ANALYSIS OF DOMESTIC WATER USE FOR COMMERCIAL ACTIVITIES AMONG THE POOR IN ALAJO AND SABON ZONGO COMMUNITIES OF ACCRA, GHANA.

By

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ABSTRACT

In cities throughout Africa, domestic water is widely used for small businesses. The amount of water used depends on the size of the business and the individuals involved in these businesses are mostly women. However, many of these businesses do not have a direct connection to the city's water network and the business owners often travel a far distance to purchase water at high prices. To explore this problem, the research titled "Analysis of Domestic Water Use for Livelihood Activities among the Poor in Alajo and Sabon Zongo Communities of Accra, Ghana" was undertaken. The main objectives of the study were two-fold: to measure the extent of domestic water use for livelihood purposes by both men and women in sub-urban communities of Accra and its contribution to their livelihoods, and enhance access of poor women to water to improve their water-dependent livelihoods and thus reduce poverty in Accra. The study also addressed issues relating to health and sanitation and explained that poor water quality in this community is as a result of damaged pipes and dirty storage tanks.

The study was carried out using qualitative approach of investigation: interviewing, focus group discussions (FGDs), and direct observation. Statistical Packages for Social Sciences (SPSS) was used to analyze data collected. The study found that income generated from water related businesses contribute either all or more than half of the household income of water-related business operators. Water prices in these communities are ten times the regulated prices charged by the water utility, which have great impact on the profit margins of these small businesses and are often the stronghold of women. The highest level

of education attained by most of the water related business owners is Junior Secondary School (Grade 8), which gives a basis for the explanation of their low income and high poverty levels.

The study posed some recommendations including the possibility of government's provision of water to every household in the communities. Furthermore, the implication of this recommendation was discussed, as it eliminates the business of water sellers and obstructs the income generated to support their households. Other livelihood activities that can be carried out by these water-related business owners were stated to include internet café business, grocery store operation, and boutique store operation.

Certain limitations of this study have also been identified as its scope was limited to some extent. Areas of further research have also been identified.

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DEDICATION

I dedicate this thesis to my mother for her unending prayers. Her prayers made a way for me and helped me achieve this success.

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LIST OF ACRONYMS

AMA – Accra Metropolitan Assembly

GHC – Ghana Cedis

GNP - Gross National Product

GWCL - Ghana Water Company Limited

IFAD- International Fund for Agricultural Development

IWMI – International Water Management Institute

MDG – Millennium Development Goals

MM - Millimeter

PURC – Public Utilities Regulatory Commission

SWITCH – Sustainable Water Management Improves Tomorrow's Cities' Health

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GLOSSARY OF TERMS

AMA – Accra Metropolitan Assembly is responsible for the formulation and enforcement of by-laws in Accra city.

Cedi is the Ghanaian currency. One hundred Peswas equal one Cedi.

Chop Bar - In the local dialect, a "chop bar" is a place where people go to eat, which is not necessarily a bar. It is synonymous to what is known as a restaurant.

Ghana Water Company Limited (GWCL) is a company owned by the government of Ghana and responsible for urban water supply. GWCL operates 86 piped water systems and has its headquarters in Accra and regional offices in the ten regional capitals of the country (Nyarko, 2007, 48).

Kenkey is a Ghanaian local food produced from maize.

Susu is a method of saving money through a money pool that is mostly used among the West Indian, African, Mexican and Asian cultures (Nowell, 2007).

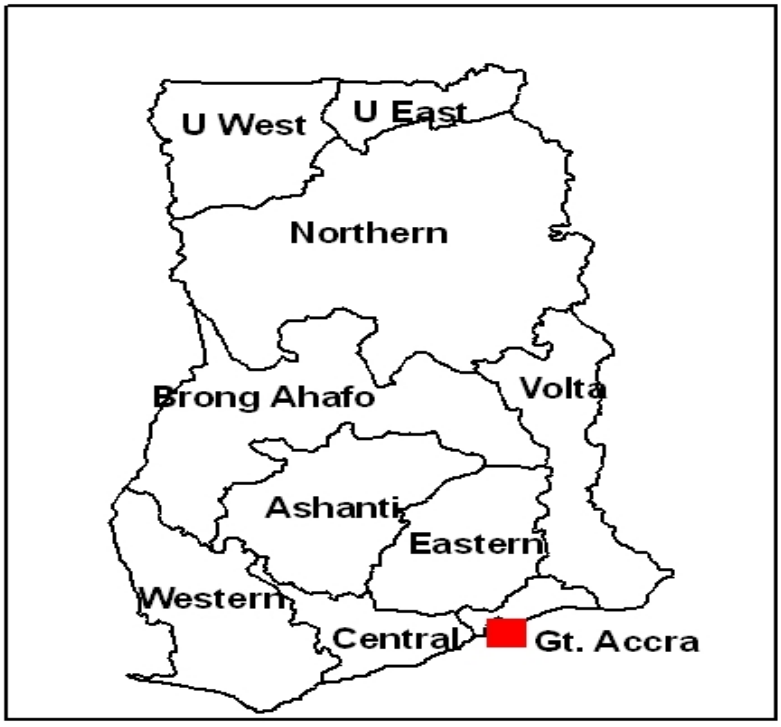
CHAPTER 1 – INTRODUCTION

1.1 Background

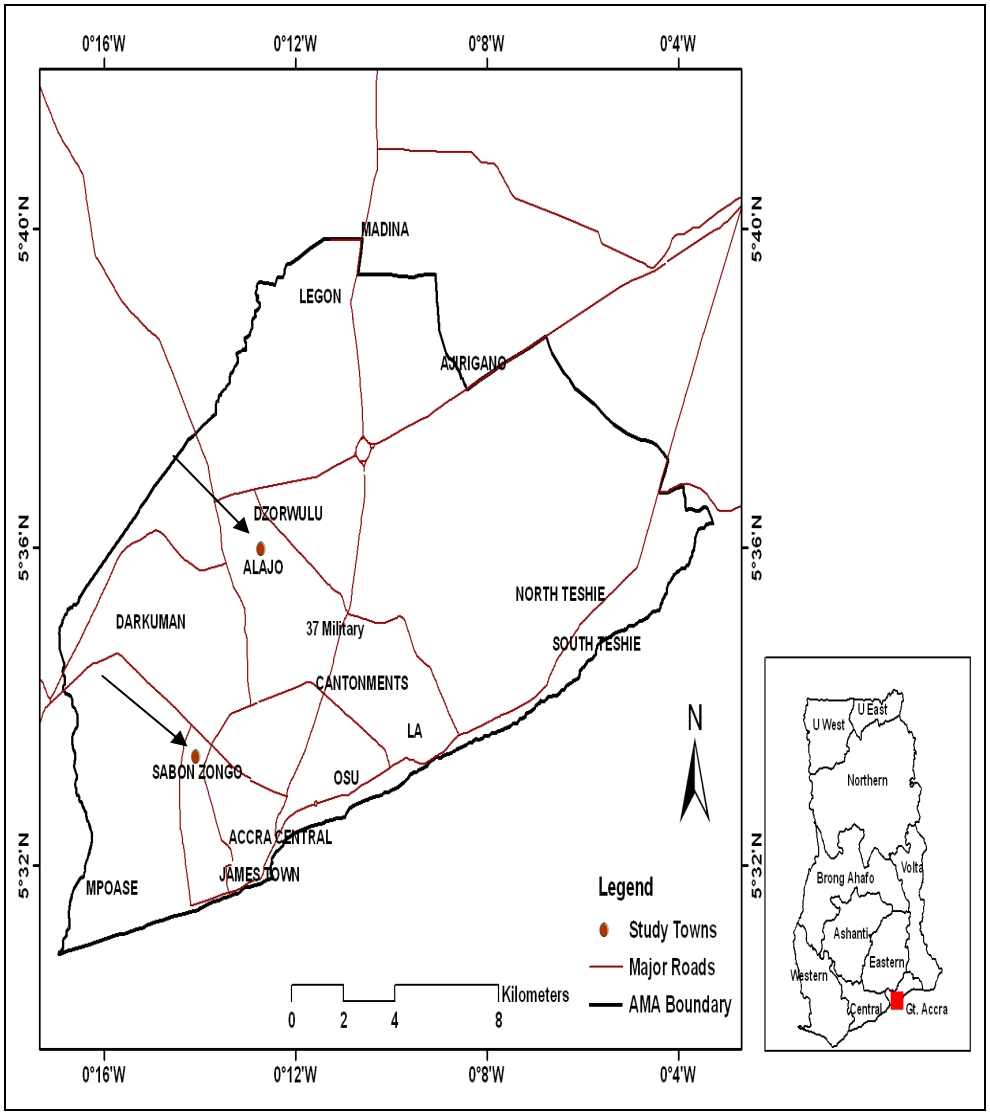
Ghana is made up of tropical forests reserves, the mountains, beaches, villages on stilt and many more. The country lies on the Gulf of Guinea (Siaw, 2001), its size being about the same as Great Britain (Siaw, 2001). It covers a distance of 672 km from south to north and 540 km from east to west. Ghana is heavily populated with 18.8 million people (Ghana Statistical Service, 2000 population census). Ghana has a warm and humid climate. The mean annual rainfall of the country is estimated at 1.187 mm. The Mean annual temperatures range from 26.1 °C near the coast to 28.9 °C in the extreme north (Aquastat report, 2005).

There are ten regions in Ghana namely Upper East region, Upper West region, Greater Accra region, Brong-Ahafo region, Northern region, Volta region, Ashanti region, Western region, Eastern region and Central region. The locations of these different regions of Ghana are shown in map 2 below with red square indicating the region (Greater Accra region) where the research was carried out. Accra is the capital of Ghana. The major part of Ghana's vegetation consists of Savannah. The Savannah covers almost 150,000 km² and stretches from the Brong-Ahafo region eastwards into the Afram Plains and northwards beyond Tamale, reaching the coast in the south-east (Wilson, 1977). Map 1 is a map of Ghana showing the country’s river segments.

Map 1: Map of Ghana, West Africa. Source: www.michaelchuck.com/accra.htm



Map 2: Map showing the regions of Ghana, West Africa. Source – IWMI, Ghana



Map 3: Map of Suburbs in Accra, Ghana showing the communities interviewed. Source – IWMI, Ghana

There are three main river systems in the country. First is the Volta river system which consists of the Oti and Daka Rivers, the White and Black Volta Rivers, the Pru, Sene and Afram Rivers. The basin covers 70 percent of the country area (Aquastat report, 2005). The second river system is called southwestern river system which consists of the Bia, Tano, Ankobra and Pra rivers and covers 22 percent of the country area. The third river system is called the coastal river system which comprises the Ochi-Nakwa, Ochi Amissah,

Ayensu, Densu and the Tordzie rivers, covering eight percent of the country area (Aquastat report, 2005). In the case of Accra, the main water supplies are piped from a nearby coastal stream, the Densu, and the Volta River where water can be treated (Kusilim, 2008).

Despite the coastal stream, piped water is not sufficient for the growing population partly because service is not available to all households and partly because of high cost. As a result, most poor urban communities obtain water from shallow boreholes, wells, ponds, springs, and private water tanker trucks (Kusilim, 2008). These water sources are sometimes polluted and the water used is often untreated. Often buying water from tanker trucks cost more when compared to paying for piped water because operating costs are higher. Water from tanker trucks is typically polluted while piped water is not (Ochieng, 2005). Poor entrepreneurs also buy water for economic purposes from neighbors at exorbitant rates, even exceeding the official water utility commercial rates recommended by the GWCL. On average, entrepreneurs of Accra city buy water at the rate of 15 peswas per 20 liters (Dumenu, 2007).

According to the Millennium Development Goals Report (2008), 1.6 billion people in the world live in areas of economic water scarcity, where human, institutional and financial capital limit access to water, even though water in nature is available locally to meet human demands. In developing countries, the quality of pipe-borne water is affected by factors like excessive construction work and the lack of plumbing materials (Aderibigbe et al., 2008). In most cases, the pipes through which water pass are very old and create room for contamination through leakages in pipe lines. Consumption of water

obtained from contaminated pipes affects the health of the community and can lead to high incidence of typhoid disease and other water-related diseases (Aderibigbe et al., 2008). Although an estimated 46% of Accra's population has pipe borne access to water, the city's urban agriculture faces contamination of crops from poor quality pipe water (Van Rooijen & Drechsel, 2008). Community's health is further harmed by water pollution and lack of sanitation.

Moreover, the mineral constituents of domestic water in Accra, Ghana determine the type of water, the uniqueness of economic activities and the return earned (Gustafsson et al., 2008). How water is harnessed for economic use determines the accessibility, consistency, and economic returns on the water use. Climatic variability [seasonality], tax payments, gender discrimination, religious beliefs, and culture, may limit the accuracy of results in determining the percentage of the poor urban women who directly use domestic water for economic purposes (Cofie & Awuah, 2008).

Most of the world's 1.2 billion poor people, two thirds of whom are women, live in water-scarce countries and do not have access to safe and reliable supplies of water for productive and domestic uses (IFAD 2001).The bulk of these poor people are dependant on water for their livelihoods and live in African countries. In these water-scarce countries, inequity in access to water resources is increasing because of competition for limited resources, and this particularly affects poor people, especially women (Wahaj & Hartl, 2007). Therefore, securing water for both productive and domestic uses is critical in achieving food security and improved livelihoods in developing parts of the world.

Although this is the 21st century and women in developing countries enjoy more freedom and power than ever before, they are still disadvantaged when compared to men in virtually all aspects of life. Women are deprived of equal access to education which has been recognized as a main aspect of human security and a means to empower women. In the case of Ghana, it is reported in the Ghana-Canada In-Concert Project Document (2000) that the females are more disadvantaged than the males. Compared to their male colleagues, the women have low literacy and income levels, limited access to quality health care and poor participation in decision-making.

Water use in Accra varies from domestic uses to livelihood uses. Households are involved in various income generating activities requiring water such as catering, small scale food processing, water vending, small industry, and various forms of urban and peri-urban agriculture. These activities contribute to their livelihoods sometimes as the primary source of income and are not accounted for (Abraham et al., 2007). However, not enough information is available to provide recommendations on policy change to ensure effective and efficient accountability.

Differentiating economic use from non economic use of water can be difficult in some cases because most users derive economic benefits indirectly from the water originally meant for non economic purposes. There are some challenges faced when trying to differentiate between the use of domestic water for economic purposes and non-economic purposes (Ikumi, 2002). First, determining the accurate number of people who use domestic water for economic purposes can be a vigorous task. Second, these users may tend to

avoid the responsibility of giving back to the society from the economic benefit derived from using domestic water. For instance, those who use water for planting vegetable may not be sincere about the volume used due to the fear of being taxed by the Government based on the quantity of water consumed for economic purposes (Ikumi, 2002). In essence, to determine the exact percentage of those who use domestic water specifically for economic purposes could be a challenge.

This thesis argues that women's secure access to water for domestic and commercial activities is central to achieving the Millennium Development Goals (MDGs). It emphasizes the linkages between poverty and gender issues and places great importance on women's empowerment as a means to reduce poverty and food insecurity. This thesis also focuses on the use of Accra's domestic water for livelihood activities in two communities – Alajo and Sabon Zongo and gives a proportion of the population of the two communities involved in water-related livelihood activities. Alternative livelihood options were recommended to women involved in water-related livelihood activities, so that they will have something to fall back to when these water-related livelihood activities are no longer lucrative.

1.2 Problem Statement:

Water is an essential part of human life. As a result, it is required for day-to-day activities. However, problems arise in accessing clean water. Many people in the world lack access to clean, drinkable water, with women and children in the developing countries most vulnerable (Millennium Development

Goals Report, 2008). The insufficient availability of water results in high prices for the limited water supply. Also, commercialization and privatization of water supplies have further limited accessibility (Multinational Monitor, 2001).

In most cases, poor people pay more than the regular price for clean water (Hutton & Haller, 2004). The poor are defined by inability to have access to currency or means of payment. A higher price for water will result in the use of dirty water, which will ultimately affect the health, social and emotional lives of the population. Previous research in Accra has shown that multiple uses of urban domestic water seem significant, but the results are insufficient to quantify the significance in terms of sources, uses, income contributions, and gender distribution (Abraham, 2008).

The question posed in this study is "What is the solution to the problem of high water pricing and unsafe water quality?" Many researchers propose the theory of "do nothing" as an option. In essence, the argument is that even by doing nothing at all in a situation something happens. The research focused upon contribution of water to household income and possible strategies to improve affordability of quality water to improve means of livelihood of poor women.

1.3 Purpose and objectives:

The overall purpose of the research conducted for this study was to evaluate the importance of domestic water use for livelihood purposes by both men and women in sub-urban communities of Accra and its contribution to livelihoods. The study focused on the two low-income communities of Alajo

and Sabon Zongo in Accra, with special interest in poor women participating in water-related income-generated activities.

Specific objectives of the research were:

1. to evaluate the importance of domestic water use for livelihood purposes;
2. to determine the contribution of water –related livelihood to household income; and
3. to provide recommendations to ensure that needs of poor men and women are met in terms of accessibility, quality and reliability of water for urban livelihood.

1.4 Research Questions

These research questions will deal with each of the objectives stated above.

1. How much local currency (Cedi) on average does water oriented activities generate on a daily basis for poor women and men in Alajo and Sabon Zongo communities?
2. Are households totally dependent on water generated activities or are there other sources of income to the households?
3. Do poor women and men in Alajo and Sabon Zongo communities face gender discrimination that influences their economic activities?

1.5 Methods:

The research was conducted from May to July 2009 using mainly the qualitative approaches of investigation: interviewing, focus group discussions

(FGDs), and direct observation. The objectives and research questions were explored through collection of primary data. The researcher spent a period of two and half months in Accra, Ghana; collecting, collating and verifying relevant data. Data were collected using semi-structured interviews and focus group discussions (FGDs) through an interpreter. Semi-structured interviews and focus group discussions addressed the research objectives.

There was one FGD in each of the communities. The FGD in Alajo consisted of adult men and adult women, while the FGD in Sabon Zongo consisted of adult women only. The researcher acted as the facilitator who directed the group discussion. There was an interpreter who interpreted the questions to the group and relayed the answers to the researcher. Discussions began with an introduction of everyone present, followed by the researcher posing a few open-ended questions as noted in Appendix C. The researcher observed by listening to discussions and taking note of the important points.

Fifty male and 50 female respondents were selected to participate in the individual interviews in each of the two communities based on profession and knowledge about the subject matter. Participants were mostly low-income earners. Men and women whose livelihood activities involve domestic water use and are between the age range of 20 and 45 were mostly selected. However, there were two women in their late 70s who were still actively involved in their water related businesses. These outliers indicate that individuals involved in these activities do not necessarily retire at an early age. Interviews' and focus group discussions' results were subjected to analysis using Statistical Package for Social Sciences (SPSS).

1.6 Study Areas: Alajo and Sabon Zongo communities, Accra, Ghana

Alajo and Sabon Zongo communities are suburbs of Greater Accra Region in Ghana (see Map 3) with populations of 23,439 and 18, 616 respectively (Ghana Statistical Service, 2000 population census). Coastal Accra is located in the Odaw-Korle catchment, and has a population of 1.97 million and a population growth rate of 3.4% annually with 1.2 to 1.6% of this accounting for rural-urban migration (Abraham et. al., 2007). The official language spoken in the city of Accra is the colonial language - English. However, there are nine other widely-spoken and government-recognized languages, which include Akan, Dagaare, Dagbane, Dangbe, Ewe, Gan, Gonja, Kasem, and Nzema (Christaller, 1933). Alajo is a multi-cultural community. Water is obtained from Ghana Water Company pipelines. About 60% of houses have a pipe connection (Abraham, 2008) with water flow being quite regular. Productive uses include construction, food preparation for vending, car washing, commercial bathroom operating, cleaning services and water closet toilet operating. Sabon Zongo is a multi-cultural community with about 70% Hausa (Abraham, 2008). About 40 to 50% of houses have pipe connection while the rest of the houses without pipe connection access water from neighbors (Abraham, 2008). The current water uses in addition to domestic purpose are food preparation for vending, washing, flushing water closet toilet, cleaning public toilets, bagging water for sale, ablution before Islamic prayers, traditional medicine preparation, car wash, local drink preparation for vending, public showers, livestock keeping, bagged and pure water vending (Abraham, 2008).

1.7 Organization of Thesis

The thesis is organized into six main chapters. The first chapter is the background chapter with general introduction to what the thesis is all about. This chapter also states objectives and questions of the research; justification which indicates that the research questions are previously unanswered; and discussion of why it is worthwhile to answer these questions. The second chapter presents a review of the literature that helps to understand various concepts associated with domestic water use and water-related livelihood activities. It focuses on preparing the conceptual and theoretical base of the research and analysis of its outcomes. The third chapter outlines the methodological approach to the research and gives details of the different data collection techniques and analytical methods used after the fieldwork. It discusses the guiding principles, sources of data collection and conceptual frameworks used.

The fourth chapter contains analysis of data collected in the two communities and the outcomes of the study in relation to the three study objectives. The fifth chapter explains and discusses the findings of the study. This chapter describes how the research questions have been answered and offers proposals on how the problem should be solved. The sixth chapter concludes the thesis with presentation of a set of recommendations, and focus on policy implications. Limitations of this study along areas of further study have also been discussed.

CHAPTER 2 - DOMESTIC WATER USE FOR SUSTAINABLE LIVELIHOODS

2.1: Introduction: Water Use in Urban Accra

In urban Accra, the government-run water distribution system does not function efficiently. Its technical design is inadequate in spatial and temporal coverage (Van Rooijen &Dreschel, 2008). The coverage of water supply to the city by the Ghana Water Company Limited is said to be 45 percent in reality. This 45 percent includes populations with household connections and yard connections, with a high proportion of this group being the urban rich (Van Rooijen et. al, 2008). Insufficient coverage of water supply by the Ghana Water Company Limited leads to high water prices paid by the poor who have no direct supply of water due to high connection cost for access which the poor cannot afford (Van Rooijen &Dreschel, 2008). Thus, commercialization is seen as a response to overcoming the inadequacy in water supply. Water commercialization is usually carried out by community members who are rich enough to access water pipeline connection from the city. Commercialization plays two important roles: supplements income of water vendors and provides water for community members.

Domestic water is used for income generating activities alongside domestic purposes. These income generating activities include street food vendoring, hairdressing, livestock farming, chop bars, car washing, floriculture, and irrigated vegetable farming (Abraham et. al, 2007). Also, a profitable water business has evolved overtime, with tanker suppliers, water sachet producers

and vendors, and small-scale private service providers. This business represents a major source of income to the households of these vendors.

Figure 1: Illustration of linkages between urban water and livelihoods through the various income generating activities. Adapted from Abraham et al., 2007: 5

Figure 1 illustrates a direct linkage between urban water use and livelihoods in Accra, Ghana. The income earned from the water enterprise shows the overall economic demand and sustainability of the enterprise. The household income generated by water use activities shows the household dependency on water. The household income that is spent on payment for water indicates the value of water and willingness to pay to sustain activities (Abraham et al., 2007).

Unavailability and lack of access to low-cost water for farming in the urban and peri-urban areas of Accra is a key factor affecting farmers. According to Obuobie et al. (2003), there are two major categories of urban crop farming in Accra: household gardening which takes place in and around homes; and open-space farming which takes place on lands situated away from human dwellings, along drains, stream banks, road sides, abandoned waste dumps, around public buildings, and wetlands. Household farmers use pipe borne water and greywater

- that is water from bathrooms and kitchens; while open-space farmers use drain water, streams/rivers, pipe borne water and hand-dug wells.

2.2: Sustainable Livelihoods Framework

The framework used for this research is sustainable livelihoods approach. The Sustainable Livelihood Framework has been chosen as it completely explains the crux of this thesis. The approach is adaptable as it can be used in a variety of different circumstances from project level to program and policy level (Department For International Development, 1999). This approach has recently been adapted in different sectors as it is recognized that a new way of thinking about poverty reduction is needed to achieve the first International Development Goal of reducing by one half of the proportion of people living in poverty by 2015 (Cahn, 2002). The promotion of sustainable livelihoods enhances poverty reduction.

Sustainable livelihoods approach provides a logical framework that promotes organized study of the basic processes and causes of poverty (Department For International Development, 1999). The basic components of the sustainable development framework are livelihood assets, livelihood strategies, transforming structures and processes, vulnerability context and livelihood outcomes. The interconnection of these components is shown in Figure 2 below. A livelihood comprises the capabilities, assets and activities required for a means of living. The full meaning of H is Human capital; S is Social capital; N is Natural capital; P is Physical capital; and F is financial capital.

Sustainable livelihood framework *"acknowledges multiple livelihood strategies that people adopt to secure their livelihoods. It seeks to achieve multiple livelihood outcomes, to be determined and negotiated by people themselves. It emphasizes multiple dimensions of sustainability (environmental, social and economic) and recognizes that there will be difficult decisions about trade-offs between these"* (Department For International Development, 1999: 3).

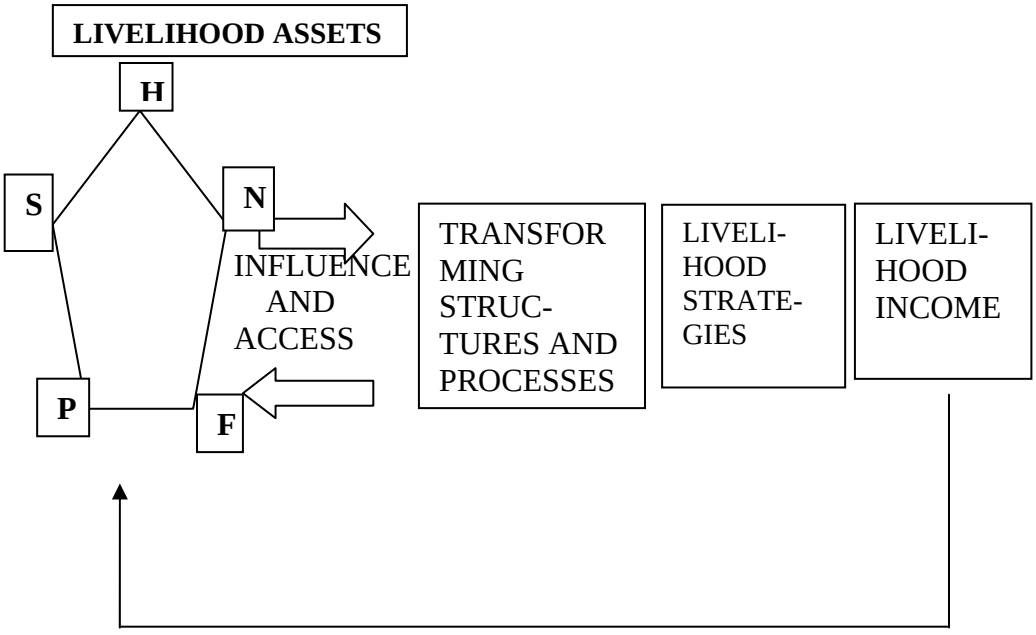


Figure 2: Sustainable Livelihoods Framework. Adapted from Department For International Development's website.

The basis of the livelihoods approach is that the asset status of the poor is important to understanding the options open to them, the strategies they need to adopt to attain livelihoods, the outcomes they aspire to and the vulnerability context under which they operate (Cahn, 2002). The foundation of a life free from poverty is having access and right to a range of assets and livelihood strategies that can sustain households and individuals through the stresses of life.

An understanding of structures and processes helps to link the micro and macro; it also helps to identify areas where restrictions, barriers or constraints occur and explain social processes that can impact livelihood sustainability (Scoones, 1998). A focus on outcomes causes a focus on achievements, indicators and progress (Cahn, 2002). A depth in livelihood outcomes aims to provide a range of outcomes that will improve well-being and reduce poverty through a participatory enquiry (Department For International Development, 1999).

Livelihood strategies are made up of activities that produce the means of survival for households (Ellis, 2000). People are able to choose livelihood strategies that present them with livelihood outcomes depending on the assets they have, the structures and processes that impact them, and the vulnerability context they operate in. It is important to state that changes in the condition and availability of natural resources alter livelihood strategies. This raises an important question of how to create livelihood options.

2.3: Gender Inequality and Water-related Sustainable Livelihoods

Livelihood is an important concept to place within the context of the relevant literature, because of its importance in domestic water use. Scoones (1998: 5) defines a livelihood to *"comprise the capabilities, assets (including both material and social resources) and activities required for a means of living"*. Scoones (1998: 5) continued on to define sustainable livelihoods: *"A livelihood is sustainable when it can cope with and recover from stresses and shocks, maintain or enhance its capabilities and assets, while not undermining*

the natural resources base". Sustainable livelihoods are often an important socioeconomic goal of water resource management.

Gender equality and women's empowerment are both important instruments for poverty reduction. Women have a significant potential role as stewards of national and global natural resources. Indigenous women are also repositories of varied and locally rooted knowledge systems that make an important contribution to the world's heritage (International Fund for Agricultural Development Report). Therefore, development agencies' aim should be to expand indigenous women's access to and control over fundamental assets such as land, capital, knowledge and technologies; strengthen their decision-making role in community affairs and representation in local institutions; improve their well being; and reduce their workload by facilitating access to services and infrastructure.

There are some gender differences in irrigated vegetable farming. It is an established fact that in Accra, and other cities in Ghana, nearly all the farmers are men (Obosu-Mensah, 1999). Women dominate the marketing of the produce and few men play the role of wholesalers but very few are found as retailers in markets. A number of reasons for this gender division include: the difficulty of farm work, especially land clearing, land preparation, carrying watering cans for watering and spraying; general lack of interest in farming and cultural definition of gender roles-men do the farming and women do the selling (Abraham et al., 2007).

Women's needs for water cannot be overestimated. Their needs are often related to small-scale activities, but they are important for the household.

Gender marginalization occurs in accessing quality water. The placement of price on water can be considered a burden for women who have the sole responsibility of providing water (Razavi & Miller 1995). Women and children often travel a long distance in search of water for their day-to-day activities. These distances travelled affect other aspects of their lives including health, psyches, children's education and women's daily productivity (Razavi & Miller 1995).

Although international policymakers are increasingly recognizing women's roles in agriculture and other water-related livelihood activities, many women remain poor, vulnerable to food insecurity and marginalized (Wahaj & Hartl, 2007). In 1992, at the International Conference on Water and the Environment, Dublin, the role of women in water management was recognized as important. Since then, policymakers have made attempts to incorporate gender issues in water development projects, including in the resolution declaring 2005-2015 the International Water for Life Decade (Wahaj & Hartl, 2007). However, these policies have not been adequately transformed into practice, and attempts in some projects to involve women in water management initiatives have only experience minimal success. The reasons for this disappointing result range from lack of understanding of gender issues by policymakers and project staff, to lack of will and commitment at the project design and implementation phases, to prevailing cultural norms in the societies (Wahaj & Hartl, 2007). Women generally have limited influence, do not exert political pressure, and are simply not heard or seen.

The role of women is not adequately addressed in planning water-related activities and as a result, some programs have had unexpected adverse social impact. There is a high economic cost to any country that does not effectively use the resources that women represent (Millennium Development Goals Report, 2008). Thus, it is important that decision makers as well as planners recognize that despite the fact that many development programs have failed to deal equitably with women in the past, there is opportunity to address this issue and incorporate women in planning process that relates to water use.

2.4: Privatization of Water and its Impacts on Access to Quality and Affordable Water

According to Mikhail Gorbachev, former president of the Soviet Union and former chairman of the board of Green Cross International - Geneva-based environmental Non-Governmental Organization, “water is not a privilege, it’s a right” (In-depth report, 2006). The reverse is the reality for poor population in developing countries. Originally, governments provided water without demanding payment or including water charges in general tax fees. However, in recent times, many countries and cities have looked into alternatives, such as private management of water works, especially in the domestic water sectors of urban areas (Grusky 2001). Public water companies in developed countries charge fees that will fully cover the cost of the quantity of water used, instead of the water being generally subsidized for all users through tax revenues (Grusky 2001). Most countries turn water provision over to a regulated private sector on the pretext of increasing access to safe water. These governments are usually motivated by potential efficiency gains with the hope that these gains will be

translated into access and enhanced service quality, thereby improving countries' health outcomes (Galiani et al., 2002).

Ghana is not an exception to this occurrence. In mid 2001, the World Bank approved a $110 million interest- free structural adjustment loan for Ghana to re-equip the state-run Ghana Water Company and hire new management. However, before disbursing the loan, the Bank forced the government of Ghana to implement several actions including increase in electricity and water tariffs by 96 percent and 95 percent respectively to cover operating costs (Grusky 2001).

The World Bank included water privatization as one of many conditions that determined the degree of Ghana's access to the portfolio of loans in the World Bank's Country Assistance Strategy (CAS). The main argument is that Ghana Water Company Limited will continue to own the system, but the new management - Aqua Vitens Rand Limited (AVRL) will operate, maintain and sell the water under a 10-year-contract. The head of the Water Sector Restructuring Secretariat, Emmanuel Nkrumah, argued that the motive for this is to enhance a partnership between the public and private sectors (Addo, 2003).

In response, a broad coalition of groups in Ghana formed the National Coalition Against the Privatization of Water (National CAP of Water), which is committed to conducting a broad campaign to ensure that all Ghanaians have access to safe and affordable water (Grusky 2001). This anti-privatization lobby argues that access to water is a human right and not a privilege. Water can be privatized only if there are customers who can pay for it. Although, there is need

to improve efficiency and root out corruption at GWCL, World Bank should not insist on privatization before it gives a loan (Addo, 2003).

People living in Accra find it difficult to access clean water at a reasonable price. They are forced to buy their water by the bucket, at a cost as much as 16 times more than water from the tap (Appiah-Kubi, 2001). To solve this problem, privatization of Accra's waterworks was proposed. However, the prospect of privatization increases consumer water costs. Also, privatization of water has quite a number of serious negative impacts on public health, women's work, access to safe, affordable water, and local control and accountability (Grusky 2001). The cost of water does not correlate to the income of the population. The average price for a bucket of water rose from eight peswas to 15 Peswas which is approximately 0.05 cents to 0.09 cents. And more than 50 percent of the population earns less than US$1 a day and approximately 40 percent fall below the national poverty line (Appiah-Kubi, 2001).

The current water tariff rates that the government of Ghana and the World Bank assume are below the market rate are already beyond the means of most of the population in Ghana. As water becomes less affordable, it is highly likely that there will be a corresponding increase in diseases stemming from reduced access to clean water (Multinational Monitor, 2001). World Bank structural adjustment loans and water-sanitation loans consistently include conditions requiring increased cost recovery, full cost recovery or economic pricing for water services (Grusky 2001). These requirements mean that user fees paid by water consumers must cover all water system costs, which usually include the

costs of operation, maintenance and capital expenditure, and sometimes the cost of servicing previous utility company debt (Grusky 2001). However, increased consumer fees for water can make safe water unaffordable for poor and vulnerable populations. As water becomes more costly and less accessible, women and children, who bear most of the burden of daily household chores, must travel farther and work harder to collect water-often resorting to water from polluted streams and rivers.

2.5 Education as a Means of Empowerment

Research on education and economic growth has shown that failure to invest in girls' education lowers a country's gross national product (GNP) (Knowles, Lorgelly, & Owen 2002; Klasen 2001). Education is of key importance as a means of empowering women with the knowledge, skills and self-confidence necessary to realize their potential. This is true not only because education is an entry point to other opportunities, but also because the educational achievements of women can have ripple effects within the family and across generations. Investing in girls' education is one of the most effective ways to reduce poverty. Higher levels of education increase the probability that women will engage in formal paid employment (Grown et al., 2005). The possibility of women's involvement in formal employment provides livelihood options for them even when their water-related livelihood activities are no longer available to them.

Education is the only passport to liberation, to political and financial empowerment. Education contributes to sustainable development. It brings

about a positive change in our lifestyles. It has the benefit of increasing earnings, improving health and raising productivity. Adult literacy programs for illiterate mothers are beneficial to themselves and their children. Literacy programs contribute to women's overall empowerment through improvements in their reproductive health and participation in income-generating activities (Grown et al., 2005). The education a mother obtains is usually more influential than the father's. An educated mother's greater influence in household negotiations usually allows her to secure more resources for her children. It has also been found that a mother's level of education has a strong positive effect on her daughters' enrollment in school more than on sons (Grown et al., 2005).

The 1994 Cairo Consensus recognized education, especially for women, as a force for social and economic development. Universal completion of primary education was set as a 20-year goal, as was wider access to secondary and higher education among girls and women (International Conference on Population and Development, 1994). Closing the gender gap in education by 2015 is also one of the benchmarks for the Millennium Development Goals (MDG Report, 2008).

2.6 Basics of Qualitative Approach

Creswell (2003) explains numerous assumptions that are involved in qualitative research, including:

1. Qualitative research necessitates fieldwork, allowing the researcher to observe behaviors and conditions in their natural setting.

2. Qualitative research is descriptive because meaning and understanding are gained through words, pictures and other media.

3. The researcher is the primary instrument for data collection and analysis.

4. Qualitative research is concerned with meaning, in other words, how people make sense of their lives, experiences, and structures of their world.

5. Qualitative research is inductive, meaning that the researcher builds abstractions, concepts, hypotheses, and theories from details observed.

There are numerous possible approaches to qualitative research including focus group discussions and semi-structured interviews (Creswell, 2003). Focus group discussion is a qualitative method to obtain in-depth information on concepts and perceptions about a certain topic through spontaneous group discussion of the topic (Krueger & Casey, 2000). Focus groups are particularly valuable because they involve some kind of informal technique that helps to assess user needs and feelings.

An interpreter interprets spoken communications, such as speeches, presentations, conversations, meetings, and interviews. Interpreters come in two general categories which are simultaneous and consecutive. A simultaneous interpreter relays conversations, speeches, and presentations as they happen, in real time. Usually, this is done through electronic equipment, but it is also often done with an interpreter whispering in your ear while your other ear picks up everything happening around you. Consecutive interpreters are the most common type used by journalists in interviews, and are much less expensive

than simultaneous interpreters. When using a consecutive interpreter, the speaker (interviewer/interviewee) pauses after each phrase to allow the interpreter to relay it in the language. This is more often used in small groups or one-on-one interviews (Tangeman, 2001).

2.7 Gaps in the Literature

The researcher's study involved field work in which first hand data and information obtained will be used to analyze the problems and make recommendations. Most of the literatures reviewed include academic journals, government reports, scholarly books, and educative websites. The literatures are related to domestic water use for productive activities; accessibility and affordability of clean water; and the role women play in water accessibility and usage in Ghana. Some authors of literatures reviewed agree that women need to be empowered through education and involvement in the decision making processes that relates to water (Razavi & Miller 1995; Millennium Development Goals Report, 2008). The authors also agreed to the high cost of clean water bored by the poor. However, focus on the contribution of domestic water to household income is minimal. Methods used to carry out the researches varied from quantitative method of analysis to qualitative methods.

CHAPTER 3: METHODS

3.1: Introduction to Methods

The most appropriate approach to address the research objectives is called qualitative approach. Qualitative research provides an in-depth understanding of the experiences, perspectives and histories of people within the context of their own setting or circumstances (Creswell, 2003) which will allow for the full exploration of the research objectives planned and propounded. Qualitative research is an effort to understand situations in their uniqueness as part of a particular context. This understanding is an end in itself, as it does not attempt to predict what may happen in the future (Merriam, 2002). Emphasis is laid on the value-laden nature of enquiry. Although qualitative research was chosen as the approach for this thesis, there are some aspects of data analysis which require the use of quantitative approach.

Creswell (1998) identified five ways of carrying out qualitative enquiry —biography, phenomenology, grounded theory, ethnography, and case study. The case study is an intensive description and analysis of a phenomenon or social unit such as an individual, group, institution, or community. This research focused on men and women involved in water-related livelihood activities.

3.2: Introduction of International Water Management Institute (IWMI)

International Water Management Institute (IWMI) is located in different regions and parts of the world. IWMI West Africa has its main office in Accra, Ghana, and activities throughout the sub-region. Projects that are carried out by the institute focus on efforts to reduce poverty and provide improved food

security through sustainable and efficient agricultural water use (IWMI website, 2009). Projects are currently distributed over six major research areas including: integrated water resource management; technology adoption and dissemination; policies and institutional capacity building; malaria risk associated with irrigation; and safe use of wastewater and solid waste in peri-(urban) agriculture (IWMI website, 2009). Sustainable Water Management Improves Tomorrow's Cities' Health (SWITCH) is a large-scale research project carried out by the institute with the aim of developing sustainable urban water systems through research, technological development, and physical demonstration. The SWITCH project is designed to cover all elements of the urban water cycle, from water demand management, to storm water management, waste prevention, treatment and reuse, governance and asset management, to river rehabilitation and eco-hydrology (SWITCH website, 2009). This research was carried out in collaboration with the institute in Accra under the SWITCH project.

3.3: Methods used in Data Collection

There were four major methods of data collection used for the qualitative research study carried out—focus group discussions, interviews, observations, and documents. The four data collection methods were used as the methods will yield the best information with which to tackle the objectives.

a) Data were collected using focus group discussions through an interpreter. There was one focus group discussion (FGD) in each of the communities. The FGD in Sabon Zongo comprised of six adult women who are involved in water-related livelihood activities; and the FGD in Alajo comprised of a mixture of

five adult men and women. The researcher acted as the facilitator who directed the group discussions. There was an interpreter who interpreted the questions to the group and transmitted the answers to the researcher. Discussions began with introduction of everyone present, followed by the researcher posing a few open-ended questions. Researcher observed by listening to discussions and taking notes of important points discussed. A copy of the focus group discussion questions is annexed as Appendix C.

Table 1 Details of focus groups

Serial Number	**Date**	**Venue**	**Number of Participants**
1.	June 5, 2009	Residence of a traditional medicine maker and seller in Sabon Zongo community	06 (all females)
2.	June 6, 2009	Residence of Mrs. Agnes in Alajo community	05 (mixture of males and females)

b) Interviews: Semi-structured interview questions which contain a mix of structured and non-structured questions were used. Fifty male and female respondents were selected to be interviewed in each of the two communities based on profession and knowledge about the subject matter. Participants were selected among men and women who are low-income earners and earn their major income from water-related livelihood activities. Although the researcher proposed to select men and women whose livelihood activities involve domestic water use and are between the age range of 20 and 45 to ensure that they are not

retired or dependent, two women within the age range of 70 and 85 were interviewed. A copy of the interview schedule is annexed as Appendix B.

Table 2 Interviewees by location

Serial Number	Community Name	Number of Interviewees
1.	Alajo	50
2	Sabon Zongo	50
	Total	100

c) The third major means of collecting data is through observation. Observational data represent a firsthand encounter with the phenomenon of interest rather than a secondhand account obtained in an interview (Merriam, 2002).

d) The fourth major source of data is documents. These are mostly written and visual (such as photographs and maps). Public records and personal documents are types of documents available for analyzing the research.

3.4 Analysis of Data

After collecting the data, the researcher went through a process of reviewing, preparing the data for analysis, analyzing the data and then integrating and synthesizing it.

1. Details of the case: The specific facts obtained about domestic water use for livelihood activities were arranged in chronological order based on the data collected during the fieldwork – focus group discussions and interview

questions. Before reviewing data, the objectives and research questions were scrutinized one more time.

Facts and figures collected during the initial stages of the fieldwork in the communities of Alajo and Sabon Zongo was initially delved into. The data were inspected, and erroneous data were corrected. No information was thrown away. All alterations to the data set were carefully and clearly documented. Thereafter, the researcher gathered information on water use for livelihood activities by doing a literature review to acquire background information and knowledge.

2. Categorization of data: In order to cluster data into meaningful groups, major categories were identified from the interviews, focus group discussions and literature review. The quality of the data was checked at this stage. The structure of the sample was accurately described. It is especially important to exactly determine the structure of the sample for easy processing during the main analysis phase.

Data categorization helps to facilitate identifying themes, patterns, and connections that enable answering the research questions effectively. This step usually involves coding, where the passages of text that have the same message are marked or are connected in some way, and an accompanying explanation of what the selected passages have in common is written.

3. Qualitative Analysis: Before analyzing the data, the researcher made sure that the data are in a format suitable for analysis. This means that all responses from interview questions were entered into a database that allows for

manipulation of numbers using analytical software called Statistical Packages for Social Sciences (SPSS).

The three steps followed to prepare data for analysis are:

- Coding the data
- Data entry into SPSS
- Error checking

The data from the interview schedules was analyzed in terms of percentages of various responses. This was done to generate the percentages of sample which responded in a particular way.

4. Synthesis and generalization: After compiling and analyzing the data, an overall assessment of the case study was done. Researcher took stock of what was found and pulled all of the pieces together. Basic conclusions were drawn for generalizations about some observed trends which were part of the scope of this study.

3.5 Ethics Review

In accordance with University of Manitoba policy #1406 (U of M Policy and Procedure, Section 1400, Policy 1406), all research under the auspices of the University of Manitoba that involve human subjects must be approved by the Research Ethics Board. The researcher took steps to ensure confidentiality of all subjects involved in research and most results will be presented in an aggregate form. A copy of the human ethics approval by the Joint-Faculty

Research Ethics Board, University of Manitoba has been attached as Appendix A.

3.6 Strategy Development

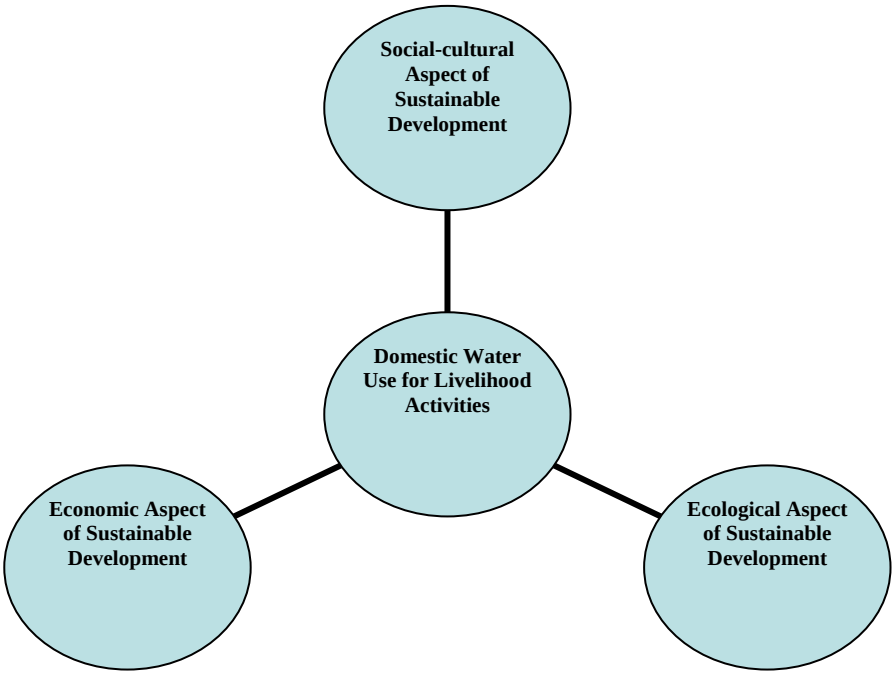


Figure 3: Relationships of the three aspects of sustainable development with domestic water use for economic activities. Source: Oyekan, 2009.

The study used a holistic and integrated approach to discuss and analyze the outcomes of the research. The researcher approached the research questions and objectives considering interdisciplinary measures. The basis for the diagram is to explain how far the impacts both water scarcity and water surplus has on economic, social, and environmental aspect of human lives. Water scarcity can limit natural and social development of societies everywhere while uncontrolled water surplus (flooding) can inflict severe economic and social losses.

CHAPTER 4: DATA AND ANALYSIS: THE CONTRIBUTION OF WATER TO HOUSEHOLD INCOME

4.1 Introduction

To gain a better insight into the importance of domestic water in livelihood activities and its contribution to household income, interviews were carried out alongside focus group discussions. These interviews and focus group discussions were conducted in the communities of Alajo and Sabon Zongo, with one focus group discussion in each community. The interviews were made up of semi-structured questionnaires. A total of 100 individuals were interviewed from the two communities – 50 in each community. In Alajo, the 50 interviewees consisted of three males and 47 females. The interviewees from Sabon Zongo consisted of eight males and 42 females.

4.2 Characteristics of Interviewees in the Alajo Community

The composition of the community was very diverse in terms of age, gender, occupation and education. Both Islamic and Christian religions are practiced. Where the number of interviewees who responded n = 50, six percent of the sample size were male and 94 percent were female (Figure 4). Interviewees' ages ranged from 20 to 82 years. Thirty-four percent of those interviewed were between the ages of 20 and 28. Those between the ages of 30 and 40 constituted 46 percent of the sample size, and those between the ages of 42 and 82 constituted 14 percent of the sample size (Figure 5). Six percent of the sample size was not willing to disclose their age.

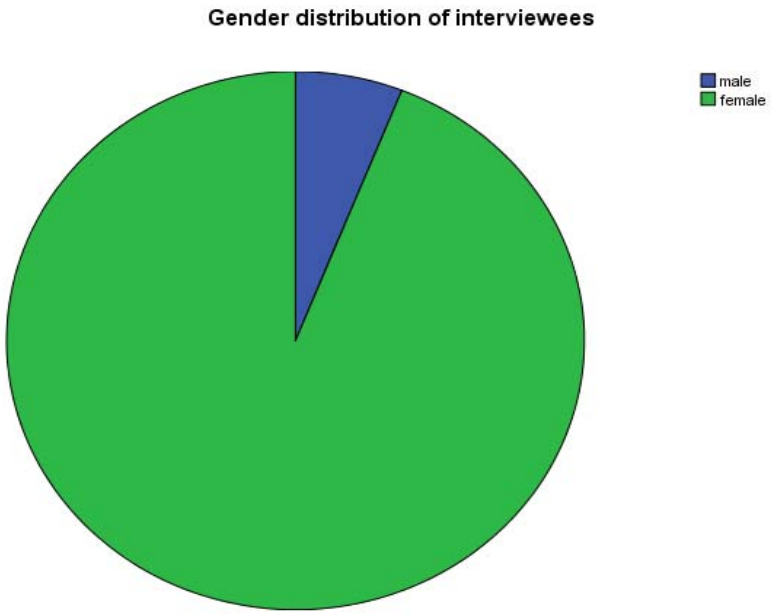


Figure 4: Gender distribution of interviewees from the Alajo community.

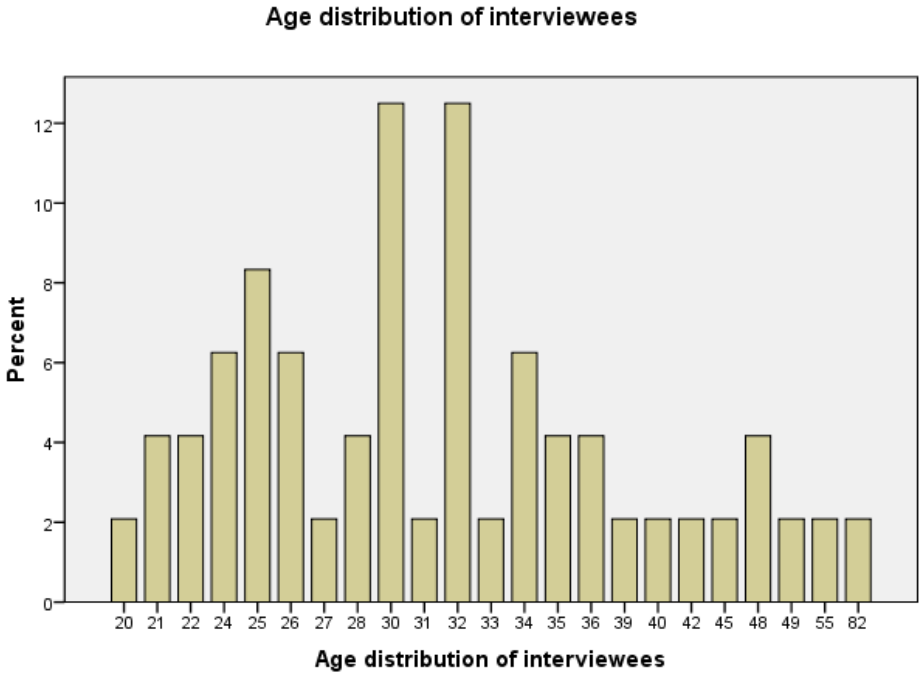


Figure 5: Age distribution of interviewees from the Alajo community.

Interviewees had different educational levels and backgrounds. Eight percent had no formal education, while four percent had primary education (grades 1-5) as the highest level of education attained. Sixty-eight percent had the highest level of education of Junior Secondary School JSS – an equivalent of grades 6-8. Four percent had vocational education, 14 percent had Senior Secondary School SSS education (grades 10-12), and two percent had post-secondary education (college). Interviewees' educational levels are revealed in a pie chart in Figure 6 where the number of interviewees who responded n = 50. The demographic stated above shows that respondents have a very low level of formal education. Those who managed to attain some form of formal education mainly ended at the basic level. This low level of the women's formal education can affect their level of empowerment to a very high extent.

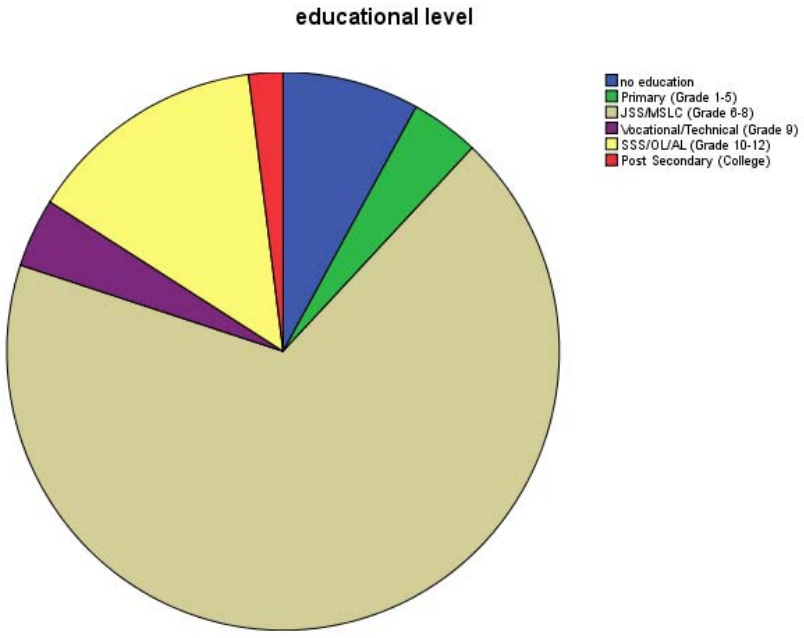


Figure 6: Educational level of interviewees from the Alajo community.

The focus group discussions assisted in finding out different water-related and non-water-related commercial activities in the community. Participants at the FGD mentioned that some non-water-related business activities community members were involved in include “petty trading, chemical selling, sales personnel, construction work, tomato selling, and drug (medication) sales”. Different water-related business activities undertaken by the interviewees include hairdressing, chop bar operations, public bathroom operations, lemon gin processing, bean selling, water selling, baking, fast food vending, kenkey selling and fried Yam selling. A chop bar is a place where people go to eat, which is not necessarily a bar. It is synonymous to what is known as a restaurant. Kenkey is a local Ghanaian food produced from maize. The predominant business activities in Alajo are hairdressing and chop bar operations with percentages of 48 and 22 respectively. Eight percent of the interviewees were involved in fried yam sales while public bathroom operations, lemon gin processing, water sales and fast food vending each hold four percent of the activities. Bean sales, baking and kenkey sales each hold two percent (Figure 7).

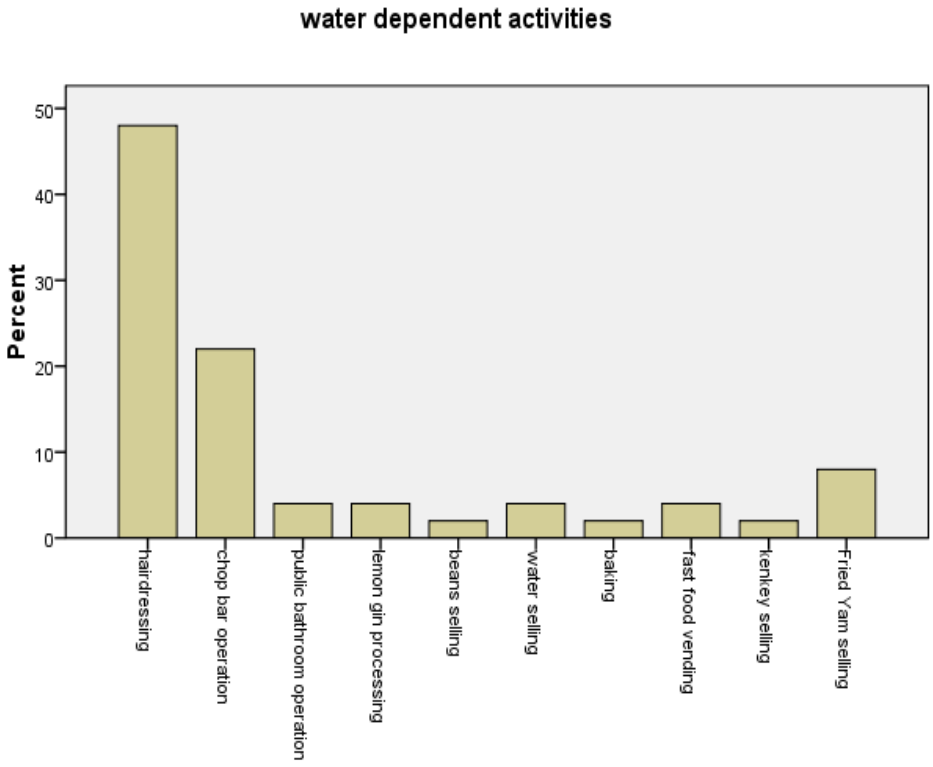


Figure 7: Different business activities carried out by interviewees.

According to the data obtained from the Accra Metropolitan Assembly (AMA), there are four major water related business activities registered with and known by the government in both Alajo and Sabon Zongo. These business activities include hairdressers, public toilets, bakery shops, and chop bars. In Alajo, there were 37 registered hairdressers and 24 hairdressers were interviewed. Out of the 24 hairdressers interviewed, 16 responded with "Yes" to the question "Is your business registered?" Six responded "I don't know" and two gave a "No" response. Thirteen chop bars were registered and 15 persons were interviewed. Among those interviewed, 14 claimed to be registered and one responded "I don't know". Seven public toilets were registered with the

government and two were persons interviewed. However, one out of the two interviewed said the business was not registered. There were eight bakery shops registered and one was interviewed. Correlating the information received from the AMA with the interviews carried out, some discrepancies can be noted. There is a possibility that the level of sincerity of the respondents is low and the government does not have reliable and up-to-date information.

Water used for business activities is retrieved either from the interviewees' pipe connections or their neighbor's connections. Individuals with pipe connections do not necessarily have plumbing facility in their houses, but they have a single tap in the compound where they fetch water in buckets and gallon-sized containers to use for their activities. Forty percent retrieve water from their own connections while 60 percent from neighbor's connections (Figure 8).

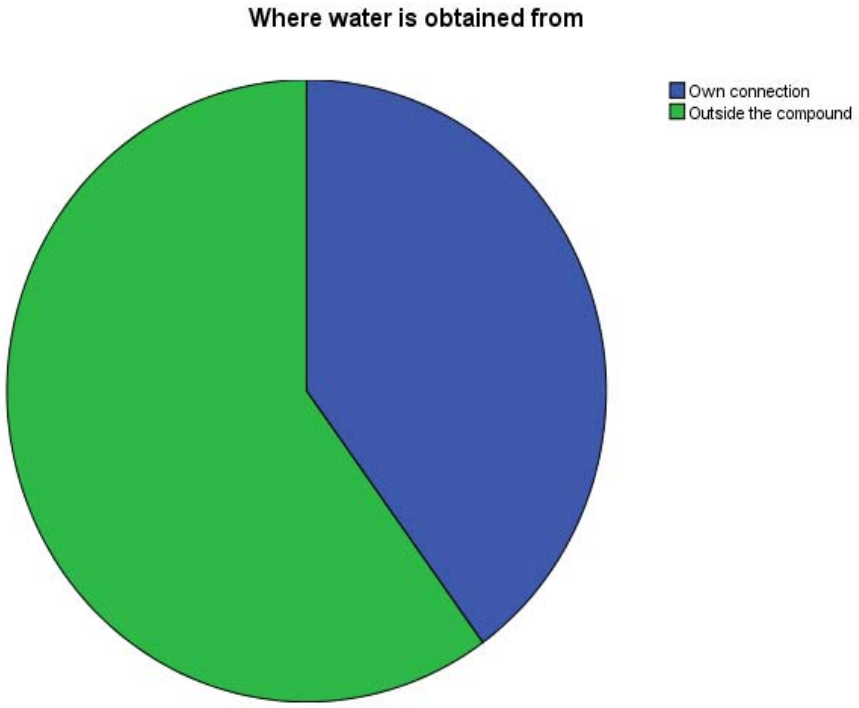


Figure 8: Interviewees' form of water retrieval in the Alajo community.

4.3 Characteristics of Interviewees in the Sabon Zongo Community

As opposed to Alajo, the Sabon Zongo community is composed of members whose religion is Islam. The community is also very diverse in terms of age, gender, occupation and education. The environment is unclean with excreta and urine in public places. Sixteen percent of the interviewees were male and 84 percent were female (Figure 9). The age range of interviewees varied from 20 to 70 years. Thirty-six percent were within the age range of 20 and 29; 52 percent were within the age range of 30 and 40; and 12 percent were within the range of 42 and 70 years (Figure 10). The number of interviewees who responded n = 50.

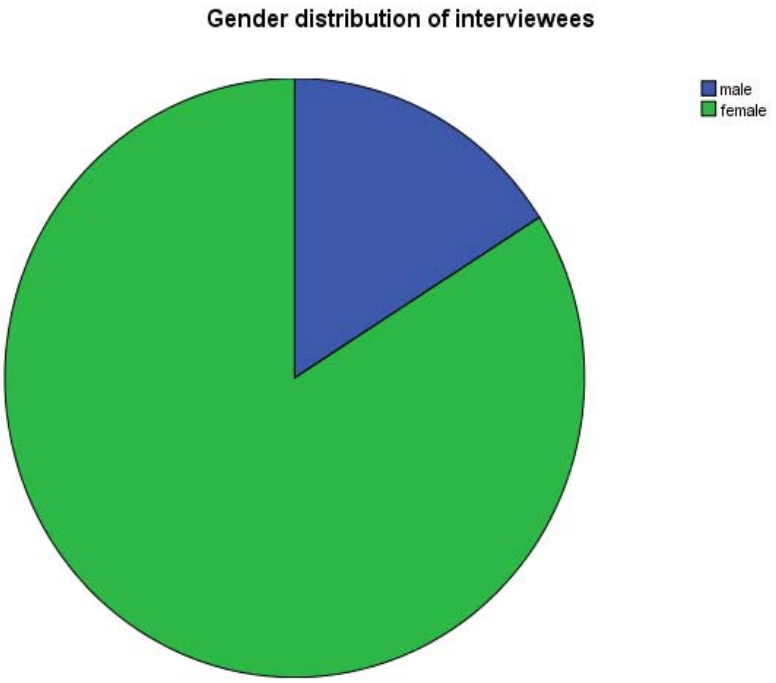


Figure 9: Gender distribution of respondents in the Sabon Zongo community.

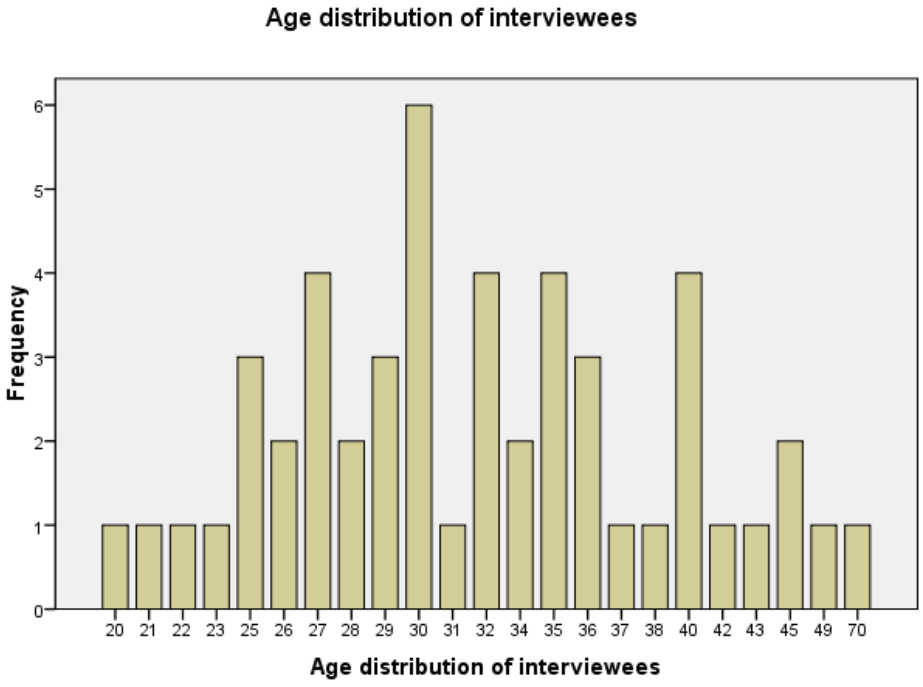


Figure 10: Age distribution of interviewees in the Sabon Zongo community.

The educational background of the interviewees varied. Where the number of interviewees who responded n = 50, 18 percent have no formal education, 10 percent have Primary (grades 1-5) education, 56 percent have Junior Secondary School - JSS (grades 6-8) education, 14 percent have Senior Secondary School – SSS (grades 10-12) education, and two percent have post-secondary (diplomas/certifications). This is illustrated in Figure 11. The demographic stated above shows that respondents have a very low level of formal education. Those who managed to attain some form of formal education ended mainly at the basic level. This low level of the women's formal education can affect their level of empowerment to a very high extent.

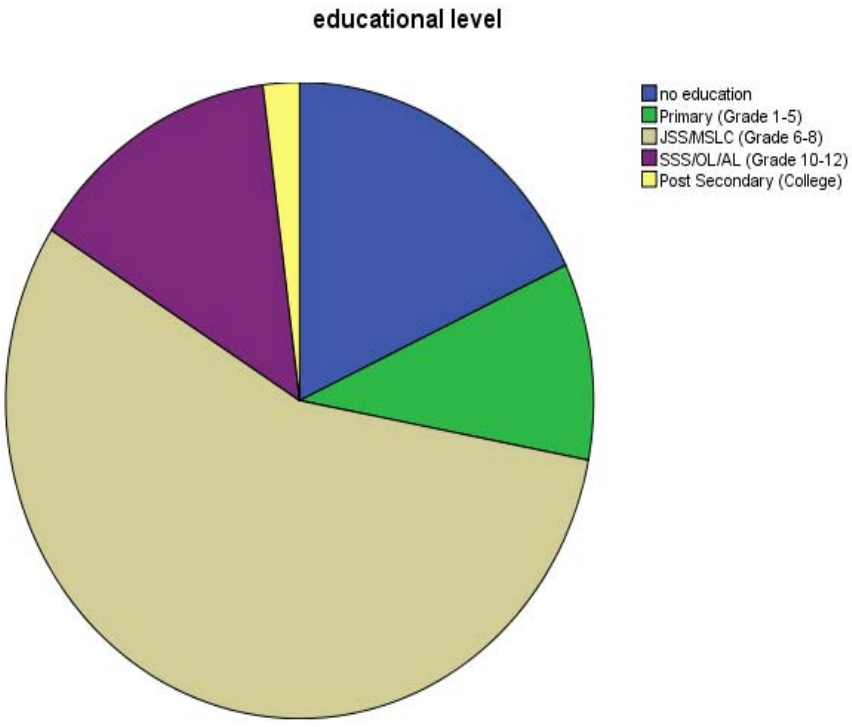


Figure 11: Educational level of interviewees in the Sabon Zongo community.

The focus group discussion assisted in finding out different water-related and non-water-related commercial activities in the community. Amongst many

others, some non-water-related activities include petty trading, chemical selling, sales personnel, construction work, tomato selling and drug (medication) sales. The major water-dependent livelihood activities of interviewees in Sabon Zongo are hairdressing, chop bar operations, public bathroom operations, lemon gin processing, bean selling, fast food vending, kenkey selling and porridge selling. As it is in Alajo, the predominant activities are hairdressing and chop bar operations. However, the proportion of the sample size involved in hairdressing is more in Alajo than in Sabon Zongo, while the proportion involved in chop bar operations is more in Sabon Zongo than in Alajo. Thirty-two percent of the interviewees were hairdressers; 26 percent were chop bar operators; 12 percent were public bathroom operators; eight percent each were lemon gin processors and fast food vendors; six percent each were kenkey sellers and porridge sellers; and two percent were bean sellers (Figure 12). The number of interviewees who responded n = 50.

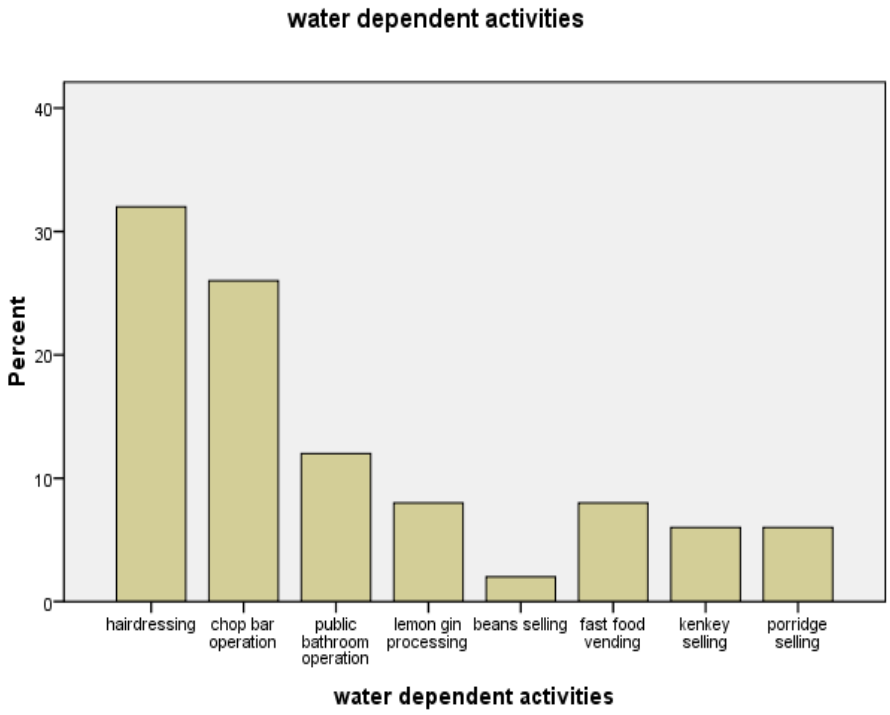


Figure 12: Water dependent livelihood activities in the Sabon Zongo community.

When asked about the motivation for participating in their various businesses, the interviewees in both communities responded "it is the most lucrative business around", "I need money to take care of my children as I am a widow", "I want to save money to be able to go back to school", "I need money to care for my mother", and "I need the money to pay my bills".

In Sabon Zongo, 20 hairdressers were registered and 16 were interviewed. Out of the 16 interviewed, 15 gave a “Yes” response to the question “Is your business registered” and one said “No”. Eight chop bars were registered with the government and 20 were interviewed. Among those interviewed, 15 said they were registered and five said they were not. Three public toilet operators were registered and six were interviewed. They all said that they were registered.

Again, correlating the information received from the AMA with the interviews carried out, some discrepancies can be noted. There is a possibility that the level of sincerity of the respondents is questionable or the government does not have reliable and up-to-date information.

The forms of water retrieval for people interviewed include individual pipe connections and their neighbor's connections. As illustrated in Figure 13, 36 percent of interviewees retrieve water from their own pipe connections and 64 percent retrieve water from neighbors' connections where the number of interviewees who responded n = 50. Most of the interviewees who retrieve water from their neighbors' connections pay to retrieve water from the other compound.

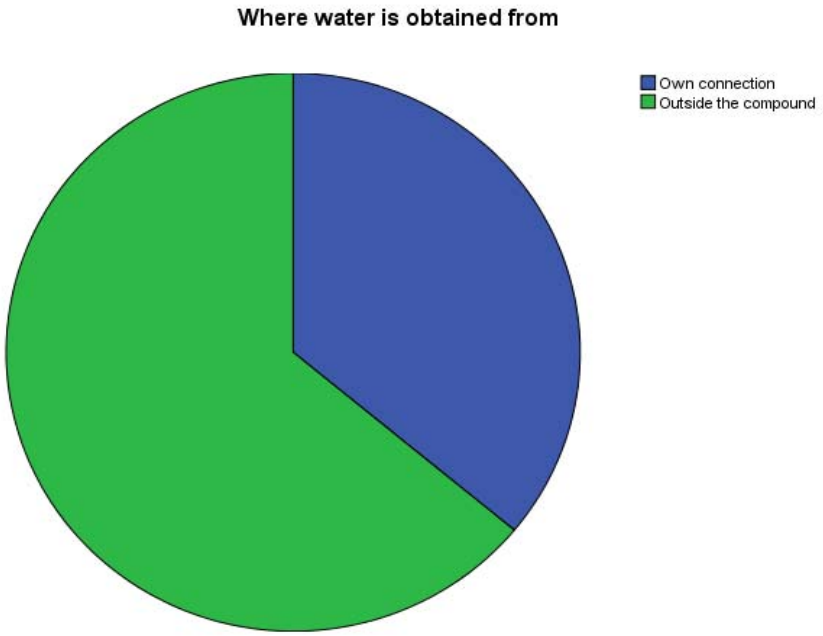


Figure 13: Interviewees' form of water retrieval in the Sabon Zongo community.

4.4 Evaluation of Cost of Water Used for Livelihood Activities in the Alajo and Sabon Zongo Communities

During the focus group discussion, the cost of water in the community was discussed. In both communities, interviewees said that on average, they purchase water at the rate of five peswas per 15 liters. It was found that people buy water at a rate ten times the regulated rate. Although Ghana's Public Utility Regulatory Commission's (PURC) domestic rate of water per liter is 0.00033 peswas, private water sellers sell a liter of water at 0.0031 peswas. Despite this occurrence, most of the community members are ignorant of the high cost of water. Fifty-four percent of the interviewees in Alajo believe the cost of water is affordable while 44 percent believe the cost is expensive (Figure 14). Two percent gave no response.

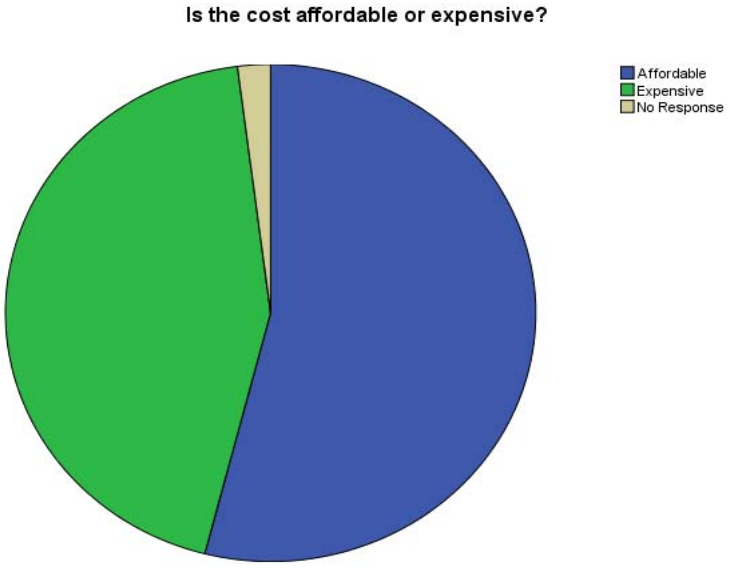


Figure 14: Interviewees' view on cost of water in the Alajo community.

In Sabon Zongo, 62 percent consider the cost of water to be affordable, 36 percent believe it is expensive and two percent gave no response (Figure 15). Most of the interviewees argue there are no problems with the accessibility and affordability of water. Respondents defined affordability of water based on the cost and not on the quality of water. Water should be viewed as affordable when there is equal access by both the poor and rich, the water quality is safe for drinking and productive uses, and the water supply system is sustainable. Water is sustainable when it is carefully and wisely used.

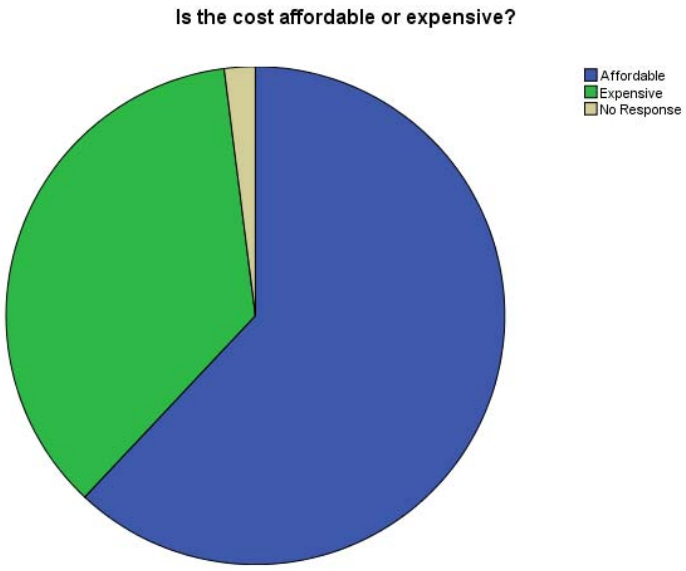


Figure 15: Interviewees' view on cost of water in the Sabon Zongo community.

In Alajo, a water-related business owner spends an average of 9.2 percent of his/her income in a month on the purchase of water. However, in Sabon Zongo, 11.1 percent of his/her income is spent on water in a month.

4.5 Amount of Domestic Water Used for Livelihood Purposes

As is the case in most developing countries' cities, citizens of Accra use domestic water for livelihood purposes. On average, a water-related business owner in Alajo uses 28,645 liters of water in a month. In Alajo, chop bar operators followed by public bathroom operators and hairdressers make use of domestic water more than any other business. However, a water-related business owner uses 26,757 liters on average in a month in Sabon Zongo. It was also found that in Sabon Zongo, as opposed to Alajo where chop bar operators use more domestic water than all other businesses, public bathroom operators use more water followed by chop bar operators and hairdressers. See Figures 16 and 17 for the amount of water used in Alajo and Sabon Zongo respectively. The number of interviewees who responded in each community n= 50.

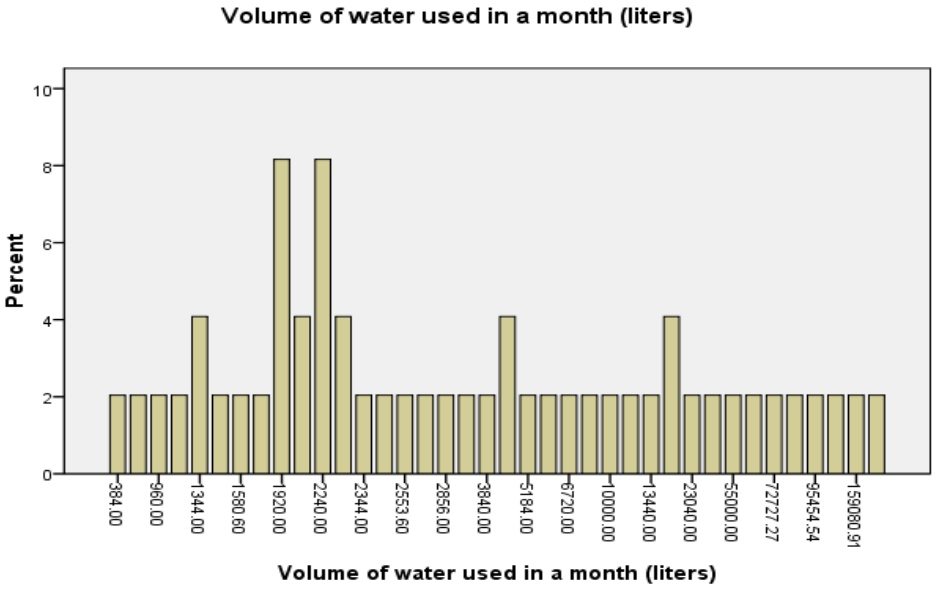


Figure 16: Average monthly amount of water used by businesses in the Alajo community.

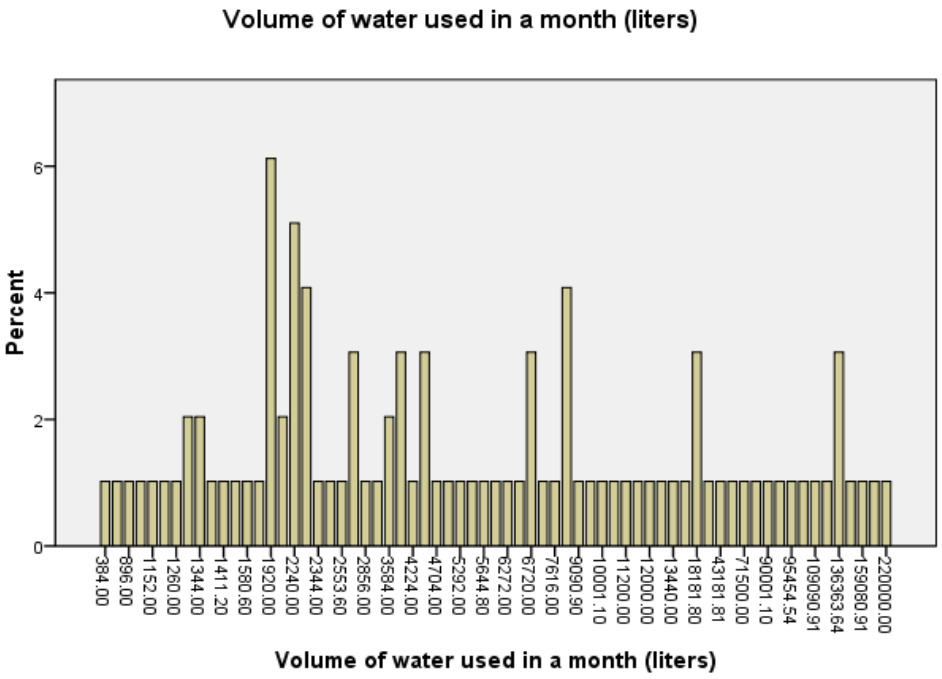


Figure 17: Average monthly amount of water used by businesses in the Sabon Zongo community.

4.6 Contribution of Water-related Livelihood Activities to Household Income in Alajo Community

Income generated from water-dependent livelihood activities contributes in a major way to the income of poor households, with most of these households depending solely on this activity for their income. In Alajo, 68 percent of the households of people interviewed totally depend on income from the water-related activities. The remaining 32 percent supplement the income generated from water-related livelihood activities with income generated from other activities like bag selling, road cleaning, cosmetic sales, wig sale, and petty trading (Figure 18), where the number of respondents n = 50.

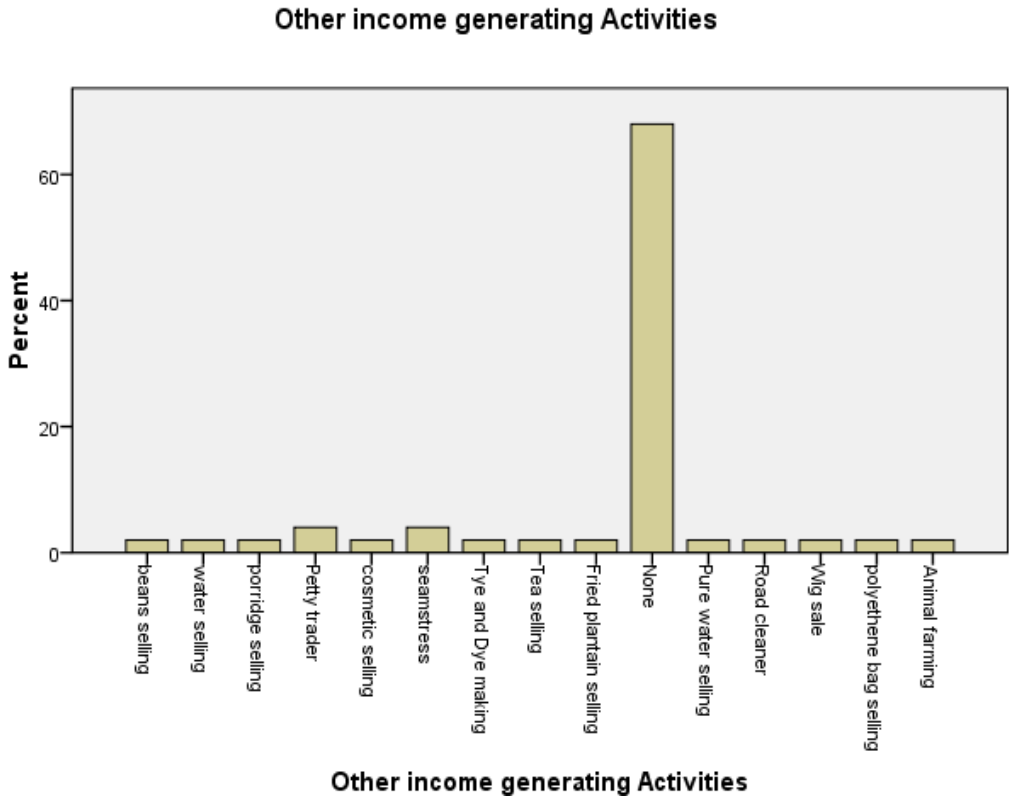


Figure 18: Other income generating activities of interviewees in Alajo.

Interviewees in the Alajo community stated that water is significant in carrying out their water-related income generation activities. The people noted that the inability to access water for their income-generating activity cause them to “close their businesses, lose income, and be tired as a result of travelling farther distances to access water”.

The income generated from the water-related activities is utilized to ensure household food security, provision of formal education for dependants and provision of basic human needs of food, shelter and clothing. In the case of most of the households, the situation is that the income generated is not sufficient to provide for their basic needs, which explains why they are said to

be experiencing poverty. Insufficient income results in a decline in their state of health, a high illiteracy rate and lack of tangible assets like land.

Other researchers (Krishnaji, 1980; Barquero et al., 2005) found that most of these poor households have quite a number of dependents who rely on the meager income from water-related livelihood activities for survival. However, this research discovered that in Alajo, where the number of respondents n = 50, 36 percent of respondents had no dependents. Twelve percent had one dependent, 28 percent had two dependents, 10 percent had three dependents, eight percent had four dependents, four percent had five dependents and two percent had seven dependents (Figure 19). Despite the low number of dependents, all respondents find it difficult to adequately provide three square meals a day for their dependents.

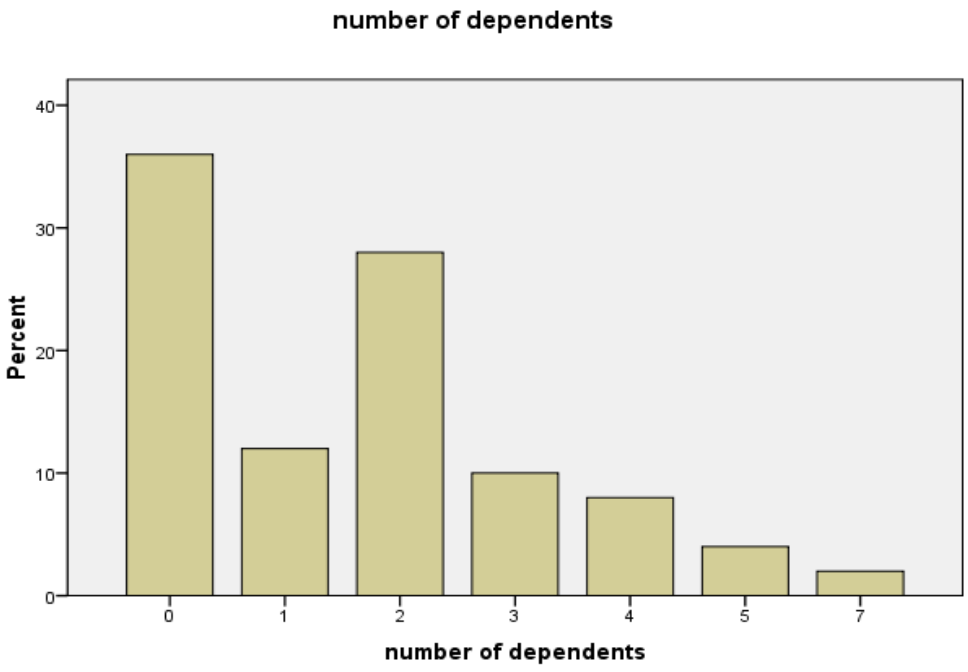


Figure 19: Number of interviewees' dependents in Alajo community.

Eighty-eight percent of the interviewees responded to questions that related to the cost of water, cost of other materials used for the business, and income obtained. Total profit was calculated by deducting the cost of materials, including water, from the total income (Table 3). Findings obtained from the interviews conducted with water-dependent business owners shows that water contributes immensely to income and the profit generated from these businesses, as the majority of business owners do profit from the businesses. Out of the 88 percent of respondents, six percent of the businesses ran at a loss in an average month.

Table 3: Average monthly total income and profit of water-related business owners in Alajo community

Water-dependent Activities	Cost of Materials including Water per Month (Cedis)	Cost of Cleaning Material per Month (Cedis)	Total Income per Month (Cedis)	Total Profit per Month (Cedis)
Hairdressing	156	0	240	84
Lemon-gin Processing	172.2	0	252	79.8
Public Bathroom Operation	191	24	980	765
Hairdressing	221.52	0	378	156.48
Hairdressing	187.32	0	630	442.68
Public Bathroom Operation	158	0	336	178
Hairdressing	14	0	875	861
Hairdressing	30.44	0	210	179.56
Chop Bar Operation	760	0	960	200
Chop Bar Operation	1095.2	0	3000	1904.8
Hairdressing	31.36	0	616	584.64
Water Selling	65	0	126	61
Bean Selling	565.04	0	1932	1366.96
Hairdressing	7.4	0	108	100.6
Fast Food Vending	1404.2	0	1680	275.8
Hairdressing	20.2	0	126	105.8
Hairdressing	40	0	126	86
Baking	15650	0	28224	12574
Chop Bar Operation	1928	0	3240	1312
Hairdressing	9	0	98	89
Fast Food Vending	1268.4	0	1890	621.6
Water Selling	47.5	0	35	-12.5
Hairdressing	80.4	0	462	381.6
Hairdressing	116	0	288	172
Chop Bar Operation	756	0	1656	900
Kenkey Selling	238	0	224	-14
Hairdressing	36.4	0	285.6	249.2
Hairdressing	23	0	245	222
Chop Bar Operation	2401.2	0	4800	2398.8
Lemon-gin Processing	107	0	508.2	401.2
Fried Yam Selling	186	0	240	54
Hairdressing	115	0	347	232
Hairdressing	14.6	0	126	111.4
Fried Yam Selling	1407	0	3360	1953
Hairdressing	38.4	0	525	486.6
Fried Yam Selling	1209.6	0	2160	950.4
Hairdressing	11.8	0	120	108.2
Fried Yam Selling	162.4	0	120	-42.4
Chop Bar Operation	3185	0	5600	2415

In Alajo, 50 percent of interviewees participate in Susu saving; 42 percent are not involved and eight percent save in the bank (Figure 20).

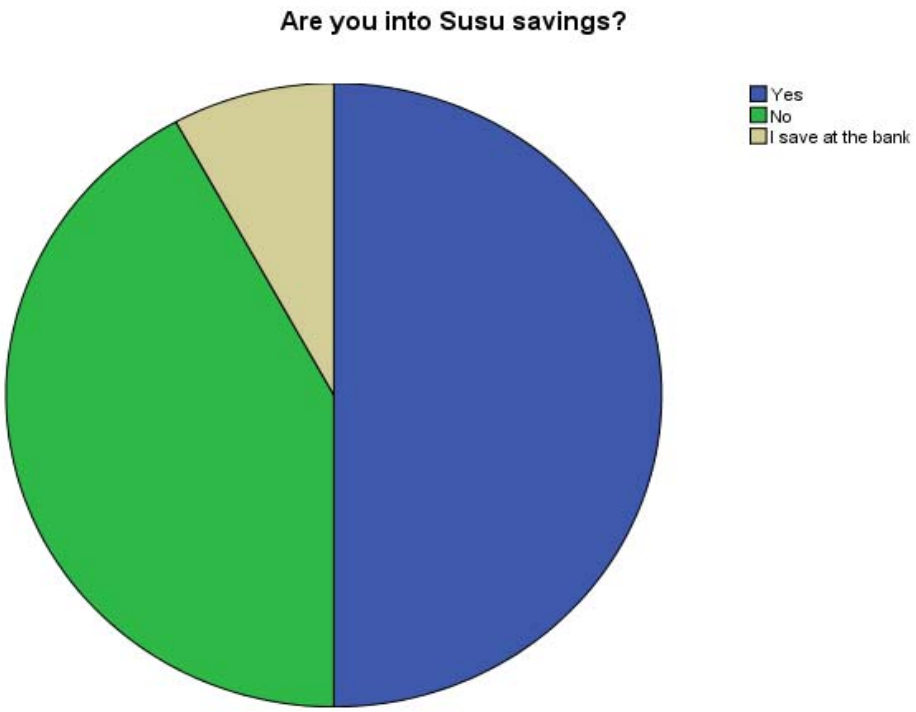


Figure 20: Interviewees' participation in Susu saving in the Alajo community.

4.7 Contribution of Water-related Livelihood Activities to Household Income in the Sabon Zongo Community

In Sabon Zongo, income generated from water-dependent livelihood activities contributes in a major way to the income of poor households, with most of these households depending solely on the activity for their income. Compared to the Alajo community, 80 percent of the interviewees' households in Sabon Zongo totally depend on income from the water-related activities. The remaining 20 percent of interviewees derive their income mainly from water-related activities, but are still involved in activities like teaching, bag selling, cloth selling,

housemaid, baking and catering to supplement the household income (Figure 21). The number of respondent n = 50.

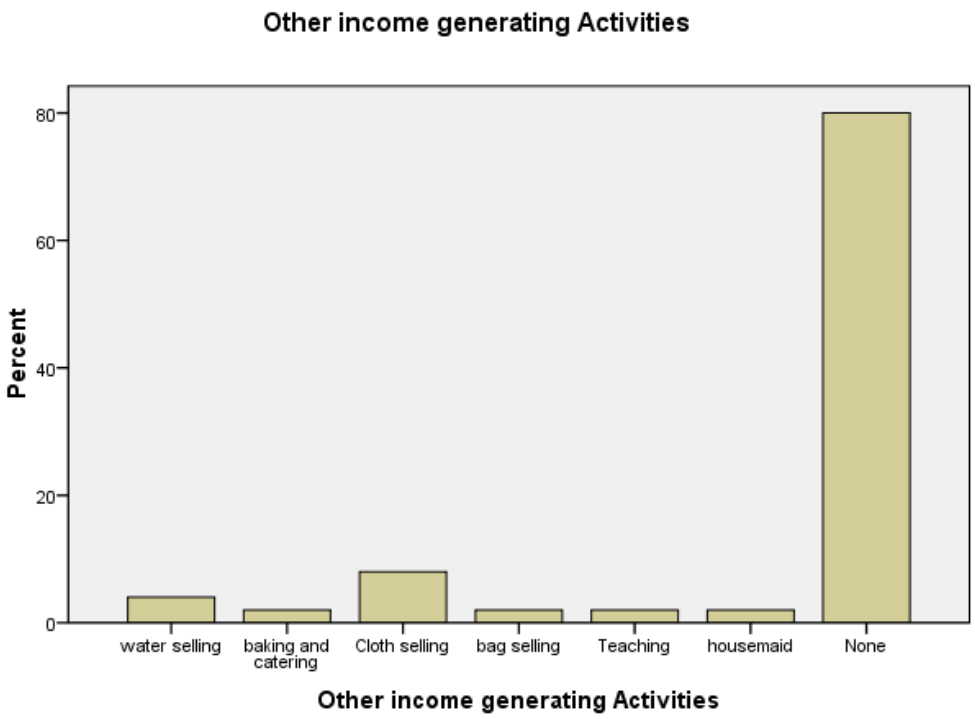


Figure 21: Other income generating activities in the Sabon Zongo community

Interviewees in Sabon Zongo discussed the significance of water in carrying out their water-related income generation activities. The people noted that the inability to access water for their income-generating activity cause them to “close their businesses, lose income, and be tired as a result of travelling farther distances to access water”.

In Sabon Zongo, 98 percent of the interviewees participated in questions relating to the cost of water, the cost of other materials used for the business, and income. After calculating the total profit made from the businesses in an

average month, it was found that only four percent suffered a loss out of the 98 percent participation rate (Table 4).

Table 4: Average monthly income of water-dependent businesses in the Sabon Zongo community

Water-dependent Activities	Cost of Materials including Water per Month (Cedis)	Cost of Cleaning Materials per Month (Cedis)	Total Income per Month (Cedis)	Total Profit per Month (Cedis)
Chop Bar Operation	1215	0	2400	1185
Public Bathroom Operation	175	5.5	140	-40.5
Hairdressing	9	0	90	81
Fast Food Vending	105.6	0	1400	1294.4
Hairdressing	44.4	0	1750	1705.6
Hairdressing	25	0	420	395
Hairdressing	18.4	0	560	541.6
Lemon-gin Processing	190.2	0	308	117.8
Bean Selling	933.32	0	3220	2267
Lemon-gin Processing	204.8	0	660	455.2
Chop Bar Operation	468	0	2800	2332
Public Bathroom Operation	125	56	980	799
Fast Food Vending	1122.8	0	3360	2237
Porridge Selling	603.6	0	8400	7796.4
Kenkey Selling	1087	0	1404	317
Hairdressing	59.5	0	350	290.5
Chop Bar Operation	1872	0	3600	1728
Chop Bar Operation	3388	0	6300	2912
Chop Bar Operation	1141	0	2380	1239
Public Bathroom Operation	170	76	1400	1154
Chop Bar Operation	2401	0	4200	1799
Hairdressing	18	0	288	270
Hairdressing	96	0	360	264
Public Bathroom Operation	120	40	560	400
Hairdressing	18.2	0	126	107.8
Kenkey Selling	1324.8	0	3840	2515
Hairdressing	32	0	384	352
Hairdressing	21	0	504	483
Chop Bar Operation	2975	0	5600	2625
Fast Food Vending	1702.4	0	3136	1433.6
Hairdressing	81.2	0	336	254.8
Chop Bar Operation	2480	0	4900	2420

Table 4: Average monthly income of water-dependent businesses in the Sabon Zongo community (continued)

Water-dependent Activities	Cost of Materials including Water per Month (Cedis)	Cost of Cleaning Materials per Month (Cedis)	Total Income per Month (Cedis)	Total Profit per Month (Cedis)
Lemon-gin Processing	124.2	0	280	155.8
Hairdressing	132	0	630	498
Public Bathroom Operation	150	40	770	580
Kenkey Selling	2804.2	0	4200	1395.8
Porridge Selling	637.2	0	1820	1182.8
Hairdressing	45.68	0	504	458.32
Chop Bar Operation	2823.8	0	5544	2720.2
Fast Food Vending	2529.8	0	4480	1950.2
Chop bar Operation	4320	0	8400	4080
Hairdressing	49.4	0	462.2	412.8
Hairdressing	49.2	0	324	274.8
Hairdressing	75	0	360	285
Chop Bar Operation	2017.5	0	1300	-717.5
Chop Bar Operation	2053.2	0	2760	706.8
Porridge Selling	105.15	0	1260	1154.85
Lemon-gin Processing	562.8	0	1540	977.2
Chop Bar Operation	2530	0	5250	2720

Seventy percent of interviewees in Sabon Zongo are involved in Susu savings. Twenty-eight percent do not participate and two percent save at the bank (Figure 22). The interviewees who participate in Susu recognize it as a useful tool in providing for their needs and supplementing their household incomes. In their own words, Susu “helps me to pay my bills, pays my children’s school fees, buys materials for my business, pays for my rent, and takes care of my mother, brothers and sisters”.

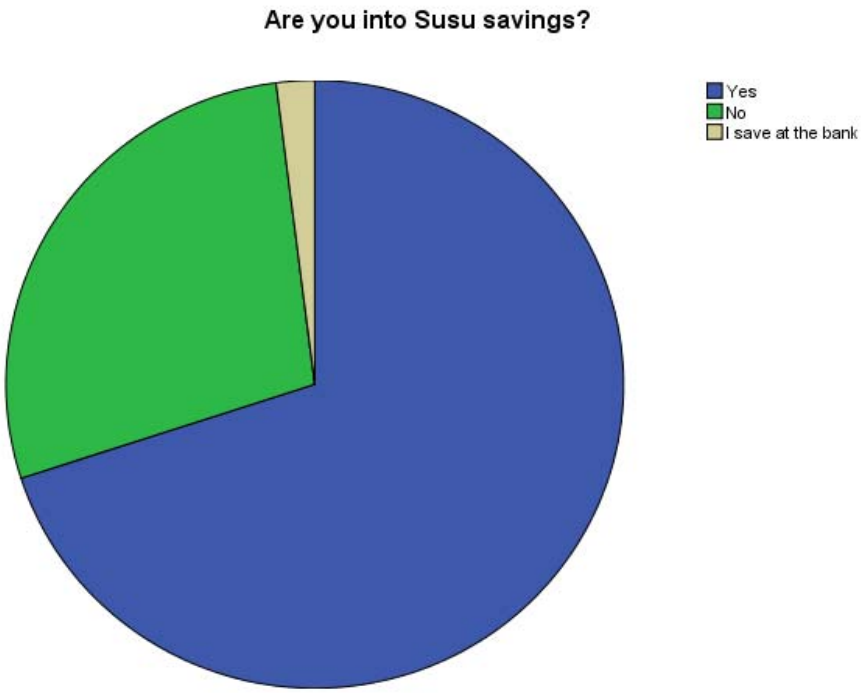


Figure 22: Interviewees' participation in Susu saving in the Sabon Zongo community.

The number of dependents per household interviewed in Sabon Zongo community varied. Thirty per cent of respondents have no dependents. Twenty-six percent have one dependent, 22 percent have two dependents, 12 percent have three dependents, six percent have four dependents, two percent have six dependents and two percent have seven dependents (Figure 23). As is the case with the respondents in Alajo, a high percentage of respondents have between one and three dependents, which is assumed to be an acceptable number per household in the society. However, these households still find it difficult to provide the basic needs for their dependents.

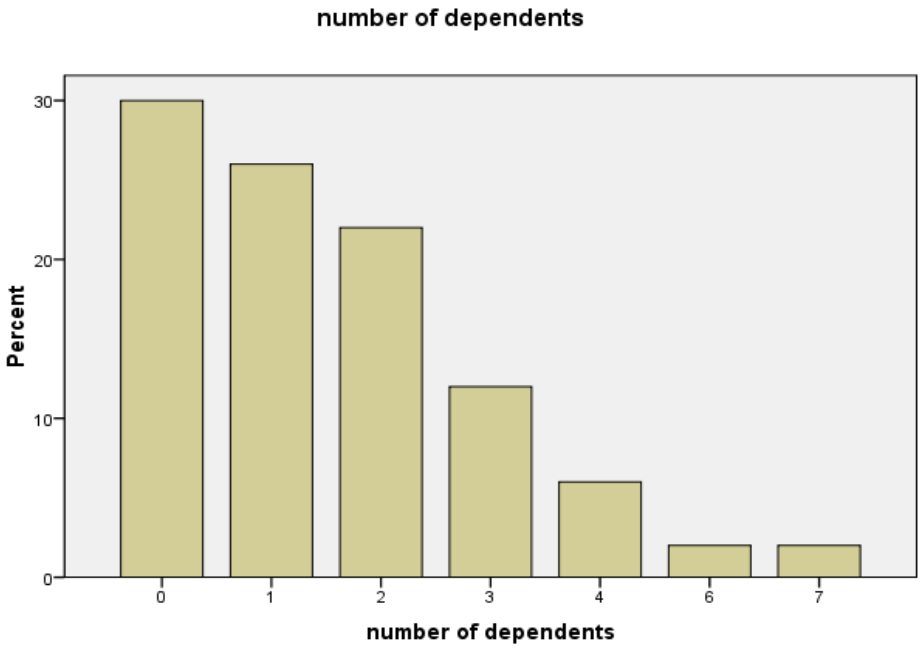


Figure 23: Number of interviewees' dependents in the Sabon Zongo community.

4.8 Interviewees' Perception on the Quality of Water Available

In Sabon Zongo, 40 percent of the respondents do not see any problem in the quality of water provided to them by the water company, based on the 84 percent of interviewees who responded. Forty-four percent perceived that the quality of water supplied is not good. Some said "there are dirts and sediments in it when kept for too long". Others said "there are dirts in the water even if you just fetch it from the pipe". Some others said "there are lots of worms and insects in the water coming directly from the pipe". Respondents explained that some of the reasons for the bad quality of water supplied are "damaged pipes that supplies water to the communities", "lack of constant and proper cleaning of storage tanks", and "bad quality of water supplied by GWCL".

Seventy-eight percent responded “Yes” to the possibility of expanding their business based on free water. Twenty percent said “No” and two percent said “I don’t know” (Figure 24).

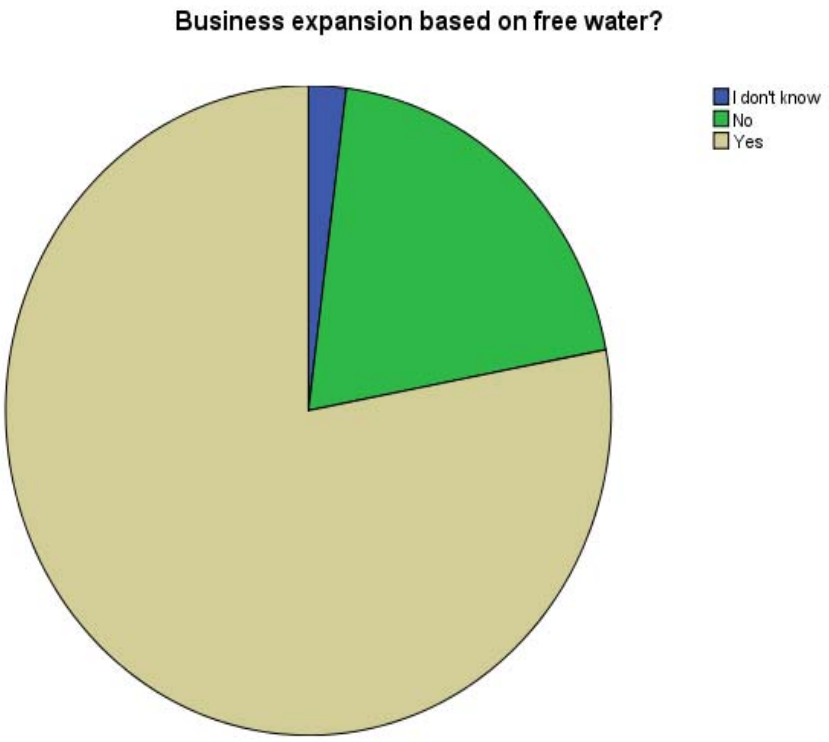


Figure 24: Business expansion based on free water in the Sabon Zongo community.

In Alajo, 42 percent do not see any problem in the quality of water provided by GWCL. Sixteen percent gave no response and 42 percent said "there are dirts in the water, the water has bad taste, the water has odor, the color of the water changes and there are worms in the water". When asked about the possibility of expanding their business with access to water at no cost, 70 percent said “Yes”, eight percent gave no response, 18 percent said “No” and four percent said “I don’t know” (Figure 25).

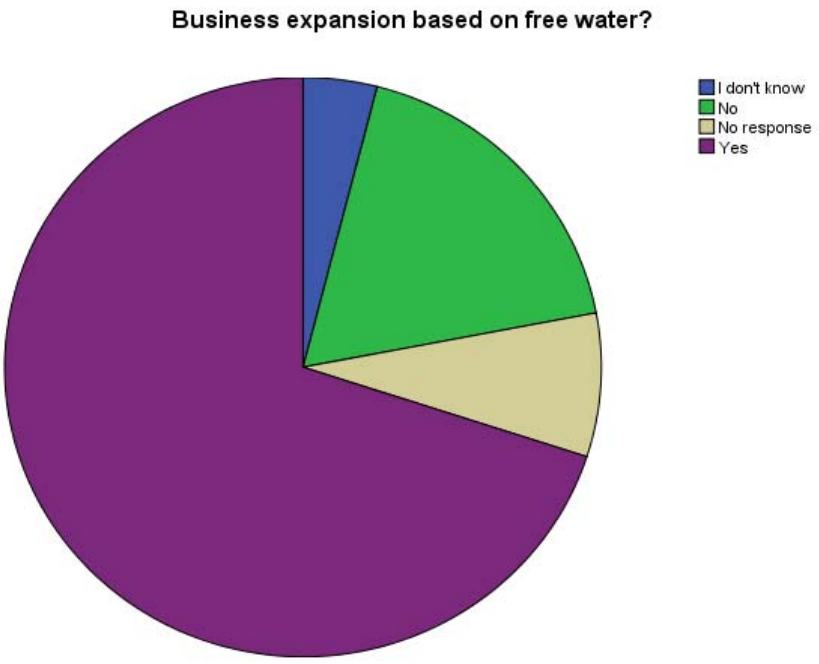


Figure 25: Business expansion based on free water in the Alajo community.

4.9 Conclusion

This research have elucidated the different types of water-related activities; the educational level of respondents as a criterion for explaining their poverty level; income generated from these activities in relation to the number of dependents; and the amount of water used for these livelihood activities. The outcome of the research carried out in Alajo and Sabon Zongo indicates that the situation in these communities is similar. Therefore, the results of the two communities will be categorized and discussed as one in the discussion chapter.

The research found that most of the respondents are women involved in water-related small businesses and live in poverty. It justifies the findings of the International Labour Office (ILO). According to the ILO report of 2004, many Ghanaians who still live in poverty are particularly women and who work in

agriculture, mostly as food crop farmers. Others are engaged in micro and small enterprises, or finding a survival income as daily casual laborers.

It was estimated in 2007 that 28.5 percent of the population of Ghana was below the poverty line of US$1 a day, and the unemployment rate estimated in 2000 was 11 percent (CIA World Fact book, 2009). Given this estimate, poverty reduction should clearly be the national development priority. One way to reduce poverty is to improve the means of livelihood of the poor. In this context and from the words of respondents, the means of livelihood can be improved by providing them with adequate quality water. More recommendations on ways to reduce poverty will be given in Chapter 6.

CHAPTER 5: DISCUSSION

5.1 Introduction: Water Distribution Systems in the Alajo And Sabon Zongo Communities

Accra's main water supplies are from two sources including the Weija Dam on the Densu River and the Akosombo Dam on the Volta River. The Weija reservoir was created in 1977, is about 116 km long, and is located 10km from the mouth of the Densu River (Uusitalo, 2002). The catchment of the reservoir lies in the coastal savanna zone where rainfall is seasonal with two peaks in June and September (Uusitalo, 2002). The Weija Water Works is located 15km west of Accra. Water is drawn from the Densu River impounded by the Weija Dam. The water is then pumped to the treatment works, located 800m from the dam via two pumping stations—the old Weija pumping station and the new Weija pumping station (Manu Sarpong et al., 2004).

Picture 1: Weija Water Plant. Source http://www.water-technology.net/projects/adam_clark/

The Weija water source supplies water for both the Alajo and Sabon Zongo communities. However, the Weija Dam is facing serious threats from the

effects of encroachment. The encroachers have built houses close to the dam, intake plant and headwork. These actions of the encroachers have resulted in pollution of the Weija Dam and a bad quality of water being produced.

Picture 2: Akosombo Dam on the Volta River in Ghana. Source http://encarta.msn.com/media_461523869/akosombo_dam.html

The Ghana Water Company Limited (GWCL) is a company owned by the government of Ghana and is responsible for urban water supply. GWCL operates 86 piped water systems and has its headquarters in Accra, with regional offices in the ten regional capitals of the country (Manu Sarpong et al., 2004). GWCL extracts water from the dams and supplies it to households in Accra. Water is supplied through pipe connections although most of the poor households in Accra lack access to pipe connections. So these households buy water from households with pipe connections at exorbitant prices with 'pail' (Picture 3) or 'Kufuor gallons' (Picture 4).

Picture 3: A woman at a Stand Pipe connection with a pail

Picture 4: A man at a pipe connection with Kufuor Gallon

People from poor households travel by foot as far as 3.22 km in search of water and then store it in a barrel with a lid (Picture 5).

Picture 5: Means of storing water – 382 liters barrel

5.2 Implications of Dams as Sources of Water Supply

Most developing nations have constructed thousands of large dams to reduce flood damages, generate hydroelectricity, and increase and stabilize their water supplies. Although these dams have provided significant benefits to the developing countries, they have also caused complex physical, biological and societal changes. These benefits are also frequently marred by pollution or contamination (Akintola & Gbadegesin, 1997).

Although the most widespread water contamination is often attributed to disease bearing human waste, other studies have shown that contamination often arises from the neglect of the environment as a vital component of the supply

side of the water equation (Akintola & Gbadegesin, 1997). The land-use practices and their spatial distribution around reservoirs are critical factors that influence changes in the quality of the water. To be able to provide adequate water to a community, there must be careful management of the vegetation surrounding dams. This is because natural vegetation maintains soil, prevents erosion and water contamination, and regulates runoff from drainage basins.

5.3 Water Dependent Livelihood Activities

Uses of domestic water vary from household use to business use. Some businesses in which water use is inevitable include hairdressing, urban farming, public toilet operations, chop bar operations and water sales. Pictures 6, 7, and 8 illustrate water-related businesses.

Picture 6: Water-related business – Fried fish sale Picture taken by Kehinde Odunuga

Picture 7: Public toilet operation - Picture taken by Kehinde Odunuga

Picture 8: Water-related business activity – urban farming - Picture taken by Kehinde Odunuga

Livelihood strategies are those activities that generate a means of income for households (Soussan et al., 2003). Cahn (2002) argues that people choose

livelihood strategies that will give them more income, increased well-being, reduced vulnerability, and improved food security. Chan's argument is true in the case of the Alajo and Sabon Zongo communities as interviewees stated one or more of the above reasons as their motivation for being involved in these water-related livelihood activities. Thus, the appropriate provision of water and sanitation can lead to income-generating opportunities for the poor; and the promotion of women's water-related and non-water-related productive activities can make a direct impact on the contribution to the household food supply (Anderson and Hagos, 2008).

5.4 Implications of Wastewater Disposal Methods

Wastewater generated from water use in the communities of Alajo and Sabon Zongo is disposed in badly constructed gutters or on roads (Pictures 9 and 10).

Picture 9:Mode of wastewater disposal – disposal on the street. Picture taken by Kehinde Odunuga

Picture 10: Mode of wastewater disposal – disposal in the gutter. Picture taken by Kehinde Odunuga

The improper disposal of wastewater has serious impacts on human health. Responses from interviewees revealed that wastewater is usually disposed of on the street as there are no drainage systems in the communities in general. Although it is well known by community members that wastewater disposed on the streets has negative impacts on their health, they justify their actions on the basis that it helps to prevent dust that emanates from the untarred road. The government should consider tarring the street and constructing proper drainage systems.

As a result of rapid growth in the developing countries' cities, it should be expected that wastewater flow will increase, which then could be recycled or reused. Effectively managed wastewater should be used as a low-cost alternative

to conventional irrigation water; it should support livelihoods and generate considerable value in urban and peri-urban agriculture. Irrigation with untreated wastewater can represent a major threat to public health of humans and livestock, food safety, and environmental quality (Scott et al., 2004). Despite the health and environmental risks associated with this practice, it is still a useful way of recycling wastewater. Improvements in wastewater treatment facilities will eliminate these health and environmental risks. As important as access to adequate wastewater treatment facilities in the developing countries is, it is very limited. Thus investment should be made to improve wastewater treatment facilities in developing countries.

5.5 Susu Savings and Their Usefulness

Rotating and non-rotating saving associations are two group saving schemes available in African countries. Rotating saving associations provide a means of accumulating savings for the purchase of indivisible goods more quickly than can be done independently by a single person (Aryeetey & Udry, 1995).

> *Suppose it costs X to open a business. By saving 1 each week, it will take an individual X weeks to accumulate enough capital to open the business. If X individuals get together to form a rotating saving association, one group member will be able to start the business in week 1, a second in week 2, and so on. Only the last group member to receive the fund will have to wait the entire X weeks before starting her business (*Aryeetey & Udry 1995*).*

Non-rotating saving associations serve a different purpose as savings are accumulated in the fund rather than distributed with each collection. One of the key properties of non-rotating saving associations is the availability of a savings fund which can be disbursed as loans to members in the case of emergencies (Aryeetey & Udry, 1995). The Susu savings scheme is an example of a non-rotating saving association. Generally in Ghana, Susus are one of the oldest forms of banking or collective economics. They mostly serve two purposes: they issue loans or act as long-term savings accounts to its members (Brown, 2009).

Susu collectors are people who manage the entire fund. They could be engaged in other professions like local barber shops or as petty traders. They collect deposits, often of low but regular value, on a daily basis over the course of a month. At the end of this period, the Susu collector returns the accumulated savings to the client but keeps one day's savings as commission. Susu collectors provide many Ghanaians who would otherwise be denied credit with access to money they need to start up small venture projects that in many cases benefit the community as a whole (Ardener and Burman, 1995).

Interviewees from the Sabon Zongo community participates more in Susu savings than those interviewees from Alajo. This is not to say that Susu savings is irrelevant in Alajo as half of the interviewees from the community participate in the savings activity. In both Alajo and Sabon Zongo, Susu has been utilized to start businesses, pay bills, house rent, and children’s school fees and much more. Susu collectors provide many community members who do not have access to loans from banks the opportunity to access money they need to start up small business projects that in many cases benefit the community as a whole.

5.6 Importance of Access to Quality Water

Access to water of good quality and quantity is of great importance in the livelihoods of poor men and women who use domestic water for small-scale commercial activities. Lack of access to a reliable water supply for commercial purposes is an essential feature of poverty in developing countries and must be reduced significantly in order to meet the Millennium Development Goals (MDGs) (Millennium Development Goals Report, 2008). Thus improved quality water supplies provided in a reliable manner will improve productivity and reduce the poverty level. In many cases, interviewees from both communities- mostly women- could access the water they needed, but this often meant they spent a long time fetching water from distant sources and queuing in line for the resource.

The Millennium Development Goal of halving the proportion of people without access to safe drinking water between 1990 and 2015 will probably be reached by some countries, but others still face enormous challenges (Millennium Development Goals Report, 2008). The problem is not only with drinking water, but that water used for water-related businesses. Limited access to quality water is a result of a lack of good water infrastructure, high vulnerability to short- and long-term drought, and difficult access to reliable water supplies. According to the Millennium Development Goal Report (2008),

> *"Water use has grown at more than twice the rate of the population for the past century. Although there is not yet a global water shortage, about 2.8 billion people, representing more than 40 per cent of the world's population, live in river basins with some form of water scarcity. More than 1.2 billion of them live under*

> *conditions of physical water scarcity, which occurs when more than 75 per cent of the river flows are withdrawn.....Another 1.6 billion people live in areas of economic water scarcity, where human, institutional and financial capitals limit access to water, even though water in nature is available locally to meet human demands". (2008, 40)*

The quality of the available water supply in Ghana is uncertain. During the focus group discussions in the two communities, all the participants said "dirty particles are seen in the water fetched directly from the pipes". The water supply is contaminated by various forms of pollution. Throughout most of the countries in the world, the most common contamination of raw water sources is from human sewage, particularly human faecal pathogens and parasites (U.S. Centers for Disease Control and Prevention, 2006). Other forms of water pollution include run-off from agricultural chemicals, irrigation, floods, the siltation of river systems, a general lack of pollution prevention laws and their enforcement, and the construction/management of rivers and large dams. Barriers to addressing water pollution problems in developing nations include poverty, illiteracy, rapid population growth, and ineffective institutions and policies for developing, distributing, pricing and conserving water resources (Scudder, 1994).

A major limiting factor of access to quality water is the cost. The most efficient way to transport and deliver potable water is through pipes. However, this requires enormous up-front infrastructure costs. Furthermore the high continual operating costs mean many systems fall into disrepair in both developed and undeveloped countries. The cost to replace the deteriorating

water and sanitation infrastructure of industrialized countries may be as high as $200 billion a year (UN World Water Development Report 3).

Also, the leakage of pipes reduces access to water. Leakage rates of 50 percent are not uncommon in urban systems (UN World Water Development Report 3). Because of the high initial investments, many debt-impoverished nations cannot afford to develop this infrastructure, thus people in these areas end up paying a much higher percentage of their income on water.

In an effort to improve water accessibility and quality in Ghana, the water sector has been involved in several reform attempts. GWCL indicated the reason for the lack of good water quality was a lack of financial means to invest in water-related technologies (Van Rooijen et al., 2008). Also, political influence plays a large role in the decision-making process of the water company. For example, as stated by Van Rooijen et al. (2008),

> *Water tariffs in Ghana were always set at a tariff thought to be affordable to users, but did not cover the operational costs and the costs of investments. Attempts by GWCL to increase the tariff in order to reach a level that covers operational costs were approved by the Public Utilities Regulatory Commission (PURC). However, the government vetoed the implementation of the tariff by subsidizing the difference in order to avoid public. Page 263*

The lack of adequate water services is the cause of much disease and illness in developing nations. According to the World Bank (1993), the use of polluted water for human consumption is the principal cause of health problems that kill more than 2 million people each year—most of them children—and make another one billion sick

It has been noted that consumers who have direct access to water supplies are well-placed officials and individuals in the public service or private sector (Owusu & Lundhen, 2006). This shows that the poor are not those who have access to a direct and cheaper water supply. Availability and access to low-cost water for farming in the urban and peri-urban areas of Accra is another key factor affecting farmers (Obuobie et al., 2003). Water access allows for vegetable production in the dry season and is crucial for profit generation (Obuobie et al., 2003). In the dry season, water can still be available for use. This can occur by prior and proper preparation. During the wet season, there is an 'excess' water supply. This water can be preserved for use in the dry season by building a reservoir and storing the water.

5.7 Significance of Education in Alleviating Poverty

Responses obtained from interviewees of both the Alajo and Sabon Zongo communities about educational level shows that the highest level of education obtained by most of the interviewees is Junior Secondary School (JSS) three, which is equivalent to Grade 8. It is a major challenge to assist socially marginalized children who normally have less access to basic education get out of poverty. The Millennium Development Goals Report (2008) reported that out of 40 countries in which surveys were conducted, 32 have attendance and participation of children in school to be higher in urban areas than in rural areas. However, in the sub-urban communities of Alajo and Sabon Zongo, a high proportion of youth and children do not study beyond Grade 8 despite the fact they live in an urban area. It has become the norm in these communities that

upon completion of Grade 8, if they complete it, youths go into learning trades in the different kind of water-related businesses available in the community.

For children to reach their full potential and for the country to develop, it is important that the quality of education the children receive be improved upon. This means that achievements made in universal primary education must be replicated at the secondary level and children must be encouraged to at least graduate from Grade 12 even if they will eventually focus on a trade. Ensuring that the most vulnerable and marginalized children are enrolled and remain in school requires targeted programs and interventions aimed at poor households (Millennium Development Goals Report, 2008). These programs and interventions should also seek to eliminate gender disparities and focus more on educating female children. Achieving quality education involves more than full enrolment. It also encompasses quality education, meaning that all children who attend school regularly should learn basic literacy and numeracy skills and complete their education on time.

5.8 Sanitation Issues and Its Impact on the Communities' Health

Public bathroom and toilet operations in Sabon Zongo also appear to be a lucrative business, as it is the business that uses the most water among all businesses in the community as opposed to Alajo. The reason for a higher number of public bathroom and toilet operations in Sabon Zongo is the belief that one's 'mess' should be done outside one's home. However, the operations of public bathrooms and toilets both in Alajo and Sabon Zongo require adequate sanitation practices, as they presently lack proper sanitation.

In both communities, public toilets cause pollution and discomfort to the community members living around the locations. Open defecation jeopardizes an entire community, not just those who practice it, because of an increased risk of diarrheal diseases, cholera, worm infestations, hepatitis and other related diseases. At some public toilets in the communities, the researcher and interpreter could not conduct the interview with the public toilet operator because the environment was polluted by odor emanating from the public toilets and thus the area was not conducive for talking. Proper sanitation practices will enhance the effectiveness of these public toilet operations.

Although more people are using improved sanitation facilities, meeting the MDG target will require a redoubling of efforts. The Millennium Development Report 2008 explains that

> *Since 1990, the number of people in developing regions using improved sanitation facilities has increased by 1.1 billion, with significant improvements in South-Eastern and Eastern Asia. Nevertheless, in order to meet the target, the number of people using improved sanitation facilities must increase by about 1.6 billion in the next seven years, substantially more than the growth achieved since 1990. Page 41*

To achieve the MDG, community members of Alajo and Sabon Zongo must be enlightened on the implications of improper sanitation practices and the benefits of engaging in proper sanitation. Alongside unsafe water, sanitation and hygiene is the leading cause of mortality and morbidity in high-mortality developing countries, and is among the top five risk factors - both environmental and non-environmental- in the same countries (Markandya, 2004).

It is critical for the government of Ghana to take real political ownership of improving sanitation and be clear on their strategies and priorities for this sector. They need to prepare the strategies and action programs for improving public toilets and building toilets in homes. It is also important they include these strategies in their short- to medium-term development plans.

5.9 Conclusion

This chapter has examined issues arising from poor water quality: the impact it has on households as well as livelihood activities, and the impact that the sanitation facilities has on the environment and community members' health. The implications of dams as a major source of the water supply have been explained. The importance of education as a means of alleviating poverty has also been emphasized.

Wastewater disposal methods used in the two communities have been examined: and the impact on the environment and community members' health has also been discussed. It was concluded that wastewater is a resource of growing global importance and its use in agriculture must be carefully managed to preserve the substantial benefits while minimizing the serious risks.

CHAPTER 6: SUMMARY, CONCLUSION AND RECOMMENDATIONS

6.1 Summary

Domestic water is found to be commonly used for livelihood activities alongside domestic activities in the Greater Accra region of Ghana. This finding challenges the traditional assumption that water delivered to households should be used for domestic purposes alone. As a step towards an in-depth study of this finding, the research entitled "Analysis of Domestic Water Use for Commercial Activities among the Poor in Alajo and Sabon Zongo Communities of Accra Ghana" was conducted. It examined how domestic water supplies can become productive and contribute to peoples' livelihoods, particularly those of women and the poor.

The main objectives of this research were to evaluate the importance of domestic water use for livelihood purposes; determine the contribution of water –related livelihoods to household income; and provide recommendations to ensure the needs of poor men and women are met in terms of accessibility and reliability of water for urban livelihoods. Based on the results of a survey which included interviewing 100 respondents – 50 from each community – and two focus group discussions – one from each community, the following conclusions have been reached. Specific conclusions pertaining to each of the three objectives were first examined followed by more general conclusions. Some important strengths of this study are that the two communities are similar in conditions of water supply, sanitation issues, affordability and accessibility to water, and results obtained.

6.2 Level of Domestic Water Use for Livelihood Purposes

Water-related livelihood activities have been discovered to range from urban farming to hairdressing salons. However, when this research was conducted, several other water-related livelihood activities were discovered which included lemon gin processing, public bathroom operations, chop-bar operations, and kenkey selling. The amount of water used by interviewees for their activities varied according to the quantity of water needed, the proximity of the water supply and the size of their businesses. However, all interviewees concluded that domestic water plays a vital role in their businesses.

During the research, it was discovered that there are two sets of people involved in water use for commercial activities, namely water providers and water users. Water providers are basically vendors (and a lower percentage of the sample size for this research) as compared to water users for commercial activities. Although it was commonly thought that the prices of water sold by water vendors were expensive, interviewees who participated in this study claimed the prices of water were fair.

A reduction in the water price or the government's ability to make water free for all and equally accessible by all will favor water users and disfavor water providers. In essence, there is a direct relationship between water providers and a reduction in water price; as the price of water is reduced, the number of water providers decreases. The implication of reduced water prices will be that some water providers go out of business. However, since the population of water providers in the community is insignificant, they can find

alternative means of livelihoods like those discussed in the recommendations section. Also, the displacement of water vendors as a result of reforms and policies formulated around making water free for all will be for a short time as these people have a strong resilience and are survivors.

6.3 Role of Water–related Livelihood Activities in Household Income

Understanding patterns of domestic water use from a perspective of meeting basic needs and commercial activities is very important as it helps to improve the ability to respond to needs and achieve sustainability. Domestic water used for commercial activities assists in alleviating poverty at the household level as it provides food, livelihood security and reduces health risks. Households with access to improved water supplies are less likely to be poor and more likely to be able to meet the cost of food than those without access.

The income generated from each water-related activity after deducting the cost of labor input to each activity and the price of water reveals the economic significance of water-related activities. For these households, income generated from these activities is highly significant as it provides more than their basic needs. The livelihood impact of increased access to water for productive uses is very important. Water-related activities can provide a broader range of benefits to poor people. This could include both financial and non-financial benefits, such as improved health, food security and nutrition, time savings, and social empowerment. Thus it is evident that access to water is a key factor in promoting small-scale enterprises.

Overall, the data presented shows the importance of the use of domestic water for productive activities in the livelihood systems and the general economies of Alajo and Sabon Zongo. The inability to access domestic water for productive purposes can reduce livelihood options in these communities, particularly for poor and vulnerable households, that have limited access to livelihood assets and few alternative income opportunities. For these people, urban gardening, running a hair dressing salon or operating a chop bar can be the key to avoiding or reducing poverty.

6.4 The Role of Women in Water-related Livelihood Activities

The study conducted reveals that women are the most involved in water-related livelihood activities. Therefore women dominate the sector. The women interviewed stated the reason for such dominance is that men feel demeaned by participating in these water-related income-generating activities. This is not to say that all men do not contribute to the household income. There are some households of women interviewed who have men as the head of the house. These men are involved in income-generating activities like construction work or are grocery store owners.

This study found that these women pay ten times the rate set by the Public Utility Regulatory Commission and as such, women are highly discriminated against when it comes to accessing water for their businesses at affordable prices.

This study also discovered that a higher percentage of men and women involved in these activities had educational levels of junior high school. One of

the findings is that education plays a prominent role in the livelihood activities of men and women, especially women. As a vital component to women's empowerment, a lack of proper education adversely influences women's lifestyles, their productivity is impaired and the possibility of exploring alternative livelihood activities is limited.

6.5 Recommendations

1. There should be the provision of adult education to members of these communities because education is the definite way to eradicate poverty. Education gives an individual the opportunity to improve his or her productive livelihood and thus be able to provide the basic necessities of life himself/herself and family. Basic education is the key to empowerment as it helps people become more proactive, gain control over their lives, and widen the range of available choices. According to the United Nations Press Release (1999), education is the primary vehicle by which economically and socially marginalized adults and children can lift themselves out of poverty and obtain the means to participate fully in their communities. It is also a key to wealth creation. Finally, education is closely linked to virtually all dimensions of development—human, economic, and social.

   Education is significant as it also helps to improve the quality of health of community members. Both the federal and regional government should take up the responsibility of educating the communities on the importance of cleaning up the drainage systems.

Among the two communities wherein the research was conducted, Alajo can be called the neat community. Although the Alajo citizens need to improve upon their cleaning exercises and schedules, Sabon Zongo is a community in which its members do not care about the quality of air they breathe or how their environment looks. While members of Alajo employs and pay people to clean up their drainage systems, members of Sabon Zongo are not involved in communal labor nor do they employ cleaners.

2. The government should improve the supply of domestic water to households because lack of access to such a necessity as water leads to poverty and food insecurity. Ensuring water security can play a wider role in poverty reduction and improved livelihoods among poor women. Improved domestic water supplies convey multiple benefits, such as:

   - sickness reduction
   - time savings
   - income generation
   - food security enhancement
   - strengthened local organizations
   - co-operation building among people.

   Time and money saved can be invested in activities that bring positive returns to the labor force. Although better water supplies may result in a loss of income for water vendors, the good quality for life of many who will benefit from an improved water supply will outweigh the loss of the few.

3. The government should also subsidize the water supply to reduce the cost paid by poor community members or better still, make water free for all citizens. The rate paid to water vendors in these areas is ten times higher than the rate declared by the PURC. Moreover, these vendors do not deliver the water to the people so the people have to walk long distances to the source.
4. Considering the implication of government subsidies on water vendors, government and community leaders should be involved in creating and subsidizing alternative income-generating activities. The government should also give these women the privilege to make alternative livelihood choices.

    In order to achieve this, a system of savings and microloans should be created by the government and women's participation encouraged. Local women should be trained in a microloan system and adult literacy so they would be able to independently manage the loans. Besides literacy and financial education, training in activities like soap-making and making energy-efficient stoves should be organized. These different kinds of training will provide women with skills that will make them more confident about themselves, provide them with alternative livelihood options, and make them eager to participate in the community's decision-making.
5. Community members justify their action of disposing wastewater on the street on the basis that it helps to prevent dust. The government should

consider tarring the street and building proper drainage systems. This will improve the living conditions of community members.

6.6 Study Limitations

As in other research studies, this study has some limitations which are summarized below.

1. The conclusions which have been drawn from this study are based on the research conducted in two study areas. A study conducted in more study areas may produce much different results.

2. Water availability was not a huge problem in the study areas which is a reason why these results were obtained. However, if the same study was carried out in a different community in the Greater Accra region, the results will vary.

3. Illiteracy and the inability of most of the poor urban men and women to speak English were barriers to estimating the accuracy of data like the quantity and quality of domestic water used for economic purposes. In most cases, responses passed from interviewees through the interpreter were diluted, making it impossible to acquire first-hand information from the interviewees.

4. The secretive nature of some of the poor men and women in regards to their economic returns based on fear of being taxed is a limitation that was encountered in acquiring accurate data. When asked how much their average income generated from water-related livelihood activities, they

replied “Why are you asking? Are you from the AMA (government)? Have you come to take us away?”

6.7 Further Research

There are additional areas of water-related livelihood activities and the environment of both the Alajo and Sabon Zongo communities that are interesting and worthy of further academic investigation.

1. The quality of water used in Alajo and Sabon Zongo is an important issue that was observed. The interviewees were only able to talk about the quality of water based on what they could see in it. However, the determination of water quality extends to dirts and germs that cannot be seen with the naked eye. Thus, scientific or laboratory research would be needed to determine the exact situation of the quality of water in these communities.

2. There are also other religious, ritual and recreational uses of water that could either be basic or productive in both communities that can be further investigated.

3. The feasibility of water treatment plants and processing options can be further investigated.

4. The effectiveness of wastewater and sewage treatment plants should also be investigated further. As wastewater contributes significantly to the livelihood of urban farmers, effective wastewater treatment will help to

reduce pathogen levels. Thus it is important these plants operate in their design capacity.

6.8 Final Thoughts

The analysis of domestic water use for livelihood activities in Alajo and Sabon Zongo is an important case study that illustrates the contribution of domestic water to household income. Water has always played a key role in economic development and this study has proven it.

This study has helped to draw the conclusion that the poorest people have the lowest access to a quality water supply and are the most dependent on water for their livelihoods; and that lack of access to a quality water supply is often the main factor that limits their ability to protect their livelihoods. It is recommended the government should improve on the water supply system in the neighborhood. The ability of the government to invest in effective water management and an efficient water supply will yield dividends like livelihood security, reduction in health risks, and poverty reduction.

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APPENDIX A

ETHICS APPROVAL CERTIFICATE

14 May 2009

TO: **Kehinde O. Oyekan** (Advisor T. Henley)

Principal Investigator

FROM: **Wayne Taylor, Chair**

Joint-Faculty Research Ethics Board (JFREB)

Re: **Protocol #J2009:049**

"Analysis of Domestic Water Use for Commercial Activities among the Poor in Alajo and Sabon Zongo Communities of Accra, Ghana"

Please be advised that your above-referenced protocol has received human ethics approval by the **Joint-Faculty Research Ethics Board**, which is organized and operates according to the Tri-Council Policy Statement**.** This approval is valid for one year only.

Any significant changes of the protocol and/or informed consent form should be reported to the Human Ethics Secretariat in advance of implementation of such changes.

Please note:

- **if you have funds pending human ethics approval, the auditor requires that you submit a copy of this Approval Certificate to Eveline Saurette in the Office of Research Services, (fax 261-0325, phone 480-1409), including the Sponsor name, before your account can be opened.**

- **if you have received multi-year funding for this research, responsibility lies with you to apply for and obtain Renewal Approval at the expiry of the initial one-year approval; otherwise the account will be locked.**

The Research Ethics Board requests a final report for your study (available at: http://umanitoba.ca/research/ors/ethics/ors_ethics_human_REB_forms_guidelines.html**) in order to be in compliance with Tri-Council Guidelines.**

APPENDIX B - INDIVIDUAL INTERVIEW SCHEDULE

1. Respondents' Biodata

Name _____

Gender _____

Location _____

Water-dependent activities _____

Age _____

Number of children or dependents _____

Marital status _____

Educational level _____

2. Types of Water-related and Non-water related Commercial Activities

Are you involved in any other income generating activities? (Researcher to probe further on any water-dependent activities)

Among the activities you mentioned, which of these contribute more to your household income? (Rank these activities based on contribution)

3. Accessibility of water

Where do you get water from? (Your own connection, outside your compound e.t.c)

If you fetch outside, how long do you stay at the source before getting water everyday?

If you fetch outside, how long does it take to get water to your business location?

What are problems encountered at the source of domestic water? Why?

How can these be solved?

What do you use to collect your water?

If you have your own connection, is your supply regular? (How often is water not flowing?)

When the usual source of water does not flow, how do you get water?

If water is freely available, will you expand your business?

Are there any problems or difficulties on your activities during the period that water does not flow?

Do you store the water? If yes, how do you store water? Where do you store water?

Are there specific problems with stored water? (How long is the water stored?)

4. Cost and Quantification of Water

How much do you buy a bucket or gallon of water? Or how much is your water bill per month?

Do you think this is affordable?

How many buckets (liters) do you use for your business everyday? (Or how much is spent on water everyday?)

How many days do you work in a week?

Does the cost of water vary per location or in time? If yes, why?

5. Income Generation from Water-related Activities

Are you the primary provider in your home?

Who else contributes to the household income?

What is his/her main income generating activity?

Will you say he/she contribute a quarter, two-thirds, half or more to the household income?

How much is the unit cost of your product? (E.g Cost of a plate of food, washing and setting, using the public washrooms e.t.c)

On average, how many customers do you serve a day?

For material oriented businesses, what materials are used for the business?

What are the costs of the materials you use for your business?

In the case of service provision, how much is paid to a person hired to clean public bathroom?

What is the cost of soap and other cleaning materials?

6. Miscellaneous

Is your business registered? If not, why?

Do you have business associations that you are involved in? Do the associations help you secure grants and loans for your business?

Are you into daily Susu savings (that is, daily money savings)?

If yes, how much do you save?

Do you receive monthly remittances from anyone?

Do you plan to expand your business?

If yes, what are the potential constraints to expanding your business?

APPENDIX C: FOCUS GROUP DISCUSSION QUESTIONS

Water-related Livelihood Activities

What are the businesses that people do in your community?

What are the businesses that adults do that involve the use of water in your community?

What are the businesses that youths do that involve the use of water in your community?

Which of these businesses are common?

Water Sources, Accessibility and Reliability

Where do you get the water you use for your businesses?

Why do you choose the source of water? Closest? Cheapest? Most Hygienic? Choice less?

How many times does the water not flow in a week, month, and year?

When the source of water does not flow, how do you get water?

How many times do you fetch water a day?

How many minutes do you walk to get the water?

How long do you wait at the source of water to get water?

For those who go out of their house to get water, how far do you walk to get water for your business?

How much time do you spend in getting water everyday?

In accessing water for your businesses, are there some issues that make it difficult for you to do so?

If yes, how can these issues be solved?

What do you use to collect your water?

Cost of Accessing Domestic Water

How much do you buy a bucket or gallon of water?

What do you think about the price? Is it affordable or expensive?

Domestic Water Quality and Water Storage Quality

When you fetch the water, what do you look out for to determine if the water is useful for the activities mentioned?

Do you really look out for all you mentioned or do you just use the water?

Do you store the water? If yes, how do you store water? Where do you store water?

How much does it cost you to use this means of storage?

Is there any problem associated with storing water?

How long does water stay in storage before use? Why?

How do you dispose off wastewater?

Are there flies and mosquitoes around where you dispose wastewater?

Do people who live around the wastewater disposal site complain?

Does the wastewater disposal site disturb activities of children and youths?

Are you responsible for cleaning the areas where you dispose wastewater?

How often do you organize clean up exercise around the sources of water?

Who initiate the process?

Do community members respond?

Is there any punishment for people who do not respond?

APPENDIX D: LETTER OF CONSENT

UNIVERSITY OF MANITOBA

Letter of Consent

ANALYSIS OF DOMESTIC WATER USE FOR COMMERCIAL ACTIVITIES AMONG THE POOR IN ALAJO AND SABON ZONGO COMMUNITIES OF ACCRA, GHANA

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This consent form, a copy of which will be left with you for your records and reference, is only part of the process of informed consent. It should give you the basic idea of what the research is about and what your participation will involve. If you would like more detail about something mentioned here, or information not included here, you should feel free to ask. Please take the time to read this carefully and to understand any accompanying information.

Purpose of Study:
The purpose of the proposed research is to measure the extent of domestic water use for livelihood purposes by both men and women in urban communities and its contribution to livelihoods, and to enhance access of poor women particularly to water so as to improve their water dependent livelihoods and reduce poverty in Accra. The study will focus on the two low-income communities of Alajo and Sabon Zongo in Accra, with special focus on poor women.

Procedures involved in the Research:
You will be asked to complete a semi-structured interview and participate in focus group discussion. You will be asked questions about your experiences with accessing domestic water and water-related livelihood activities you are involved in.

Risks:
There are no harms or discomfort associated with this study. It is not necessary to answer questions that make you uncomfortable or that you do not want to answer.

Benefits:
The completed thesis will provide strategy that will improve water-related livelihood opportunities.

Confidentiality:
Your name will not be published in the final report. The data will stored in a locked office in the department (Natural Resources Institute) during the period of analysis and will be destroyed after completion of the researcher's thesis in April 2010. Any information on a computer will be password protected.

Debriefing/ Verification:
An executive summary of the research will be provided to you. A hard copy of the thesis will be provided to International Water Management Institute (IWMI) in Accra, Ghana.

Participation:
Your participation in this study is voluntary. At any point in the study when you are no longer interested in participating, you can stop, even after signing the consent form. If you decide to stop participating, there will be no consequences to you. If you do not wish to answer some questions, you do not have to, but you may still participate in the study.

Your signature on this form indicates that you have understood to your satisfaction the information regarding participation in the research project and agree to participate as a subject. In no way does this waive your legal rights nor release the researchers, sponsors, or involved institutions from their legal and professional responsibilities. You are free to withdraw from the study at any time, and /or refrain from answering any questions you prefer to omit, without prejudice or consequence. Your continued participation should be as informed as your initial

consent, so you should feel free to ask for clarification or new information throughout your participation.

This research has been approved by the Joint-Faculty Research Ethics Board. If you have any concerns or complaints about this project you may contact any of the above-named persons or the Human Ethics Secretariat at 474-7122, or e-mail margaret_bowman@umanitoba.ca. A copy of this consent form has been given to you to keep for your records and reference.

Consent:
I have read the information presented in the letter about the study being conducted by Kehinde Oyekan of the University of Manitoba. I have had the opportunity to ask questions about my involvement in this study, and to receive any additional details I wanted to know about the study. I understand that I may withdraw from the study at any time, if I choose to do so, and I agree to participate in this study. I have been given a copy of this form.

_____

Participant's Signature Date

_____

Researcher and/or Delegate's Signature Date