

**ASSESSMENT OF PUBLIC-PRIVATE PARTNERSHIP APPROACH IN WATER  
SUPPLY AND SANITATION SERVICES TO HOUSEHOLDS IN BUSIA  
MUNICIPALITY, KENYA**

**BY**

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**DECLARATION AND APPROVAL****Declaration by Student**

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## **DEDICATION**

I dedicate this research to my beloved mum and the entire family for their endless support during the course of study.

## ABSTRACT

Access to safe drinking water remains a challenge for most developing countries including Kenya, which is seen as a water-scarce Country. To enhance its provision, many initiatives have been put in place by the Government of Kenya; the most celebrated being the enactment of the Water Act of 2002, which opened the door for private sector to partner with government to revitalize water service delivery. Despite the introduction of public-private partnership approach in provision of water supply and sanitation services, the problem of accessibility still persist. The purpose of this study was to assess the public-private partnership (PPP) approach in provision of water and sanitation services to household consumers. Specifically, the study looked at water consumption; coverage expansion through public-private partnership approach; contribution of PPP approach in improving quality service delivery; relationship between water sources and household water related health problems and finally challenges facing PPP approach in provision of water supply and sanitation services. The study employed household survey methodology, using questionnaires and interviews to gather the relevant information. Stratified sampling techniques, simple random and purposive sampling techniques were used to select sample size. Data collected was analyzed both quantitatively and qualitatively using descriptive statistics. The study found that PPP approach has contributed to improved accessibility to water supply services since the majority (84.4%) of households could access water within a distance less than one kilometre. The study also found that water related health problems in the Municipality are not correlated to water source, thus there must be other factors that contribute to water related health problem in the Municipality. However, the provision of sanitation service is still poor due to the fact that it was still in the hands of local authority. Therefore, the study recommends that sanitation especially garbage collection should be handed over to private firms to provide the services to residents. The study further recommends harmonisation of policies in both private and public sector so as to have comprehensive policy framework that serves the interest of all stakeholders.

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**ABBREVIATION**

|        |   |
|--------|---|
| AEFJN  | Africa-Europe Faith and Justice Network |
| BDO    | Build Develop Operate                   |
| BOO    | Build Own Operate                       |
| BOT    | Build Operate Transfer                  |
| CBO    | Community Based Organization            |
| CSO    | Civil Society Organization              |
| DBO    | Design Build Operate                    |
| DDP    | District Development Plan               |
| EAP    | East Asia and the Pacific               |
| GOK    | Government of Kenya                     |
| IMF    | International Monetary Fund             |
| JMP    | Joint Monitoring Program                |
| KIG    | Kenya Information Guide                 |
| MGD    | Millennium Development Goal             |
| NGO    | Non-Governmental Organization           |
| PPP    | Public-Private Partnership              |
| SSA    | Sub-Saharan Africa                      |
| UNDP   | United Nation Development Program       |
| WSP    | Water Service Providers                 |
| WASREB | Water Service Regulatory Board          |
| WWSC   | Western Water Service Company           |
| WWDR   | World Water Development Report          |

## **OPERATIONAL DEFINITIONS OF KEY CONCEPTS**

**Public sector**-According to Longman Dictionary of Contemporary English (1987), Public sector means those industries and services that are owned and run by the State. For this study, public sector shall imply to public agency that provides services to the citizens.

**Private sector**-According to Longman Dictionary of Contemporary English (1987), Private sector implies those industries and services in the country that are owned and run by private companies/individuals, not the State. For this study, it imply to private agency which can be company, individual, community based organization (CBO), non-governmental organization (NGO) and church group involved in provision of water and sanitation services.

**Privatization**-is the transfer of ownership and/or management of supply of public utilities from public sector to private sector includes the total or partial sale of assets by the State. For this study is where accountability of service delivery is transferred to private sector.

**Partnership:** According to European Commission (2003) partnership means an arrangement between two or more parties who have agreed to work cooperatively toward shared and/or compatible objectives and in which there is shared authority and responsibility; joint investment of resources; shared liability or risk-taking; and ideally, mutual benefits. For this study, partnership will imply collaboration between government and private sector to provide water and sanitation services.

**Public-private partnership:** Lewis (2002) define a public-private partnership as a relationship that consists of shared and/or compatible objectives and an acknowledged distribution of specific roles and responsibilities among the participants which can be formal or informal, contractual or voluntary, between two or more parties. For this study, it implies a relationship between the public sector and private sector with the aim of providing water and sanitation services to household(s).

**Water Consumer-** According to Longman Dictionary of Contemporary English (1987), a consumer means a person who buys and uses goods and services. Therefore, water consumer will imply to a person who uses water for domestic purposes such as drinking, cooking, washing and bathing.

**Water supply-**refers to the provision of adequate safe water for domestic water needs. For this study, it means intervention to improve access to and ensure security of safe water at household.



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## **CHAPTER ONE**

### **INTRODUCTION**

#### **1.0 Chapter Overview**

The chapter presents the background information of the study highlighting existing gaps in provision of water services. The chapter also provides a statement of the problem, justification of the study, objectives, research questions, scope of the study, operation definition of terms and thesis layout.

#### **1.1 Background to the Study**

Water is an essential resource for all aspects of human enterprise and development: for agriculture, energy production, industrial production and human health. A reliable and stable water supply and sanitation services can reduce or eliminate waterborne diseases and hence promote public health. Thus, adequate supply of clean and portable water is vital for individual welfare and society development both in urban and rural establishment. Further, in UN Millennium Declaration 2000 in which lies the famous Millennium Development Goals (MDGs), the UN affiliated countries pledged to fight global poverty and hunger, protect the environment, improve health and sanitation to the poor, and promote education and gender equality. One of the key targets of the MDGs is to ‘halve, by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation’ (UN, 2000). In this regard, access to clean water has been highlighted as an important factor in the attainment of the MDGs. Furthermore, the recognition by both the Kenya’s Constitution 2010 and UN General Assembly, in 2010, of water and sanitation as a human right provides additional political impetus towards the ultimate goal of providing everyone with access to these vital services (G.O.K, 2010;

UNICEF/WHO, 2012). Many countries and agencies have joined hands in the Sanitation and Water for All partnership; such collective efforts offer real promise. In spite of this crucial role of water resource, many parts of the world especially of developing countries, for example Kenya, majority of her population do not have access to safe water and sanitation services, (UNDP 2006).

Globally, over 780 million people have no access to safe drinking water, and 2.5 billion people still lacked access to improved sanitation (UNICEF/WHO, 2012). According to WWDR (2003) and World Bank (2012) more than 1 billion people practiced open defecation, posing enormous health risks and 2.2 million people especially children die from water related diseases every year. It is estimated that women in developing countries spend 40 billion hours annually fetching and carrying water from water sources far away from home and that may not provide clean water (WHO/UNICEF, 2008). More than a quarter of the population in several countries of Sub-Saharan Africa takes longer than 30 minutes to make one water collection round trip. In various countries, most notably in Eastern Africa, more than a quarter of the population spends more than half an hour per round trip to collect water (WHO/UNICEF, 2010). This leads to a vicious circle for the billions of people who are locked in a cycle of poverty and disease (WHO, 2005). Thus this poverty trap can clearly be overcome by access to safe water and improved sanitation services.

Many African governments, as are others in the rest of the development world, face a daunting task in their attempts to provide effective and equitable public services

especially water and sanitation. When looking at the various surveys available, it becomes quite apparent that basic infrastructure in Sub-Saharan Africa (SSA) lags well behind the rest of the world. Poor quality and lack of widespread availability of water and sanitation services is quite common in some SSA countries, and the average for the region is well below others. Worldwide, 37% of World populations have no access to improved source of drinking-water live in Sub-Saharan Africa (WHO/UNICEF, 2010).

Locally, 59% of Kenyans have access to improved drinking water sources and only 19% have access to piped water through house or yard connection (JMP, 2010). Water supply and sanitation in Kenya has been characterized by inaccessibility, especially in urban slums and rural areas, as well as poor quality service in the form of intermittent water supply (Nicol, 2000). In order to reduce environmental related diseases, Kenya's Vision 2030 recognizes the public-private partnership as the main strategy of improving efficiency and access in water and sanitation delivery (GOK, 2007). However, public-private partnership (PPP), which has emerged as a trend in managing urban water systems in many counties of the world, Kenya included, are likely to have their challenges and thus they should not be considered a panacea for the problems of urban water systems.

In Busia, Lake Victoria North Water Service Board (LVNWSB), Western Water Service Company (WWSC) is partnering with local authority to provide water and sanitation services in Busia Municipality. The present water supply facilities in Busia municipality have a total production capacity of 3,800m<sup>3</sup>/day, which relies on pumping from boreholes

and the nearby River Sio, (WWSC, 2010). This supply is inadequate for the Busia municipality with urban population estimated at 35,665 as per 2009 population census. The problem of water consumption and inadequate sanitation facilities in Busia municipality is not only the inability of the service providers to deliver and maintain basic infrastructure services for the growing population, but also how to improve access to water and sanitation facilities in the Border Town. Therefore, the proposed study seeks to assess public-private partnership approach in water supply and sanitation services to households in Busia Municipality.

### **1.2 Statement of the Problem**

Water is an essential commodity in the life of human beings. The livelihood of people is supported and sustained by water through agriculture, industrial and domestic usage among others. The importance is even more pronounced in urban areas where water is required for sewerage systems to function properly as well as keeping the environment clean. However, water supply in Kenya and especially in Busia Municipality is characterized by low levels of access as well as poor service quality in the form of intermittent water supply. Only nine out of 55 water service providers in Kenya provide continuous water supply (Water Service Regulatory, 2009). Thus, poor service delivery has engendered uncontrolled sinking of wells and tapping of underground water whose quality is unknown to consumers in Busia Municipality. Further, in Township municipality, poor sewage system and lack of designated dumpsites poses environmental hazard to the households of Busia Municipality (DDP, 2009). In fact, this is in line with UNDP reports which notes that even where water supply systems and sanitation facilities have been installed, they are still often inadequate, unsafe and in

disrepair (UNDP, 2006). As such, the task of providing water and sanitation services has remained daunting for years. Therefore, it is amply clear that the challenge of providing basic water and sanitation services persists even after the Water Act 2002 coming into effect. The Act opened door for private sector participation whose role in Kenya has been increasing as its institutions are now the main actors involved in the design and implementation of water supply and sanitation projects and programmes and have a growing role in contract-based management. Government and donor organizations have been promoting PPP approach in service delivery, for instance: Water Act 2002, Economic Recovery Strategy of 2003-2007 and Kenya's Vision 2030 call for PPP approach in improving public service delivery. Despite this extensive promotion of PPP approach, the problem of water accessibility; inadequate sanitation and sewerage facilities and water related health problems are still major issues in Busia Municipality (DDP, 2009). Therefore, the issue of public-private partnership approach in providing water and sanitation services raises many questions: can this partnership approach run more efficiently and feasible in water supply? Is PPP approach panacea for sanitation problems in Busia Municipality? It is on this basis that the study seeks to assess the public-private partnership approach in water supply and sanitation services to household in Busia Municipality.

### **1.3 Research objectives**

#### **1.3.1 General Objective**

The main objective of the study was to assess the effectiveness of Public-Private Partnership approach in water supply and sanitation services to households in Busia Municipality.

### **1.3.2 Specific Objectives**

In order to achieve this main objective above, the study narrowed down to the following specific objectives:-

1. To determine amount of water consumed in Busia Municipality
2. To investigate the contribution of PPP approach in improving water and sanitation accessibility to households consumers in Busia Municipality.
3. To establish the contribution of PPP approach in enhancing quality service delivery in water supply and sanitation services of Busia Municipality.
4. To establish relationship between water sources and incidences of household water related health problems in Busia Municipality.
5. To find out the challenges facing PPP approach in water supply and sanitation services in Busia Municipality.

### **1.4 Research Question**

1. What is the amount of water consumed in Busia Municipality?
2. To what extent has PPP approach contributed to water and sanitation accessibility to households in Busia Municipality?
3. What are the contributions of PPP approach in enhancing quality service delivery in water supply and sanitation services of Busia Municipality?
4. What is the relationship between water sources and incidence of household water related health problems in Busia Municipality?
5. What are the challenges facing PPP approach in water supply and sanitation services in Busia Municipality?

### **1.5 Justification of the Study**

Currently there is lack of clarity on contribution of public-private partnership approach in provision of water supply and sanitation services to consumers in urban municipality in Kenya. Lack of data on the population served and on the quality of services provided has made it difficult to assess the overall contribution of PPP projects in developing countries (Marin, 2009).

Most of the studies that the researcher has come across on the subject have mainly been done in developed countries especially in Europe while little is known on the Kenyan situation. In addition, there are little studies on impact of public-private partnership approach in provision of water and sanitation service to their clients. This therefore implies that the academia world still has less information on the subject in Kenya. This study is expected to increase the body of knowledge among environmentalist as it contributes to the scanty literature available on the provision of water and sanitation services in urban municipalities in Kenya under the partnership approach. The study will also be beneficial to water service providers (both public and private) since it will enable them understand existing gaps and possible factors that impede their performance. The study will also be important to water regulatory board to enable them to understand water accessibility to urban consumers and finally the study will highlight the relationship between water sources and incidences of household water related health problems in Busia Municipality.



### **1.6 Scope of the study**

The study focused on the impacts of public private partnership approach in provision of water and sanitation services to household consumers of Busia municipality. The unit of analysis was households who had been residents of the Municipality for at least one year. The study looked at households water consumption in the Municipality; the extent of coverage (accessibility) through public-private partnership approach; quality of the service delivery; challenges facing PPP approach; and relationship between water sources and incidences of household water related health problems in Busia Municipality.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.0 Chapter Overview**

This chapter presents literature review starting with general information globally narrowing down to local scenes identifying the gaps, various models of PPP approach, changes that have taken place in Kenya's water sector, theoretical framework and conceptual framework of the study.

#### **2.1 General information about Water issues**

Water is a basic human right as it is fundamental to life support systems. It is a key asset for socio-economic growth and development at all levels, ranging from the local, national and global levels. Access to water is therefore an essential component of any effort to alleviate poverty (UNDP, 2006).

Sub-Saharan Africa remains the area of greatest concern. It is a region of the world where, over the period 1990-2004, the number of people without access to drinking water increased by 23% (WHO/UNICEF, 2006). Moreover, the region experienced 85% increase of its urban population between 1990 and 2004, but the number of urban dwellers unable to access safe drinking water doubled during the same period. According to the Human Development Report 2006, some 1.1 billion people in the developing world do not have access to a minimal amount of clean water. While the minimum threshold is about 20 litres a day, these 1.1 billion people use about 5 litres a day (UNDP, 2006).

A major cause of poor access to water services in sub-Saharan Africa is the inefficiencies of water utilities, especially those that serve the urban areas. Many systems are characterized by high water losses; insufficient funds and poor revenues collection to cover operating costs, dilapidated and poor functioning infrastructure, lack of investments, low billing and collection efficiency, chronic water shortages and failure to meet the existing demand, low coverage, especially for the urban poor, and corruption, among others (World Bank, 2004). In addition, the quality of water services is often low. For instance, it is estimated that over one-third of the urban water supplies in Africa operate intermittently and with quality concerns (WHO/UNICEF, 2000).

In most countries, water supply has been managed and provided according to public criteria; water facilities were centrally owned and publicly managed, (Attia, 2005). However, in the beginning of 19<sup>th</sup> century, France resorted to private concessions and opened the road for privatization of urban water management (Ellysar *et al* 2005). Also Chile privatized in 1980, but only after the access of water was almost universal (UNDP2006).

Introducing competition for the right to operate the main water network has been central to reform in many developing countries. In 1990s, concession was the main conduit for private investment in water with foreign and domestic companies assuming responsibility for financing and running the water sector. Some improved efficiency, reduced water losses; increased supply, extended meters and revenue collection and enlarged coverage. For instance, Morocco created four concessions between 1997-2002 which lead to expansion of coverage as well as improved service delivery. Also South Africa

transferred a water utility Durban to concessions which led to improvement in access among the poor household, (UNDP, 2006). However, besides the success stories, high profile shortfalls in the public-private partnership in water have been experienced, for example in Argentina and Jakarta the partnership approach move failed to kick-off well.

Like other countries in sub-Saharan Africa, Kenya's socio-economic development goals are highly dependent on the availability of water in good quantity and quality. The government's long-term objective is to ensure that all Kenyans have access to clean potable water (GOK, 2010), and that water is available for key economic activities such as agriculture, fisheries, livestock production (and therefore food security), manufacturing, hydropower generation, and tourism (MWI, 2005; Kenya, 2006).

Kenya's Vision 2030 aims at ensuring that there are improved water and sanitation services available and accessible to all (GOK. 2007). This goal seems to be elusive to the government attempt to provide water and sanitation services for all. The Kenyan water sector has undergone far-reaching reforms through the Water Act 2002. After the passage of this Act, service provision has been gradually decentralized to 117 Water Service Providers (WSPs). Responsibility for water and sanitation service provision is in the hands of Water Services Boards. However, they are not required to provide services directly - they can delegate them to commercially oriented public-private enterprises, the so called Water Service Providers (ROK, 2002).

Water companies maintain that they can provide solutions to the water crisis of the poor in developing countries but, so far, experience has proved that the claim is unfounded.

Privatisation of water services also promotes a one-sided range of strategic options for water procurement and treatment based on economic criteria and interests, (Africa-Europe Faith and Justice Network, 2003).

According to World Bank report, the manner in which provision of basic infrastructure services is dispensed to meet the demands of the public in general will determine the level of economic activity and, in turn, the overall development of a nation. The report asserts that infrastructure can be seen as the “wheels of economic activity,” (World Bank, 1994). It should be noted that adequate and effective delivery of public services is also central to achieving the Millennium Development Goals (MDGs). Thus, to ensure sustainable development and guarantee a progressive stride towards achieving many of the goals, in particular, improved health and environmental sustainability, widespread access to water, sanitation and other basic public services are proving to be fundamental preconditions, (OECD, 2004).

In general, the widespread dominance of public enterprises in the provision of public goods in Africa has been repeatedly blamed for the terrible state of these services. The MDGs put particular emphasis on the importance of improved coverage of water and sanitation supply and have a global target to reduce “by half the proportion of people without sustainable access to safe drinking water and basic sanitation by the year 2015”. For many countries in Africa, achieving the targets will entail various challenges and pose a continuous up-hill struggle, (UNDP, 2006).

World Health Organization (WHO) report point out that, as a result of rapid growth in urbanization with increased rural-urban migration, mushrooming informal settlements,

population growth and growing poverty, African governments will need to be able to provide access to safe water to 210 million and sanitation to 211 million additional urban residents over the next 15 years (WHO, 2006). It is also estimated that almost 300 million Africans will be living in slums and informal settlements by the year 2020 (Water Utility Partnership, 2003). This implies that investments in water supply and sanitation would require an injection of large amounts of capital (World Bank, 2003).

## **2.2 Private sector involvement in water supply**

Private sector development and investments are critical for poverty reduction, (World Bank, 2012). The private sector has always been involved in the water sector in some form or other, in form of tendering for construction contracts in large urban supplies to informal provision of vended water in areas not served. According to New South Wales Treasury report (2009) shows that private sector involvement in the delivery of public service is not a new concept.

Already in the 1980s, as part of the structural adjustment ideology advanced by the World Bank and International Monetary Fund (IMF), privatization was seen by these institutions as the best way to rejuvenate and revitalize the water sector in developing countries. The government's role was reduced to one of regulation, (Budds & McGranahan, 2003). However, it has become apparent that private sector involvement, as it was envisioned and implemented in the 1990s, is not the 'golden solution' that many had believed it to be a decade earlier (Parker and Kirkpatrick, 2005; Prasad, 2006).

By the beginning of the 21 century, 14 countries in sub-Saharan Africa had adopted some form of private sector involvement, while some others were proposing it

(Bayliss, 2003). However, most of the sub-Saharan African countries have in general been unable to attract companies that are willing to invest in the region, as it is regarded as too risky (Budds & McGranahan, 2003). There have been many instances of PPPs failing to achieve their desired goals and critics argue that the failure of PPPs in many developing countries is related to these nations adopting a model that did not fit their domestic institutional settings (Venkatachalam, 2007).

Since the urban water supply sector experiences severe crises in the hands of the government sector, the governments with the help of international donors have gradually moved into a system to attract private investment by way of providing substantial amount of incentives. In this regard, the population served by private water operators in developing countries has continued to increase steadily from 94 million in 2004 to more than 160 million in 2007 (World Bank, 2010). In addition, private sector participation has improved water bill collection, effective in reducing water losses and improved labour productivity (Marin, 2009).

However, Owen (2005), assert that the private sector participation in urban water supply sector has not delivered the goods adequately. Furthermore, Collignon and Vezina (2000) pointed out that the manners in which private sector participation are being carried out reveals that the agenda was commercial rather than service oriented. Nowadays, full privatization as a way to reform the water sector is seen by many as undesirable and unnecessary (Hukka and Katko, 2003).

Despite the resistance to private sector participation, it has continued to gain popularity. Coppel and Klaass (2011), points out that, the idea of partnership will be better able to meet the complex challenges many developing countries face in providing public services. Note that, public-private partnership stress that private sector involvement does not exclude the public sector or consumers from involvement in the provision of water services, even if the private sector involvement is increased, roles and responsibilities of public and community organization remains.

### **2.3 Contributions of Public-private partnership Approach in water sector**

The challenges of achieving the MDG target for water supply are multidimensional in nature and require innovative financial tools to finance increased coverage, strong institutional framework, organizational capacity as well as water utilities and appropriate technologies. According to Coppel and Klaass (2011), water services in most developing countries have suffered from poor performance of its public utilities. Further, they argue that the problems that face water sector include low service coverage, high unaccounted for-water, and inefficient billing and collection practices. Therefore, partnership between public and private sector was seen as messiah to the problems in water sector.

According to Kolk *et al* (2008), in the past two decades, partnerships have become important instruments for addressing problems of the global development and reaching the MDG. Therefore, Partnership between the public sector and private sector organizations have gained popularity in recent years as mechanism to modernized aging government owned infrastructure and create new facilities. Flinders (2005) noted that the



concept of partnership is built upon the theory that capital projects and public service can be delivered by private firms under contract to the State.

These partnerships are used primarily as procurement vehicle for government organization to build and upgrade infrastructure. Further, Kwak *et al* (2009) points out that the rationale for emerging popularity of these relationships is that a purely public approach to projects may result in government failure, slow and inefficient decision making, governance, organization design and lack of competition and efficiency. Comparatively, they argue that a strict private approach can result in market failure such as uneven distribution of infrastructure and services.

Flinders (2005) asserts out that in recent years the focus has shifted to quality of service delivery and not who is delivering the services. Hodge and Greve (2007), asserts that public-private partnership are considered to be the primary alternative either to public approach or privatization of services and are therefore viewed as it supports the strength of both public and private sector participants. Naren (2006) argues that private sector participation will bring in much needed investment, increase access and improve the quality of the water supply services. Therefore, the essence of PPP is the creation of added value because of the cooperation of public and private partners in service delivery.

#### **2.4 Types of Public-private partnership**

Public-private partnership is based on contract between a public authority and a private sector service provider. The public authority entrusts specific tasks to the private sector and stipulates precise objectives. The public authority retains regulatory control and

ownership of all related assets. Such partnership between both public and private sectors could be well established through delegated management contracts with privatization, which is based on an ownership transfer to the private operator. According to Budds & McGranahan (2003) and Akumu (2006) there are various forms of public-private partnership in public utilities provision. Such types include: services contract, management contract, lease contract, concession contract, joint ventures and cooperatives. The World Bank (2009) identifies four types of projects under PPP approach namely: management and lease contract, concessions, Greenfield projects and divestitures.

In **management and lease contracts**-a private entity takes over the management of state-owned enterprise for fixed period, while ownership and investment decisions remains with the state. There are two sub-classes of management and lease contracts: *management contract* where the government pays a private operator to manage the facility, while operational risk remains with the government; and *lease contract* is where the government leases the asset to a private operator for a fee, while the private operator takes on the operational risk.

In **concession**- a private entity takes over the management of state-owned enterprise for a given period during which it also assumes significant investment risk. It includes: rehabilitate operate and transfer (ROT); rehabilitate lease and transfer (RLT); and build rehabilitate operate and transfer (BROT).

**Greenfield projects**- a private entity or a public-private joint venture builds and operates a new facility for a period specified in the project contract. The project may return to the public sector at the end of the concession period. They include: build lease and transfer (BLT), build operate transfer (BOT), and build own and operate (BOO).

In **divestitures**-a private entity buys an equity stake in a state-owned enterprise through an asset sale, public offering or mass privatization program. This can either be full or partial transfer.

In a **joint venture**, a new company is formed that combined private and public sector. With a public limited company (PLC), a commercial company is formed but owned by local, provincial and national government. In water cooperatives, customers are members of board, but uncommon in large cities (rural water in Chile). With divestiture, ownership of the existing assets and responsibility for future upkeep and expansion are transferred to the private sector.

## **2.5 Water supply and sanitation in Kenya**

After independence in 1963, the government formed the Ministry of Water Development to develop and oversee the country's water resources. The government embarked on improving access to safe and clean water with emphasis on a policy of implementing water projects on a self-help basis in which local communities took control. By the 1990s, however, it had become clear that this strategy was inadequate and the government lacked sufficient resources to match communities' water needs (ROK, 2002).

Therefore, Kenya's water sector has experienced a continual process of reform in recent years since the adoption of a national water policy in 1999. In 2002, a Water Act was enacted aiming at providing for a harmonised and streamlined management of water resources and water and sanitation services. The Act provides for the involvement of the private sector in water services and allows communities to run water projects. It further spells out institutional reforms that separate water resources management from water services provision. The key principles of the Act are:

- Separation of water resources management from water service provision.
- Separation of roles between policy level, sector regulation, asset holding, and operations.
- Devolution of responsibility for water supply and sanitation services provision, from the Ministry of Water and Irrigation (MWI), the National Water Conservation and Pipeline Corporation (NWCPC), and others, to seven Water Service Boards, local authorities, communities, private sector and other actors.
- Decentralisation of powers by creating catchment area level operations of the water resources management authority.

The Act provided for the establishment of a Water Services Regulatory Board (WSRB) which oversees water services provision and licensing; Water Services Boards (WSB) responsible for water and sanitation services provision and asset development; and a Water Services Trust Fund (WSTF) to facilitate financing of water development in rural and low income urban areas. The WSRB and the WSTF were established in March 2003 and all seven WSBs in 2004. The Water Act 2002 also mandates the commercialisation of water services, which means that the WSB should not provide services directly but

contract Water Services Providers (WSPs) as their agent to deliver services to customers. Those WSPs may be established by local governments as limited liability companies run on a commercial basis which are then contracted by the WSBs. Water supply and sewerage services are delivered through water services providers (WSPs) acting as agents of eight regional Water Services Boards (WSBs). WSBs own and develop infrastructure used in the production and delivery of water services, and contract WSPs to operate the systems in demarcated service areas. The Water Services Regulatory Board (WASREB), the independent industry regulator, licenses WSBs who in turn engage WSPs as agents through Service Provision Agreements (SPAs). The WASREB oversees the implementation of policies and strategies relating to the provision of water and sewerage services; approves tariff rates; sets rules; and monitors the performance of WSBs and WSPs (WSP, 2011). At present, capital investment in water is almost entirely financed from public funds. Infrastructure investment projects are executed by the WSBs and the National Water Conservation Pipeline Company (NWCPC), a state corporation acting as the implementing agency of the Ministry of Water and Irrigation (MWI) funded by the government development budget, which is engaged in development of water resources through construction of dams and drilling of boreholes (WSP, 2011).

Water supply in Kenya is characterized by low levels of access, in particular in urban slums and in rural areas, as well as poor service quality in the form of intermittent water supply. Only 9 out of 55 water service providers in Kenya provide continuous water supply (WASREB, 2009). The water sector reforms in Kenya under the Water Act 2002 was designed to contribute to the realization of this long-term objective as well as to

addressing the policy, regulation and service provision weaknesses in the previous set-up under Water Act Cap 372. Furthermore, according to Economic Recovery Strategy for Wealth & Employment Creation (Kenya, 2003), and Vision 2030 considers the water sector as an essential pillar in the government's poverty reduction efforts (GOK, 2007). Although the Water Act 2002 has come into effect, majority of urban population still cannot access portable water. These reforms in water sector were aimed at improving the efficiency and service delivery to all Kenyans. The past few years, have witnessed an upsurge in the commercialization of public services provision through building partnerships with the private sector.

### **2.5.1 Current water Policy in Kenya**

The Water Act 2002 is the currently existing legislation on water resource management and provision. This Act of Parliament is aimed at finding solution in water sector including enhancing water accessibility while protecting the environment. Therefore the Act led to the establishment of Water Resource Management Authority, and hence the shift of water and sanitation services provision from the Municipal Councils to other licensed and private water providers such as Kakamega/Busia Water Supply Company. The Act stipulates how such service providers will be contracted and licensed through signing Service Provision Agreement (SPA).

### **2.5.2 Water consumption in Kenya**

The past 20 years have seen increasing water use for food and energy production to meet the demands of a growing population and to enhance human wellbeing, a continuing global trend (WWAP, 2006). Therefore, water is essential natural resources and is a prerequisite for economic growth, basic human needs and environments requirements.

These fundamental needs compete for water resource, meeting the ever increasing demand has been a challenge. As the demand for water continues to rise, its economic values also rises and these needs to be recognized by the water users. It has been already agreed internationally as documented in one of the four Dublin principles that water is an economic good. The revised NWRMS 2010-2016 emphasis integrated approach with effective stakeholder participation in order for the strategy to be released.

Estimates from the Joint Monitoring Program for Water Supply and Sanitation (JMP, 2010) showed that in 2008, 59% of Kenyans had access to improved drinking water sources and 19% of Kenyans are reported as having access to piped water through a house or yard connection. Furthermore, the JMP report indicates that access to improved water sources in urban areas decreased from 91% in 1990 to 83% in 2008. In rural areas, however, access increased from 32% to 52% during the same period (JMP, 2010). According to a different definition called "weighted access", the 2009 Impact Report estimates that in 2006-2007 only 37% of Kenyans had access to sufficient and safe drinking water close to their homes at an affordable price (Kenya Information Guide, 2011). Countrywide estimates for 2008 by the JMP indicate that 31% Kenyans had access to private improved sanitation. In urban areas an additional 51% of the population used shared latrines. In rural areas, open defecation was estimated to be still practiced by 18% of the population (WHO, 2009).

### **2.5.3 Lake Victoria North Water Service Board**

Lake Victoria North Water Service Board (LVNWSB) is one of the eight water service board established under the Water Act 2002 as part of the reforms in the water sector.

The mandate of the board is to contract, monitor and enforce agreement between the Board and Water Service Providers in accordance with regulation set by Water Services Regulatory Board; ensure effective and economic provision of water service; plan, manage and develop water and sewerage services. The ultimate objective of the board is to increase access to water and sewerage services in the Board's area of jurisdiction. LVNWSB serves the whole of Western Province and parts of the Rift Valley province approximately 14,000 km<sup>2</sup> with an estimated population of about 6500,000 people. However, the board faces a number of challenges: poor existing infrastructure and low services level, low level of water and sanitation coverage hence high demand; and finally high level of unaccounted for water.

#### **2.5.4 Busia Municipality water supply system**

The existing main water supply for Busia Municipality is of surface water abstraction from River Sio located approximately 12 km from Busia town near the Kisumu-Busia road. This water supply is supplemented by boreholes within the Municipality. The water supply is operated by Western Water Service Company (WWSC) under LVNWSB. This water supply serves both Busia-Mundika areas within Municipality, Angoromo; and Funyula-Bumala areas which are outside the Municipality. The water supply relies on a two stage pumping regime from the abstraction to the treatment plant and thereafter to the town main storage tanks in Milimani area near the District Commissioner's residence. This supply is supplemented with groundwater supply from nine boreholes located within the Municipality.



### **2.5.5 Mundika-Busia Water Treatment Plant**

The existing water treatment works was constructed in two phase between 1975 and 1986. The treatment works for the surface water scheme has its raw water abstraction intake on River Sio. The raw water from the intake is pumped by low lift pumps to the treatment plants which consist of the conventional treatment units with a total design of 2700 m<sup>3</sup>/day. However, the average production has been recorded as about 1530 m<sup>3</sup>/day between November, 2006 and March, 2007 since a new bulk meter was installed on Funyala-Bumala pipeline. There are nine boreholes that supplement water supply in Busia Municipality. One of the boreholes is located within Alupe Hospital compound and its supply is limited to the hospital compound and neighboring research institutions that is Medical-KEMRI and agricultural-KARI. The other eight boreholes that supplement public water supply have a total production yield of about 1080 m<sup>3</sup>/day. These boreholes include: D.C Residence compound, Catholic Church Mission Centre, Showground, G.K Prison, AFTC and Bulanda Primary.

### **2.6 Challenges in Privatization of Water and Sanitation Services in Kenya**

The privatization of water is a radical new social experiment. Most major water privatizations are less than a decade old, but already it appears clearly that they follow the pattern of privatization in other service sectors. Some of the challenges include: lack of commitment to expanded access to low-in-come consumers; inequity in the quality of service based on the ability to pay; service cut-offs' weak regulatory oversight' and lack of accountability to local consumer needs.

According to Munala & Kainz (2012), one of the challenges for the successful management of water supply services is the perceived barriers between stakeholders. They observed that municipality perceives the private sector as purely profit driven without social and public responsibility, and the private sector perceives the municipality as politically vulnerable and lacking commitment that do not want to pay for the basic, essential services which they feel they should get for free. Such attitude has affected implementation of PPP approach in water sector.

According to Nyangena (2008), reveals that the absence of a law on privatization establishing legal parameters and a framework on water rights was a major area of weakness and concern, often creating uncertainty and a policy vacuum. In spite of the steps the government has taken, it must be recognized that Kenya is yet to develop an effective policy on water privatization and management of water resources. All the service providers interviewed felt that some service providers and a majority of water consumers were not aware that there exists a Water Act 2002 meant to give guidelines on privatization of water and sanitation services. In particular, the role and relationship among various government departments is still not well defined, often resulting in conflict and competition over control and autonomy.

As already noted, the absence of a well-constructed statute on privatization has left the legislative framework spread across a multiplicity of often competing and contradictory statutes. While applauding the government's determination to supply adequate water in both urban and rural areas, privatization efforts have been hampered by lack of resources, administrative incompetence and bad governance against an ever-increasing demand for

water to meet consumption, industrial and agricultural needs (Nation, December 2004; PANA/UN Habitat, November 2004).

## **2.7 Research Gaps**

Successfully implementation of public-private partnership in water sector remains a challenging issue for the government. The lack of systematic evaluation of performance, there is no evidence that the benefits of introducing private sector offset the cost. There is no clear answer to the question of who are the winners and losers of public-private partnership. From literature, it's not clear about the merit of PPP approach for improving performance in water sector in developing countries (Marin, 2009). Further, there is little information concerning different interest of partners (government, investors and consumers) in water sector thus friction and conflict over the life of partnership. Similarly, the review of literature notes the difficulty of reconciling the perspectives of the public and private sectors with regard to service provision in PPP given that each entity functions around different objectives and has different working culture. In addition, lack of attention given to small scale and informal initiatives in water sector has not been noted in the literature. This may be due to either lack of recognition hence less documented than large scale or less likely to be considered as PPP. The literature discussing PPP seem to be exclusively confined to the structure of arrangement, primarily focusing on institutional responsibilities, tariff structures and the framework for regulation; and there is little or no documentation of the performance and nature of relationship between the partners. Therefore, the study seeks to fill these gaps by generating information.

## **2.8 Theoretical framework**

### **2.8.1 Open Systems theory**

This study was guided by an open systems theory that describes a system as a set of interacting elements or sub-systems that make up an integrated whole, forming part of larger systems. Because open systems theory deals with organizations in general and across all sectors, it is applicable to public-private partnership and other organizations contributing to water supply. Open systems theory provides a framework to study partnership as a social system with sub-systems that interact with each other and with the environment (Katz and Kahn, 1978). The historical roots of open systems theory lie with von Bertalanffy's general systems theory that describes dynamic, recurring patterns in biological systems. Open systems theory adapted to this study of organizations, proposing that systems maintain themselves through contact with the environment. An open system is defined as a coalition of shifting interest groups, strongly influenced by environmental factors that develop goals by negotiating its structure, activities, and outcomes. Open systems theory argues that organizations are social systems made up of a structuring of events or processes (Katz and Kahn 1978).

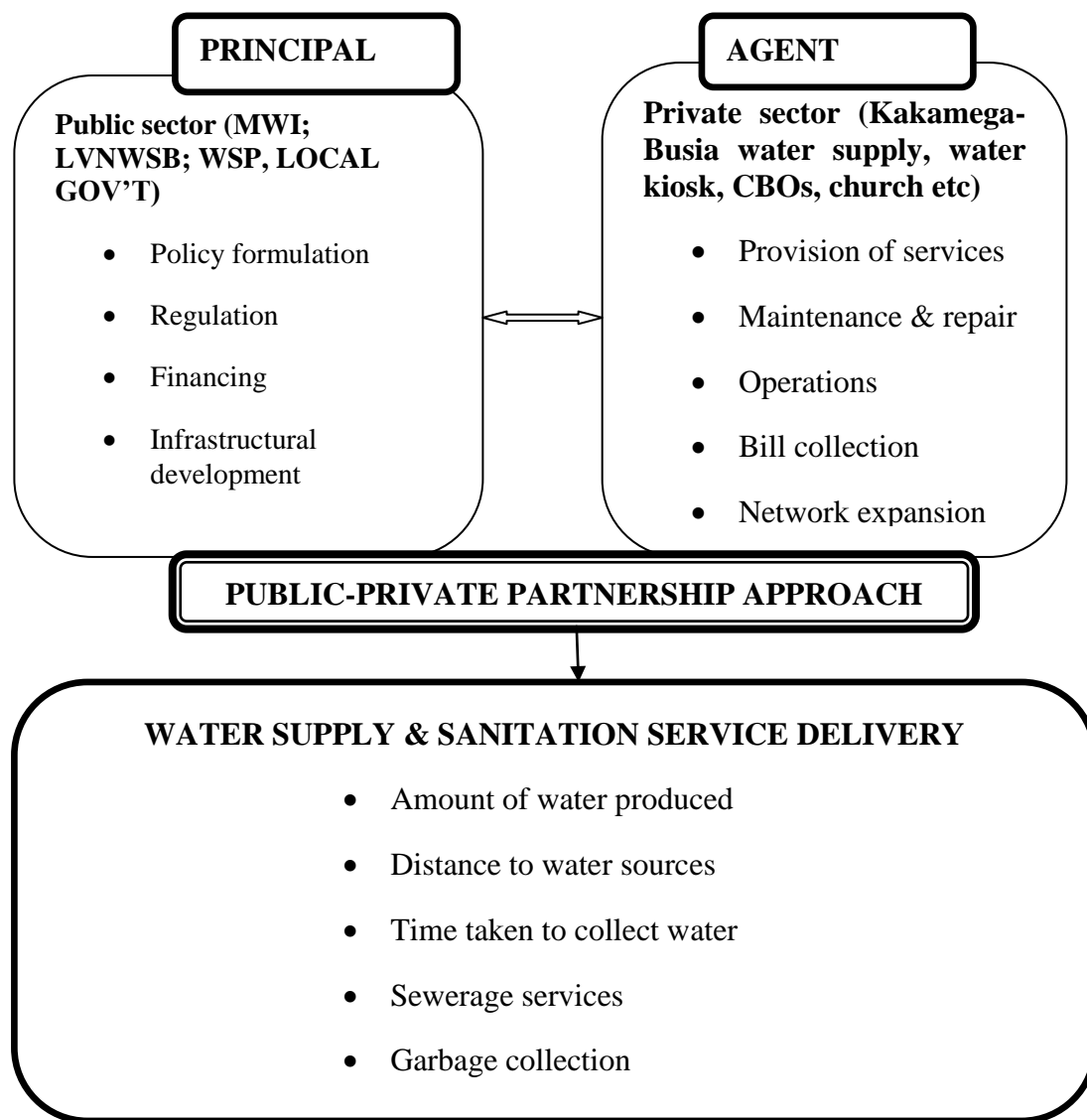
### **2.8.2 Principal agent theory**

The principal agent theory can be defined as an economic theory of cooperation with respect to the utilization of scarce resource (water) in a world where externalities and imperfect information prevails. The starting point of the theory is an agency relationship which is characterized by one part the agent acting on behalf of another party the principal. The rationale for agency relationship is specific information and skills advantage of the agent with regard to the task to be carried. Therefore, the analysis of the transfer of provision of water to private sector was based on principal agency theory

framework. This theoretical choice can be justified on the ground that the principal agency theory addresses the issues of delegation and the resulting problems of controls. Thus it promises to identify instruments and structures to manage shared accountability between the levels of the partnership.

## **2.9 Conceptual framework**

The conceptual framework of the study was based on partnership concept in provision of services. The concept recognizes collaboration or cooperation of partners in provision of public utilities whereby the public sector that is the government and private sector work collectively to supply water services to the urban residents (Figure 2.1). This cooperation results in improved service delivery in terms of regular water flows, fair billing, reduced leakages, easy access of water, and clean and safe water. For this to be achieved, the organization has to work as system and interact with environment rather in isolation.



(Source: Author, 2012)

**Figure 2.1: Conceptual framework of the study**

## CHAPTER THREE

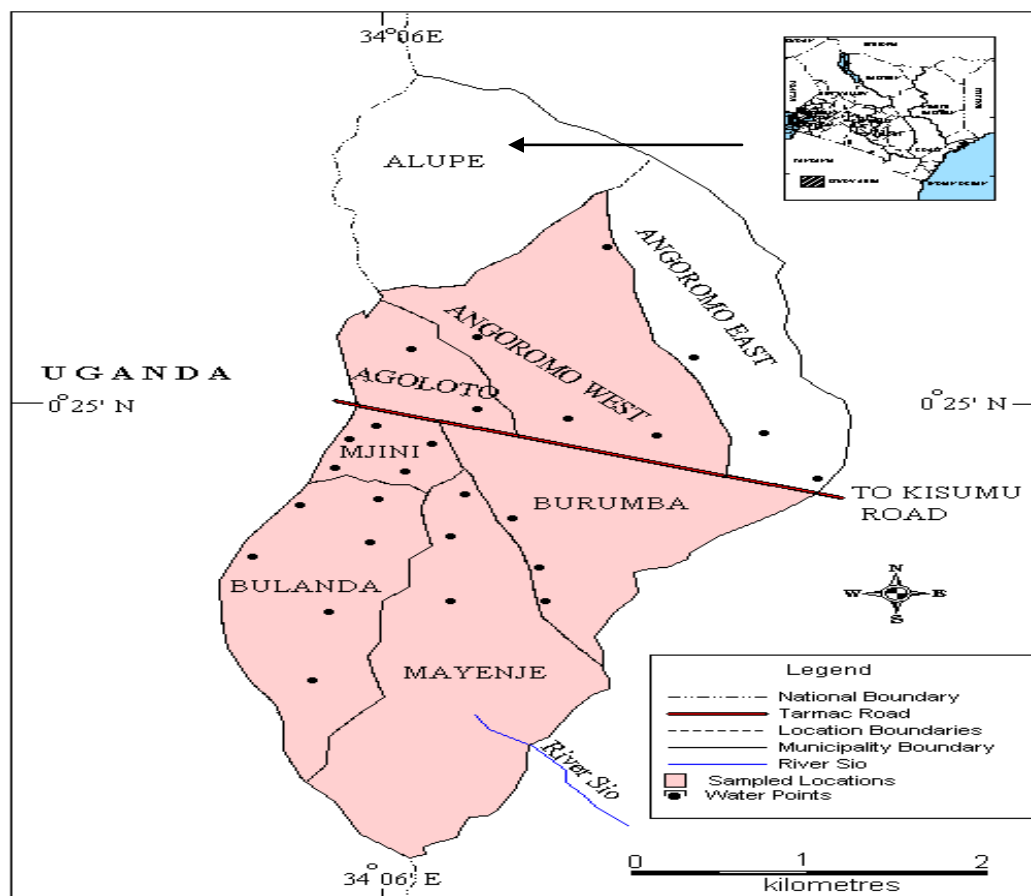
### METHODOLOGY

#### 3.0 Chapter Overview

This chapter discusses the following aspects; the study area in terms of geographical location, its administrative units, relief, climate, and economic activities; detailed sampling procedure as well as data collection methods and rationale behind their use has been provided together with various techniques and methods of data entry and analysis.

#### 3.1 Study Area

Busia County is one of the four counties in the former Western Province, and it borders Kakamega county to the East and Bunguma county to the North East, Uganda to the North and Siaya County to the South. It lies between latitudes  $0^{\circ} 1' 36''$  South and  $0^{\circ} 33'$  North and longitudes  $33^{\circ} 54'32''$  East and  $34^{\circ} 25'24''$  East (Figure 3.1).



(Source: Author, 2012)

**Figure 3.1: A map of Busia Municipality showing water points in the study area.**

### 3.1.1 Administrative Units

Busia County is divided into seven districts namely: Busia, Bunyala, Butula, Funyula, Nambale, Teso South and Teso North Districts. Busia District is one of these seven districts found in the County and it covers an area of 673.6Km<sup>2</sup>. The settlement patterns in the district vary with dense population in the town centre of Mjini and parts of Mayenje sub-location with population density of 4062 persons per Km<sup>2</sup> (Busia District Development Plan 2009). There is linear settlement along the roads and water bodies to



access social amenities. In township there are slum areas around Marachii estate on the border of Kenya and Uganda.

### **3.1.2 Busia Municipality**

Busia Municipality covers the entire Township Division of Busia District and parts of Teso District. Busia Town is the most common crossing point between Kenya and Uganda and is a busy commercial area with a heterogeneous mix of people. The Municipality has a total number of 14,684 households with population size of 61,727 as per 2009 census report. The economic activities of the residents in the Municipality are business activities and subsistence and urban farming. There is also trafficking of commodities being a border town.

### **3.2 Research Design**

Household survey research method was used where household were identified from the list collected from assistant chiefs in the Municipality. The design was preferred for the study because it was seeking household water consumers' opinions on public-private partnership approach in provision of water and sanitation services in Busia municipality. Further, stratified sampling technique was employed to have estates/villages based on administrative boundaries, population size and socio-economic status to strata. Households were then randomly sampled from sampled estate/villages found in the municipality; purposive sampling was used to select key informants because they hold relevant information. In order to have representative sample size, proportional sample size in each estate was considered.

### 3.3 Target population

The study was targeting 8,558 urban household water consumers as per 2009 population census results in Busia Municipality since they had essential information on the study. The study also consisted of seven key informants from the WWC, Lake Victoria North Water Service Board, District Water Officer, District Environmental Officer, District Public Health Officer and local NGOs dealing with water issue in the Municipality.

### 3.4 Sampling procedures

#### 3.4.1 Sampling Frame

The census data for Busia Municipality was according to the Municipal Council office unavailable, whereas Busia office of the National Bureau of Statistic was only in possession of a ready report presenting the general profile of the Municipality. Alternatively, Assistant Chiefs of each Sub-location had a register of the population of its villages together with number of households. Therefore, each of sub-location within the Municipality was visited and number of household copied to form sampling frame.

#### 3.4.2 Sample size

The sample size was determined from the formula proposed by Yamane cited by Isreal (2009) which state that:

$$n = \frac{N}{1 + N(e)^2}$$

Where n=sample size

N=target population size

e = level of precision (sampling error)

Therefore, N=8558 households and e=7%

$$\begin{aligned} n &= \frac{8558}{1 + 8558(0.07)^2} \\ &= \frac{8558}{42.9342} = 199 \text{ household.} \end{aligned}$$

The 199 households were selected randomly after the population had been stratified and proportional sample was considered to have sample size. A list of household numbers per estate was obtained from Assistant Chiefs to form sampling frame from which the sample was drawn. After identifying the actual sample size from each estate, simple random sampling was used to select households where each had an equal chance of being selected. The sample size per estate was then calculated using the formula: *sample size = No. of household per estate / total no. of households in Municipality x 199* to have proportional representation of the estates in the sample size (Table 3.1). In addition, there were seven key informants from stakeholders dealing with water issue in the district.

**Table 3.1: Number of sampled household per estate in the study area**

| <b>Name of the Estates Sampled</b> | <b>No. of households per estate</b> | <b>Sampled No. of households per estate</b> |
|------------------------------------|-------------------------------------|---|
| Burumba                            | 2118                                | 49  |
| Mauko                              | 1588                                | 37  |
| Marachi                            | 1535                                | 36  |
| Amerikwai                          | 1826                                | 42  |
| Agoloto                            | 1491                                | 35  |
| <b>Total</b>                       | <b>8558</b>                         | <b>199</b>                                  |

(Source: *Busia statistic office 2009*)

### **3.5 Data collection**

#### **3.5.1 Sources of Data Collection**

Diverse methods of data collection were employed at various stages of the study. These were within the confines of appropriate sampling techniques. In some cases, a single method of data collection was used while in others a combination of two or more techniques was necessary. The main techniques of data collection used were:

### **3.5.2 Primary Data**

Primary data was collected from the households within the Municipality and seven key informants (staff working) at Western Water Company, Lake Victoria North Water Service Board and the Ministry of water at the district level, district environmental officer, district public health officer and district hospitals. This was done with the help of questionnaires and interviews schedules (Appendix I) where households and key informants were required to provide information based on the questions asked to them regarding their views on public-private partnership approach in water sector.

### **3.5.3 Secondary Data**

This was employed at the first phase of the study, during proposal development and especially in the development of the problem statement. Secondary data was collected from various literature sources including personal and institutional libraries, archives and information offices at the district levels and internet services. It involved going through books, journals, dissertations, thesis reports, policy documents, reports and other articles in order to gather relevant data. The method provided factual and authoritative information on what other studies have done on public-private partnership approach in the supply of water to the residents. This was important in identifying the gaps in other scholars' works.

## **3.6 Data Collection Instruments**

### **3.6.1 Questionnaires**

Questionnaires were administered to household heads and in the situation where the household were not found or unavailable, the senior most member of the household was picked for the administering of the questionnaires. The questionnaire was chosen as it

provides a more comprehensive view than any other research tool. Questionnaires were used to obtain primary data from the sampled population. All the respondents were asked the same questions in the same order. The questionnaire contained both open and closed questions. It was standardized and completely predetermined. Questionnaires produced both qualitative and quantitative data. The main advantage of the instrument was that it allowed the study to control and focus responses to the research objectives. Thus, enhancing relevancy of data collected.

### **3.6.2 Interviews**

Information from key informants was collected by the use of interview schedule. This included interviewing officials from Water Supply Company, district development officers, district water officer, public health officer and Lake Victoria North Water Service Board officials. This was because of the position of the management of water supply and sanitation services, and by extension their role, duty and function enable them to provide the required information on the subject. Interview schedules were important because it helped in getting some valuable information from water company officials, water service board officials, district water officer, public health officer and Municipality officials.

## **3.7 Validity and Reliability**

### **3.7.1 Validity**

Validity refers to the degree to which results obtained from the analysis of the data actually represent the phenomenon under study (Mugenda *et al.*, 1999). To determine and improve the validity of the questionnaires pilot study was carried out to 50 household in Busia Municipality (from Angoromo West which was not included in the final sample)

and assistance was sought from experienced supervisors. This allowed the preparation of the final questionnaire. Note that pilot study participants were not sampled in the final collection of data.

### **3.7.2 Reliability**

Kothari (2004) states that the reliability of the questionnaires' test refers to the ability of that test to consistently yield the same results when repeated measurements are taken of the same individual under the same conditions. According to the study reliability therefore implies the degree to which a research instrument yields consistent results or data after repeated trials. To test reliability, the study used test re-tests method. This ensured that the data collection instruments are reliable to collect data.

### **3.8 Methods of Data Analysis**

Data was analyzed both qualitatively and quantitatively. Qualitative analysis was done on the information collected from interviews and questionnaires using descriptive analysis. On the other hand, quantitative analysis included descriptive statistical techniques with the aid of SPSS computer package was done. Descriptive statistics of variables such as frequencies, mean and percentages counts which was summarized data and presented using tables, graphs and charts. Pearson correlation and Chi-square analyses were used to make deductions for the study. It was used since it enabled the researcher to meaningfully describe a distribution of scores or measurements using some indices like mean. This further allowed the study to generalize the results from the study sample to the study population.

### **3.9 Ethical Consideration**

Permission to carry out the study was sought from the relevant authority and from the participants who participated in the study. The nature and the purpose of the research were explained to the respondents by the researcher. The study respected the individuals' rights to safeguard their personal integrity. During the course of the data collection, the respondents were assured of anonymity, confidentiality and they were also assured of their ability to withdraw from the study at any time if they wished to do so. No names or personal identification numbers were reflected on the questionnaires except the numbering for questionnaires, which was for purposes of identification of data during data editing. It was indicated to the respondents that results of the study shall be availed to the relevant authority and to those participants who are interested in knowing the results. All participants in the study signed an informed consent form which assured them of anonymity and confidentiality.

## CHAPTER FOUR

### RESULTS AND DISCUSSION

#### 4.0 Chapter Overview

This chapter presents the study findings and discussions based on the analysis and the interpretation of the data collected and collated by all the various methods described in the study design. The quantitative figures unless otherwise specified, refer to the results attained from the survey of 199 households using the survey questionnaire.

#### 4.1 Socio-economic characteristics

##### 4.1.1 Gender

It was important to establish gender distribution in the study area because it tends to have implications on water consumption of the households. Respondents were asked to state their gender and it was established that majority (62%) of the respondent were female. This is as illustrated in the Table 4.1.

**Table 4.1 Rrespondent's gender**

| <b>Gender</b> | <b>Frequency</b> | <b>Percent</b> |
|---------------|------------------|----------------|
| Female        | 123              | 62             |
| Male          | 76               | 38             |
| <b>Total</b>  | <b>199</b>       | <b>100.0</b>   |

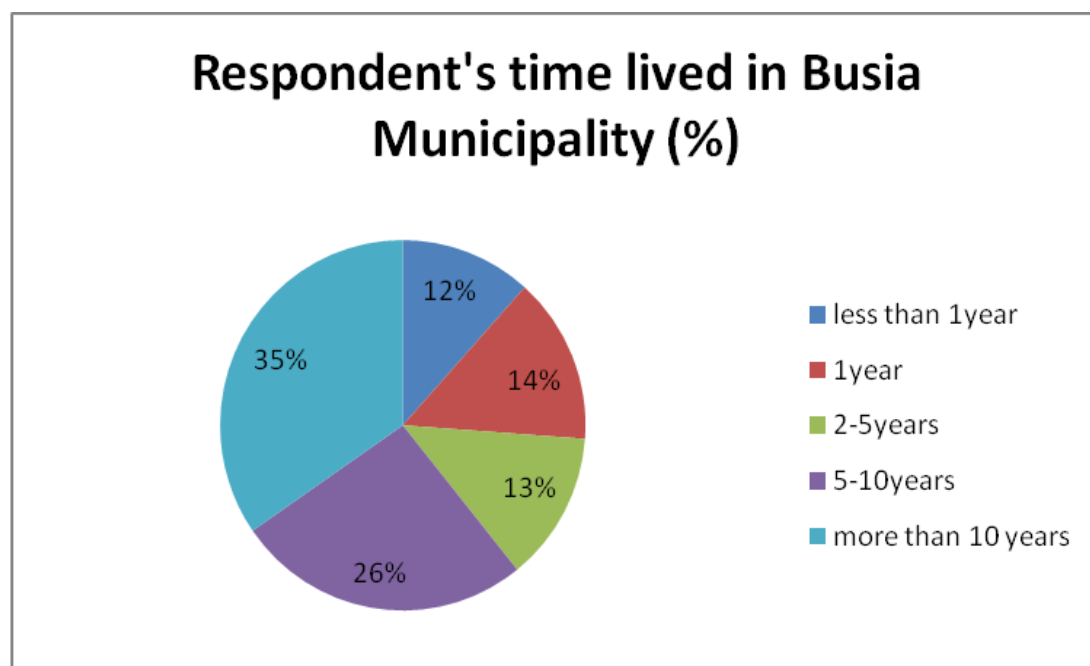
As for respondents profile, close to two third were female and only a third were male, probably due to the fact that many household were interviewed during working hours and



females respondents were at household who reported that their husband had gone work. This indicates that in the study area most male persons are main bread winner for the households while most female are left at home/house to undertake domestic roles.

#### 4.1.2 Time lived in Busia Municipality

Development changes normally does not occur overnight but it takes time, thus it was important to establish for how long had respondent lived in the Municipality because they are likely to have witness the development changes in the area. It was established that more than (60%) of the respondent have lived for a period of more than five years in the Municipality, as illustrated in the Figure 4.1.



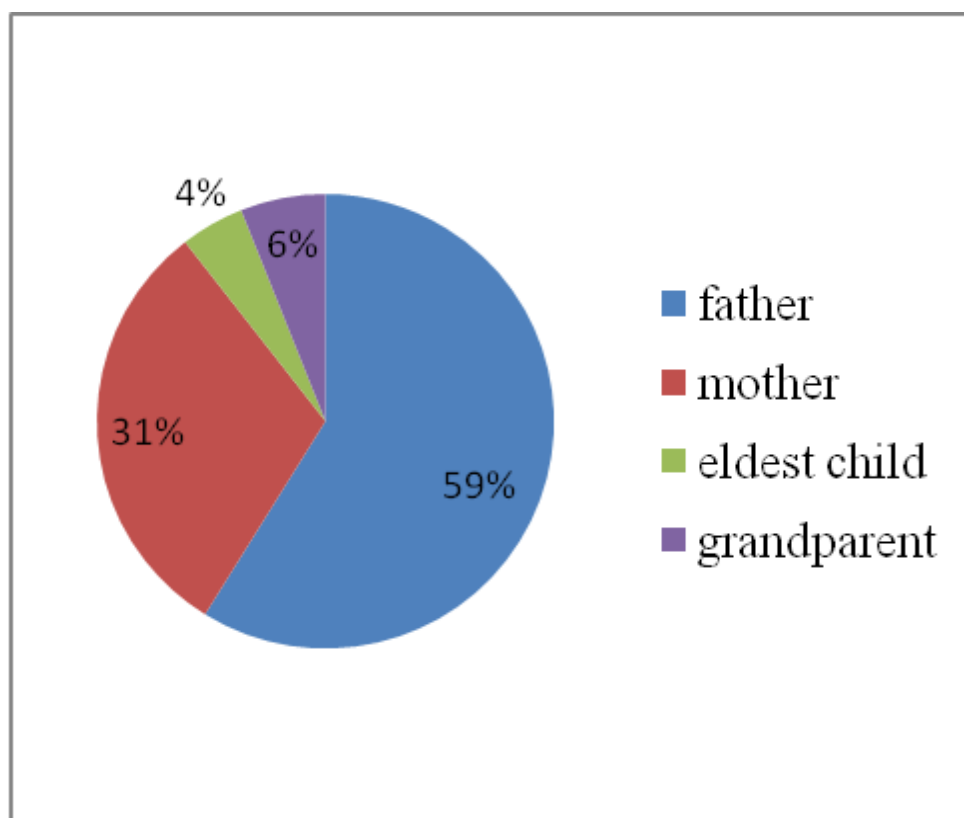
**Figure: 4.1: Respondent's time lived in Busia Municipality**

The finding shows that 35% had lived in Busia for more than 10 years, 26% for 5-10 years, 13% for 2-5 years, and 14% for 1 year while remaining 12% for less than 1 year.

It can be deduced that 35% of the respondent had stayed in the Municipality for duration more than 10 years; this was due to the fact that most of them were staying on their ancestral land. Thus, suggesting that they have relevant information concerning trend of development in the Municipality. Most of the respondents acknowledge that there had been remarkable development changes especially infrastructural improvement over the years especially regarding the provision of public services water included.

#### 4.1.3 Household head

From the study findings, it was established that majority of the household heads were father as illustrated in Figure 4.2.

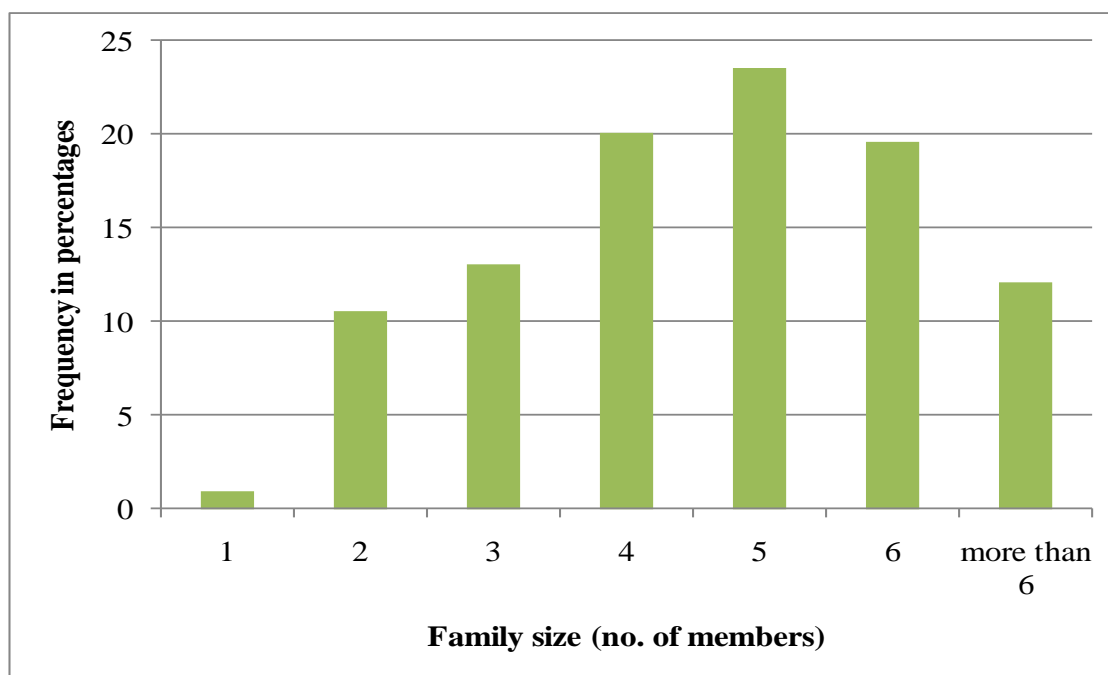


**Figure 4.2: Household head in the Municipality**

Fifty nine percent of the households were headed by father, thirty one percent by mother, six percent by grandparent and four percent by eldest child. This finding reveal that majority of households were male headed. Understanding household head was useful in knowing who makes the decision regarding where the family lives consequently affecting accessibility of water and sanitation services for the family. Household in pre-urban areas of the Municipality reported walking to nearby river to collect water.

#### 4.1.4 Household size

When respondents were asked to state their family size in terms of number of household members they have, majority (55.3%) of them said they had more than four members as illustrated in the Figure 4.3.



**Figure 4.3: Distribution family size per house hold**

The data reveals that 1% of the respondents had one member, 10.6% had two members, 13.1% had three members, 20.1% had four members, 23.6% had five members, 19.6% had six members and remaining 12.1% had more than six members, it revealed that a household on average had at least four members. This implies that majority (55.3%) of the respondents had large family size which means that meeting family needs water inclusive was costly and also increases the water consumed since a lot of water is required to meet the needs of family members. Furthermore, this findings show that the respondents had access to free labour force in collecting water since in Africa members of one's household form part of his/her labour force.

In an interview with one mother who had six children on the effect of family size on water demand she said;

*'mimi sina maji ya mfereji, huwa ninanunua maji kwa kiosk na mutungi moja ni shilingi mbili. Mimi kwangu nahitaji mitungi sita au saba kwa siku.'* (That I don't have piped water but I normally buy water from water kiosk whereby 20 liters costs two shillings. At the end of the day, I require between six to seven 20 liter jerry cans of water.) This reveals that a household with more members requires more water for their daily usage as illustrated by a cross tabulation in Table 4.2.

#### **4.1.5 A cross tabulation between family size and the amount of water collected**

A cross tabulation was carried out between family size and the amount of water collected per trip to establish whether there exist relationship between family size and amount of water collected per trip, the finding of cross tabulation is presented in the Table 4.2.

**Table 4.2: A cross tabulation between family size and the amount of water collected**

|             |               | FS-family size * AC-amounted of water collected per trip Cross tabulation |           |           |                     | Total  |
|-------------|---------------|---|-----------|-----------|---------------------|--------|
|             |               | AC-amount of water collected per trip                                     |           |           |                     |        |
|             |               |   | 10 litres | 20 litres | more than 20 litres |        |
| family size | one           | Count   | 0         | 1         | 1                   | 2      |
|             |               | % of Total  | .0%       | .5%       | .5%                 | 1.0%   |
|             | two           | Count   | 1         | 14        | 6                   | 21     |
|             |               | % of Total  | .5%       | 7.0%      | 3%                  | 10.6%  |
|             | three         | Count   | 1         | 17        | 8                   | 26     |
|             |               | % of Total  | .5%       | 8.5%      | 4%                  | 13.1%  |
|             | four          | Count   | 0         | 29        | 11                  | 40     |
|             |               | % of Total  | .0%       | 14.6%     | 5.5%                | 20.1%  |
|             | five          | Count   | 1         | 19        | 27                  | 47     |
|             |               | % of Total  | .5%       | 9.5%      | 13.6%               | 23.6%  |
|             | six           | Count   | 1         | 11        | 27                  | 39     |
|             |               | % of Total  | .5%       | 5.5%      | 13.6%               | 19.6%  |
|             | more than six | Count   | 1         | 11        | 12                  | 24     |
|             |               | % of Total  | .5%       | 5.5%      | 6%                  | 12.1%  |
| Total       |               | Count   | 5         | 102       | 92                  | 199    |
|             |               | % of Total  | 2.5%      | 51.3%     | 39.2%               | 100.0% |

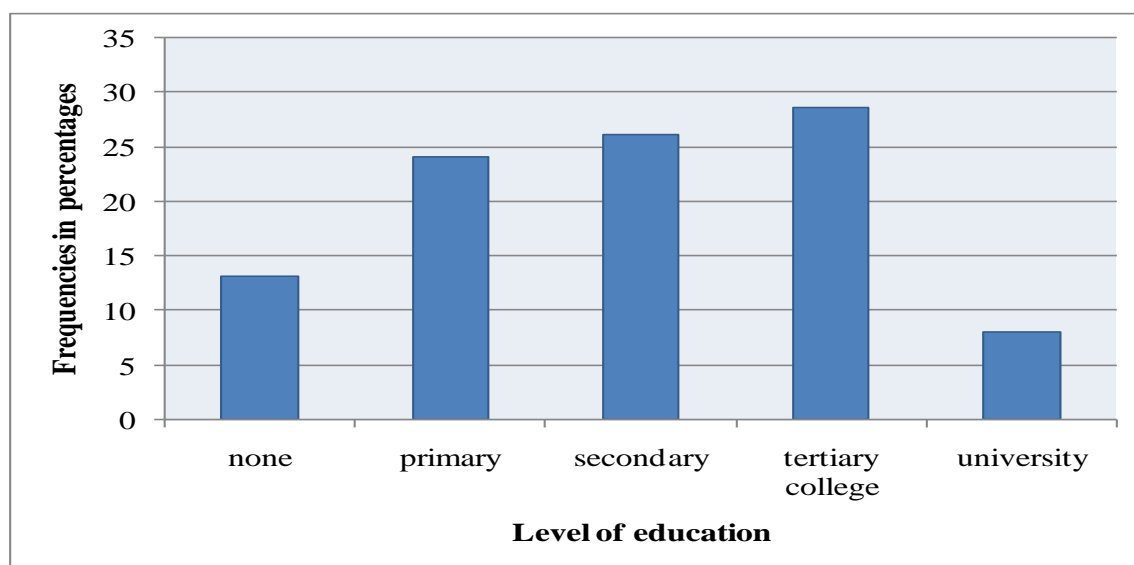
$$X^2 = 35.581, df=18, p \text{ value}=0.008$$

The study findings indicate that 1% of the respondents from a family of one member collects 20 litres and above per trip, 0.5% from a family of two collects 10 litres of water per trip, 7% from the same family size collects 20 litres of water per trip while 3% from the same family size collects more than 20 litres per trip. In households with three members, reported that only 0.5% collected 10 litres per trip, 8.5% reported to collect 20 litres per trip while 4% reported to collect more than 20 litres per trip; in households with four members, 14.6% reported to collect 20 litres per trip and only 5.5% reported to collect more than 20 litres per trip; in households with five members, 0.5% reported to collect 10 litres per trip, 9.5% said they collect 20 liters per trip, and 13.6% collect more

than 20 litres; in households with six members: 0.5% reported that they collect 10 litres per trip, 5.5% said that they collect 20 litres; and finally in the households with more than six members: 0.5% said they collect 10 litres per trip, 5.5% said they collect 20 litres per trip and 6% said that they collect more than 20 litres per trip. Findings from this cross-tabulation indicate that there is a significant relationship between family size and the amount of water collected. This is attested by the p value being less than the significance value ( $0.008 < 0.05$ ). This therefore implies that the larger the family size the more amount of water collected per trip.

#### 4.1.6 Respondent's Level of Education

Education level plays an influential role when it comes to making decision regarding the use of public utilities and where one stays; therefore, it was important to understand the level of education of the respondents. The data finding of this is as illustrated in Figure 4.4.

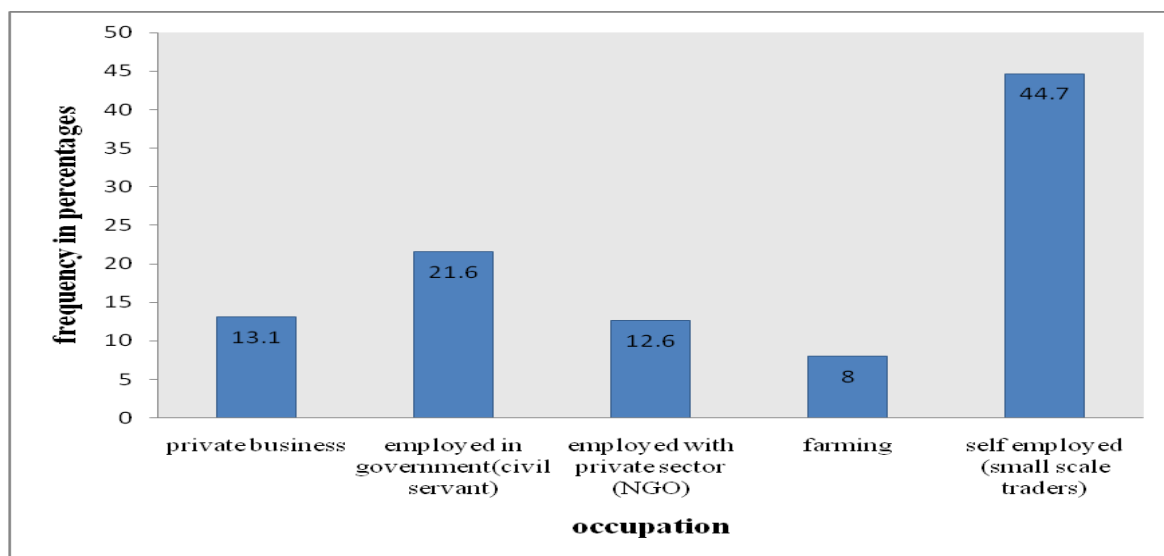


**Figure 4.4: Distribution of respondent's level of education**

Those with University education were only 8%, 28.6% had tertiary college level, 26.1% had secondary education, and 24.1% had primary level education while 13.1% had never attended schooling. Basically, more than 60% of respondents in Busia Municipality had at least secondary education which suggests a fairly educated society. This implies that they know importance of having access to improved water supply and sanitation service. Educated community in most cases is aware of the importance of accessing clean and safe water; and aware of the repercussions of using unsafe water. In addition, the study benefited from the respondents' level of education because they were in a position of understanding the study problem and therefore provided relevant and valid information.

#### 4.1.7 Respondent's Occupation status

When respondents were asked how they earn a livelihood, majority (44.7%) of them said through doing small scale trade activities, as illustrated in the Figure 4.5.



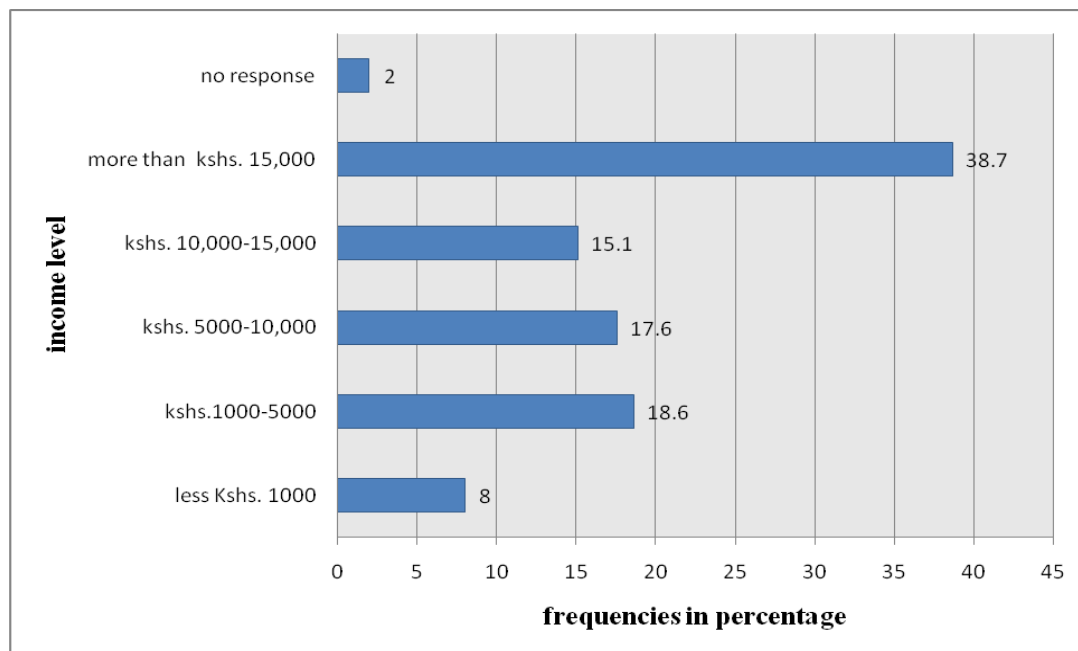
**Figure 4.5: Distribution of Respondent's Occupation**

The Figure 4.5 demonstrates the occupation of the respondents in the study area. It reveals that majority are self-employed (small-scale traders) which is 44.7%, this can be attributed to existence of black market being a border town, 21.6% are employed in the Government, 13.1% in private business, 12.6% employed with private sector (NGO), whereas the remaining 8% practice farming. It can be deduced that small-scale trade and the government are major source of employment in the Municipality. The occupational status of the residents is very crucial to this study because it determines access to safe and clean domestic water usage. Being connected to piped water requires an individual to pay for the services rendered by the service provider. Occupation of the person therefore generates income which allows the person to pay for such services and thus, access to safe and clean water.

#### **4.1.8 Household's income level**

The economic aspects of the household are very crucial when it comes to determining access to safe drinking water of a family. Therefore, respondent's economic welfare was sorted in terms of the average monthly income level as illustrated in Figure 4.6.



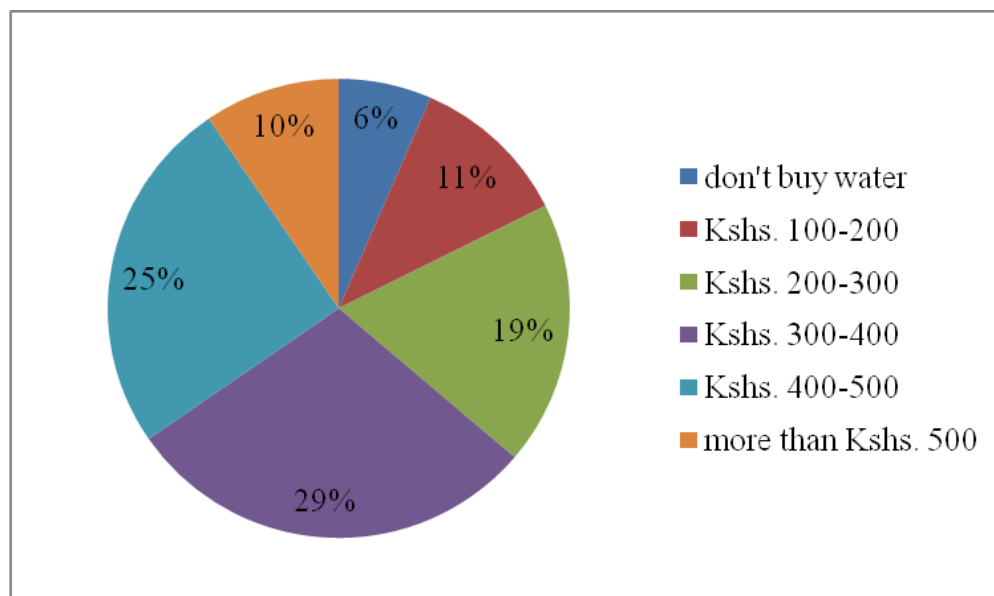


**Figure 4.6: Distribution of monthly household income level**

From Figure 4.6, 38.7% earn more than Kshs 15,000 per month, 18.6% earn between Kshs.1,000-5,000, 17.6% earn between Kshs.5,000-10,000, 15.1% earn between Kshs. 10,000-15,000 while remaining 8% earn less than Kshs.1,000. 2% of the respondent had no response. It further reveals that majority of respondents fall within income level more than Kshs. 15,000 per month. As it is with occupation of the residents, income level actually determines whether one's access to clean and safe water. Lack of income implies that one may not be able to access clean and safe water because of the small fee required. This may culminate into a person seeking other alternatives of accessing water (for instance, using water from nearby river which is not certified for human use). In conclusion therefore, it can be deduced that income of the residents affect access to improved water supply and sanitation services in the municipality.

#### 4.1.9 Respondent's average monthly water expenses

The monthly water expense of the household was established and majority of the respondents spend between Kshs.300-400 per month as illustrated in the Figure 4.7.



**Figure 4.7: Distribution of household average monthly water expense**

Figure 4.7 show respondent's water expenses per month on average, 29% of respondents spend about Kshs. 300-400, 25% spend Kshs. 400-500, 19% spend Kshs 200-300, 11% spend Kshs. 100-200, 10% spend more than Kshs.500 and the remaining 6% don't buy. It reveals that more than 60% of the respondents on average spend more than Kshs.200 per month on water. This reveals that households without income may not access potable water hence resort to alternative water sources which is not clean.

#### 4.2 Water consumption in Busia Municipality

The first objective of the study was to establish water consumption of households in Busia Municipality. This objective was measured by looking at the following variables:

categories of water costumers; total production; amount of water sold; frequency of water collected per day; the amount of water collected per trip per day; household water uses; and correlation between amount of water consumed and family size was carried out to establish whether there was any association.

#### 4.2.1 Categories of water customers in the municipality

The common water costumers in the Municipality is domestic customers which accounts for the highest number of water consumers and of course there are other customer categories which include schools, government institutions and water kiosks/yard taps, this is as demonstrated in Table 4.3.

**Table 4.3: Water supply customer category in Busia Municipality**

| Customer category              | Total No. of costumer for the last four month |               |              |               |
|--------------------------------|---|---------------|--------------|---------------|
|                                | November 2011                                 | December 2011 | January 2012 | February 2012 |
| Domestic                       | 2,974   | 3,011         | 3,070        | 3,122         |
| Commercial                     | 1   | 1             | 1            | 1             |
| School                         | 12  | 12            | 12           | 13            |
| Water kiosk                    | 54  | 54            | 54           | 54            |
| Government                     | 4   | 4             | 4            | 4             |
| <b>Total population served</b> | <b>3,045</b>                                  | <b>3,081</b>  | <b>3,141</b> | <b>3,194</b>  |

The data collected from the Western Water Service Company reveals that the major category of customer in the Municipality is domestic consumers and their number has been ever increasing as demonstrated in Table 4.3.

According to Customer Manager of the Company, the ever increasing number of consumers is a clear indication of high water consumption in the Municipality which is

attributed to high population growth being a border town. Interview with the Company's Manager revealed that out of 54 water kiosk, 44 were owned by the company while the remaining is owned by the municipality.

*'.....oh yes, actually the total number of water kiosks in this municipality is 54 but we only have 44 of our own others are for municipal and what we do is we contract them out to individual persons or groups who are qualified to operate them'.*

This means that individuals who contracted with company to operate the kiosks are supposed to raise money for the company and the excess of money is theirs hence act as source of livelihood for those who work. Furthermore, it was established the operators of these water kiosks also sale goods to their clients as depicted in Plate 1.

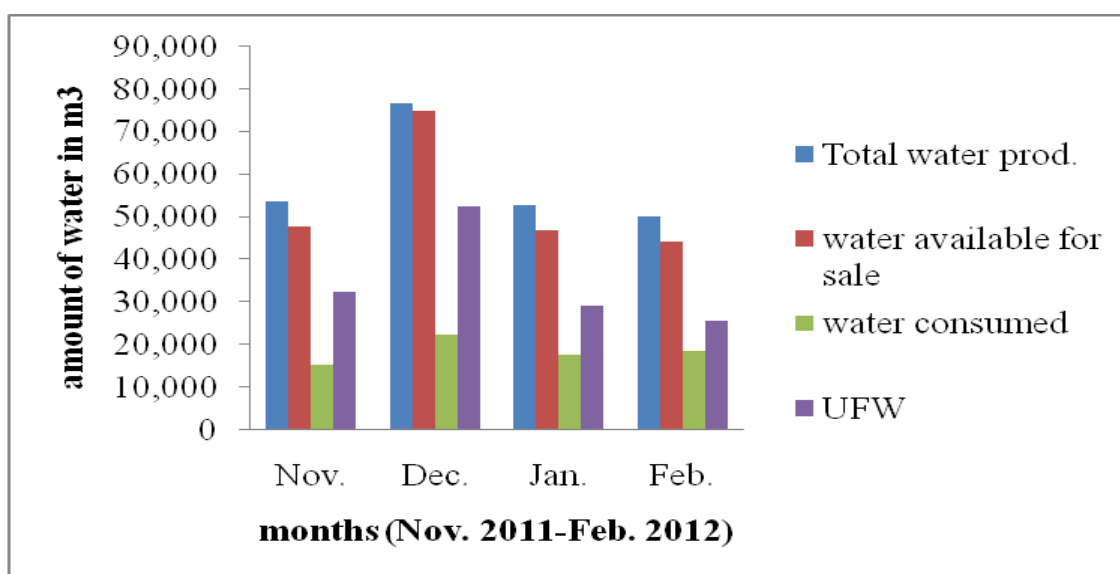


**Plate 1: Water kiosks which act as a grocery shop in Busia Municipality**

(Source: Author, 2012)

#### 4.2.2 Water Production and consumption in Busia Municipality

The water supply in Busia Municipality can be considered to be adequate since the data from the Service providers in the area indicate that the total water supplied is more than water consumed as illustrated in the Figure 4.8.



(Source: author, 2012)

**Figure 4.8: Water production, water available for sale, water consumed and UFW for four month.**

From Figure 4.8, it can be established that water production in December was high as compared to other months, in the month of November 2011, total water production was 53,773m<sup>3</sup>, water available for sale was 47,773m<sup>3</sup>, water consumed was 15,234m<sup>3</sup> while UFW was 32,539m<sup>3</sup>; in the month of December 2011, total water production was 76,823m<sup>3</sup>, water available for sale was 74,823m<sup>3</sup>, water consumed was 22,356m<sup>3</sup> while UFW 52,467m<sup>3</sup>; in month of January 2012, total water production was 52,869m<sup>3</sup>, water available for sale was 46,869m<sup>3</sup>, water consumed was 17,765m<sup>3</sup> while UFW was

29,104m<sup>3</sup>; and finally in the month of February 2012 total water production was 50,294m<sup>3</sup>, water available for sale was 44,294m<sup>3</sup>, water consumed was 18,666m<sup>3</sup> while UFW was 25,628m<sup>3</sup>, therefore, on average monthly water consumption in the Municipality was established to 19,596m<sup>3</sup> per month. It was also found out that the amount of Water consumed in the month of December is slightly higher because of the increased consumption of water which is as a result, of festivities carried out in December. However, the amount of unaccounted for water (UFW) is fairly high in the Municipality which can be due to frequent break down and leakages.

The study also established that across the year, the amount of water produced and total amount of water for sale is normally high than water consumed. This therefore implies that amount of water consumed in the Municipality is still low; this was attribute to low number of population connected to piped water system. Therefore, there is need for the service providers to strategize ways of increasing water consumed in order to match water available for use. This will assist in curbing wastage in terms of leakages due to pressure and water that is unaccounted for. When asked why the UFW value was high, the Customer Service Manager said;

*‘one of the reason is high rate of leakages due to high water pressure. Another reason is vandalism of water infrastructure’*

Furthermore, the Customer Service Manager said that the major challenge that the water board faces is demand management at consumer level. This finding affirms the claim that unaccounted for water is a problem in water sector of the developing countries (Coppel and Klaass, 2011).

### 4.2.3 Water collection responsibilities at household

Water collection is part of a gender division of labour reflecting gender inequality within households. Therefore, when respondents were asked who collects water, majority of the respondents said they are females who mainly collect water as demonstrated in the Table 4.4.

**Table 4.4: Water collection responsibilities at household**

|                          | <b>Frequency</b> | <b>Percent</b> |
|--------------------------|------------------|----------------|
| Mother                   | 69               | 34.7           |
| Daughters                | 34               | 17.1           |
| Sons                     | 7                | 3.5            |
| Father                   | 3                | 1.5            |
| House help/worker        | 55               | 27.6           |
| mother & daughter        | 18               | 9.0            |
| mother, daughters & sons | 13               | 6.5            |
| <b>Total</b>             | <b>199</b>       | <b>100.0</b>   |

From Table 4.4, 34.7% of the respondents said that its mothers who collect water, 27.6% said house help/worker, 17.1% said its daughters who collect water, 3.5% said sons and only 1.5% said father. While 9% of the respondents said its both mother and daughter who collects water; and the remaining 6.5% said that its mother, daughters and sons who collects water. It can be deduced that water collection is mainly done by female (mothers and daughters) therefore suggesting that women spend more time than men collecting water. The UNICEF/WHO (2011) report on Drinking Water Equity, Safety and Sustainability indicates that the household without access to safe drinking water on the premises, women and girls have the primary responsibility of collecting water. One of the benefits of improved access to water is in saving time for women and in expansion of women's choices. The burden of fetching water leads to exhaustion reduces the time available

for rest, child care and income generation as well as limits the scope for women to take advantage of market opportunities.

#### 4.2.4 Frequency of Water Collection per Day by Households

When respondents were asked to state how often they collected water for household use in a day, majority (22.6%) said they collect more than five times per day; this is as illustrated in the Table 4.5 below.

**Table 4.5: Frequency of water collection per day by households**

|                              | <b>Frequency</b> | <b>Percent</b> |
|------------------------------|------------------|----------------|
| Twice per day                | 40               | 20.1           |
| Three times per day          | 35               | 17.6           |
| Four times per day           | 42               | 21.1           |
| Five times per day           | 24               | 12.1           |
| More than five times per day | 45               | 22.6           |
| Irregular                    | 13               | 6.5            |
| <b>Total</b>                 | <b>199</b>       | <b>100.0</b>   |

From Table 4.5, 22.6% said that they collect water more than five times per day, 21.1% said four times per day, 20.1% said twice per day, 17.6% said three time per day and only 12.1% said five times per day while the remaining 6.5% said that they collected irregularly. This is due to the fact that some respondents had water storage facilities which enabled them not to fetch the commodity every day. As a result, it can be deduced that more than 40% of the respondents collect water four times per day using 20 litre jerry cane, suggesting that those who consume more water depends on their household needs.



#### 4.2.5 Amount of water collected per trip per day

It was important to establish the amount of water collect per trip per day, therefore, respondents were asked to state the amount of water collected in liters per trip per day and the findings are as illustrated in Table 4.6.

**Table 4.6: amount of water collected per trip per day**

|                     | <b>Frequency</b> | <b>Percent</b> |
|---------------------|------------------|----------------|
| 10 litres           | 5                | 2.5            |
| 20 litres           | 102              | 51.3           |
| more than 20 litres | 78               | 39.2           |
| Don't know          | 14               | 7.0            |
| <b>Total</b>        | <b>199</b>       | <b>100.0</b>   |

From Table 4.6, 51.3% of the respondents said that they collect 20 litres of water per trip per day, 39.2% said they collect more than 20 litres per trip per day and only 2.5% said 10 litres per trip per day while the remaining 7% could not estimate the amount because they collect using various containers. This findings show that majority (51.3%) of the respondents collect at least 20 litres of water per trip.

#### 4.3 Contributions of PPP Approach in improving Water supply and sanitation services accessibility in the Municipality

The second objective of the study was to investigate the contribution of PPP approach in improving water and sanitation services in Busia Municipality. The driving force of adopting PPP approach in water sector was to improve accessibility to improved water and sanitation services. This objective was measured by looking at the following attributes: water sources, distance to water points from the household before and after

PPP approach, type of toilet facilities used by household, garbage collection, water supply problem and rating Municipal sewerage services.

#### 4.3.1 Water sources from which households collect water

When respondent were asked from which water source they do collect water for their domestic use, they gave various sources ranging from a single source to multiple sources as illustrated in the Table 4.7.

**Table 4.7: water sources from which households collect water**

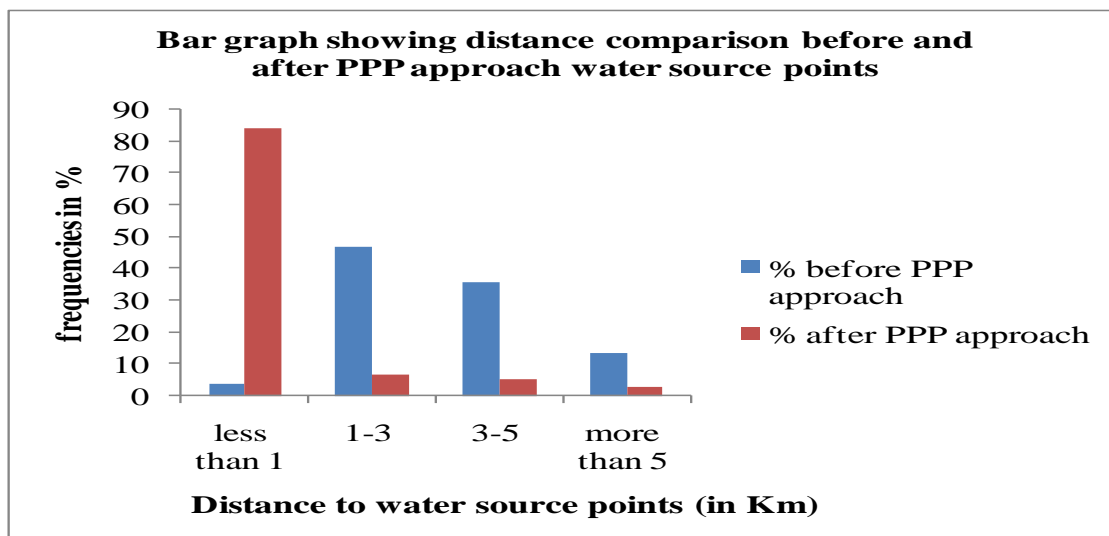
|                              | <b>Frequency</b> | <b>Percent</b> |
|------------------------------|------------------|----------------|
| Piped water                  | 43               | 21.6           |
| Borehole                     | 27               | 13.6           |
| Protected well               | 42               | 21.1           |
| River                        | 13               | 6.5            |
| Water kiosks                 | 20               | 10.1           |
| Piped water & borehole       | 11               | 5.5            |
| Borehole & water kiosks      | 16               | 8.0            |
| Piped water & protected well | 6                | 3.0            |
| Protected well & water kiosk | 17               | 8.5            |
| River & water kiosks         | 4                | 2.0            |
| <b>Total</b>                 | <b>199</b>       | <b>100.0</b>   |

From Table 4.7, 21.6% of the respondents reported that piped water was the main source of water, 21.1% reported to use protected well, 13.6% said that they use borehole water, 10.1% use water kiosks and 6.5% get their water from the river. However, other reported to use more than one water source. 8.5% reported to get water from both protected well and water kiosks, 8% from both borehole and water kiosks, 5.5% from both piped water and borehole, 3% from both piped water and 2% from both river and water kiosks. As result, it can be established that the common water source in Busia Municipality is piped water suggesting that the PPP approach have made water

connection process faster hence more residents have access to improved water source since the piped is classified as improved water source according to W.H.O standard. This finding confirms those of Tati (2005) who found out that once the private management takes part in water supply operation, water connection becomes faster and improves performance. For those who use multiple sources cited different reasons that force them to have alternative sources. Respondents argued that at times boreholes and protected well give them dirty water hence force them to go for piped water. Others thought that water from borehole, protected well and river is unsafe hence they only use it for laundry work and get piped for drinking and cooking. However, it can be revealed that residents of Busia have not explored other alternative waters source especially rain water harvesting despite the fact the region more specifically the Municipality receive adequate amount of rainfall throughout the year.

#### **4.3.2 Household distance to water points before and after PPP approach.**

For the purpose of comparison, it was important to establish the distance before and after PPP approach was introduced in water sector, therefore respondents were asked to estimate the distance to water source point by then and the current distance, hence their response were as illustrated in Figure 4.9.



**Figure 4.9: Household distance to water points before and after PPP approach.**

Majority (84.4%) of respondent estimated the distance to water source point from the household after PPP approach to be less than 1km as compared to only 8% who estimated the distance to be less than 1km before PPP approach, this reveals that there had been a major improvement in reducing distance walk by resident to collect water, 7% estimated the distance in a range of 1-3 km after the PPP approach as compared to 46.7 % before the PPP approach, 35.7% estimated the distance to be between 3-5 km before PPP as compared to 5.5% after PPP approach, and 13.6% said the distance was more than 5 km before the PPP approach as compared to only 3% who said the distance is more than 5 km after the PPP approach. From the data it can be established that majority of residents don't walk a long distance looking for water and they are within recommended distance by the international community which is less than 1km walking distance. The global assessment criterion has defined 'reasonable access' as the availability of at least 20 litres per person per day from a source within a kilometer from the dwelling (WHO, 2001). According to UNICEF (2004) access to water is defined as having regular access to 20

litres of water per person per day within 1 km of the house from an improved source. Therefore, this data reveals that majority (84.4%) of the resident within the Municipality have a reasonable access to water point hence it can be argued out that the approach has contributed to enhancing water accessibility in the study area. This finding is in support of views of Naren (2006), who holds that partnership approach in water sector enhances accessibility and improves quality of service delivery.

Before PPP approach was initiated, most residents used to travel for one kilometer and above to look for water, however, after the PPP approach was put in place, the distance of access to water reduced drastically as some managed to secure piped water in places of their residence, while others accessed water from kiosks which are near their places of residence. Furthermore, although PPP approach has significantly improved access to quality water as well effective sanitary services, there is still work to be done in order to ensure that no resident of the municipality access quality water beyond a kilometer.

#### **4.3.3 Time taken to collect one round trip of water**

When respondents were asked to estimate time taken to collect one round trip, majority of respondent said that they took less than 1 hour as shown in Table 4.8.

**Table 4.8: Time taken to collect one round trip of water**

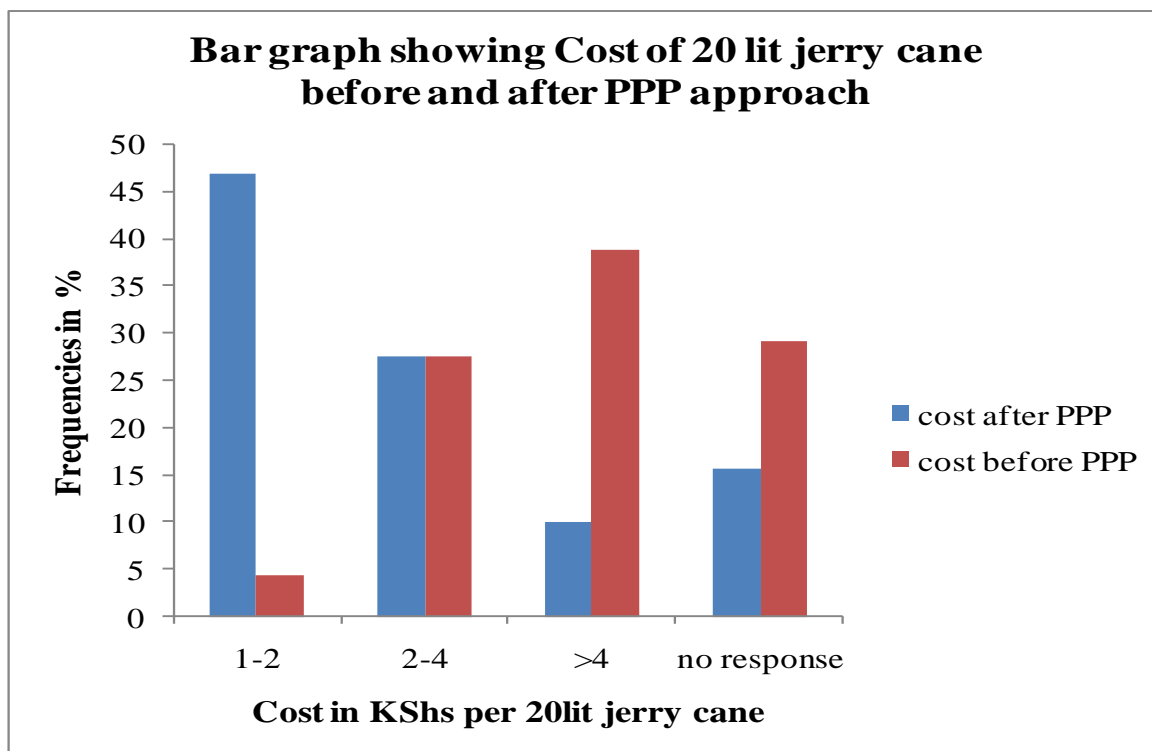
| <b>Time</b>  | <b>Frequency</b> | <b>Percent</b> |
|--------------|------------------|----------------|
| < 30 min     | 63               | 31.7           |
| 30min-1hr    | 104              | 52.3           |
| 1hr-2hrs     | 14               | 7.0            |
| Don't know   | 18               | 9.0            |
| <b>Total</b> | <b>199</b>       | <b>100.0</b>   |

From Table 4.8, 31.7% of the respondent said they take less than 30min to fetch one round trip of water, 52.3% said they took 30min-1hour to fetch one round trip of water, 7% said they took about 1hour-2hours while the remaining 9% of the respondent were unable to estimate the time taken to collect one round trip of water. This suggests that majority of the respondents in the Municipality spends less than one hour to collect water imply that they are within the recommended standards by the international organization.

These findings are similar with findings in section 4.3.2 (distance covered to water point) since majority admitted that after the introduction of PPP approach, distance to water point drastically reduced which also affects time taken. The shorter the distance, the lesser time taken to access water. As a result, residents can have enough time to participate in other developmental activities than before PPP approach was initiated because a lot of time was dedicated to accessing quality water services.

#### **4.3.4 Cost of water before and after PPP approach**

When respondent were asked how much it cost 20 litres jerry cane before and after the PPP approach, 46.7% of the respondent reported that there has been a drop in the cost from five shilling to two shilling as shown in Figure 4.10.



**Figure 4.10 cost of water before and after PPP approach**

From Figure 4.10, before the PPP approach 20 litres jerry cane the cost was more than four shillings as compared to two shillings after the PPP approach. Only 10.1% reported that after PPP approach, the cost was more than four shillings and they argued that it especially during the time when there was a breakdown or water shortage which rarely occurs. Those who said that the cost was two shilling were asked why it was that low, they said that since the PPP approach came into operation the water supply was more than the consumption.

#### **4.3.5 Type of toilet facilities used**

Toilet facilities are very crucial sanitation service and play useful role in assisting to reduce disease infection especially water borne diseases. Therefore, it was deemed necessary to finding out the type of toilet facilities in Busia Municipality and

respondent's opinion concerning general sewerage services in the area. Table 4.9 illustrates the type of toilet facilities as highlighted by the respondent.

**Table 4.9: Type of toilet facilities used**

|                            | <b>Frequency</b> | <b>Percent</b> |
|----------------------------|------------------|----------------|
| Flash toilet               | 37               | 18.6           |
| VIP latrine                | 37               | 18.6           |
| PIT latrine                | 90               | 45.2           |
| Covered latrine            | 26               | 13.1           |
| Uncovered latrine          | 3                | 1.5            |
| Flash toilet & PIT latrine | 6                | 3.0            |
| <b>Total</b>               | <b>199</b>       | <b>100.0</b>   |

From the Table 4.9, it can be established that the common type of toilet facilities in the Busia Municipality is PIT latrine as the majority (45.2%) of the respondent reported, 18.6% said they use flash toilet and VIP latrines each, 13.1% use covered latrine, 3% said they both flash toilet and PIT latrine while the 1.5% reported to use uncovered latrine. As result, it can be deduced that very few people in the Municipality are connected to the sewerage network system since about 20% of the respondent use flash toilets which requires sewerage connection or septic tanks. This is a clear indication that sewerage system in the area is not spread. It can be deduce that PPP approach has not extended the sewerage system to the majority of estates in the Municipality. This is confirmed by views of residents in Marachii, Mauko and Bulanda who reported that they are not connected to the sewer system. Furthermore, some respondents who use flash toilets in the municipality said that they use septic tanks because the sewer system is not near their



residential areas. One landlord gave the following views in relation to the sewerage system in the municipality;

*‘I don’t find the sewerage system of the council as much important because their network is far away from our area of residence which makes connection to their line very costly.*

*This is why I opted for septic tank in that when it is filled, I just seek services of those who can empty the tank for me’.*

Therefore this opinion further validates the fact that sewerage system in the municipality is still active in the Central Business District but has not widened its scope to other estates within the municipality.

#### **4.3.6 Opinion on existing toilet facilities**

When respondents were asked whether they were satisfied with the type of toilet facilities they used, majority (63.8%) of the respondent said they were satisfied as indicated in Table 4.10.

**Table 4.10: Opinion on existing toilet facilities**

|              | <b>Frequency</b> | <b>Percent</b> |
|--------------|------------------|----------------|
| Satisfied    | 127              | 63.8           |
| Dissatisfied | 64               | 32.2           |
| No opinion   | 8                | 4.0            |
| <b>Total</b> | <b>199</b>       | <b>100.0</b>   |

From Table 4.10, 63.8% said they were satisfied with the toilet facilities they were using, 32.2% said they were not satisfied whereas the remaining 4% had no opinion regarding the type of the toilet facilities they were using. As a result, it can be deduced that the

majority of residents in Busia Municipality had no problem with the type of toilet facilities existing in the Municipality. However, those who said that they were dissatisfied with it due to conditions of those toilet facilities were in especially during rainy season. They argued the landlords never repair the latrine and poorly situated in that they are adjacent to the boreholes or wells hence high chances of contamination of water sources.

#### 4.3.7 Municipal sewerage services rating

Sewerage service key in controlling the spread of water health related problems in any society, thus when respondents were asked to rate the sewerage services in the Municipality, majority (38.7%) of the respondents reported that the services were bad as illustrated in Table 4.11.

**Table 4.11: Rating of Municipal sewerage services**

|              | Frequency  | Percent      |
|--------------|------------|--------------|
| Best         | 5          | 2.5          |
| Good         | 25         | 12.6         |
| Fair         | 64         | 32.2         |
| Bad          | 77         | 38.7         |
| Worse        | 28         | 14.0         |
| <b>Total</b> | <b>199</b> | <b>100.0</b> |

From Table 4.11, 38.7% of the respondents rated the sewerage services of the Municipal as bad, 32.2% rated the services as fair, 14.0% rate it as worse, and 12.6% rated the services as good, while the remaining 2.5% rated it to be best. It can be deduced that 50% of the respondent rated the sewerage services to be bad suggesting that they are not satisfied with sewerage services in the Municipality despite the PPP approach being in

use for some time now. They blamed the Municipality and the companies for being irresponsible in carrying out the duties pertaining sanitation services for instance trench were either inexistence or closed in most estates as illustrated in Plate 2.



**Plate 2: Site where there is no sewer line in operation in the Municipality**

(Source: Author, 2012)

As evidenced in Plate 2, it can be deduce that living condition in the Municipality is poor since the estate lacks proper function sewerage system and is coupled with poor housing in the area which is likely to hinder expansion of the sewerage network to the affected place. Such living condition exposes the resident to health problems especially water related health problems such as cholera and typhoid.

#### **4.3.8 Household Waste disposal**

It was important to know how household dispose of solid waste generated, therefore, respondent were asked how they disposed off solid waste and majority of them said they dump anyway within their residential areas as demonstrated in Table 4.12.

**Table 4.12: Household solid waste disposal method**

|                           | <b>Frequency</b> | <b>Percent</b> |
|---------------------------|------------------|----------------|
| Collected by municipal    | 13               | 6.5            |
| Collected by private firm | 6                | 3              |
| Burning                   | 86               | 43.2           |
| Dumping                   | 94               | 47.2           |
| <b>Total</b>              | <b>199</b>       | <b>100.0</b>   |

From the responses obtained, 47.2% of the respondents said that they dump their waste anywhere, 43.2% said they burn, 6.5% said that waste is collected by the Municipal worker while the remaining 3.1% said it's collected by private firms. It was found out that there was no designate place for waste disposals for the households in the Municipality. Thus this suggests that existing waste management system in the Municipality encourages disposal of solid waste within residential vicinity consequently promoting pollution within Municipality.

#### **4.4 Enhancing quality of service delivery in water supply and sanitation services through PPP Approach**

The third objective of the study was to establish the contribution of PPP approach in enhancing quality of service delivery in water supply and sanitation services in Busia Municipality. In order to test this, the study looked at whether if there exist a partnership between government and private sector, service comparison before and after PPP approach, service improvement, kind of improvement, opinion on level of service enhancement, service continuity and garbage collection.

#### 4.4.1 Awareness about existence of partnerships in water sector.

When respondents were asked if there was any partnership between the government and private sector providing water and sanitation services to the residents of Busia Municipality majority (61.8%) said YES while 38.2% said NO as shown in Table 4.13.

**Table 4.13: Awareness about existence of partnerships in water sector**

|              | <b>Frequency</b> | <b>Percent</b> |
|--------------|------------------|----------------|
| Yes          | 123              | 61.8           |
| No           | 76               | 38.2           |
| <b>Total</b> | <b>199</b>       | <b>100.0</b>   |

From Table 4.13, majority (61.8%) of the respondent were aware about the existence of partnership between the government and private sector, suggesting that they were aware of PPP approach in water sector as advocated in the Water Act 2002. However, majority were unable to identify exact number of the partnership. In fact majority confused the China's Company that were contracted to construct and rehabilitate the water supply and sanitation network system to be service provider. They reported that since the china water coming to the Municipality they no longer experience water problems since they were many water kiosks from which they could buy water. There is need therefore for the water service providers to provide education and trainings to the residents so that they can be aware of their services which among them include provision of quality water as well as effective sewerage systems.

#### 4.4.2 Opinion on if PPP approach has resulted in service improvement

The introduction of partnership approach in water sector was aimed at improving service delivery to customers. When the respondents were asked about service improvement through partnership approach, majority (80.9%) said YES while only 19.1% said that the approach had not resulted to any improvement. This is as shown in Table 4.14.

**Table 4.14: Opinion on if PPP approach has resulted in service improvement**

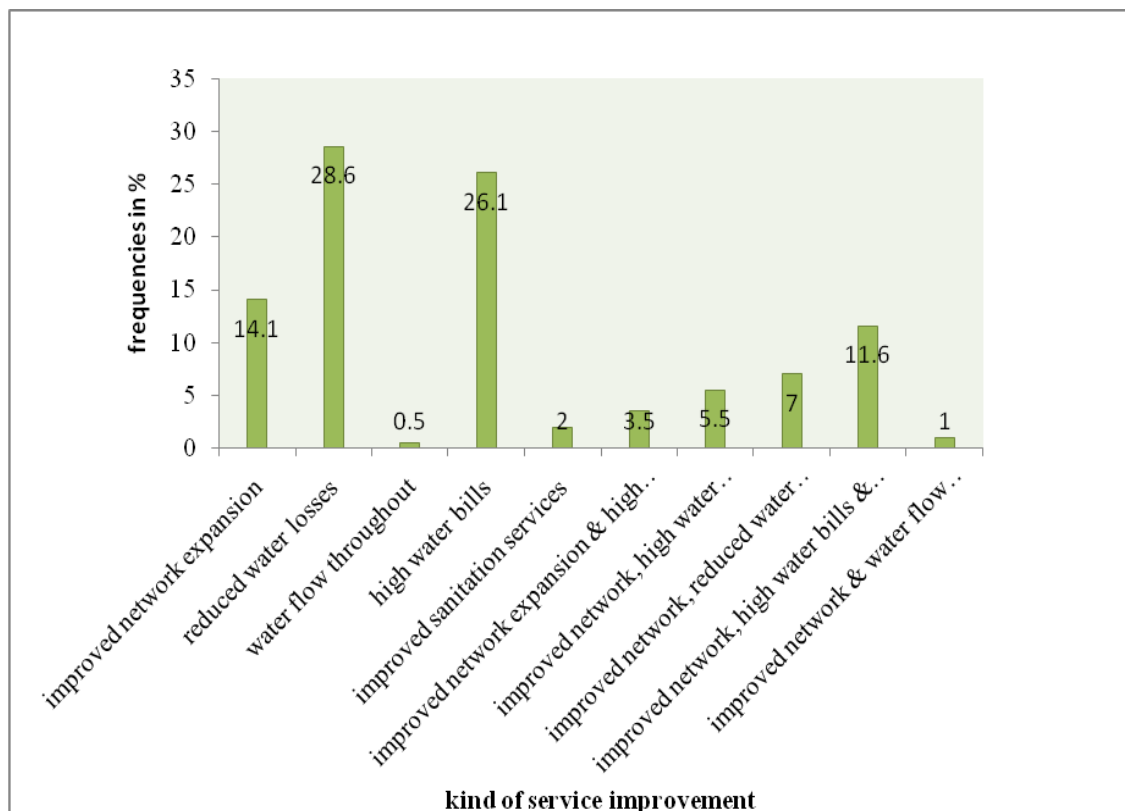
|              | <b>frequencies</b> | <b>percentages</b> |
|--------------|--------------------|--------------------|
| Yes          | 161                | 80.9               |
| No           | 38                 | 19.1               |
| <b>Total</b> | <b>199</b>         | <b>100</b>         |

This data finding indicates majority (80.9%) of water consumer appreciate that partnership approach has resulted to service improvement especially in network system expansion and reduced water losses as shown in section 4.4. The study established that increment of water kiosks in the municipality; expansion of tap water to the residents in the municipality and expansion of sewer system were among the factors that made majority of the respondents who are residents of the municipality to confirm that PPP approach has improved service delivery. This finding is consistent with the argument of Obosi (2011) that the provision of water services improves under private sector than it could have been under public ownership alone.

#### 4.4.3 Service improvement through PPP approach in water sector

As stated earlier, service improvement was the core drive of introducing partnership approach in water sector, the study found out those water costumers highlighted various

kinds of service improvements in the water sector since the introduction of partnership approach as illustrated in Figure 4.12.



**Figure 4.12: Service improvement through PPP approach in water sector**

From Figure 4.12, majority (28.6%) of the respondents reported that PPP approach has resulted to reduced water losses, 26.1% said that it resulted to high water bills, 14.1% said that it had resulted to improved network expansion, 2% said that it lead to improved sanitation services, and only 0.5% reported that it had resulted to water flowing throughout. Note that other respondents gave more than one response: 11.6% said that the approach resulted in the improved network, high water bills and reduced water losses, 7% said that it resulted to improved network expansion, reduced water losses and high water

bills; 5.5% said that the approach resulted in improved network, high water bills and frequent checks-up and repair; 3.5% reported that the approach resulted in the improved network expansion and high water bills; and only 1% reported that the approach resulted in improved network expansion and water flow throughout. This finding, therefore, indicates that majority of the respondents appreciate that PPP approach has resulted to diverse range of improvement ranging from network expansion to reducing water losses. However, they also complain that the approach also resulted to the high water bills consequently affecting its accessibility which compels them to rely on the other alternative water sources which could not be safe (for instance, fetching water from rivers).

#### **4.4.4 Whether PPP approach is appropriate in provision of water supply and sanitation services**

When respondents were asked if PPP approach was appropriate in provision of water and sanitation services, majority 88.9% agreed that the approach is appropriate as illustrated in Table 4.15.

**Table 4.15: Whether PPP approach is appropriate in provision of water and sanitation services**

|                 | <b>Frequency</b> | <b>Percent</b> |
|-----------------|------------------|----------------|
| Appropriate     | 177              | 88.9           |
| Not appropriate | 22               | 11.1           |
| <b>Total</b>    | <b>199</b>       | <b>100.0</b>   |

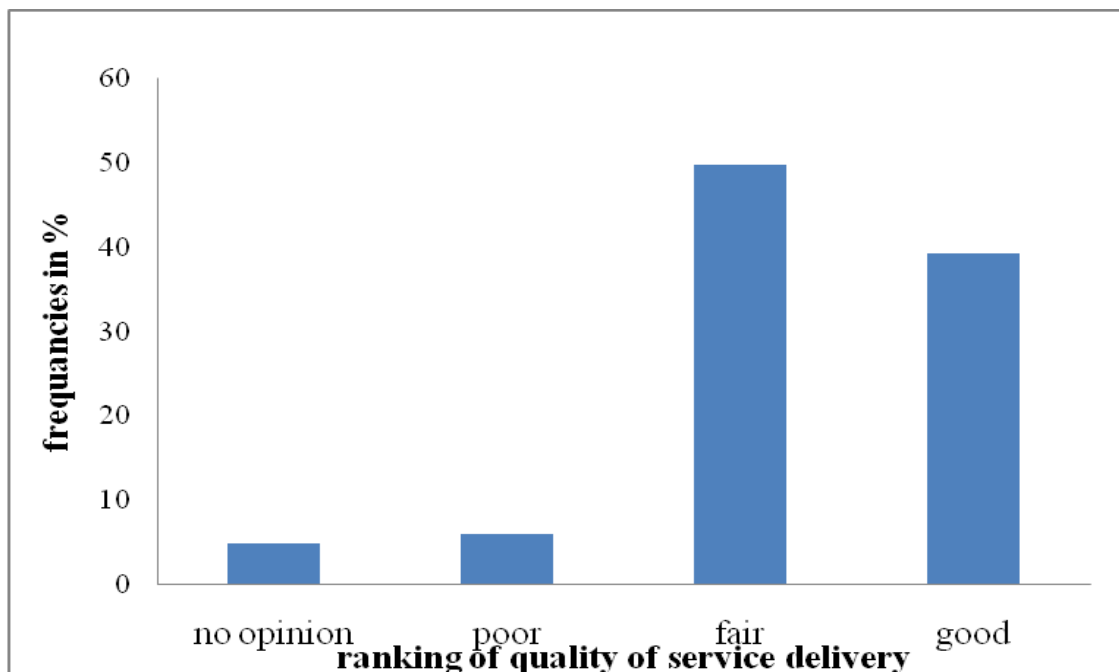
From Table 4.15 only 11.1% said that the approach is not appropriate mechanism of water provision. Those who agree that the approach is appropriate argued that the approach brings on board all stakeholders in water sector including the consumer in



decision making process. They further said that involving private sector in water sector brings in better management skills and financial resources necessary in network expansion. Furthermore, the approach has enabled residents to access quality services that were unavailable before PPP approach was put in place. This study finding is contrary to those of Hukka and Katko (2003) who holds that full privatization as a way of reforms in water sector is by many as undesirable and unnecessary. However, those who said no to this approach hold that since the invitation of private sector to water sector has resulted to water becoming expensive especially water bills hence making it unaffordable for most households in the Municipality. These findings are consistent with the argument of Collignon and Vezin (2000) that the manner in which PPP are being carried out reveals that the agenda is commercial rather than service oriented due to high water bills complains.

#### **4.4.5 Ranking quality of service delivery in water sector through PPP approach**

Households were asked to rank the quality of service delivery in water sector through PPP approach and majority said that the service were good as illustrated in Figure 4.13.



**Figure 4.13: PPP service delivery quality ranking**

From Figure 4.13, 39.2% ranked the quality of service delivery as good, 49.7% said the services were fair and 6% ranked services as poor while remaining 5% had no opinion. As a result, almost half of the respondent ranked the quality of service delivery through PPP approach to be fair just as majority that the approach is appropriate as indicated in Figure 4.13. This is because looking at the previous records reveals that water services were poorly provided by the public sector that targeted the rich class at the expense of the poor who were majority. It was established that the level of water leakages and frequent repair had reduce and increased respectively in most estates.

#### 4.4.6 The extent to which PPP approach has enhanced quality of service delivery in water sector

When respondents were asked to what extent the PPP approach has resulted in enhancing quality of the service delivery, majority said the extent is fair as illustrated in Table 4.16.

**Table 4.16: Extent to which PPP approach has enhanced quality of service delivery in water sector**

|              | <b>Frequency</b> | <b>Percent</b> |
|--------------|------------------|----------------|
| Very good    | 14               | 7.0            |
| Good         | 86               | 43.2           |
| Fair         | 88               | 44.2           |
| Bad          | 5                | 2.5            |
| Very bad     | 6                | 3.0            |
| <b>Total</b> | <b>199</b>       | <b>100.0</b>   |

From Table 4.16 above it can be establish that 44.2% of the respondent said that PPP approach was doing fairly good in enhancing quality of service delivery, 43.2% said good, 7% said very good, 3% said that it doing very bad while remaining 2.5% said bad. This finding reveals that above 40% of the respondent said the extent of enhancing quality of service delivery was fair meaning they were happy with the changes occurring in the water sector under the PPP approach mechanism.

**Table 4.17: Across tabulation between whether PPP approach has resulted in services improvement and the extent of PPP approach in enhancing quality of service delivery in water supply and sanitation services.**

| <b>Whether PPP approach has resulted in service improvement * extent of PPP approach in enhancing quality of service delivery in HO<sub>2</sub> supply and sanitation services</b> |     |            |   |       |       |      |          |        |
|--|-----|------------|---|-------|-------|------|----------|--------|
|  |     |            | extent of PPP approach in enhancing quality of service delivery |       |       |      |          | Total  |
|  |     |            | very good   | good  | fair  | bad  | very bad |        |
| Whether PPP approach has result in service improvement   | yes | Count      | 11  | 77    | 71    | 2    | 0        | 161    |
|  |     | % of Total | 5.5%  | 38.7% | 35.7% | 1.0% | 0%       | 80.9%  |
|  | no  | Count      | 3   | 3     | 6     | 9    | 17       | 38     |
|  |     | % of Total | 1.5%  | 1.5%  | 3.0%  | 4.5% | 8.5%     | 19.1%  |
| Total  |     | Count      | 14  | 80    | 77    | 11   | 17       | 199    |
|  |     | % of Total | 7.0%  | 40.2% | 38.7% | 5.5% | 8.5%     | 100.0% |

$$X^2 = 35.035, df = 4, \text{sign. value} = 0.000$$

A cross tabulation between whether PPP approach has resulted in service improvement and the extent of PPP approach in enhancing quality of service delivery in water supply and sanitation service was carried out to establish whether there was any relationship between the variables. Findings from the cross tabulation show that among the respondents (80.9%) who said that PPP approach has resulted in service improvement 5.5% rated the extent of enhancing quality of service delivery to be very good, 38.7% said it was good, 35.7% said it was fair and 1% said it was bad. Although some of the respondents (19.1%) said that PPP approach had not resulted in the service improvement but they still recognized that the approach had enhanced quality of service delivery to a smaller extent. 1.5% of those who said no, argued that the extent of enhancing quality

was very good, another 1.5% said it was good, 3% said it was fair, 4.5% said the extent is bad while the remaining 8.5% said it was very bad.

Findings from this cross-tabulation indicate that there is a significant relationship between whether PPP approach has resulted in service improvement and the extent of PPP approach in enhancing quality of service delivery in water supply and sanitation service. This is attested by the p value being less than the significance value ( $0.000 < 0.05$ ). This therefore implies that the PPP approach has enhanced the quality of service delivery in water supply and sanitation services.

#### **4.4.7 Garbage collection within Municipality**

When the respondents were asked if there were satisfied with garbage collection services within the Municipality majority of them said they were unsatisfied as illustrated in Table 4.18.

**Table: 4.18: Garbage collection within Municipality**

|              | <b>Frequency</b> | <b>Percent</b> |
|--------------|------------------|----------------|
| Satisfied    | 44               | 22.1           |
| Unsatisfied  | 116              | 58.3           |
| don't know   | 39               | 19.6           |
| <b>Total</b> | <b>199</b>       | <b>100.0</b>   |

Garbage collection in Busia Municipality is poor as highlighted by the resident, 58.3% said that they were not satisfied with garbage collection, 22.1% said they were satisfied while the remaining 19.6% were unable to state their position. This finding reveals that garbage collection services within the Municipality are still a challenge. The respondents cited poor organization by the Municipality authority have contributed to this problem

since the authority is only interested in levy collection without reciprocating with improving garbage collection services.

In an interview with one businessman in Busia town over garbage collection, he said; *'hawa watu wa council hakuna kitu wanafanya kabisa. Kazi yao ni pesa lakini takataka imejaa town yote'* (that this municipal people only demand money but their services are very poor.)



**Plate 3: Garbage left uncollected in Municipality**

**(Source: Author, 2012)**

From plate 3, it was evident that sanitary conditions with regard to water supply and use in the Municipality are extremely poor. Solid waste disposal was found to be a major environmental problem in the area. The Municipality normally has inadequate equipments and tends to provide services that are unreliable. This has thus resulted into solid waste in many estates to be left uncollected for long times exhibiting unusual characteristics of smell and blocking the sewer line as depicted in above photograph taken in Marachii estate.

#### 4.5 Incidences of household water related health problems in the Municipality

The fourth objective of the study was to establish relationship between water sources and incidences of household water related health problems in Busia Municipality. This was analyzed by looking at the following variables: whether the household treats water, water treatment methods, type of health problems, and frequency of household suffering from water related health problem.

##### 4.5.1 Whether Respondents Treat Water for Household Consumption

When respondents were asked to state whether they treat water for household consumption, it was found that majority (59.8%) said YES as shown in Table 4.19.

**Table 4.19: whether Respondents Treat Water for Household Consumption**

|              | Frequency  | Percent      |
|--------------|------------|--------------|
| Yes          | 119        | 59.8         |
| Sometimes    | 27         | 13.6         |
| No           | 53         | 26.6         |
| <b>Total</b> | <b>199</b> | <b>100.0</b> |

From the above findings, 59.8% treat their water, 13.6% said that they sometimes treat their water while the remaining 26.6% do not treat their water. As a result, it is clear that most of the respondent use treated water. This is because Busia Municipality has in recent past reported incidences of water health related problems and therefore most residents do take precautions by treating their water. However, few still use raw (untreated) water due to various reasons which have been explained in section 4.5.2. Furthermore, it was established that residents sometimes do not treat their water for

consumption because they assume that water providers do treat water before it is being released to them and therefore it is safe.

#### 4.5.2 Reasons for not treating water

When respondents were asked why they don't treat water for household consumption, they gave various reasons as shown in Table 4.20.

**Table 4.20 Reasons for not treating water**

|                                       | <b>Frequency</b> | <b>Percent</b> |
|---------------------------------------|------------------|----------------|
| I don't think it's necessary          | 27               | 13.6           |
| I can't afford it                     | 2                | 1.0            |
| I don't know how to do it effectively | 11               | 5.5            |
| I only use potable water              | 13               | 6.5            |
| Not applicable                        | 146              | 73.4           |
| <b>Total</b>                          | <b>199</b>       | <b>100.0</b>   |

From Table 4.20, majority (73.4%) of the respondent said it's not applicable because they treat water, 13.6% said that they don't think it's necessary, 1% said they cannot afford treatment, 5.5% said they don't know how to do it effectively while remaining 6.5% said they only use potable water. Some respondents said that they don't think it was necessary for them to use treated water because they believe that raw water is safe and that treating water is like adding chemicals which is harmful. In an interview with one old man over the reasons for not treating water, he said

*'sisi zamani hatukujua maneno ya madawa kuweka kwa maji na hakuna binadamu aliyekuwa mgonjwa kwa sababu ya maji. Hii madawa imekuja na wazungu kuutuungamiza....'* (That from time immemorial we did not know about chemicals for treating water yet nobody got sick due to using raw water. These water treatment chemicals have been brought by colonials to finish us).

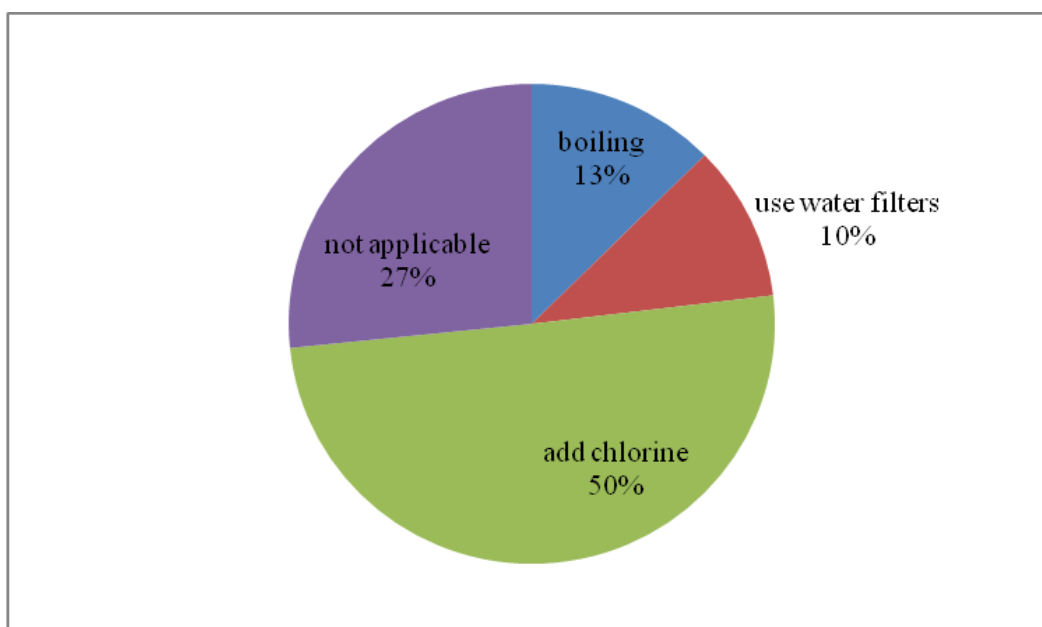
From the above sentiments it is clear that some of the respondents have negative attitude towards water treatment which therefore makes it hard to reduce water health related



problems as well as promoting the use of portable water amongst households. It was also established that water treatment chemicals being expensive for some households was the reason why they use raw water while others argued that they don't know how to treat water effectively hence need to promote awareness and sensitize households on the methods of water treatment.

#### 4.5.3 Respondent's water treatment method

Water treatment is very crucial in reducing water health related problems. When respondents were asked to state the various methods used in treating water, it was established that majority (50%) use chlorine as shown in Figure 4.14.



**Figure 4.14: Pie-chart showing respondent's water treatment method**

Findings from Figure 4.14 suggest that 50% said that they use chlorine, 10% use water filters, 13% boil water while the remaining 27% do not treat their water and therefore this section did not apply to them. As the result reveals, most households use chlorine for

treating water because according to them chlorine is faster and easy to administer than any other method. It was also established that boiling water takes long time and use either charcoal or firewood as source of energy to boil water.

#### 4.5.4 Respondent's Water related health problem suffering

When respondents were asked whether if any of household members have suffered from the water-related health problems in the last month, majority (68.3%) said they had not as shown in Table 4.21.

**Table 4.21: Whether respondents have suffered from water related health problem**

|              | Frequency  | Percent      |
|--------------|------------|--------------|
| Yes          | 63         | 31.7         |
| No           | 136        | 68.3         |
| <b>Total</b> | <b>199</b> | <b>100.0</b> |

From the above table, 68.3% reported that none of their household member suffered from water related health problems while the remaining 31.7% said that they have suffered from water related health problem. This different in suffering can be attributed to the fact majority of household in Busia Municipality use treated water as indicated in Table 4.18. This concurs with findings reported by Onyango and Angienda (2010) in their study about epidemiology of waterborne diarrhoeal diseases among children aged 6-36 month old in Busia-Western Kenya, that domestic drinking water treatment reduces prevalence of waterborne diseases especially diarrhoeal. Therefore, it can be concluded that water treatment assist in reducing incidences of water related health problems among the household.

#### 4.5.5 Type of water related health problem

Since it was established that 31.7% agreed that for the past one month, there have been water health related problems, the study further sought to identify types of water related health problems. As a result, majority (14.6%) said that typhoid was the main water related health problem as shown in Table 4.22.

**Table 4.22: Type of water related health problems**

|                | <b>Frequency</b> | <b>Percent</b> |
|----------------|------------------|----------------|
| Typhoid        | 29               | 14.6           |
| Cholera        | 6                | 3.0            |
| Dysentery      | 8                | 4.0            |
| Stomach ache   | 20               | 10.1           |
| Not Applicable | 136              | 68.3           |
| <b>Total</b>   | <b>199</b>       | <b>100.0</b>   |

Findings from Table 4.22 suggest that 14.6% suffered from typhoid, 10.1% suffered from stomach ache and 4% suffered from dysentery while the remaining 3% suffered from cholera. Thus, it was established that typhoid was the prevalent and most common water related health problem among residents of Busia Municipality. However, the study did not ascertain whether typhoid was as a result of using unsafe water but findings were dependent on the respondents' opinions. However, despite typhoid being prevalent, it was also established that stomach ache, dysentery and cholera were also available and therefore should not be looked down upon.

#### 4.5.6 Frequency of water related health problem suffering

When respondents who suffered water related health problems were asked to state how often they suffered from the diseases majority (23.1%) said once in a few month as shown in Table 4.23.

**Table 4.23: Frequency of water related health problem suffering**

|                     | <b>Frequency</b> | <b>Percent</b> |
|---------------------|------------------|----------------|
| Once in two weeks   | 11               | 5.5            |
| Once in a month     | 15               | 7.5            |
| Once in a few month | 46               | 23.1           |
| Not applicable      | 127              | 63.8           |
| <b>Total</b>        | <b>199</b>       | <b>100.0</b>   |

From the table above, it was revealed that 23.1% suffered once in a few months, 7.5% once in a month and 5.5% said once in two weeks. The remaining 63.8% have never reported the suffering. However, despite the fact that water related health problem was reported in the Municipality, it occurs occasionally meaning water is not the main cause of these diseases, but there may be other factors.

#### 4.5.7 Whether use of unsafe water is related to incidences of water related health problem

When the respondents were asked if these diseases were related to use of unsafe water, it was established that majority agreed to the statement as shown in Table 4.24.

**Table 4.24: Whether the use of unsafe water is related to incidence of water related health problems**

|                | Frequency  | Percent      |
|----------------|------------|--------------|
| Yes            | 29         | 14.6         |
| Unsure         | 26         | 13.1         |
| No             | 17         | 8.5          |
| Not applicable | 127        | 63.8         |
| <b>Total</b>   | <b>199</b> | <b>100.0</b> |

Findings from Table 4.24 shows that, 14.6% of the respondent said yes, 13.1% were unsure while 8.5% said no. This did not apply to the majority of the respondent because they reported they had not suffered from water related health problem. From the finding, it can be deduced that there is association between the unsafe water use and the aforementioned diseases. This is in line with view of Kevin (2011) that unsafe water use and poor sanitation causes sickness, inability to work and high healthcare expenditure that collectively undermines livelihoods. Therefore, there is need for every stakeholder in water sector to promote sanitation and persuade households to invest in it to achieve the public good benefit. According to World Bank report (2012), access to reliable supplies of safe drinking water and sanitary disposal of excreta are two of the most important means of improving human health and protecting the environment.

#### **4.5.8 A cross-Tabulation between Water sources and Incidences of household water related health problems**

A cross tabulation of water sources and incidences of household water related health problems was carried out in order to establish whether there exists relationships between the variables. Findings have been presented in Table 4.25. Findings on cross-tabulations

show that 4.5% of the respondents who agreed that their household members have suffered from water related health problem for the past one month use piped water as their main source, 6% who use borehole, 5% who use protected well, 3.5% who use rivers and 2.5% who get from water kiosks. For those who reported using more than one source of water, it was established that 2% who agreed that they had experienced water related health problems used both piped water and borehole water sources, 3% used borehole and water kiosks, 1% used piped water and protected 0.5% used river and water kiosks while remaining 3.5% used protected wells and water kiosks. For those using more one source, attributed to water rationing for piped water, high water bills and questionable safety of water from unimproved sources such as Rivers and Wells. When a chi-square test was run for the two variables, the value recorded was 10.058,  $df=9$  and a significant value of 0.346. The significant value is greater than the expected level of confidence (99%) 0.01 ( $0.346 > 0.01$ ). This therefore implies that there is no significant relationship between water sources and incidences of household water related health problems. The findings from cross-tabulation reveals that incidences of water related health problems does not necessarily emanate from water sources but there are other causes which plays a vital role.

**Table 4.25: A Cross-tabulation between water related health problems and water sources**

|                      |                              | water related health problems |              | Total        |               |
|----------------------|------------------------------|-------------------------------|--------------|--------------|---------------|
|                      |                              | Yes                           | No           |              |               |
| <b>water sources</b> | piped water                  | Count                         | 9            | 34           | 43            |
|                      |                              | % of Total                    | 4.5%         | 17.1%        | 21.6%         |
|                      | Borehole                     | Count                         | 12           | 15           | 27            |
|                      |                              | % of Total                    | 6.0%         | 7.5%         | 13.6%         |
|                      | protected well               | Count                         | 10           | 32           | 42            |
|                      |                              | % of Total                    | 5.0%         | 16.1%        | 21.1%         |
|                      | River                        | Count                         | 7            | 6            | 13            |
|                      |                              | % of Total                    | 3.5%         | 3.0%         | 6.5%          |
|                      | water kiosks                 | Count                         | 5            | 15           | 20            |
|                      |                              | % of Total                    | 2.5%         | 7.5%         | 10.1%         |
|                      | piped water & borehole       | Count                         | 4            | 7            | 11            |
|                      |                              | % of Total                    | 2.0%         | 3.5%         | 5.5%          |
|                      | borehole & water kiosks      | Count                         | 6            | 10           | 16            |
|                      |                              | % of Total                    | 3.0%         | 5.0%         | 8.0%          |
|                      | piped water & protected well | Count                         | 2            | 4            | 6             |
|                      |                              | % of Total                    | 1.0%         | 2.0%         | 3.0%          |
|                      | protected well & water kiosk | Count                         | 7            | 10           | 17            |
|                      |                              | % of Total                    | 3.5%         | 5.0%         | 8.5%          |
| river & water kiosks | Count                        | 1                             | 3            | 4            |               |
|                      | % of Total                   | .5%                           | 1.5%         | 2.0%         |               |
| <b>Total</b>         |                              | <b>Count</b>                  | <b>63</b>    | <b>136</b>   | <b>199</b>    |
|                      |                              | <b>% of Total</b>             | <b>31.7%</b> | <b>68.3%</b> | <b>100.0%</b> |

$X^2 = 10.058$ , d.f = 9, sign. Value = 0.346

#### **4.6 Challenges facing PPP approach in water supply**

Interview with the Busia Municipality engineer revealed that limited awareness and technical capacity to undertake PPP approach in water sector is a serious challenge. He argued that this resulted in the implementing agencies not satisfactorily address the water issues especially concerning demand management. The study further found out that inadequate baseline information, lack of clarity on risk sharing and weakness in the

service provision process has contributed to difficulties in getting the approach off the ground. This finding confirms the views that there exist misunderstandings among stakeholders in water sector as reported by Munala & Kainz (2012), in their study about the managing interaction in the informal water markets: the case of Kisumu. Therefore, the study noted that there was need for partners to develop a better understanding of the roles of each of the various actors in order to sustain better service delivery.

It was also found out the inadequate legislation for private sector participation in water services and bureaucratic inertia is a major challenge to partnership approach in water sector. Note that, the public and private sector have little experience of working together except on basis of the procurement and infrastructural development. Furthermore, it was reported that issues such as the cost of time delays and indecision are important barriers to partnerships. For instance, an officer with Western Water Company said that it takes long time for the government to approve budgetary allocation for water projects.

The study also established that payment of water bills by the consumer was another major challenge. Some clients delay in paying of their water expenses which limits the company's operations. The study further found out that roles and relationship among various government departments and partners is still not well defined, often resulting in conflict and competition over control and autonomy. This finding concurs with those of Diederik and Bram (2011) in their study about the failure in services delivery by public-private networks: the case of Flemish childcare in Belgium, that the providers may face



conflicting public accountabilities. This was attributed to the absence of a well-constructed law on PPP approach in water sector.

## **CHAPTER FIVE**

### **CONCLUSION AND RECOMMENDATION**

#### **5.0 Chapter Overview**

The study assessed public-private partnership approach in water supply and sanitation services to households in Busia Municipality. This chapter provides summary of the study findings, logical conclusion and recommendations. Areas for further research have also been highlighted.

#### **5.1 Conclusions**

##### **5.1.1 Water consumption in Busia Municipality**

The first objective of the study was to establish water consumption in Busia Municipality. In relation to customer water categories, it was found that water customers were categorized into four categories: domestic, schools, commercial, and government. However, domestic category was found to have many (3,122) clients than other categories. It was found out that on average water consumption in the Municipality stand at 19,596m<sup>3</sup> per month.

In relation to water sources, it was established that majority (21.6%) of the respondents in Busia Municipality use piped water. However, the study also established that borehole, protected well, river, and water kiosks were other sources of water used by residents. Furthermore, it was revealed that residents of Busia have not explored rain water harvesting despite the fact the region receive adequate amount of rainfall throughout the

year. In addition, it was established that frequency of water collection was at least three times per day by majority of respondents while few reported irregular collection of water.

### **5.1.2 Contributions of PPP Approach in improving Water supply and sanitation services accessibility in the Municipality.**

The second objective of the study was to investigate the contribution of PPP approach in improving water and sanitation accessibility to household in Busia Municipality. It was found that the accessibility had greatly improved since the PPP approach was initiated. In relation to distance to water source points, majority (84.4%) of the respondent have reasonable access to water point which is less than a kilometer as compared to before the PPP approach when they used to walk for long distance looking for water. Further, it was found out that time spend collecting one round trip of water was less than 1 hour.

### **5.1.3 Enhancing quality of service delivery in water supply and sanitation services through PPP Approach**

The third objective of the study was to establish the contribution of PPP approach in enhancing quality of service delivery in water supply and sanitation services in Busia Municipality. In relation to existence of partnership between the government and private sector that provides water and sanitation services it was established that majority (61.8%) of respondents are aware that there is a partnership between the government and the private sector in the provision of quality water. Though, few respondents denied probably due to lack of knowledge of the existing partnership.

The study established that the partnership between the government and private organization in the provision of water and sanitation services has improved service delivery among residents of Busia Municipality. The major services that have improved since the PPP approach was initiated include: reduction of water losses; improved network expansion; improved sanitation services and increase in water production (water flowing throughout). As a result, it was established that PPP was appropriate in the provision of water and sanitation services. In addition, the quality of service delivery to the residents of Busia Municipality was fair enough. This is because more than 50% of the respondents ranked the quality of services provided as fair and good respectively. Thus, the PPP approach has enhanced provision of quality services to the residents. On the other hand, garbage collection in the municipality is still a major challenge because most residents are not satisfied with this particular service.

#### **5.1.4 Incidences of household water related health problems in the Municipality**

The fourth objective of the study was to establish relationship between water sources and incidences of household water related health problems in Busia Municipality. In relation to whether residents treat water for consumption, it was established that majority of the residents treat their water while few do it occasionally. Some of the reasons why residents do not regularly treat their water include: water treatment is not necessary; some cannot afford treatment costs; some do not have the knowledge of water treatment while some use portable water. Regarding water treatment method, it was established that majority use chlorine, few use boiling and filtration method. The study also established

that few residents had suffered from water related health problems and the following water related health problems were reported: typhoid; cholera; stomach ache and dysentery. In relation to how often the residents suffered from water related health problems, it was established that majority suffered once in a few month imply that water related health problems is not common in the area. Furthermore, when asked to state whether the usage of unsafe water was related to incidences of water health related problems, some agreed while others were not sure.

## **5.2 Recommendations**

The study recommends that PPP approach should be adopted especially in garbage collection in the Municipality since garbage collection is still in the hands of the Municipality.

From the study finding regarding challenge facing PPP approach in water supply and sanitation services, the study recommends that there is need for the government to develop well structured policy or law regarding the role of each party in the partnership so that conflict may not arise during the operation of the cooperation between the partners.

The study further recommends introduction of prepaid water bill service whereby water consumers only pay for the amount of water required for use hence assisting water demand management. In addition to that, there is need for carrying out capacity building and sensitization activities regarding PPP approach in water sector and community at large. Basing on the study finding, there is need for more baseline surveys and research

on PPP approach to generate information regarding risk sharing and how well the PPP approach can be fully implemented in water sector.

### **5.3 Further areas of research**

There is need for a comparative study on PPP approach in water sector and sanitation service in other Municipalities to establish the performance of the approach especially regarding service delivery. In addition, there is need for further research on how to harmonize the policies in both private and public sector in order to have a comprehensive policy framework for PPP approach.

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## APPENDICES

### APPENDIX I: Household survey questionnaires

#### Preamble

Good morning/afternoon. My name is \_\_\_\_\_ and I represent Paul Kombo Nakhungu a student at University of Eldoret, School of Environmental Studies undertaking a Master of philosophy degree in Environmental studies (Environmental Human Ecology). Kombo is interested in *assessing PPP approach in water supply & sanitation services to household in Busia Municipality*. If you allow me I would like to ask you some questions. Some of these questions are personal, but the answers you provide shall remain confidential and will not be shared with anyone. I will not write your name in these papers. The information you provide will only help us to learn more about PPP approach in water supply & sanitation services and shall not be used at anytime for any other purpose other than this. Please feel comfortable to answer all questions. You are however free not to answer any question(s) you feel uncomfortable to respond to or stop the interview at any time. The interview is expected to last about 30 minutes and no more than 45 minutes. Do I have your permission to continue?

1 =YES    2=NO (END INTERVIEW)

(Interviewer: Arrange for a private setting to administer questionnaires)

Start Time: \_\_\_\_\_                      End Time: \_\_\_\_\_

QUESTIONNAIRE SERIAL NUMBER: \_\_\_\_\_

Name of Estate \_\_\_\_\_

#### **Respondent Information**

1. Sex: Male  Female

#### **SECTION A: SOCIO-ECONOMIC**

A1. How long have you/your family lived here?

1. Less than 1year  2. 1year  3. 2-5years  4. 5-10years  5. More than 10years

A2. Who is the household head?

1. Father  2. Mother  3. Eldest child  4. Grandparents

A3. What is the household size (people)?

1. One  2. Two  3. Three  4. Four  5. Five  6. Six  7. Others  specify please.....

A4. Which is the level of education attained by the household head?

1. None  2. Primary  3. Secondary  4. Middle level/tertiary College   
5. University

A5. What is your occupation?

1. private business  2 employment in government  3 employed with private sector   
4 farming  5 self employed (small scale traders)   
6. Others, specify-----

A6. What is the average monthly household income?

1. Less than 1000  2. 1000-5,000  3. 5,000- 10,000  4. 10,000-15,000  5. More than 15,000

A7. How much on average Ksh. do you spend on water per month in the household?

1. 100- 200  2. 200-300  3. 300- 400  4. 400- 500  5. More than 500

### **SECTION B: WATER ACCESSIBILITY AND CONSUMPTION**

B1. From which water sources does your household collect water? *Multiple answers possible*

1. Piped water  2. Borehole  3 protected well  4. River  5 Water kiosks  6. Others  specify please.....

B2. Who collects household water? *Multiple answers possible*

1. Mother  2 Daughters  3. Sons  4. Father  5. Others  specify please.....

B3. How often (times per day)?

1. Twice per day  2. Three times per day  3. Four times a day  4. Five times per day  5. More than five times per day  please specify.....

B4. How much water is collected per trip? (*in jerry canes*)

1. 5litres  2. 10 litres  3. 20 litres  4 more than 20 litres

B5. What are the water uses at your household? (*Multiple answers possible*)

1. Drinking  2. Cooking  3. Washing  4. Bathing  5. Other  specify please.....

B6. Is water supplied/collected adequate? 1. Yes  2. No

B7. What is the distance to the water source point from the household? Estimate in kilometers.

1. 0-1  2. 1- 3  3. 3-5  4. more than 5

B8. Approximate, how long does it take for one trip to collect water?

1. 30min-1hour  2. 1hour-2hours  3. 2hours-3hours  4. more than 3hours

B9. Before the partnership approach, how far was the water source? Estimate in kilometers.

B10. How long did it take to fetch one trip of water? Approximate in hours.

B11. How much did cost per jerry cane before the PPP approach?

B12. Who is the main supplier of water in Busia Municipality?

1. Public  2. Private sector  3. NGOs  4. Community water  5. Public-private partnership

B13. Can anybody be restrained to collect water from supplier?

1. Yes  2. No

B14. If yes, why?

1. Failure to pay  2. Privately owned hence no access  3. Religious reasons   
4. Other reason(s)  please specify.....

B15. How is water supply a problem in the Municipality? *Multiple answers possible*

1. Far away  2. Long queues  3 frequent breakdowns  4 Rationing  5 Others

B16. Which of the following toilet facilities do your household members use?

1. Flash toilet  2. V.I.P latrine  3. PIT latrine  4. Covered latrine  5  
Uncovered latrine  6. Others  specify.....

B17. What is your opinion on existing household's toilet facilities?

1. Satisfied  2. Dissatisfied  3. No opinion

B18. How are household waste/ garbage disposed off?

1. Collected by Municipal  2. Collected by private firm  3. Burning  4. Dumping
5. Others  specify .....

B19. Does municipal/private firm provide containers for waste disposal in the Municipality?

1. Yes  2. No

B20. How often does waste/garbage emptied from dust containers?

1. Daily  2. Twice a week  3. Weekly  4. No idea

B21. In your opinion how would you rate Municipal sewerage services?

1. Better  2. Good  3. Fair  4. Bad  5. Worse

### **C. QUALITY SERVICE DELIVERY THROUGH PPP APPROACH**

C1. Do we have any partnership between the government and private sector providing water and sanitation services?

- 1 Yes  2 No

C2. If yes, how many are they? Please specify.....

C3. Have partnership approach results to improvement in provision of water and sanitation services?

- 1 Yes  2 No

C4. If yes, what kind of improvement? *Multiple answers possible*

- 1 improved expansion  2 reduced water loses  3 water flows throughout
- 4 high water bills  5 frequent repair and check up  6 improved sanitation services

C5. Has service provision improved compared to before partnership approach?

- 1 Yes  2 No

C6. When is water available? *Multiple answers possible*

1 Morning hours  2 Evening hours  3 At night  4 Weekends  5 Twice a week

6 Weekly basis

C7. How is the water pressure from the tap?

1 low pressure  2 Normal pressure  3 High pressure

C8. What causes water shortages? *Multiple answers possible*

1 rationing  2 Leakages  3 Diversions  4 Repairs and maintenance

5 Nonpayment of water bills

C9. Do you feel that PPP approach is appropriate in provision of water supply and sanitation services?

1 Appropriate  2 Not appropriate

C10. How would you rank the quality of service delivery in water sector through PPP approach?

1 No opinion  2 Poor  3 Fair  4 Good

C11. To what extent have PPP approach enhanced quality of service delivery in water sector through PPP approach?

1 Very good  2 Good  3 Fair  4 Bad  5 Very bad

C12. Are you satisfied with garbage collection services within the Municipality?

1 Satisfied  2 Unsatisfied  3 Don't know

#### **D. HOUSEHOLD WATER RELATED HEALTH PROBLEM**

D1. Do you treat water for household consumption?

1 Yes  2 Sometimes  3 No

D2. If No, why?

1 I don't think it's necessary  2 I can't afford it  3 I don't know how to do it effectively



4 I only use portable water [ ] 5 Not applicable (*respondent treats water*) [ ].

D3. If yes, how do you do it?

1 boiling [ ] 2 use water filters [ ] 3 add chlorine [ ] 4 others [ ] please specify.....

5 Not applicable (*respondents don't treat water*) [ ]

D4. Has any member of your household suffered from water related health problem last month?

1 yes [ ] 2 No [ ]

D5. If yes, what type of water related health problem? *Multiple answers possible*

1 typhoid [ ] 2 cholera [ ] 3 dysentery [ ] 4 stomach ache [ ]

D6. How often does your household suffer from these water borne diseases?

1 once a week [ ] 2 once in 2 weeks [ ] 3 once a month [ ] 4 once in a few month [ ]

5 not applicable (*household does not suffer from any of the diseases*) [ ]

D7. Do you think these water borne diseases could be the result of using unsafe water?

1 Yes [ ] 2 Unsure [ ] 3 No [ ] 4Not applicable (*no disease in respondents household*)[ ]

**Thank you**

**End**

## APPENDIX II: Interview schedule for public sector

### Preamble

Good morning/afternoon. My name is Paul Kombo Nakhungu a student at University of Eldoret, School of Environmental Studies undertaking a Master of philosophy degree in Environmental studies (Environmental Human Ecology). I am undertaking a study on PPP approach in water supply & sanitation services to household in Busia Municipality. If you allow me I would like to ask you some questions. Some of these questions are personal, but the answers you provide shall remain confidential and will not be shared with anyone. I will not write your name in these papers. The information you provide will only help us to learn more about PPP approach in water supply & sanitation services and shall not be used at anytime for any other purpose other than this. Please feel comfortable to answer all questions. You are however free not to answer any question(s) you feel uncomfortable to respond to or stop the interview at any time. The interview is expected to last about 30 minutes and no more than 45 minutes. Do I have your permission to continue?

1 =YES    2=NO (END INTERVIEW)

Start Time: \_\_\_\_\_ End Time: \_\_\_\_\_

District water officer & LVNWSB

1. What is the water supply capacity of Mundika-Busia water supply system?
2. What is the water consumption in the municipality?
3. What are the water sources in the Municipality?
4. How many household are served by main water supply network of the municipality?
5. Is water consumer satisfied with service provision in the Municipality?
6. Is there any cooperation with private sector in provision of water and sanitation services to household in the municipality?
7. How much does 20 litre water jerry cane cost?
8. To what extend is the participation of private sector in water supply?
9. What are the challenges in water sector face by government?

### **APPENDIX III: Interview schedule for private sectors in water**

#### Preamble

Good morning/afternoon. My name is Paul Kombo Nakhungu a student at University of Eldoret; School of Environmental Studies undertaking a Master of philosophy degree in Environmental studies (Environmental Human Ecology). I am undertaking a study on PPP approach in water supply & sanitation services to household in Busia Municipality. If you allow me I would like to ask you some questions. Some of these questions are personal, but the answers you provide shall remain confidential and will not be shared with anyone. I will not write your name in these papers. The information you provide will only help us to learn more about PPP approach in water supply & sanitation services and shall not be used at anytime for any other purpose other than this. Please feel comfortable to answer all questions. You are however free not to answer any question(s) you feel uncomfortable to respond to or stop the interview at any time. The interview is expected to last about 30 minutes and no more than 45 minutes. Do I have your permission to continue?

1 =YES    2=NO (END INTERVIEW)

Start Time: \_\_\_\_\_ End Time: \_\_\_\_\_

#### Private sectors

1. Which areas are you currently supply water in Busia County?
2. Is your company involved in provision of water & sanitation services in Busia Municipality?
3. What services are you offering to households of Busia Municipality?
4. How much water is supplied per day?
5. Is water provision to household consumers throughout the day?
6. Are household water consumers satisfied with service provision?
7. How much does 20litres water jerry cane cost?
8. What are the challenges you face in provision of water services to household consumers?
9. How would you rate the partnership approach in water supply and sanitation services?

#### **APPENDIX IV: Interview schedule for public health officer**

##### Preamble

Good morning/afternoon. My name is Paul Kombo Nakhungu a student at University of Eldoret, School of Environmental Studies undertaking a Master of philosophy degree in Environmental studies (Environmental Human Ecology). I am undertaking study on PPP approach in water supply & sanitation services to household in Busia Municipality. If you allow me I would like to ask you some questions. Some of these questions are personal, but the answers you provide shall remain confidential and will not be shared with anyone. I will not write your name in these papers. The information you provide will only help us to learn more about PPP approach in water supply & sanitation services and shall not be used at anytime for any other purpose other than this. Please feel comfortable to answer all questions. You are however free not to answer any question(s) you feel uncomfortable to respond to or stop the interview at any time. The interview is expected to last about 30 minutes and no more than 45 minutes. Do I have your permission to continue?

1 =YES    2=NO (END INTERVIEW)

Start Time: \_\_\_\_\_ End Time: \_\_\_\_\_

##### Public Health officers

1. Are water borne disease incidences common in the Busia Municipality?
2. Is there any relationship between the water sources used by household and disease incidence?
3. How is household waste/garbage disposal in Busia Municipality?
4. How is toilet facilities situation generally in Busia Municipality?
5. Is water from hand dig borehole suitable for human consumption in Busia Municipality?
6. How was the waterborne disease before PPP approach in Busia Municipality?
7. What is your opinion on PPP approach in provision of water & sanitation services?
8. What are the challenges you face in public health in relation to improving sanitation services?