tankers to supply water to the community. Unfortunately, this project was terminated because it was calculated as an expensive way to deliver water to the community.

Neighbourhood resale

This approach depends on the individual's connection to the network. They pay the monthly bill to the public utility, and they sell the water to the community with higher price to earn some profits. It does not require any investment beside the connection fee. The advantage of this system is people can have access to water without getting connected individually. However, it really depends on the individual willingness and closeness of the neighbours. In other words, it depends on how big is the willingness of the neighbour to sell water from his/her own tap for his/her neighbours.

1.9.5 The relationship between data analysis process and information obtained

Valid and reliable data and information is needed to formulate policies, strategies, program, or even projects. The way data collected and analyze would affect the information that could be obtained. Further would affect the decision made. Learning from Walle et al. (2001), in appraising irrigation projects in Vietnam, there are two approaches in appraising which projects better than others. Here, the two approaches can be interpreted as approaches to define different process of data analysis that will generate different information.

- *Quick and dirty process.* Here, data are generalized and simplified, thus, information obtained from this process is likely to be broad and common.
- *Slow and clean process.* It is the opposite of the first process. Data are analyzed in detail so that it generates more specific information. Here, the process realized that there is indeed heterogeneity.

In relation to mapping, the use of two processes or combination between the two would be determined what kind of information showed in the mapping. This study considers relationship between data analysis and information obtained in each its step.

1.10 Analytical framework

The analytical framework in this research derived from the understanding that in practice, there are alternative solutions in delivering water services to customers. It has been understand that it is government responsibility through water utilities as water provider, to deliver services to customers. Limited water sources indicate that water should be managed properly and the government cannot do this by themselves. In practice, the small scale alternative service provider has been growing in many different forms, such as water kiosk, water tankers, water vendors, water cart, neighbourhood seller, etc. They play important role in delivering water to community, instead of depending too much on water utilities.

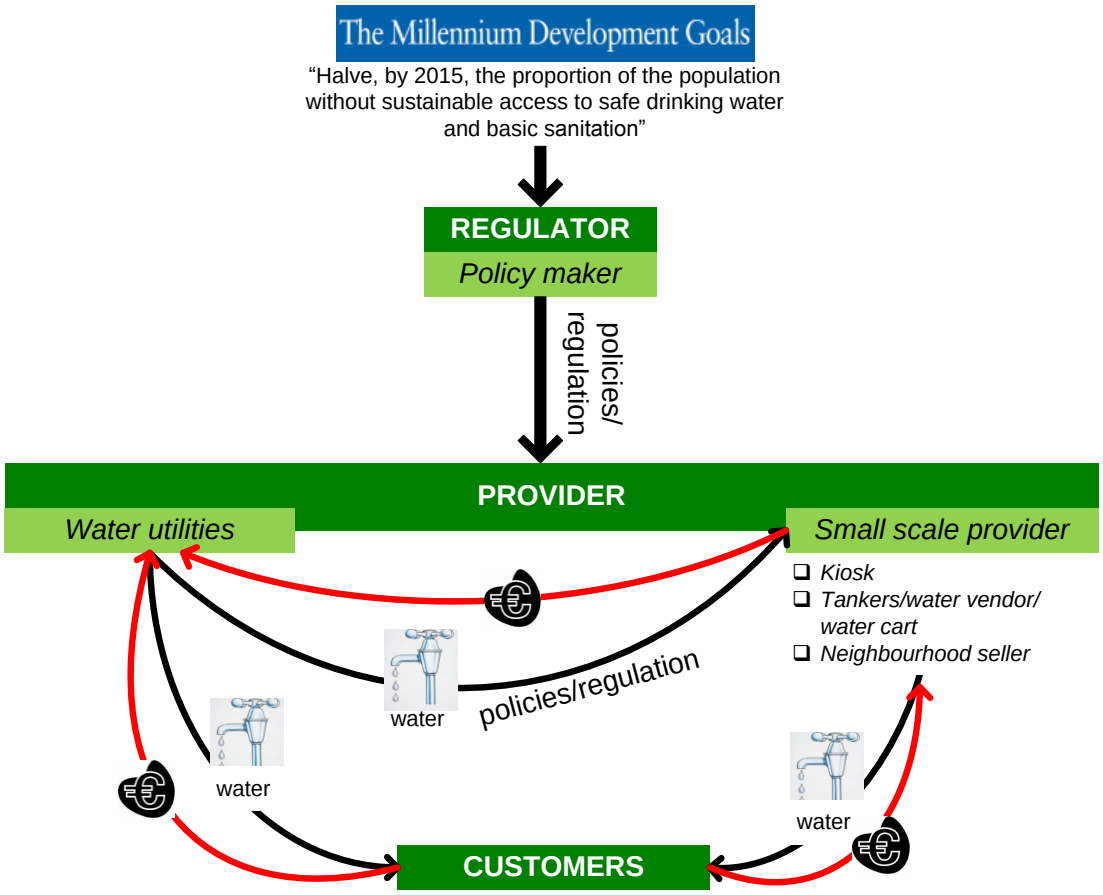

Figure 0-2: Formal and informal urban water supply chain

However, many SSASP practices has not yet regulated in a formal system. Many of them are operating in an illegal way such as selling water from their own tap to the neighbours. They settle the payment to the water utility and they sell the water with higher price. Another example is they abstract the water illegally from the main. In other words, they are making money out of it.

This study used existing information from the field survey to find the most suitable alternative solution for the community in West Nima and North Tehshie based on several parameters such as technology used, availability of water source, regulatory, etc. Furthermore, in the case of servicing the poor in urban area, SSASP and the government are the major players in delivering the service. They have to collaborate in order to ensure reliable access to water for the customers. Government will share the responsibility with SSASP, and the SSASP will generate the local income for its sustainability. This study assessed SSASP practice in urban area nowadays and how these will improve in the future.

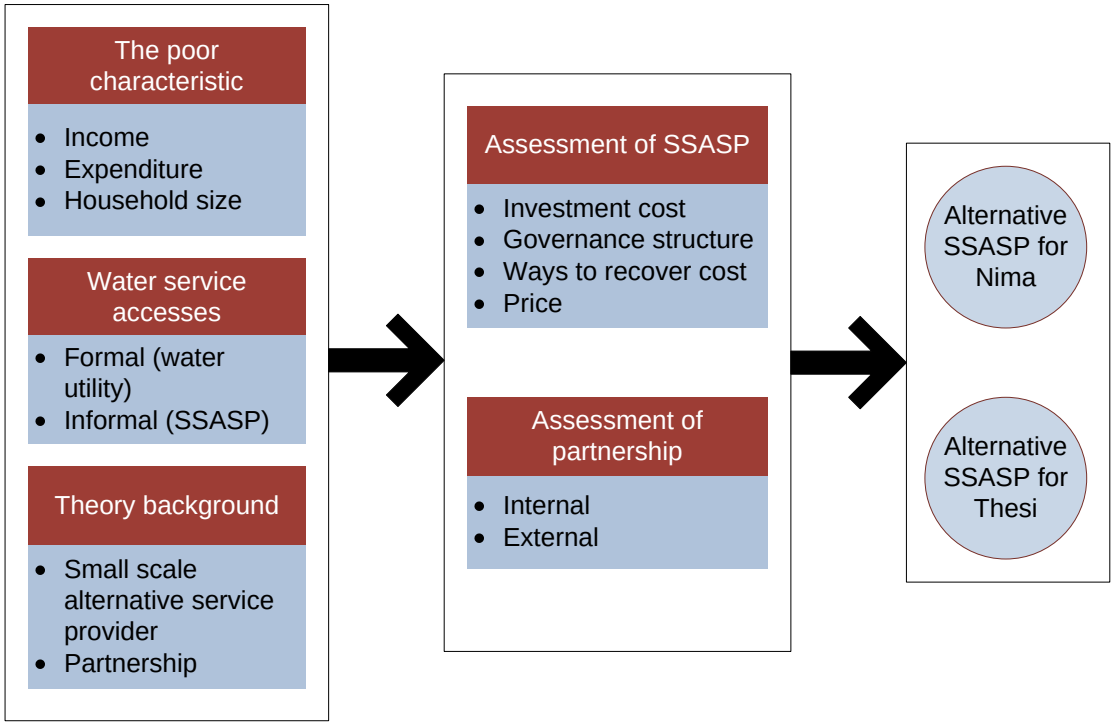

Figure 0-3: Analytical framework

1.11 Method

Considering the purpose of the research, this research could be classified as case study research that focus at exploring and explaining water supply and sanitation services especially in poor area (Yin, 2003). The main questions of this research will reflect the how and why questions (how and why choose a particular method). As a whole, this research will follow steps mentioned below:

- To specify the issue being evaluated.
- To determine scope of the case study.
- To design the case study based on the objective of the research.
- To determine methods for collecting data
- To analyze data
- To report on data

1.11.1 Method for collecting secondary data

Yin in his book mentioned data and information in a case study research as evidence that may come from different sources, namely documentations, archival reports, interviews, direct observation, participant-observations, and physical artefacts. This research is focusing on identifying alternative solutions for servicing the poor in urban area. Thus, 'evidence' or data in this research is categorized as secondary data that will be collected mainly from documentations, such as:

- Administrative document, such as policies, regulation, and statistic figures, etc.
- Previous studies that relates to servicing the poor in urban area.

Those data will be collected from published and unpublished sources through internet browsing and libraries finding. To maximize the use of data (or called as evidence), Yin stated three principles that have to be considered in case study research, i.e.:

- The use of multiple sources of evidence so that this research will have broader range of views and much more convincing and accurate arguments.
- The creation of a case study database in order to manage data in a manner to get easily being retrieved.
- The maintenance of a chain of evidence so as to get without difficulty to trace relationship among evidence.

1.11.2 Method for collecting primary data

Primary data was collected through site visit and interviews. Site visit focused in two locations: Nima and Thesi. These locations were chosen since they were categorized as urban areas with low income population. There were two interviews conducted: first is interview with the policy makers (officer of Ministry of Water Resources Works and Housing; PURC, Accra Metropolitan Assembly (AMA), Ledzokuku Krowor Municipality Assembly (LEKMA), Ayawaso Sub Metro, AVRL/GWCL); and second is the interview with domestic customers in Nima and Thesi. Interview with stakeholders were in format of discussion, while with domestic customers were using simple questioner (see Annex). 48 respondents, represent domestic costumer in Nima and Thesi, were randomly chosen as interviewees.
Data collected during the site visit and interviews are:

- Policy in water supply
- The performance of GWCL over the past years, monitoring mechanism, guidelines
- Service area of GWCL, reports
- Number of people in the location, water supply facilities
- Respondent's characteristics such as level of education and household size
- Access to water, type of access, frequency of the flow, etc.

1.11.3Method for analysing data

As mentioned before, the principle data analysis method for case studies are to observe, to think, to test, and to revise. In addition, Yin also mentioned that data analysis in case study research consist of several points namely examining, categorizing, tabulating, testing, and recombining both quantitative and qualitative data to address the proposition of a research. Furthermore, Yin classified five techniques for analysing case studies, i.e.: pattern matching, explanation building, time-series analysis, logic models and cross-case synthesis.

Considering its purpose, technique that will be used in this research is explanation building. Using explanation building technique, this research will try to narrate and explain servicing water for the poor in urban area. Based on the technique and objective of the research, data analysing in this research will divided into three steps:

- Assessing the characteristics of the poor

  First of all, the result from the interviews was compiled and analysed based on their income, expenditure and household size. This step is required to have a better description of the respondents. How much their income and how much their expenditure level then compared it to the Ghana poverty level. Many studies had been conducted to define poverty by using various indicators. There is also poverty based on the access to water. This step also elaborates several dimensions in poverty. For the purpose of this study, the poverty level in Ghana was used to see where the position of the respondents is.

- Assessing the existing SSASP

  After analysing the characteristics of the respondents, the next step is about the access to water. Here, the study described the water access of the respondents, whether they have connection to the network, or any other access to water, how much do they pay for the access, etc. In other words, it describes the existing small scale alternative private provider in West Nima and North Teshie.

- Assessing the possibility of partnerships between GWCL and SSASP, and also between the Government of Ghana and Aqualyng

  In this step, a further analysis is done to look at the partnership between the public utility and SSASP, and between the Government of Ghana and Aqualyng. Do these partnerships bring any benefit to the poor or not? If yes, what lessons can be learnt for future engagements, or to have successful partnerships in the water sector?

2 Findings

2.1 The poor in Accra

Since there are so many differences in defining or measuring poverty, this study uses the poverty line in Ghana. The overall poverty line in Ghana is GH¢ 2,884,700, equal to new GH¢ 288.47, (extreme poverty line) and GH¢ 3,708,900, equal to new GH¢ 370.89, (upper poverty line) per adult per year (GSS, 2007). It is based on calorie requirements or nutrition based poverty line. This represents roughly $1 a day as suggested by the World Bank in 1995 (GSS, 2007). The extreme poverty line means if the individual's total expenditures fell below this line, they could not afford their basic nutrition requirements. For the upper poverty line, if the individual's total expenditure is lower than this level, means he/she could not meet his/her needs on food and non food consumption.

Characteristics of the respondents

To have a better picture about the economical status of the location of the study, a survey has been conducted to several households in Nima and Teshie as described in the table below.

Table 2-1 Average monthly expenditure among respondents in the study area

Expenditure Item	West Nima		North Teshie	
	Amount GH¢	%	Amount GH¢	%
Food	279.48	69.25	108.26	58.87
Housing	6.33	1.57	12.17	6.62
Others	117.76	29.18	63.48	34.52
Total	**403.57**	**100**	**183.91**	**100**

[*Source*: survey data by researcher n = 48]

According to the result, respondents in West Nima spent more than the respondents in North Teshie. Both locations are showing the same result in term of expenditure for food, which is the highest proportion from their living cost (more than 50% of their total cost). Others and housing expenses are the second and the last proportion of their total expenditure. This survey gives the same result as studied by The Consortium (2008) in Nima and South Teshie (CIHSD, 2008). They concluded that food, education and water are the main expenses in the household cost. As an example, monthly expenditure for water is about GH¢ 28.51 (10.3% from the total monthly expenditure) in South Teshie and GH¢ 21.75 (7.7% from the total monthly expenditure) in Nima. However,

comparison between these figures and the Ghana poverty line shows that on average, no respondents live below the poverty line, since the upper poverty line, if converted in monthly, is equal to GH¢ 30.9. The result is contradictory with the map from Ghana Statistical Service which stated that Nima and Teshie are considered as the low income areas.

Expenditures per person per month

The result, discussed above, does not show the real expenditures per person per month. It is likely to show the expenditures of a respondent based on his or her household's consumption as a whole per month. The average size of household in West Nima and North Teshie is 4 and 9 persons respectively. If these numbers are used to calculate monthly expenditures per person, with an assuming that all household members are adults, then the expenditures per person in West Nima would be GH¢ 100.89 per month, while for the North Teshie, the expenditure per person would only be GH¢ 20.43 per month. If these results are compared with the lower poverty line (equal to GH¢ 24.04 per month) and the upper poverty line (equal to GH¢ 30.9 per month), it shows that no respondent from West Nima lives below the poverty line, while in North Teshie, all respondents are living below the extreme or lower poverty line. It means that the respondents from North Teshie can not afford their basic nutrition requirements even if they allocated their entire budget to food.

Income, expenditures and household size

Further analysis is done by dividing all respondents into three categories: lower, middle and higher in terms of monthly income, monthly expenditure and size of household (displayed below).

Table 2-2 Respondents categories based on monthly income, monthly expenditure and size of household

Monthly income	**Range (GH¢)**	**Number of respondents**
Lower	< 166.67	28
Middle	166.67 – 333.33	12
Higher	333.33 - 500	8
Total		**48**
Monthly expenditure	**Range (GH¢)**	**Number of respondents**
Lower	< 500	40
Middle	500 – 1000	7
Higher	1000 - 1500	1
Total		**48**
Size of the household	**Range (Number of people)**	**Number of respondents**
Small	< 6	28
Medium	6 – 12	11
Large	12 - 18	9
Total		**48**

This table shows that 58.33% of the respondents relatively have lower average monthly income compared to the rest of the respondents regardless their location. As much as 83.33% of the respondents relatively spent less than the other respondents in a month. It means more than 80% of the respondents relatively have lower income since they spent less compare to other respondents. However, if their monthly expenditures, which are lower than GH¢ 500, is compared with the national poverty line in (GH¢ 24.04 and GH¢ 30.9), they still live above the national poverty line. Although, there are four respondents live below the extreme or lower poverty line and only one respondent lives below the upper poverty line (in total only 10.41% of the respondents live below the poverty line). For the size of the household, 18.75% of the respondents relatively have larger size of household compared to the rest of the respondents. It means more than 80% of the respondents relatively have medium or smaller family. Unfortunately, this figure can not directly correlate with the poverty line, since the poverty line in Ghana is based on the nutrition requirement and not on the household size. The correlation between the size of household or family with the poverty is disputable. Empirical studies, based on household survey, usually present a positive correlation between poverty and household size (the bigger the family the poorer they are). However, a study in Vietnam found that after several adjustments were made, this correlation become weaker and finally it was concluded that larger households are not necessarily poor. Moreover, it was found that many poor people are living in the smaller households (White et al., 2003).

2.2 The water supply in West Nima and North Teshie

2.2.1 Access to the network

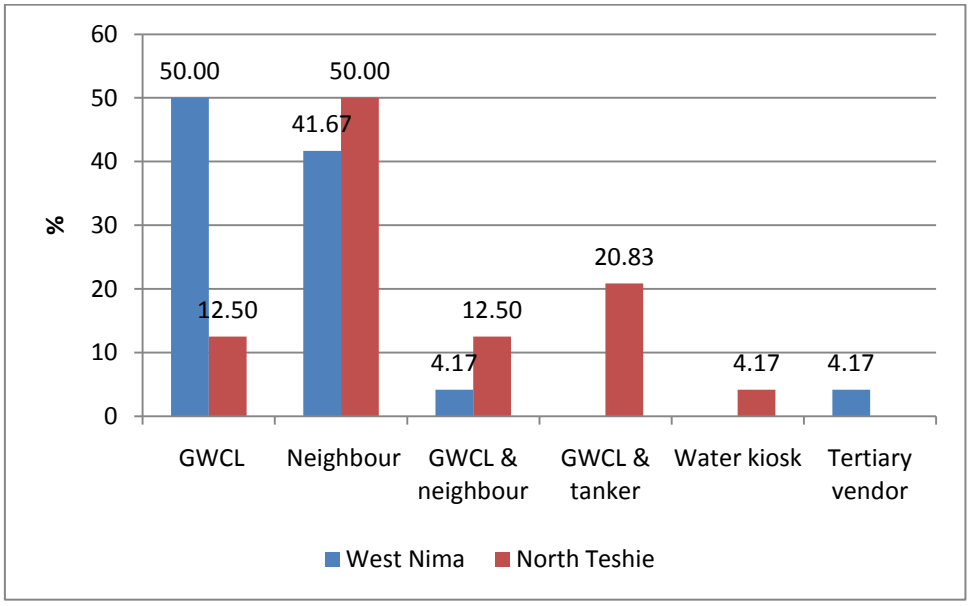

Figure 2-1: Access to water

The figure above shows how many respondents have access to water. Based on the survey for this research half of the respondents in West Nima are connected to the network from GWCL, while 41.67% are relying on their neighbour's and the rest of them are relying on both, directly and indirectly (neighbour) from GWCL and tertiary vendors. Based on the survey, there are several reasons why they do not have a

connection to the network. First, the water is not flowing from the pipe. They think that why they should get connected while the water is not running. It will only cost them a lot of money to pay the connection fee but still there is no water coming out from the tap. In addition, they still have to pay for the bill because sometimes even when the water was not flowing, the water meter still indicates consumption because of air pressure in the pipes. Even if they have connection to the network, most of the time they have to go their neighbour to buy some water because the water is not running. Second, there is no network near their house. Third, they think it is expensive to get a connection to the network. The official connection fee for domestic costumer is GH¢ 288 (PURC, 2007). It is not possible for the household, especially the poor, to get connected since they have to allocate more than half of their income to pay the connection fee.

In North Teshie, half of the respondents are relying on their neighbour's connection. As much as 20.83% of the respondents are using combination between direct water from GWCL and buying from tankers and 12.50% of them are directly connected to the network and combine their own connection with their neighbour's connection. From the interviews, we found that the landlord is not ready to get connected to the network since there will be a difficulty in sharing the bill among the tenants. Most of the respondents live in a compound house. A compound house is a house with several rooms occupied by different families with one shared front yard. Another respond said that officers from the water utility are making money from the household who wants to get the connection. Sometimes they have to pay a lot of money to get the connection compared to the official connection fee. The same result as respondents in West Nima also found in North Teshie: to get connected is expensive and there is no water anyway even if the network is there.

From the figure above, it can be concluded that two different situations regarding the access to the national grid exist. On one hand, most of the respondents in West Nima depend on water from their own taps. On the other hand, most of the respondents in North Teshie are relying on their neighbour's taps. It does imply that the coverage area of water supply in West Nima (54.17%) is slightly higher than in North Teshie (45.83%).

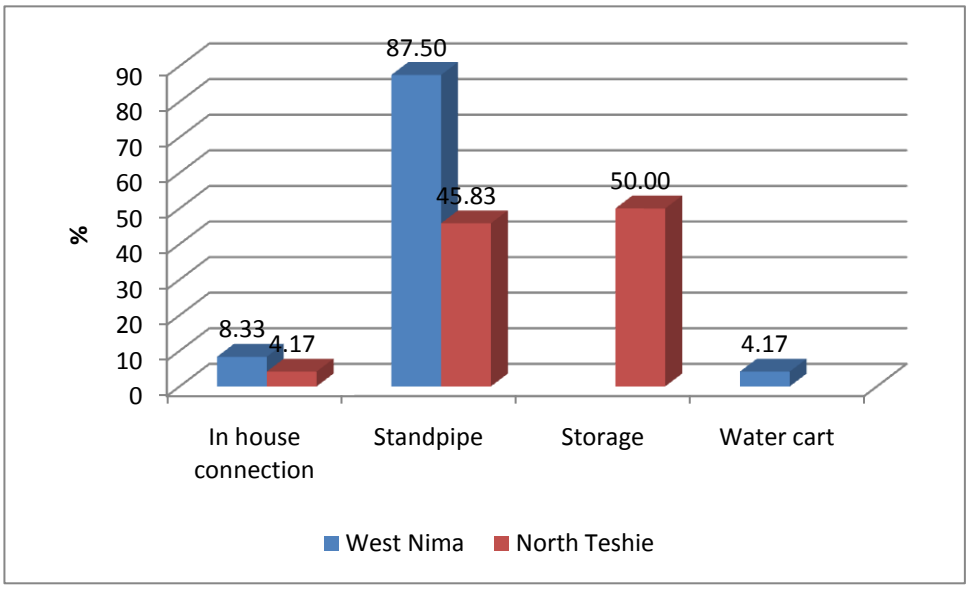

Figure 2-2: Type of water access

Regarding the type of access, most of the respondents in West Nima are using only standpipes, while in North Teshie, half of the respondents are using storage tanks (made of concrete or poly tank) in anticipation of infrequent water flow. When there is no water coming from the taps, they still can use water that is already stored in their storage tanks. However, about 45.83% of the respondents in North Teshi are still directly depending on standpipes.

2.2.2 Alternative sources of water

As illustrated in figure 4-1, many households have alternative sources other than the network. The reason why they have more than one type of access is because they can not rely only on one way of access which is from GWCL. If the tap is not running, they have to find another alternative to fetch the water. To have a better picture of how the water flow from the taps in the study area, a survey of 48 people had been carried out and came out with the result in the figure below. It shows that water from the taps in West Nima flows mor frequently compared to the water flow in North Teshie. In West Nima, households have more days with water flowing. While in North Teshie, most of the households are experiencing dried taps since 3 to 10 years ago.

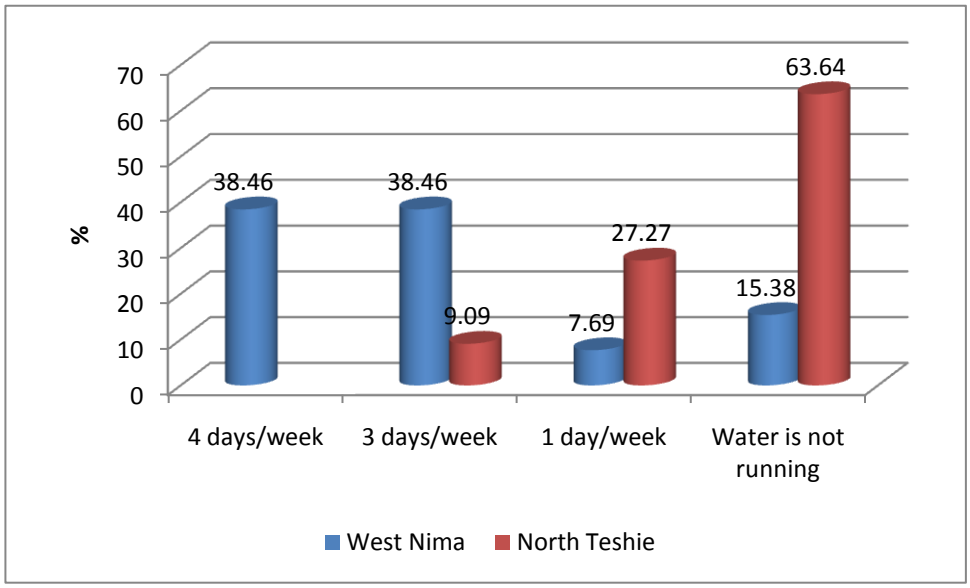

Figure 2-3: Water flow frequency

Neighbour's connection

If there is no water available, most households get water from their neighbours by using containers such 20 litres buckets, silver bowls, yellow plastic containers, etc. Based on the survey conducted in West Nima, they usually pay GH¢ 0.1 – 0.2 per 20 litre. There are also respondent who pay GH¢ 1 for 50 litres, GH¢ 1.5 per 100 litres and GH¢ 3 – 5 per 300 litres. The price of the water varies based on the location and availability of the water. Sometimes when there is a shortage, the price is increased. If they have to buy it from the neighbour, than they have to pay 10 times more than the official price from GWCL.


Figure 2-4: Neighbour's connection in West Nima (left) and a woman carrying yellow plastic container in North Teshie (right)

Water tanker provider

Another alternative way for the household to get the water is from the water tanker providers. They are managed by individual or groups. Based on the survey in North Teshie, there are about 20% of the respondents depend on this water tanker provider. Normally, there are small, medium and big sizes (9000 litres) of water tanker operating in Teshie. Usually the households pay around GH¢ 50 – 60 per trip, it depends on the size of the tanker. According to the respondents these water tankers got their water from GWCL and brought it to the community. Although the quality of the water is considered good, they think the price is very expensive.

Water kiosk

During the field study in North Teshie, it was found that there is also an option to get the water from the water kiosk. To have the water, household usually pay GH¢ 2 per day. They mentioned that this amount of money is very expensive and the quality of the water is not good.

Tertiary vendor

During the survey in West Nima, it was found that there is also another way to get the water which is from tertiary seller or vendor. They sell the water using water cart and they go around the neighbourhood and sell the water door to door. The household usually pays GH¢ 1 for 40 litres of water.

2.3 Possible options Nima and Teshie

2.3.1 Desalination plant

The Government of Ghana is planning to build desalination plant in Nungua, as an alternative in response to shortage in water sources. Nungua is an area located next to Teshie and close to the shore. Additionally, this location is at the very end of the

network. With its rapid population and high density, it is experiencing the most severe water shortage many years ago.

The plan was initiated in 2006 and the construction work will be started in this year. This project involves Aqualyng, as a well-known Norwegian company expertise in desalination projects and is structured as a PPP. This is a pilot project with the scheme of Build Operate Own Transfer (BOOT) for 25 years contract (a joint venture of Aqualyng and Kwami Solution). The capacity of the plant is 20,000 m^3/day or roughly around 4.4 billions gallon/day and the project cost is US$ 42,000,000. For the price of the desalinated water, GWCL and Aqualyng have signed a Water Purchase Agreement which stated that GWCL is obliged to pay the water from this plant for US$ 1.21/m^3 and this price is already approved by the PURC as the regulator.

There are several explanations why the government wants this project. First, the currnt system is too old, need replacement and its condition is deteriorating. If nothing has been done, the situation will become devastating. Maintaining and even improving the situation requires huge amount of capital which the Government of Ghana do not have. Second, GWCL do not want to invest in building a new treatment plant since it will increase their risk of investing more in delivering water, without being sure of being paid by the consumers. Third, the social benefit of the desalination plant is expected to be higher compared to investment cost to build the treatment plant, in the sense that this could help to prevent social unrest or chaos in case of water shortages.

It is claimed that the desalination plant will have several advantages (Aqualyng, 2009). It replaces the unnecessary cost buying water from water tankers for \$7/m^3; the price for end users will not changed; since the highest cost for the plant is energy, the plant will use low energy alternative as their source of power such as wind turbines, biomass, generic energy and solar energy; etc. However, these statements have several implications for the government. First, if the price to the costumer will not be changed then the government, in this case represented by GWCL, has to cover the price discrepancy between the real cost and the water price. Secondly, since the cost of energy is really high, there are some arrangements needed in energy issues in order to bring down the energy cost. Thirdly, it is also essential to raise the issue of environment since this plant will produce some residues. This residue shall not contaminate the natural environment in the sea and also the habitat.

2.3.2 Standpipes

There are several approaches which is possible to implement in delivering the service to the poor, since the formal way to connect households to the network is not feasible anymore. For areas with sufficient water sources this approach is a good alternative, since laying pipes to connect everyone is not possible anymore. It will cost huge amounts of money to install the pipes and connect everyone in not well designed settlements. By putting stand pipes the consumer near this point can go and fetch the water from this point. It does not require high technology implementation. It only requires a connection to the main system. Based on the interview with an officer from AVRL (operator for GWCL) they use a special price for this type of access. The regular costumer will only pay 80% of the official price and the vendor will only pay 30% of the official price if they buy their water from the official stand pipes.

However, to assess this option, several factors shall be taken into account. If there is enough water, this option is considered possible. However, this situation is not found in West Nima and North Teshie since the water in those locations is not enough. The flow frequency is only 1 – 3 days per week. For West Nima and North Teshie, there are some

locations that close to the network. For those locations, it might be possible to construct the stand pipe. Low installation cost will be the most benefiting point. The distance from this point to the targeted community shall close enough to reduce the time and walking distance to fetch water. This approach does not require big space to install. For that, stand pipe is possible option for West Nima and North Teshie although the space in West Nima is relatively smaller than in North Teshie. Another element regarding location is how many costumers are going to be served by one stand pipe. Because there should be a maximum number of costumer for a stand pipe in order to prevent long queuing and insufficient amount of water for the community. There should be individual or group of individual who responsible for the operational and maintenance, payment, etc. There is possibility for some arrangements between the public utility and individual or community in both locations. Since this is actually happen in the field. However, the field survey did not find any communal standpipes. Most of the standpipes are private standpipes.

2.3.3 Storage tanks

This option is more reliable than standpipes since it can store water even when the water is not flowing because this storage can also filled with water from tankers or tertiary vendors. It also does not require high technology application and relatively low investment cost. However, location might be a problem since it requires bigger space to construct the storage. Survey in the field proved that most of the spaces in West Nima are crowded. Construction of the storage needs confirmation from the land lords. Contrary with the situation in North Teshie where there are some available spaces in the field. To manage and operate this facility needs an arrangement as well, whether it is going to be managed by the community or by individual. It is including cleaning the storage tank to ensure the water quality is not deteriorated, collecting the fee, etc. Study from the field revealed that there are two mechanism of supplying this storage. The first one is the storage supplied through the network which is found in West Nima. The second one, in North Teshie, most of the storage is supplied by the water tanker providers who abstract the water from appointed filling point by GWCL.

2.3.4 Water tankers

This option has different characteristics compared to other options since it has high mobility that can go everywhere as long as it is possible to pass through. In terms of reliability, this provider can be considered as reliable enough because they can deliver the water anytime with several refilling points. It does not require any specific place to deploy since it is mobile. A difficulty of this option is that if the filling points are not sufficient compared to the number of the tankers. It will cause long queue at the filling points. The technology requirement is low since it uses general tanker vehicles. A major problem probably comes from the investment, operation and maintenance cost. The survey in North Teshie found that many respondents depend on the water tankers. The tankers usually come to fill the storages once or twice a week. They also mentioned that the price is expensive. Another study also found that the price from the mobile operator sometimes 10 times higher than the water from the piped supply (Kariuki et al., 2005). There is an issue about the quality of the water transported using this tanker. Therefore, a regulation for price and water quality is really essential for the community, especially the poor.

An example of this alternative is done by GWCL several years before as a partnership initiative. To accommodate water demand of the poor particularly, AVRL/GWCL had developed different approaches. Once, AVRL/GWCL hired private tanker operators to

supply water to several storage tanks. After 1.5 years, AVRL/GWCL hired consultancy companies (TPP and TREND) to conduct a study for this project. Based on the result of the study, they concluded that delivering water through water tankers is very expensive. Moreover, this approach was not working well because initially, they would like to create a competition among the water vendors in order to bring down the price of the water based on the market competition. Unfortunately, this was not the case. People prefer to buy water from the closest place even with higher prices than from awater point with a lower price but away. In the end, the project was stopped and GWCL built several storage tanks and transferred it to the community so they could manage by themselves by hiring private water tankers to fill their storage tanks.

According to Adank et al. (2009), there are 7 water tanker associations that operate in Accra (their operational areas are described below). They are obliged to keep their tankers cleaned to ensure that the water quality is not deteriorated. It is believed that some operators abstract water illegally from questionable source in term of quality of the water, which would threaten the health of the people that they served. Therefore, several point sources also appointed by the GWCL to be the responsible points for filling up the tankers, so that the GWCL could guarantee that the community still have high quality standard of water supplied. In addition, there is monitoring and evaluation mechanism to ensure that providers perform their job as it should be (more description in box 1). This is an example of a partnership between GWCL and the community.

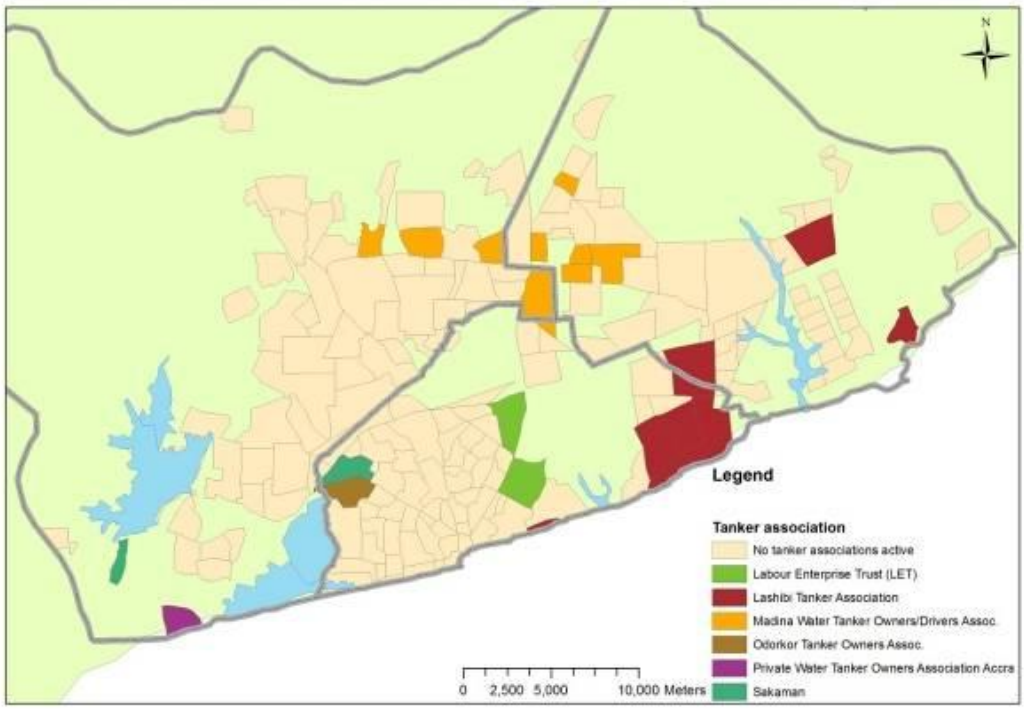

Figure 2-5: Tanker Associations in Accra
[*Source*: Manu and Abrampah, 2006 in Adank et al., 2009]

Box 1
(*Water tanker service guidelines*, 2008)
Tanker service is defined as a practice by individual, group of individuals or entrepreneurs who supply water to their costumers through bulk tankers mounted on vehicles. Water tanker service practice is rapidly growing in Accra since the costumers could not get their water from the network, whether for domestic, industrial or construction purposes. Even though the water is there but it could not reach the costumer, not to mention the insufficiency and consequent rationing. Domestic costumers who do not have a connection to the network rely on water tankers and domestic vendors. These domestic vendors as well, mostly rely on water tankers.
There are 7 associations of water tanker operate in Accra with 520 tankers in total (one association has as many as 300 member vehicles). They signed a Memorandum of Understanding (MoU) with GWCL for fetching water from designated points. Unfortunately, they are unregulated in terms of price and water quality. Therefore, as an implementation of PURC Act, 1997, Act 538, PURC issued a guideline for Water Tanker Service Operations throughout Ghana.
Safety of the costumer is the main objective of this guideline. In order to do it, several filling points must be determined by GWCL, so the operators could only fill the tankers from trusted and unquestionable points. There are several considerations in determining the filling point: operational cost, access, number of filling points, equal distribution, etc. The filling points in ATMA are Watermaen Service Ltd., East Legon, Adjirigano, Sylkanab Enterprise and Awoshie 1.
Another mechanism to ensure the water quality is by monitoring the water quality to the secondary and tertiary markets. This monitoring shall include random sampling at filling points, within the tankers and at costumer points. Several key points shall be considered by service providers: the same water quality as specified, adequate safeguards during transporting and unloading, the system used shall not contaminating the water, etc.
For determining the price for the operators, there are several considerations: level of accessibility, metering, price for the costumer, etc. While for determining the price for the costumer, the considerations are consultation with PURC and Tanker Associations, tariff based, published the tariff, etc. However, PURC will not regulate the price of water to end-users.
If the water tanker operators can not meet the requirements, they will be de-registered until defects have been rectified and re-certified by GWCL. They will also loose their registration if there are repetitions in failures.

2.3.5 Private connection seller

The last option of getting access to water is buy it from your neighbour. This is the easiest way since the selling point is usually near the premises. Therefore, location would be the most benefitting factor. Unfortunately, still, reliability of the water supply is questioned, whether the continuity of the flow is sufficient. The survey in West Nima found many neighbour sellers still depend on the water from GWCL. There is also a combination between their connections to the network and storage tank. Survey in North Teshie found that many neighbour sellers depend on the water from taps and also from water tankers. They do not have alternative sources of water such as private well or borehole because the water is too saline. The cost for having this facility mostly came from paying the connection fee to the public utility, which is GH¢ 288 and the monthly bill based on the monthly consumption read on the water meter. The official rate is GH¢ 0.66 (0 – 20,000 litres) and GH¢ 91 (21,000 and above) for domestic. According to the survey, the neighbour sellers sell the water with higher price than the official price (usually ten times higher). In addition, this price is really sensitive with the availability and the continuity of the flow. In other words, the price is fluctuating based on the supply and demand principle. The technology requirement is relatively low, since they only need to get connected to the network and as an addition to their facility, they could add storage to store the water for future usage. However, based on the interview with the people in the field, sometimes they add booster pump to increase the pressure so they can get more water, when there is water shortage. This action will disturb other

location since the disturbance will change the pressure in the whole system around the neighbourhood. This private connection seller is usually managed by the owner of the connection or the land lord.

2.4 Discussion

2.4.1 Alternative solution assessment

Based on the analysis above, there is possibility for any of those alternative providers to become legitimate and regulated by the government or perhaps making collaboration with the water utility. Below is the summary of those alternative solutions based on investment cost, governance structure, ways to recover cost and price.

Investment cost

The investment cost for each of the option is varying from the cheapest one up to the most expensive one. In this case, the most expensive one is the desalination plant, since this option is a production unit or system and not a delivery unit or system, and it will be funded by the private company (US$ 42,000,000). While the other options are delivery unit or system and the investment cost is in a range of US$ 100 – 300 per connection (private connection sellers), US$ 100 – 2000 for networks (water kiosk) and US$ 10,000 – 15,000 for second hand water tanker.3

Governance structure

The desalination plant will be run by the private company (through BOOT scheme) using as many local labours as possible. They will train them in order to have enough knowledge and capability to run and manage the plant. While for the distribution or delivery part, it relies on the network already built and maintained by GWCL. For standpipes, it could be managed by individual, enterprise, self-help group, neighbourhood association or community based organisation. There is also possibility to have a contract with the utility and it requires license or permit to sell the water. If the person who in charge of the standpipe is from the utility, it could also applied performance incentive mechanism to stimulate the motivation. This option requires water quality testing to ensure that the water being delivered to the consumers complies with the standard. The same condition applied to water kiosk option. For water tanker, it requires abstraction, transport and selling permit and there is also a standard for tanker cleanliness. It usually staffed with driver and assistant. There is no legal status for private connection sellers. There is a possibility engagement in a contract with the utility which requires business license or agreement with costumers. It also requires groundwater abstraction permit, resale permit and rights to own infrastructure. It usually operated by 2 – 4 employees. It can be concluded that partnership is an example of governance structure for each options.

Ways to recover cost

For standpipes, it usually sells on volumetric basis with the costumer tariff or bulk purchase price. For water kiosk, it usually applies bulk, special tariff or household tariff based on volume and this option has a very high payment rate (weekly or monthly billing) compared to standpipes. For water tankers, it also applies bulk and costumer

tariff based on volumetric (weekly or monthly billing), however the price is fluctuative. Finally for the private connection sellers, it also applies bulk rates and costumer tariff with monthly or tailored payment.

Price

GWCL has to buy the desalinated water from the private company for a price of US$ 1.21/m3 (equal to GH¢ 1.72/1000 litres), and later on sell it to consumer based on the official tariff (GH¢ 0.66 – 0.91/1000 litres for domestic). It means there is discrepancy between the price bought from the private company and sold to the consumer. The difference is around GH¢ 0.81 – 1.06/1000 litres and GWCL has to cover this discrepancy. Furthermore, the cost is in foreign currency while the revenue is in local currency. If there is devaluation of the local currency, it means the cost will become higher for GWCL for buying the desalinated water. The price for water from standpipes and water kiosk is in a range of 4.5 – 10 times the basic tariff; for water tanker, the price is very expensive (10 – 50 times basic tariff) and for private connection sellers the price is 1.5 times basic tariff (Eaux, 1998). However, the price from the survey shows different result: water kiosk (GH¢ 30/1000 litres), water tankers (GH¢ 6 – 7/1000 litres) and private connection seller (GH¢ 5 – 70/1000 litres). For the assessment of the SSASP, this study used the price from the survey, except for standpipes since the survey did not find any communal standpipes in both locations.

The table below summarize all parameters that were discussed above.

Table 2-3 Summary of the different options

Alternative solutions	Investment cost	Governance structure	Ways to cost recovery	Price
Desalination plant	• US$ 42,000,000 (GH¢ 59,640,000)	• Operated and maintained by the private company • Absorb local labours	• Sell desalinated water to GWCL based on the WPA	• US$ 1.21/m^3 (equal to GH¢ 1.72/1000 litres) from the private company to GWCL • GH¢ 0.66/1000 litres for domestic consumers (0 – 20,000 litres consumption)
Standpipes	• Cheaper than other system	• Individual, enterprise, self-help group, neighbourhood association, community based organisation • Contract with utility • License/permit • Performance incentive • Water quality testing	• Volumetric basis • Costumer tariff • Bulk purchase price	• Price 4.5 - 10 times basic tariff (GH¢ 2.97 – 6.6/1000 litres)
Water kiosk	• US$ 100 – 2000 (GH¢ 142 – 2,840) for networks	• Contract with utility • Groundwater abstraction permit • Operated on a for-profit basis • Individual, group of individual • Performance incentive • Water quality testing	• Bulk, special tariff or household tariff based on volume • Very high payment rate • Weekly or monthly billing	• GH¢ 2/day (if the demand for urban poor is 75 lpcd, it equals to GH¢ 0.03/litre = GH¢ 30/1000 litres)
Water tankers	• US$ 10,000 – 15,000 (GH¢ 14,200 – 21,300) for second hand tanker	• Utility contract • Abstraction, transport and selling permit • Individual or group • Tanker cleanliness • Staffed with driver and assistant	• Bulk, costumer tariff based on volumetric • Monthly or weekly billing	• Price is fluctuative • GH¢ 50 – 60/trip (if tanker capacity is 9000 litres, it equal to GH¢ 0.006 – 0.007/litre = GH¢ 6 - 7/1000 litres)

Private connection sellers	• No investment cost, except the connection fee (GH¢ 288) • Connection or membership fee • US$ 100 – 300 (GH¢ 142 – 462) per connection (for network establishment)	• No legal status • Contract with utility, business license, costumer agreements • Groundwater abstraction permit, resale permit, rights to own infrastructure • Individual or group • 2 – 4 employees	• Bulk rates, costumer tariff • Monthly and tailored payment	• GH¢ 0.005 – 0.07/litre = GH¢ 5 – 70/1000 litres

[*Source*: Eaux, L. d., 1998; van Dijk et al., 2010; Kariuki et al., 2005]

Based on the explanation above, this study tried to compare each option to find the most suitable alternative solution for West Nima and North Teshie, by putting plus and minus marks into the table below based on the parameters mentioned before.

Table 2-4 Comparison between alternative solutions for both locations

	West Nima					North Teshie				
	IC	GS	WRC	P		IC	GS	WRC	P	
Desalination plant						-	+	-	+	X
Standpipes	+	+	+	-	√	+	+	+	-	√
Water kiosk	+	+	+	-	X	+	+	+	-	X
Water tankers	+	+	+	-	X	+	+	+	-	X
Neighbourhood sellers	+	+	+	-	X	+	+	+	-	X

IC = cost investment, GS = governance structure, WRC = ways to recover cost, P = price

It appears that the most suitable option for both locations is the standpipes since it has advantages in almost all parameters except for the price. However it requires some arrangements such as license to sell and regulation for the tariff to ensure that the community pay the same amount as the official tariff (80% from the official tariff). In addition, it heavily depends on the continuity of the flow. Hence it is better to equipped them with storages.

The other three options (water kiosk, water tankers and private connection seller), also have some advantages. However, based on the empirical data, they usually sell water with higher price compared to standpipes. In addition, it requires more space to construct the water kiosk and accessibility is become the major issue for water tankers. In West Nima, since the location is very crowded and dense, water tankers can not reach into the very deep areas. It can only service the community who lives near the main street. Furthermore, since most of the house is categorized as compound house, most of the lands are owned by the landlords. It is necessary to ask for their permission if GWCL wants to construct a water kiosk.

Desalination plant, as perceived as an alternative solution of water resource for locations near the shore, shows insignificant advantages besides the well arranged governance and equal tariff as the official one. Because, GWCL has to deal with the discrepancy of the cost and revenue in foreign currency and the investment cost is very high, even it is funded by the private company. However, according to PURC officer, the investment cost for this plant is bearable compared to the social cost of community crying for water.

2.4.2 Partnership assessment

After defining the suitable alternative solution, it is better to look at how this alternative option is going to be implemented. As explained before, small scale providers in both locations abstracted or received their water from the network. During survey, respondents in West Nima said that the neighbourhood sell the water from GWCL. The same result also collected from North Teshie, the water tankers that supply the neighbourhood seller filled their tankers with water from GWCL. The filling points were appointed by the GWCL. Looking at the reality, informal partnership between GWCL and the small scale providers is already exist.

However, according to an officer of AVRL (operator of GWCL) there are some challenges in performing the service to the poor:

- There is no sufficient data and well maintained system of information
- Need investment to increase the capacity and to improve the network
- Need for community education together with AMA to reduce illegal connection
- Need for capacity building, especially for the staff at district level

These challenges could be interpreted as internal and external factors from the public utility side, as explained by van Dijk et al. (2010), before engaging into partnership with the small scale providers.

Internal and external factors for utility

One of the internal factors from GWCL that can be considered important is good planning, since to make a good plan, it requires sufficient and reliable data and information. The information about the consumer's behaviour in a certain area could be one of the information required before implementing the alternative options that were discussed before. An example can be drawn from the previous partnership between GWCL and water tanker operator. Unfortunately, the consumers do not want to walk and fetch water from water points which are filled by the tankers only because they are a little bit far from their house, although the price is lower. Feasibility study for this project could be of help to prevent this situation.

Secondly, capacity building for the staff at district level can be defined as the relevant knowledge and experience factor for the utility to get involved with small scale providers. Thus, improving their knowledge on contracts, licensing, etc., will improve the chance to build a successful partnership. An example of this factor is shown in the partnership between the Government of Ghana and Aqualyng. Instead of hiring foreign workers, the agreed to use as many local people as possible to operate and maintain the desalination plant. It implies that there is an effort in capacity building for the local employees. Therefore they will have relevant knowledge and experience in new technology.

Financial availability could be interpreted as the external factor for the utility. Engaging into partnership with the small scale alternative providers will requires some financial sources especially if there is a need to build infrastructures. This financial resource might be from the utility or from outside the utility. For instance, the need for investment in capacity and network in Ghana requires huge amounts of money which could not fully provided by the utility. This means financial from outside utility is necessary to meet the required investment. A concrete example of this case is the

partnership between the Government of Ghana and Aqualyng. The private company will provide the funds and GWCL will deliver the desalinated water to the community. Although the plant has not built yet, it can not be avoided that available finance plays a role in promoting the success, particularly for the partnership, of delivering water to the community, especially the poor.

Another example of influencing factor that is coming from the external of GWCL is the demand for this partnership. Based on the survey, it is clear that more than half of the respondents rely on water from small scale provider. This implies that the poor are exposed to pay more for the water. Hence, partnering with the small scale provider is believed as an alternative way to ensure that the poor can have their water with affordable price by regulating small scale providers through agreements, contracts or licenses which include tariff setting. However, regulating the tariff requires strong commitment from the government as the regulator. The picture below is showing how the price of water from the respondent's perceptions.

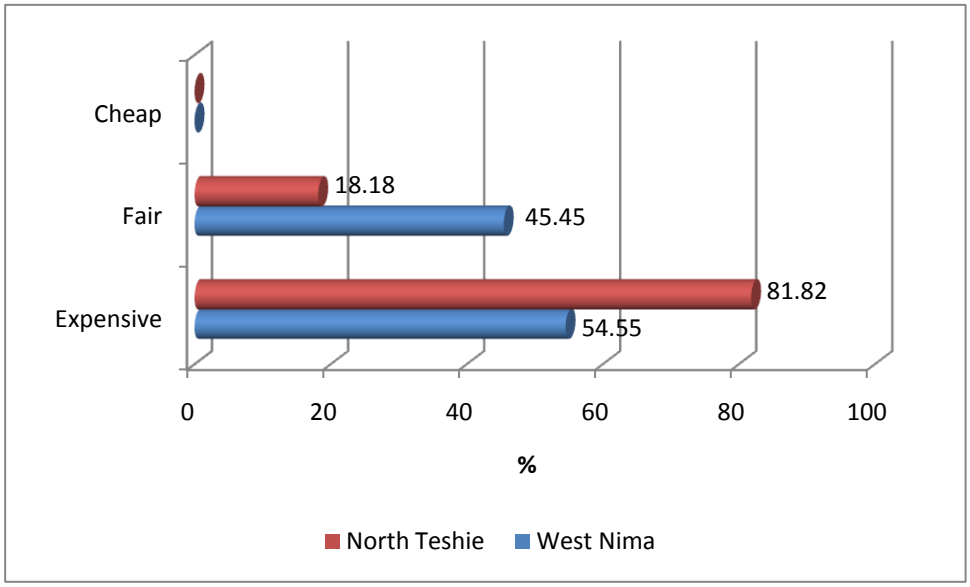

Figure 2-6: Respondent's perceptions on price of the water

Internal and external factors for SSASP

Partnership is about parties who are agreed to share their sources in order to reach mutual goals. Thus, looking from the small scale provider's point of view is also essential. For instance, internal factor such as win-win situation is also an important factor for them since they also want to have a sustainable business not only for short term but also in the long term.

For the external factors, social conditions from the location that the partnership will take place, also a major consideration in shaping the partnership. The survey from the field revealed that the respondents do not really concern about who is going to deliver the water for them as long as they get their water for their needs and the most important opinion is that they still believe the utility shall provide them water.

However, there is one important external factor that is still emerging as a major problem if the partnership is running. This factor is the availability of the water source. As revealed from the survey, most of the small scale providers depend on the water from

GWCL on one hand. On the other hand, Accra is experiencing water shortages since the capacity of the treatment plants and the network is not enough and losses are still high. Therefore rationing, done by the utility, is unavoidable. Unless there is alternative source of water, building storage tanks for any type of the alternative options is better.

2.5 Implication for targeting policy, program and project at the poor

Defining the poor with their heterogeneity and describing their access to water with available alternatives are considered as basic data and information for mapping the poor. To produce a clear pro poor mapping in terms of water supply, it requires sufficient data regarding income, expenditure, household size, etc. up to a certain level of detail, since this is one of the challenges that is faced by the utility. This step is required to provide available data which reliable and comprehensive so that the product will be easily used and understandable for the users.

Overall, in making or planning a policy, program or project (e.g. designing a project to deliver water) specially aiming at the poor, there are several considerations that have to be undertaken regarding the base data or information. For instance, data availability should be there since in calculating or projecting a plan, it requires sufficient data or information up to a certain level of detail. Not only availability, the reliability of the data also important since planning using unreliable data would result in miss targeting and under achievement of the policy, program or project. An example could be taken from benchmarking study done by South East Asia Water Utility Network (SEAWUN) and Asian Development Bank (ADB) from 2003 – 2005; there was an issue about data reliability since some utilities who participate gave estimated data or information (Blokland, 2009). As the result, there was no attempt for analysing which utility has done better than others. Another example is done for a project for irrigation in Vietnam. The study was conducted to measure the impact of infrastructure investment in rural areas. It was found that by conducting two different methods (quick & dirty and slow & clean method) with different level of detail, will bring out different results (Walle et al., 2001).

In relation with delivering water to the poor, the most suitable option for Nima and Teshie is standpipes. The challenge that should be addressed is that how this stand pipe is going to be managed. Is it going to be managed by GWCL employees or not? A notion of partnership between GWCL and the community could be an alternative way to manage the stand pipe. There is also an option that from this stand pipe, the tertiary vendor could abstract the water and deliver it directly to the consumers. By involving the community it was believed that the level of acceptance from the community would be higher because they know what they really needed. Of course some arrangements still have to be made in order to keep this partnership sustainable and benefit for the poor.

The desalination plant is playing a big role especially for additional water resource near coastal areas. Although, it is expensive because of the huge investment cost, it is expected to supply enough water for the community in Teshie. In the future, it is expected to be executed at other coastal areas in Ghana in order to prevent water shortages.

3 Conclusions

Mapping the poor in this study come up with several conclusions:

- The poor in Ghana is an adult who spend less than GH¢ 3,708,900 per year. This figure is known as upper poverty line and represents individual's total expenditure to afford their basic nutrition requirements. The second definition of the poor is an adult who spend less than GH¢ 2,884,700 per year. This figure is known as extreme poverty line and means he/she can not fulfil his/her food and noon food consumption. This poverty line is equal to $1 per day as mentioned by the World Bank in 1995.
- Based on the result from the survey, half of the respondents have access to the network. The rest of them depend on their neighbour's access or any other type of alternative provider such as water kiosk, water tankers, etc. The reason why they do not have access is varied. First, the water is not flowing. They do not think getting connected will solve their access to water. Second, in some areas, there is no network since it is not well planned areas. Lying pipes for making new network is not possible. Third, based on the survey, most of the respondents think that it is expensive to get a connection. The official connection fee for domestic household is GH¢ 288. Whilst the average monthly income in West Nima and North Teshie are GH¢ 260 and GH¢ 144.35 respectively. Based on this information, it indicates that the connection fee is too high for them. As the result, they try to find water from other sources such as their neighbour's connection, water kiosk, water tankers, etc. This is proved by the survey's result which indicates that more than half of the respondents in West Nima and North Teshie are using alternative solutions even if they need to pay higher than the domestic rate.
- Based on the analysis, the suitable alternative option for West Nima and North Teshie is standpipes. However, only relying on the water that comes from the taps is not enough since the water flow is not continuous. Complementing it with storage facilities is helping especially when there is water shortage. Another way to overcome the problem is by finding other sources of water such as boreholes, hand dug well, etc. The desalination plant will help to improve the availability of the water for the coastal areas.
- Partnership between the public utility and SSASP is possible to increase the service to the poor. Before engaging, there are several considerations that shall be taken into account, such as internal and external factors, in order to have a successful partnership. Relevant knowledge and experience of both parties could be of important for the utility since they have problem in capacity building, especially for the employees at district level. For the alternative provider, this factor is essential since they do not have any knowledge in contracts, regulation, etc. An example of external factor for the utility is that they realized the condition in the field that there is demand for water and small scale provider are helping them in terms of delivering water. Making partnership with the utility could be translated as the acknowledgement for the small scale provider by the government. In other words, they have a chance to be legitimated and legalized. This could improve the chance of the partnership to be successful in the future since the level of acceptance would be higher.

- Mapping the poor is considered as a supporting data or information in formulating a policy, program or project for the water utility. In order to have a good pro poor mapping, it requires data availability and reliability. While for appraising a policy, program or project, requires different level of evaluations (simplified and specific) in order to have a better impact on the beneficiaries.

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Annex

UNESCO-IHE
QUESTIONS for Water Supply & Sanitation Survey in Accra

Location: Date:
Remark:

This is a survey about domestic water supply and sanitation in Accra conducted by student at UNESCO-IHE, Delft – The Netherlands. Your participation is completely voluntary and you do not have to answer any question if you do not want to.

I. Respondent Characteristics

1. Are you the head of household? [Yes] [No] Gender of Respondent: [M] [F]
   If NO – Who is? [Wife] [Husband] [Mother] [Father] [Other :]
2. What is the head of household's occupation? [ ]
   Respondent's occupation?
3. What is the highest level of education completed by the head of household?
   [Less than Secondary School] [Secondary School] [University and higher]
   Respondent's education?
4. Number of people in your house [ ]
5. Please estimate your household's monthly income. [ ]
6. Please estimate your household's monthly expenditure:
   a. food [ ] b. housing [ ] c. others [ ]

II. Water Supply

The next section has questions about how you normally get water for use in your home:

1. Do you have access to water? a. yes b. no
   If yes, is it from: a. GWCL b. others (specify) [ ]

a. For GWCL costumer:

2. What kind of access?
3. How frequent do you receive water?
   a. hourly (specify) [hours/day]
   b. daily (specify) [day/week]
4. What do you think about the quality of the water?
   a. good b. fair c. poor
5. Is your water access account metered? a. yes b. no
   If yes, is it read regularly? a. yes b. no
6. How much do you pay for the bill monthly?
7. What do you think about the price? a. expensive b. fair c. cheap
8. What is the level of satisfaction of GWCL service?
   a. satisfied b. fair c. not satisfied
9. Do you have any recommendation for GWCL service?

b. For non GWCL costumer:

2. What kind of access?
3. Why you do not have access to GWCL service?
   a. there is no network
   b. it is expensive
   c. other (specify) …….
4. How much does it cost to have the access?

What is the best solution for your access to water?
a. GWCL b. non GWCL

III. Sanitation

Now we would like to hear your thoughts on the sanitation in your area:

1. Do you have access to sanitation? a. yes b. no
   If yes, what kind of sanitation facilities?
   Who provide it? a. municipality b. self provision
   If no, how do you manage your sanitation needs?
2. Do you pay for the sanitation services? a. yes b. no
   If yes, how much?

Do you have any recommendation for sanitation service