UNIVERSITY FOR DEVELOPMENT STUDIES

POTABLE WATER ACCESSIBILITY AND ITS IMPACT ON GIRL CHILD EDUCATION IN WA MUNICIPALITY, GHANA

YAHAYA ABDUS – SALLAM UMAR

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BY

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A DESSERTATION SUBMITTED TOTHE UNIVERSITY FOR DEVELOPMENT STUDIES INSTITUTE FOR INTERDISCIPLINARY RESEARCH AND CONSULTANCY SERVICE (IIRaCS)IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF MASTER OF ARTS IN ENVIRONMENTAL SECURITY AND LIVELIHOOD CHANGE

MARCH, 2017.

DECLARATION

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

Candidate's Name: YahayaAbdus – Sallam Umar

Signature..... Date.....

Supervisor's Declaration

I hereby declare that the preparation and presentation of the thesis were supervised in accordance with the guidelines on supervision of thesis laid down by the University for Development Studies.

Name of Supervisor: .Dr. Shamsu -DeenZiblim

Signature..... Date:.....

ABSTRACT

Water is an important commodity in our daily lives. Without it all activities be it social or economic will not be possible. The aim of this study was to examine the impact of portable water accessibility and how it affects girl child education in the Wa Municipality of the Upper west Region of Ghana. Accessibility of potable water in developing countries including Ghana is predominantly the work of the girl child as it is the gender role of girls. Most girls in developing countries spend lots of time in search for and collect tap water to their homes for domestic use and sometimes for commercial use at the expense of education. In conducting this study, both qualitative and quantitative (mixed) methods of data collection were employed. Tools such as questionnaires, focus group discussions guides and interview guides were employed in collecting data for the study. The study revealed that 2.7 percent of the people in the study area had portable water in their household while the remaining 97.3% accessed portable water outside their households. It was revealed that girls walked long distance in search for water and some of them spent a lot of time at the water sources to access water. The study also revealed that girls reported to school very late and some just refused to go for the fear that their teacher will punish them for reporting late to school. The study further revealed that the performance of the girl child is very poor as compared to their boy counterparts in almost all the schools selected for the study. The study came out with the recommendations that, the Ghana Water Company should increase the number of stand pipes in almost all the areas of the study. Also, parents should be educated on the importance of girl child education. Household head are encouraged to connect pipe born water into their households.

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I wish to acknowledge with sincere gratitude, the support and assistance provided by a number of personalities in bringing this work into fruition. First of all, I am most grateful to the Almighty God for the protection enjoyed throughout this programme. Without Him I would not have reached where I am.

This work has benefited greatly from the guidance, patience, ideas and critical review of my supervisor Dr. Shamsu-DeenZiblim. I say thank you and may God bless you. To Mr. Issah Ibrahim Shaibu I say thank you for your immense assistance. I equally wish to express my sincere gratitude to all the lecturers of the department for their guidance and encouragement.

I am also grateful to my wife Faustina for coping with me throughout this period. I also want to acknowledge the assistance given to me by all persons who have helped me in anyway in my education and finally to my course mates who I learnt so much from during while in school.

DEDICATION

This work is dedicated to my mother, father, wife, children and the entire LimanyiriVouri family with much love.

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ADRA	Adventist Relief Development Agency
AWDR	Africa Water Development Report
AWV	Africa Water Vision
ADRA	Adventists Development Relief Agency
BBC	British Broadcasting Corporation
COWAP	Community Water Project
CSO	Civil Society Organisation
CWSA	Community Water and Sanitation Agency
FGD	Focus Group Discussion
GDP	Gross Domestic Product
GSS	Ghana Statistical Service
GWA	Gender and Water Alliance
IAEA	International Atomic Energy Agency
IMF	International Monetary Fund
IWA	International Water Association
JMP	Joint Monitoring Programme

MDG	Millennium Development Goal
MEO	Municipal Education Office
NGO	Non – governmental Organisation
PRONET	Professional Network Association
TECHNO SERVE	Technology Services
UN	United Nations
UNDP	United Nations Development Programme
UNESCO	United Nations Educational Scientific and Cultural Organisation
UNEP	United Nations Environmental Programme
UNICEF	United Nations International Children Educational Fund
UNPF	United Nations Population Fund
USGS	United States Geological Survey
UNWS	United Nations Water Supply
UNWWDR	United Nations World Water Development Report
UWP	Urban Water Project
WHO	World Health Organization
WRC	World Resource Centre

WWR	World Water Report
WS & S	Water Supply and Sanitation

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

Water is crucial for sustainable development. However, limited access to clean and safe waterassociated with poor water supply, hygiene and sanitation at household level is widening thepoverty gap, gender inequalities and the prevalence of water borne diseases (Gender and WaterAlliance (GWA), 2006). This is contributing to 3.7% of the total global disease burden and2.2million deaths each year with women and children in the developing countries being the mostaffected (WHO/UNICEF, 2008). Although the Millennium Development goals (MDGs) target7(c) seeks to "halve by 2015 the proportion of people without access to safe drinking water andsanitation" (UNDP, 2005), a huge population of the world are still without potable water.

There are as many as 884million people worldwide living without potable water, which is one of the basic needs for humans (UN/UNICEF, 2010). For every 20 years, global consumption of fresh water doubles and is likely to triple in the next 50 years (Population and housing census, 2010). The world population of over six billion is already using about 54% of all the accessible fresh water. Global human shareof fresh water usage is expected to go up to 70% by 2025; about 3 billion people in 90 different countries are expected to experience severe water stress(UN/WWR 2007). According to a 2012 report released by the World Health Organization (WHO) and the United Nations Children's Fund (UNICEF), roughly 780 million people around

the world lack access to clean drinking water and an estimated 2.5 billion people (40% of the world's population) are without access to safe sanitation facilities.

It is anticipated that Sub-Saharan Africa will only reach the MDGswater target by 2040 (Sutton, 2008).But still, some 400 million of the people living in sub- Saharan Africa will be left without access to safe water with a majority of them being womenand children living in rural households (Sutton, 2008).

Safe drinking water is drawn from freshwater sources, which represent only 2.5% of the 1.4 billion cubic kilometres of water covering the earth. Less than 1% of this fresh water is safe to drink without prior treatment (BBC news, 2007) Safe drinking water can also be obtained from salt water through desalination (BBC news, 2004). Considering the immense contribution of water to human life its accessibility should not be a privilege but a right.

African girls and women are disproportionally burdened by the scarcity of clean drinking water. In most African countries women and girls are branded as water collectors, managers and guardians of water, especially within the domestic sphere like household chores, cooking, washing and child care.

About 3 million people die across Sub – Saharan Africa the region annually as a result of water related diseases (AWDR, 2006 &WWDR, 2006). About 72% of all reported cholera cases in the world in 1998 were in Africa (AWDR, 2006). The report also noted that poor water quality is a key cause of poverty in Africa. In 2002, 3.1 million people died as a result of diarrheal diseases and malaria, 90% of who were children.

In Ghana, potable water is not easy to access even in most parts of the national capital (Accra) to a larger population of its inhabitants. The accessibility of potable water becomes even more difficult as one moved away from the national capital. Access to improved water in Ghana is less than 56% (AMDG, 2011). In the study area, potable water is difficult to access partly due to population growth, protracted irregular flow of water in pipe lines and poor infrastructural development. It is customary to see women and girls in the early hours of the morning walking long distances, queuing over long periods to take their turns to fetch water which is sometimes often contaminated. Tiredness, late arrival at school, truancy, non – attentiveness and sleepiness in class during lessons by such girls has a negative impact on their education. The interaction of poor access to potable water and lateness or even absence from school signals an appreciable gap in school enrolment between boys and girls in the study area. This results in a significant drop in girls'school attendance. This research is therefore intended to find out how the accessibility of potable water can affect the enrolment and performance of the girl child in school and to make recommendations towards the improvement of the provision of potable water to enhance girls' education in the study area.

1.2 Problem Statement

Global health burden associated with the lack of potable water and sanitation is that 400 – 600 children die each year (WSSCC2004). The acute lack of potable water exerts a huge responsibility on women and girls of school going age in Ghana. Women and children do most of the water collection if drinking water is not available at home. Collecting and carrying water takes time and is a heavy burden on them. Ghana currently suffers from shortages in clean drinking water, particularly in the three Northern Regions where 40% (CWSA, 2009) of the

people use unimproved sources of drinking water leading to the high incidence of water borne diseases.

The water situation in Wa municipal is not different from other places in Africa suffering from inadequate potable water supply. Like in many Sub – Saharan African countries, water collection is mainly a female affair. According to (Buckingham, 2000, Rodda, 1993) even though water crisis is observed as a general problem for the rural population, women bear the greatest burden because of their socially gendered roles, which involve looking for and collecting water for households.Over the years, however, attempts have been made by different bodies to fix the water problem in the study area. Non – governmental organisations such as; ADRA, COWAP, PRONET and TECHNO SERVE, have dugout wells and constructed bore holes at different locations within the study area to solve the water problem. Recently, there has also been the proliferation of mechanised bore holes by private people to sell water, privately owned tanker services as well as individual homes and sections contributing to build their own bore holes.

Despite all the above interventions, potable water accessibility is still a huge hurdle. Many women and girls of school going age set off in the early hours of the morning at the expense of resting, to look for and fetch water. Every available water collection source within the study area gets crowded with mostly girls in the early mornings and late evenings. Long distances are usually sometimes covered as observed by UNICEF (2008), ‘on average, women and girls in developing countries walk 6 kilometres a day, carrying 20 litres of water, greatly reducing the time they have for other productive work or for girls to attend school.

Long queues formed and waiting for hours to fetch wateras noted by (Hill & King, 1995)that time costs generated by fetching water are usually put forward as the reason for including access

to water as an education determinant, since girls are considered the main water-fetchers in many African and South Asian Countries (Hill and King ,1995). Lack of sufficient sleep, tiredness of walking, standing in long queues over long periods, make girl who go-water fetching all the time both physically and mentally weak.

The effect is that such girls get persistently tired, weak and feel sleepy while in class. Most of them get to school late and in the middle of lessons and become confused.As a result,a gender gap iscreated between boys and girls in both school attendance and performance which explains the reason for very large gender gaps in school attendance and performance in the study area and many Sub – Saharan countries including Ghana.

If the joint impact of lack of access to potable water at home and school and the eventualities associated with its search as well as lateness to and truancy from school is significant, it may help to explain why there is a gender gap in education in the Junior High Schools in the Wa Municipality.

Some stakeholders in education attribute poor school enrolment and academic output of the girl child to the gender role of the girl in the Wala traditional set – up including "potable water search". This research is therefore intended to find out how the lack of potable water affects the education of girls in the Wa Municipality.

1.3 Research Questions

The main research question is, how does the accessibility of potable water affect the education of the girl- child in the Wa Municipality?

1. How does potable water search affect girls'school attendance in Wa Municipality?

2.Does lack of potable water search and its search have any effect on girls' academic performance?

3. How does the provision of potable water affect the education of the girl child?

4. How can potable water accessibility be improved in the Wa Municipality?

1.4 Research Objectives

The broad objective of this study is to investigate and understand how the provision and accessibility of potable water will affect girl - child education in the study area. The specific objectives of the study include the following:

1 .To find out the effects of potable water search and collection on girls' school attendance.

2. To ascertain how the lack of potable water affects school performance of the girl child.

3. To examine how the provision and accessibility of potable water can improve the education of the girl child.

4. To come out with suggestions and recommendations on the provision of potable water to improve upon the attendance and academic output of the girl child.

1.5Scope of the Study

Geographically, the study area covered the whole of Wa Municipal which is located in the Upper West Region of Ghana. It shares boundaries with Wa West to the west, Nadowli West to the

north and Wa East to the east. Accessing potable water is a real contemporary issue in the developing world and Ghana in particular. Wa Municipal like many other settlements in the three Northern regions of Ghana is confronted with perennial water shortages. The persistent haulageof water by both women and girls in the morning, afternoon and evening each day over long hours and distances has prompted the researcher to choose the area for a study. The population from which the sample was drawn is forty five because there are a total of forty five (45) Junior High Schools in the Wa Municipality. There are twelve circuits in the study area out of which a school would be randomly sampled for study.

1.6 Relevance of the Study

The future of every nation lies in her children and this can only be realized if the children are well educated to strengthen the human resource base of the nation and so enable them take over from the aging population. This study is expected to throw more light onto the ‘‘problem” of potable water accessibility and how it impacts on the education of the girl –child especially in the study area. It also seeks to create the awareness of the issues to the administrative authorities, stakeholders in education, NGOs in the water sector and local community and how to address them. The findings from the studies would help authorities concerned to know the magnitude of the problem in the study area. The recommendations if implemented can help minimize the effects of the problems associated with lack of potable water in the study area with reference to the education of girls. Due to the feminine role of girls as drawers of water in the study area, most girls are irregular in school attendance. This is likely to have a negative effect on the personal development of the girls and the nation as a whole. The study would help to re- enforce the need for appropriate enforcement mechanisms to improve upon the provision of potable

water to foster girl – child education. The research findings would also add to the existing literature of knowledge. The research findings and recommendations would stimulate interest in the area and call for further research in future.

1.7Limitations of the Study

A couple of challenges were faced during the research. The scattered nature of the schools within the study area made it difficult to administer questionnaires.This problem was solved by relying on teachers in some of the sampled schools to help administer questionnaires.

The heads of some basic schools were not willing to grant the researcher permit to administer the questionnaire to their students. This problem was, however, solved after the researcher had gone to such schools to plead and explain to the heads to that, the exercise was purely for academic purposes.

At the time of collection of the data it was realized that most girls were absent in some of the classes that were sampled for the administration of questionnaires. To ensure a wider response base, class teachers were allowed a three day grace period to administer questionnaire to ensure a wider response in each class.Cumulative records of all the students in the sampled classes were not available. This was solved by going trough available records to have a fair idea of the performance of boys' and girls'.

1.8 The Organisation of the Thesis

The research has been organized into five chapters. The first chapter introduced the research, identified the key problem under investigation and asks the relevant research questions. It further

states the specific objectives for the research, defines its scope, gives a justification for the selection of the topic and outlines the limitations of the research. This chapter is relevant to the study because it puts the study into perspective and helps to check deviations.

The second chapter presents a review of relevant literature on the nature of the water situation in the study area. Relevant literature was conducted to identify how poor access to potable water and sanitation created specific problems on girls' schooling. Definition of access to potable water and cost of accessing water. Under cost of accessing water, parameters such as: distance, time, energy, health, and psychic cost associated with water search was reviewed separately. Furthermore, the data to be used in this study was introduced including the major variables that are to be used to find out the impact of potable water accessibility on girl child education.

Chapter Three contains a profile of the research area, research design adopted, the data requirement and the sources of the data, the data collection tools employed, the sampling technique, the key data variables and the tool for data analysis and reporting.

Chapter four deals with how the various data were presented and analyzed .The study sample, demographic characteristics of respondents, accessibility of potable water to girl child education, waiting time at water source, effect of walking distance to and from water source on academic performance, house hold chores that girls do before going to school, effects of lack of potable water on school attendance and performance, how easy access to portable water affects girls education and opinions from Focus Group Discussions.

The fifth chapter constitutes a summary of the study, recommendations and a general conclusion for the study. This is very relevant to the study because it discloses information which hitherto was unknown and hence adds to the existing body of knowledge.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This study examines the relationship between the difficulty in accessing household drinking water and how that will impact on the school attendance and performance of the girl child. However, water can not be discussed without sanitation. Some aspects of sanitation are therefore reviewed alongside water. The literature reviewed therefore discussed different parameters of water searching and fetching that affect girls' school enrolment and performance.

2.2 Historical Perspective of the provision of Potable Water in Wa

Wa is the capital of the Upper West region of the Republic of Ghana. The inhabitants enjoyed adequate water supply from 1957 to the later part of the 1970s (GWCL Wa; June, 2015). This was because the population of the town was commensurate to the supply of water. Public taps could be seen flowing at every point they were located, for long periods. Water collection points were closer to the inhabitants. People spent short periods to collect water and needed not to queue for long periods to take their turn to collect water.

The population of the town has since increased at a very fast rate to a current figure of 100,705 inhabitants. The existing water supply system is based on ground water made up of eighteen boreholes located in three fields. All the boreholes pump water directly into two storage tanks at a central reservoir site.

The installed capacity of the boreholes is 1,672m^3/day while current production stands at 1,320m^3/day. The present estimated water demand to adequately serve the population is 11,310m^3/day(GWCL Wa; June 2015). The current production therefore represents only 11.67% of the current daily water demand. Production from these boreholes has declined considerably over the years due to aquifer depletion and deterioration of the boreholes due to pressure from over exploitation of water due to population growth. It can be argued that the lack of financial resources to expand, operate and maintain facilities and failure to treat water as a scarce commodity lies at the heart of the challenges in water supply and sanitation (Young, 1996).

This has resulted in the persistent search for water by the female folk in the township. Potable water is now rationed to the public in turns. Even then taps flow not more than three hours, starting from 5:30 am to 8:00 am.As a solution, a more reliable water supply to meet current and future demand is to be based on a surface water source, the Black Volta River. For now, the water requirements of the population are not met.

As a short term measure, under the Urban Water Project (UWP) sponsored by the World Bank and Government of Ghana, GWCL is redeveloping ten existing boreholes and has drilled and mechanized nine new ones to increase the yield to about 3,112m^3/day. About 30kilometes of transmission pipelines are being laid while lying of 39kilometres of distribution pipelines has been completed. The capital investment cost of the project is estimated at US$5,856,488.This intervention will still not be enough to meet the 2025 demand of 19,637m^3/day(GWCL Wa; June, 2015).

2.3The Gender Roles of Girls in Wa Municipal

Most countries in Sub – Saharan Africa and South East Asia have defined roles for females. These same gender imposed roles are also performed by girls in Wa Municipal. Most household chores; cleaning of rooms, compounds and utensils, fetching of firewood, water for domestic and washing of clothes are all defined roles of the girls in Wa. According to(Lindskog and Lundqvist1989) observed that water is carried "almost exclusively" by women and older girls.

In households, abuses are spelt at any male who engages in any female defined roles. In fact, the search for and collection of water is tasking and time consuming.This is due to low numbers outlets of both public and private points of collecting water in the Municipality.The role of collecting water assigned to girls, make them sacrifice a variety of household chores to sourcing water.

In a study by Mehretu and Mutambirwa(1992) in the Chiduku Communal Area in Zimbabwe, (found that women and girls account for 90.8 percent of the total time spent collecting water (61.1 percent by wives, 25.5 percent by daughters, and 3.7 percent by other women and girls). To girls, getting water to the house is a priority in fulfilling their gender imposed role. They compromise their time, health, leisure and walk long distances to get water home.

Makule, (1997) cites a UNDP study from the Arusha area of Tanzania that found that women and girls bore responsibility for water collection in 75 percent of households interviewed; boys (13 Percent) and men (9 percent) were responsible in most of the rest.

2.4 Need for water

Water is a natural commodity of fundamental importance. It supports all forms of life, creates jobs, and generates wealth in the water sector, tourism, recreation and fisheries (Ntengwe, 2005). Without water life as it exists on our planet is impossible (Asthana and Asthana, 2001). There is therefore the urgent need for potable water to be available and easily accessible by humans.

Over the year, women have accumulated an impressive store of environmental wisdom, being the ones to find water, educate children on hygiene matters and to understand the impact of poorsanitation on health.In November 2002, the Committee on Economic, Social and Cultural Rights adopted its general comment No. 15 on the right to water, defined the right of everyone to sufficient, safe, acceptable, physically accessible and affordable water for personal and domestic uses. However, fresh water is not accessible for human consumption.

2.5 The water crisis

Globally, there is water crisis today. This crisis is not about having too little water to satisfy our needs. It is a crisis of managing water so badly that billions of people- and the environment- suffer badly (World Water Vision Report). The number of people who rely on the earth's limited fresh water reserves is increasing every day. In fact, a scarcity of clean, fresh water is one of the world's most pressing environmental problems (Arms, 2008). At the 2002 World Summit on Sustainable Development in Johannesburg, South Africa, great concern was expressed about the 1.1 billion people in the world who do not have access to clean drinking water and the 2.4 billion who live without proper sanitation (Cech, 2005).

The resulting toll on the human race is roughly 3.3 billion cases of illness and 2million deaths annually. Moreover, as the world's population grows, the limited easily accessible water in the rivers, lakes and shallow underground aquifers are dwindling as a result of over- exploitation and water quality degradation (IAEA, 2004). Water scarcity currently affects four out of every ten people in the world.

The situation is worsening owing to population growth, urbanisation, pollution of water resources and the impact of climate change. However, water scarcity is not inevitable; it is heavily influenced by human behaviour, social customs and institutions, and government policies. In fact much of what passes for scarcity is a policy- induced consequence of mismanaging water resources (UNDP, 2002).

More than 100 million people in Europe lack access to potable water resulting in the death of 40 children per day from diarrheal state ailments (UN, 2008). In 2006 alone, 170,000 cases of water related diseases were reported in Europe (UN, 2006). In Eastern Europe, 16% of the population is without access to potable water, whiles in rural areas more than half of all the people do not have a reliable supply of safe water (UN, 2006).

In North America more waste water is generated and dispersed today than any other time in the history of the planet; more than one out of six people lack safe drinking water, that is 1.1 billion people, and nearly 2.6 billion people lack adequate sanitation (WHO/ UNCEF/ JMP, 2004). More than 4 billion people do not also have their waste water treated to any degree since Kyoto (IWA, 2003). This led to a record 3,900 infant mortality everyday from water borne diseases (WHO, 2004). In Latin America, less than 20% of the population has access to potable water

(UNDP, 2006). “The scarcity at the heart of the global crisis is enrooted in power, poverty and inequality not physical availability’’ (UNDP, 2006).

Africa as a continent appears to have an abundance of water; it has 17 rivers, each with catchments of over 100,000 Km^2, more than 160 lakes larger than 27km^2, vast wetlands and limited, but widespread groundwater.Rainfall similarly is plentiful, with Africa’s annual average being at a level comparable to that of Europe and North America (AWV, for 2025). Withdrawal of water in Africa for its three main uses – agriculture, domestic and industry- is low, estimated to be only 3.8% of total annual renewable water resources (AWV for 2025).

Water scarcity was experienced in 10 African countries in 1995: Algeria, Burundi, Cape Verde, Djibouti, Egypt, Kenya, Libya, Malawi, Rwanda and Tunisia. Projections indicate that the situation will worsen by 2025, 14 countries will suffer water scarcity and a further 11 countries will suffer water stress (AWV, 2025).

According to (IMF, 2003), growing water scarcities and water pollution in developing and developed countries alike have plunged the world into a water crisis.

2.6 Access to Potable Water

The target of Millennium Development Goal 7calls to halve by 2015, the proportionof the population without sustainable access to safe drinking water and basic sanitation.

It is a challenging proposition to define “access” to water and sanitation. Over the years, the subject “access” to water has become an issue of international priority, a number of metrics have been used to explain the concept of access to potable water. The earliest official attempt to define

access was made by the (WHO, 1981). In proposing metrics to measure progress towards improving health for all citizens by 2000, the organization suggested as a useful indicator the presence of a "safe and adequate" water source within a given walking time, though no specific walking time thresholds were recommended.

Gadgil (1998) describes nine different sets of standards for measuring access adopted by various developing nations during the 1990s. Some measured walking time between households and water sources (with access ranging from 5 to 30 minutes, each way), while others measured the linear distance (ranging from 50 m to 2 km, each way) between the two.

According to UNESCO (2006), every person needs 20 to 50 litre of potable water a day fortheir basic needs: drinking, cooking and cleaning, but more than one in six does not haveaccess to such amount of potable water.

The World Health Organization (WHO) carried out a survey in 1975 which revealed that only 22% of the rural population in developing countries had access to safe drinking water. The findings which were published in 1976, led to the declaration of 1981-1990 as the International Drinking Water Supply and Sanitation Decade, by the United Nations Water Conference (Dada *et al.*, 1988).

In 2009, Africa's population exceeded 1 billion (UNPF 2009) and continues to increase at a rate of 2.4% annually. Of this population, 341 million lack accesses to clean drinking water,(WHO/UNICEF 2008) and a further 589 million have no access to adequate sanitation(WHO/UNICEF 2008).

The international drinking water supply and sanitation decade, declared by the United Nations, ended in 1990 with an additional 1.3 billion people having access to drinking water, but still left about 1.2 billion people without access to safe drinking water (de Roy, 1990). In most cultures, women are primarily responsible for the use and management of water resources, sanitation and health at the household level.

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From above it is clear that for what ever reason access to potable water is not easy across the globe. It has been calculated that in South Africa alone, women collectively walk the equivalent distance of 16 times to the moon and back per day gathering water for families (Maude, 2002)

In many countries, while the poorest get less water of a lower quality, they are also often charged the most. People living in the slums of Jakarta, Manila and Nairobi pay 5 to 10 times more for water than those living in high-income areas in those same cities and more than consumers in London or New York. In Accra, many of the 800,000 people living at or below the poverty line pay 10 times more for their water than residents in high-income areas (UNDP, Human Development Report 2006).

The right to water contains freedoms**.** These freedomsinclude protection against arbitrary and illegal disconnections; prohibition of unlawful pollution of water resources; non-discrimination in access to safe drinking water and sanitation, notably on the basis of land or housing status; non-interference with access to existing water supplies, especially to traditional water sources; and ensuring that personal security is not threatened when accessing water or sanitation outside the home.

Access to potable water by women and girls is accompanied by certain dimensions; distance, time, health, effects of lack of water on menstruationand psychic costs are all issues that come up when fetching water. Relevant literature will therefore be reviewed in these areas.

2.7 Household Decision Making on Girls' Education

According to Mbilinyi (1999) a household as a group of individuals unified by commonly held factors of belonging and identity, in which individual members have rights and entitlements, as defined by the norms of the wider society.

The common categories of household which exist in Tanzania are extended and composite households. Household is an important social institution which shapes gender relations, transmits gender norms from one generation to the next and determines roles and opportunities available to the household members based on sex.

According to Chilembo (2004), the link between school and household is coined in decisions of child enrolment, placement, progression, and ultimate academic achievement. In developing countries the parents/guardians' decision to enroll a child in school is determined by household size. Thus, household size may reduce children's participation and progress in school as well as parents' investment in schooling

To Lloyd(1994), the magnitude of this effect is determined by socio-economic development, the level of social expenditure by the state, family culture and the phase of demographic transition. According to Rugh(2000) parents/guardians' decision to enroll a child in school is determined by the perceived returns on investment as far as schooling is based on social and

economic rationale. For example, female children, through marriage, are expected to benefit their husbands' families. In contrast, manyparents think that male children deserve education because they are likely to benefit from their education. These are common perceptions within patrilineal systems where males are expected to stay with their families.

In Malaysia and China girls appear disadvantaged in larger households but their brothers are not (Shreeniwas, 1993). In India, families from urban slums in Tamil Nadu discriminate girls in order to provide quality private education to few children, mainly boys. Where mothers enter the labour force, it is girls who must stay at home. In rural Maharashtra, if there are fewer younger siblings, boys benefit with more schooling and less work, and girls must ensure tasks traditionally assigned to them are completed (Jejeebhoy, 1993).

The above reviews are indications that from the very on set most families in developing countries show little or no interest in educating their female children and so tie them to the execution of domestic duties.

2.8Feminism, household chores and girls education

The meaning of the term "feminism" is often debated. It is even more difficult to generalize about African feminism which is used to explain African gender relations.

According to Steady (1987) African feminism is "an epistemology that enables African women to theorize their racialised status in society". As a theory, African feminism differs from other conceptual approaches to studying black women's history:African feminism combines racial, sexual, class and cultural dimensions of oppression to produce a more inclusive brand of

feminism through which women are viewed first and foremost as human, rather than as sexual beings.Western feminists in particular have been interested in shaping a progressive position on gender issues in education. Feminism here is defined as the commitment to the political, social, and economic equality of women, which draws on and has instigated a variety of movements, theories, philosophies and campaigns. To the feminist, socio-economic differences, ethnic origin and language intersect with gender to influence educational performance and indeed,it was found that such social factors are more influential as students grow older (Sammons, 1995).

Historically,two main approaches to educational gender or sex differences in western cultures were identified. The first conservative approach contends that social and cultural difference between men and women is seen as biological, natural and therefore unchanging. In many cultures, this perspective went unchallenged for a long time, underpinned by a large literature focusing on women's inferiority. For example, in nineteenth-century Britain, males and females were expected to take up separate roles in society: men were associated with the public sphere and women with the private (Vicinus, 1972). So-called scientific studies were published that 'proved' that if women entered universities; their reproductive capabilities would be harmed (Delamont & Duffin, 1978).

The second, progressive approach, perceives men and women's social roles as shaped largely by influences arising out of history, culture and society, and thus constantly in the process of change as society itself changes. From this point of view, women have occupied different (and usually subordinate) positions historically because Western and other societies are patriarchal, that is that men have power over women and therefore are in a position to interpret so-called biological differences in stereotyped ways (De Beauvoir, 1953; Harding, 1986; Riley, 1988; Scott, 1988;

Hill-Collins, 1990).The emphasis of this perspective is to understand gender or sex difference as a cultural phenomenon, arising out of the dominant ideas of a particular era or culture. Education is here regarded as an instrument for creating awareness of why particular sex differences are seen as important at particular times and for encouraging greater equality between the sexes, as well as for challenging dualistic and stereotyped assumptions.

A twentieth-century development of this perspective is that differences in behaviour between the sexes stem from innate biological differences between girls and boys. Accordingly, men are physically stronger, less resilient, have greater spatial, numerical and mechanical abilities and tend to see the world in terms of objects, ideas and theories. Women on the other hand mature physically and psychologically at an earlier stage, are more affiliative and nurturing, have higher and more precocious verbal skills and see the world in personal, aesthetic and moral terms. In an influential book Males and Females Hutt asserted, for example, that women and men are intrinsically different and that, therefore, these characteristics are not susceptible to change (Hutt, 1972). From this conservative perspective on sex differences, education is seen as a means of socialising and educating boys and girls into their 'natural' roles as men (breadwinner, work-oriented, head of the family) and women (nurturer, carer, family-oriented).

There is a lot of literature to substantiate the fact that women are discriminated against in the realm of education. It is therefore not surprising that women's inadequate access to education has been seen as the source of the various discriminations that they suffer (Alabi, Bahal, and Alabi, 2014).

In Nigeria, only 20% of women in the North West and North East of the country are literate and have attended school while the North Central and North West presents the worst scenarios

(UNICEF, 2007). According to Dugbazah (2009) gender composition of occupations in both the formal and informal sectors, of a country is an important indicator of the economic opportunities open to women. This then entails that women were from the onset disenfranchised in the formal employment sector since jobs in this sector are mainly negotiable through acquisition of education and skill.

Despiteefforts to boost female education, by governments, international organizations and NGOs, there is still a gender disparity in education. It has been observed by (Oke, 2000 and Oladosu, 2007) that females still have low access to education, low participation and poor performance in many subjects, especially Mathematics and Science subjects. Many factors which are home, community and school based, continue to restrict developments in female education (Uremu, 2012).

It is clear from the above that female education has since time immemorial suffered a lot of discrimination. Females are therefore disadvantaged in assuming jobs in many areas of the economies of countries due largely to poor or abrupt termination of schooling.

2.9Impact of Distance Covered in Fetching Water on Girls School Attendance

It has been calculated that in South Africa alone, women collectively walk the equivalent distance of 16 times to the moon and back per day gathering water for families (Maude, 2002)

The review above provides a vivid outlook of how women in South Africa toil to look for and collect water for domestic use. This can also be an indicator of the time and energy spent in

water search not only in the area under review but in the whole of Sub – Saharan Africa and South East Asia.

According to UNICEF (2008), 'on average, women and girls in developing countries walk 6 kilometres a day, carrying 20 litres of water, greatly reducing the time they have for other productive work or for girls to attend school.' According to the above review walking and collection of water by women and girls has been found to drastically reduce girls' school attendance. Once attendance is poor, performance can also be adversely affected.

Multivariate analyses also show a strong negative link between the distances to water sources and girls' schooling. For example,(Akabayashi and Psachapopoulos, 1999) founds a significant negative impact of distance to overwhelmingly, proximity dictates the source and use of the water, particularly or poorer and female-headed households. Water sources on girls' school hours but not on boys'. It has been found that distance to water source has a negative dictate to the use of water, as well as girls schooling and not boys. Comparatively therefore, girls are disadvantaged with regards to water search and school attendance.

Several trips must be made each day to the nearest tube well or surface water body to meet water needs, with women and girls devoting several hours each day to ensure household water security. The distance to be covered can range from a few yards to several hundred yards. The enormous distance covered by women and girls in most developing countries in their quest to find and collect water for domestic use undoubtedly has serious effects on girl's school enrolment. Time spent in the fetching of water depends both on the distance of the source of water and the crowd at the source.

Effort is therefore required by girls to walk such enormous distances some to collect a bucket or a head pan of even contaminated water in other to meet domestic needs. In effect, relevant literature has it that, walking long distances by girls to collect water has a negative impact on their school enrolment.

2.10 Effects of water collection time on girls school enrolment

There is virtually no activity without time lapse. However, due to the distances involved in water – search in most poor nations, water drawers (women and girls) weak up in the early hours of the morning to look for and collect water for their families.

This emphasis on collection time was supported by a case study from Mozambique (Cairncross and Cliff, 1987), which found that following construction of a new water system in one village and a subsequent reduction in collection times from 5 hours to 10 minutes, water consumption in the village increased by a factor of 2.7 and incidence of trachoma dropped to half that of aneighbouring community.

A study in Zimbabwe indicates that the burden of collecting water has a feminine face, with women and girls being largely engaged searching for and collecting water. This can consume lots of time, especially when water is to be collected in the morning before going to school. Time costs generated by fetching water are usually put forward as the reason for including access to water as an education determinant, since girls are considered the main water-fetchers in many African and South Asian Countries (Hill and King, 1995).

Fetching of water generates more time costs for girls who can otherwise use the time to travel to their school. Women and girls spend 8 or more hours per day collecting water and carrying up to 20 kilos or 15 litres per trip (Bulajic, 1998) for household chores. Every normal person needs a maximum of 8 hours of rest to be healthy. From the above review, girls who collect water for their households do not usually have enough rest. They sometimes therefore go to school late or stay away form school due to tiredness.

In Senegal, women spend 17.5 hours per week collecting water. In Mozambique, they spend 15.3 hours per week collecting water in the dry season. In the Baroda region of India, women spend 7 hours per week collecting water. Observations from Nepal confirm the important role of female children in the collection of water, with girls of 10 and over devoting almost 5 hours per week to the task (UN 2000). In Bangladesh, women and girls have been found to walk between 2 and 5 hours each day to fetch water (Shamim and Salahuddin, 1994).

Fetching water takes time – an estimated 700 hours per person per year in Ghana (World Bank 1994) keep girls out of school and limits the economic productivity of women. Globally, more than 1 in 5 girls of primary school age are not in school.

Due to lack of clean water available at community level and home, girls persistently put in so much effort to collect water home. Girls like their mothers often walk miles to fetch the daily water supply. The time spent annually looking for water is so enormous that virtually the whole year can be wasted in collecting water. On a more serious note this can be a very long time to stay away from school completely. This constitutes a very big set back to girls education.

Due to the urgency of the water fetching situation and its negative impact on the education of girls Tharoor says;

"*If I had to pick the one thing we must do above all else to improve the world, I*

Would say: 'educate girls' ", (Tharoor, 2007: 165).Tharoor's statement above emphasises the importance of girls education and that it should be given prominence. To give girl education prominence, water, which is an important ingredient in life needs to be made clean and readily accessible for collection by girls. This will help save both time and energy in water searching at the expense of studies.

The tragedy is that the water which they work so hard to collect is often dirty, polluted and unsafe to drink, coming from rivers, ponds or simply holes in the ground. In urban areas, women and girls have to walk long distances to collect water, use polluted sources such as factory rendering their hard work in vain.From the above reviews it is obvious that water fetching consumes lots of time at the expense of schooling thus generating a time cost.

A time cost generated by fetching water is the usual reason for including access to potable water as a schooling determinant in the demand for schooling models, since girls are considered the main water-fetchers in many African and South Asian Countries (Burke and Beegle, 2004; Hill and King, 1995).

2.11Societal and Family Influence on Girls Academic Performance

Parents have different attitudes towards their sons and daughters. Daughters are brought up for female roles such as child rearing and good execution of household duties in preparation towards

a successful marriage while sons have a whole working life to devote to career building.Parents believe that females do not have qualities of independence, initiative and assertiveness (Mampele, 1994). According to Karugu(1987) whether in school or not, girls of primary school age spend significantly more time on household chores than boys.

Psacharopoulos and Woodhall (1985) also noted that parents, particularly mothers favored boys' education because they depend on the sons for old age insurance.Bernard (2002) observed that lack of positive policy environment and structure for girls' education, including a lack of co-ordination between the education sector and other social sectors, inhibits girls' achievement in education.According to Rothstein (2000)argues that;learning is not only a product of formal schooling but also of communities, families and peers. Socioeconomic and socio-cultural forces can affect learning and thus school achievement.

African countries largely have a male preference attitude. The boy child is expected to be able to do wonders in the world of knowledge and technology whereas a woman's place is at home, keep up with the livelihood of the family (Mischi, 2002). Family development efforts, including schooling are invested on the boys because they are makers of clans while the girlsare expected to be married to husbands who will speak for them. As a result few efforts and resources are spent on girls' education (World Bank, 2002). This may lead to low academic achievement among girls in examination. To Ballara (1992) observes that households, fathers and men in general have a negative attitude towards women's education, especially when it results in the possibility of learning new skills that give women a new role in the family, and in the society.

These in turn impede the schooling of girls and hence cause low academic achievement in national examinations.

Accordingly, Ademola (1989) noted that among the Sisala tribe of Ghana, girls are given powerful skills of being housewives yet denied that part of education that will make them compete favourably in other sectors as opposed to their counter parts. In that way, girls shy off and hence develop some dependent attitudes. On the other hand, Kihumba (1997) notedthat in Lesotho, girls who would otherwise remain at home to be well fed and learn duties of good housewifery are taken to schools rather than boys who go to look after cattle. The Gachathi report (1976) concluded that the education of women is much less developed than that of men due to traditional believes and prejudices held by people in society. There is need to ensure that career prospects for women and men are made similar through guidance and counseling, increasing girls' opportunities.

2.12 Influence/effects of Household Chores On Girls' Academic Performance

Academic achievement of the girls is likely to be affected bythe girls undertaking household chores. Household work is often mentioned as occupying most of the girl's time.

In a study by Mbilinyi (2003), he observed that most students especially girls are engaged in such activities as caring for their siblings when their parents are away, fetching water and taking care of the sick children in their family thus limit them to have enough time for study and make revision concerning their study which affect their academic performance.Kakonge et al (2001) who conducted their study on girls' education in Wajir and Mandera districts of Kenya discovered that the home environment had an impact on girls' academic performance in

secondary schools as reflected in their national examinations. Girls suffer from overwork in the home, which makes them exhausted and many lose their interest in doing school works. Even in a family where there is both a female and male student, the girls will always be busy from the time they wake up to the time they go to bed while boys will spend most of their time loitering, playing and studying. They found that these practices put girls at a disadvantage because they scores poor performance.

Also, Jacobs and Kathleen (2004) noted the role of women in society and the organization of the schools system to be the major causes of poor academic performance. Girls are expected to contribute to childcare or home production at an early age. In addition, they found out that adults were judging the division of labour at home to be fair. Thus, adults, including parents, supported the division of labour at home. On the other hand, children judged the division of household chores based on gender as unfair. That unequal division of labour at home discouraged those who seemed to have more duties to perform.

To Dupont (1989) images of women reflect the values and pressures of society, while at the same time permeating mental attitudes and underpinning social conventions. In addition, they mould thoughts and habits together with the family and economic structures peculiar to each society. Therefore, the society helps to determine the status of women in all walks of life including academic achievement through psychosocial influences. For instance, girls' self efficacy influences their decision to pursue science subjects.

According to Bendera (1994) there was remarkable different treatment in classes/schools reinforced by teachers, parents and society in regard to future expectations among boys and girls. It was observed that some of the statements discouraged girls to excel academically, which

impacted the social and psychological set up for a child in academic environment. This induced academic superiority for boys and inferiority complex for girls.Kigoonya (1998) conducted a study on the impact of school culture on girls' participation and achievement in co-education and non co-education secondary schools in Kampala, Uganda.The study found that in the co-education secondary schools, the school culture was patriarchal and hence the girls found themselves being pushed off the gender space by the boys. This was due to the socialization process at home and at the schools.

Consequently, girls tended to succumb to social control of the boys and tended to be shy and unassertive in utilising all the facilities provided for them. This in turn rendered the girls' participation and performance ineffective compared to boys and their counterparts in girls secondary schools. Furthermore, some studies attribute the low academic performance of girls to their socio-economic environment. However, such a relationship is not found to be conclusive in developing countries as in the developed ones.

Empirical studies conducted on the factors accounting for girls' poor academic performance in examinations (Malekela, Cooksey andNdabi 1990;Bustillo, 1993; Hamad, 1994;Sandra, 2000; Omari, 2001) have disclosed that it is socio-economic, cultural, attitudinal, self esteem, motivational and unfavourable school and home environment,as well as the level of parents' education which are the underlying factors behind girls' poor academic performance. However, there is no comprehensive study that has examined the impact of household chores on girls' academic performance. Therefore, the study intended to fill the gap by exploring girls' participation in household chores and its impact on their academic performance.

2.13Health Implications of Collecting and consuming contaminated Water by Girls

The further the source of water, the longer the distance covered and the more time spent in collecting the water. To girls part of school time is spent in the haunt for water.

According to Gleick (1998) estimates that 25 litres per day is enough for personal consumption and sanitation, but that another 25 litres per day is needed for bathing and food preparation, producing a total daily requirement of 50 litres per person. In poor settlements women and girls look for and collect as much as 50 litres of water for each member of their families. This indicates the amount of work involved in collecting water by women and girls to meet daily needs by family members. To the girl of school going age, the task and the time elapse in searching for water are lost opportunities to be in school.

In schools and in some public places, we are getting familiar with a slogan which states *'water is life* ". Of course, it is true without which living things cannot exist, but it would have been better if the slogan is replaced by '*clean water is life*' because we have learnt that everyday many people die because of water borne and water related diseases, due to the consumption of uncleanwater.

Constant carrying heavy water containers, that weigh up to 20kg, on the head, hip or back, havesevere health implications. In extreme cases curved spines and pelvic deformities can result, causing problems in childbirth. Further problems occur when women are menstruating and during childbirth because of a lack of water. Estimates suggest that investments in clean water and adequate sanitation facilities are exceedingly cost-efficient with regard to health returns (Montgomery and Elimelech, 2007).

According to the United Nations (U.N.), more than 14,000 people die daily from water-borneillnesses. The bulk of these deaths are related to a number of infections, including: 2 billion cases of intestinal worms; 5 million cases of lymphatic filariasis and trachoma, each; 1.4 million child diarrheal deaths; and 500,000 deaths from malaria (UNWS, 2005).

The UN has agreed that unclean water results in the incidence of some water borne diseases as well as the death of so many children. The provision of potable water can drastically solve the problems associated with the use of contaminated water. When the health of school going girls is affected they can be a lag in school attendance and so lead to poor performance.

Several diseases, including diarrhoea and several neglected tropical diseases are contractedthrough contact with bacteria infested water and soil and cause millions of deaths and illnessesannually. According to the United Nations World Water Development Report, water related diseases are among the most common diseases causing death in developing countries.Insufficient sanitation and hygiene claimed about 2,213,000 lives and presently 1.1 billion people lack access to potable water (UNWWDR 2000).

Also, (Wu et al, 1999) found out that, half of the population (700 million) in China is consuming contaminated water which is a major source of infectious and parasitic disease. They also find that the situation is much worse in rural China, where potable water is not easy to access.

There can be a reduction in infectious diseases when potable water is made accessible by people irrespective of the area. Girls would spend less time to collect water home so that they can go to school on time like their male colleagues do.From August 2006 to May 2007 China's Ministry of Health conducted a survey of drinking water and hygiene in the rural areas in 31 provinces,

regions and cities. At least 300 million rural residents in China were estimated to have no access to safe and clean drinking water, and only 31 percent of rural toilets reach hygienic standards (China View2, 13 Aug 2006).

In rural China and most rural settlements and cities in Sub – Saharan Africa, access to clean water has also been regarded as a major social issue. Water-related diseases such as Schistomiasis which have part of their lifecycle in water; diseases like malaria with water-related vectors; and others such as legionellosis carried by aerosols containing certain micro-organisms.

It also contributes to the spread of dangerous food related illnesses like salmonella and E. coli.

Hence both girls' and boys' schooling may be affected by the general health related consequences of poor water, since it is found that children's health is an important determinant of their schooling (Colcloughet al, 2000).

As frequent and prolonged spending on children's health related expenses increases, parents will have to cut the family budget for children's schooling. Since girls have much bigger probability of having special gender-related symptoms, poverty stricken parents may not be able to afford the related health costs for their daughters, and may consider it essential to withdraw their daughters from school and arrange them for a 'necessary' marriage that can transfer the further health costs to the maternal family (Kirk and Sommer, 2006).

Moreover, even though parents are financially better off, they will seek to maximize the return from investing in their children's schooling and hence are more likely to invest in healthier

children's schooling (Ayalev, 2005).In this respect, girls with recurring illness due to the joint impact of menarche and poor access to water may have to quit school first.

Recent estimates attribute 1.5 million child deaths each year to unclean water, inadequate hygiene, and a lack of adequate sanitation (UNICEF 2010). Lack of clean water and adequate sanitation is the leading contributor to diarrheal diseases in children (Gamper-Rabindran et al. 2007), which account for 19 percent of total child deaths (Boschi-Pinto et al. 2008).

Improving access to piped water and sanitation has been shown to significantly reduce infant mortality rates (Gamper-Rabindran et al. 2007, DaVanzo, 1988). Other studies have shown that access to adequate water and sanitation is more highly correlated with decreased child mortality than other socioeconomic indicators, such as access to health care or percentage of households below the poverty line (Shi 2000).

The dangers to the health of Africans from inadequate household water supplies are vividly described in a memorable (though perhaps overstated)passage exerted that an African housewife gets up in the morning and soon begins to fetch water. She walks through the thicketed savannah to the water source.

This is the habitat of tsetse flies and she is exposed to their unpleasant bites and the risk of sleeping sickness. She reaches the water source in a valley bottom and has to wait her turn. This is the habitat of disease-bearing mosquitoes and of a different tsetse fly more efficientlytransmitting sleeping sickness. The stream contains snails-transmitting bilharziasis if it is sluggish, or breeds the vectors of onchocerciasis if it is rapid, or may contain guinea worm

larvae if it is a mere muddy hole. She collects the water, which today bears a highly dilute load of human excreta and may contain typhoid bacilli or hepatitis virus.

She returns, past the tsetse flies, to home...She prepares the family's main meal. The scarcity of water discourages the washing of hands before the meal.Some unboiled water is drunk by her thirsty family, who pick up the germs from it (White, Bradley & White, 1972).

Although this passage was written in 1972, the dangers it describes remain a pervasive part of life for many rural African women today. From the review above almost all water is collected by women and girls in most developing countries. Collecting water from a distant source appears to impose a number of health costs on women, girls and other members of the family. Women and Girls expend some energy walking away from home to draw water and so endure physical pains. Also the girl- child becomes prone to infection of water borne diseases and therefore most likely to stay away from school until she recovers.

There is the need for a sound mind to be in a sound body. When children get sick as a result of consuming unclean water, they might not be able to go to school or even have sound mind to cope with academic work. The health cost of accessing unclean water over long distances would have a negative impact on girls' education.

2.14 Access to Water, Menstruation and Girls Education

This section has to do with sanitation. It is reviewed because of the intricate link between water and sanitation. Irrespective of the proliferation of a variety of brands of pads for females during

menstruation, it might appear as if water is not necessary. Water is life and very vital for proper sanitation.

The lack of access to separate and decent toilets at school is impeding girls' access to their education UNICEF and the International Water and Sanitation Centre have noted that "education for girls can be supported and fostered by something as basic as a girls-only toilet,"(UNICEF 2005) arguing that the lack of access to separate and descent toilets at school is impeding girls' access to their education. In Africa despite this, girls are still less likely than boys to be in school in 28 countries, 18 of which are in sub-Saharan (UNESCO 2009).

At the same time, poor access to water can interact with menarche to reduce girls' education. Research has found that girls' health is at risk if proper personal hygiene is not in place after menarche (see Dagwood 1995; Secerino and Moline, 1995), a problem which arises particularly when poor access to water means girls are unable to clean themselves (see Bista, 2004, Nahar, 2006; Kirk and Sommer, 2006; Singh, 1999). Self cleaning is of priority to girls during menstruation so as to keep them in school an indication of the significance of the accessibility of potable water. Reduced health and cleanliness worries will clearly impact education.

In fact, there is quite a large literature on poor sanitation in rural schools, and the adverse consequences for children's education (e.g. Behrman et al. 1997), in particular for girls' schooling (El-Gilany, 2005). According to Cairncross et al(1998) school sanitation programme in Bangladesh increased girls' enrolment by 11 per cent. Many more girls are likely to keep going to school in developing countries as in Bangladesh as stated in the above review.

ToBurrows et al (2006,)Lack of adequate water and sanitation both at home and school prevents girls from attending school when menstruating. Girls have a sense of being unclean when there is little clean water to wash themselves and this can lead them to stay away from school. Also there are rarely private facilities at school where girls can go to the toilet or wash the rags they use during their periods. They can also pick up infections if the water they use to wash rags is dirty, leading to more time off school".

The World Bank has put concrete numbers on the menstruation problem: if a girl misses 4 days of school every 4 weeks due to her period, she will miss 10 to 20 percent of her school days (World Bank, 2005; Tjon a Ten, 2007). According to the World Bank a significant amount of 20 percent of the educational activities of girls is lost with the figures given in the review above.

The possible role for menstruation in limiting school attendance has received significant attention in popular media, nearly all of which argues that menstruation is likely to be a significant factor in schooling (e.g. Kristof and WuDunn, 2009; Kayiggwa, 2007; Mawathe, 2006; BBC, 2010).

Kristof (2009) writes: "education experts increasingly believe that a cost-effective way to keep high school girls from dropping out in poor countries is to help provide them with sanitaryproducts." These arguments are based largely on anecdotal evidence: Girls report missing school during their period and report limited access to modern sanitary products.Whilst there is no evidence to show that menstruation is the only factor leading to drop out of girls, self reporting by girls suggests that inadequate toilet facilities in schools are a contributory factor for truancy, failing classes, absenteeism, and drop out, particularly in the transition from primary to

secondary schools (Abioye-Kutei, 2000; Gautum, 2010; Jones & Finlay, 2000; Fakeye&Egade, 1994; Deo, 2007).

Research also found that girls' health is at risk if proper personal hygiene is not in place after menarche (see Ahmad and Yesmin, 2008; Dagwood, 1995; Severino and Moline, 1995), a problem which arises particularly when poor access to water means girls are unable to clean themselves (Bista, 2004, Nahar, 2006; Kirk and Sommer, 2006; and Singh et al., 1999).

A number of researchers and policy-makers have argued the importance of menstruation in limiting school attendance and attainment (World Bank, 2005; Beyene, 1989; Herz et al, 1990; Mehrah, 1995; Sommer, 2009).

Lidonde(2005) asserts that girls from poor African countries are marginalized in accessing education because of inadequate sanitation facilities that allow them no privacy, especially during their menstrual period. Also, Behrman et al (1997), using detailed data from rural Pakistan, find that poor access to water and toilet facilities significantly reduces school performance. Lidonde (2005) also finds about 1in10 school age African girls do not attend school during menstruation or they drop out altogether at puberty because of a lack of clean and private facilities.

The lack of private sanitary facilities for girls at schools will also contribute to there being fewer women teachers to encourage girls to attend schools (Bista, 2004).Oster and Thornton (2009) find girls in general come back home from school to wash their rags andinvolve self cleaning activities during their period. If girls do not have clean and safe water sources either at home or school, they may find it difficult to remove the odour and spot resulting from menstruation and

may thus be subject to physical and sexual abuse from boys and even male teachers (Bista, 2004). It is important to provide potable water both at school and home.

From above literature, it is clear that the joint impact of access to potable water and the onset of menstruation are important determinant in girls' school attendance.

2.15 Psychic Cost Associated with Water Search to the Girl Child

Usually at the onset of menstruation, most girls both in and out of school are aware of what they are going to go through. Lots of emphasis is placed on the need for proper sanitation in schools, to enhance girls' education. Proper sanitation can, however, not be achieved without adequate potable water. Poor access to potable water in schools may also generate typical psychic costs on post menarche girls' schooling.

In areas where there is poor access to water parents do not feel safe sending their girls to male-dominated environments, e.g. schools, during their period (Kirk 2005). This reality indicates the existence of a typical psychic cost on parents' side as well as on the girls' side to prevent the girls from attending school during their period for safety. In rural India, menstruating girls are often subject to certain taboos.

Girls are asked to remove themselves from public spaces such as classrooms and thus suffer their schooling during all the menstruation period (Nahar, 2006). The arguments above boils down to the possibility that post-menarche girls' education suffers due to the greater time, health and psychic costs associated with poor access to clean water. All these 'special' costs induced by the

interaction of the poor water access and menarche are likely to make girls dropout of school early.

Poor access to water may also generate typical psychic costs on postmenarche girls' schooling. There is quite a large literature on poor sanitation in rural schools, and its adverse consequences for girls' education (e.g., El-Gilany et al, 2005; Behrman at al. 1999a). After having conducted interviews with many school girls,(Snel& Shordt,2005) conclude that school drop-out rates and low literacy levels, especially among adolescent girls, can be attributed in part to inadequate sanitation and health conditions in schools. Also, Cairncross et al(1996) also found that a school sanitation programme in Bangladesh increasedgirl's enrolment by 11 per cent.

Similar, Lidonde (2005) asserted that girls from poor African countriesare marginalized in accessing education because of inadequate sanitation facilities that allow them no privacy, especially during their menstrual period. Behrman et al (1997), using detailed data from rural Pakistan, find that poor access to water and toilet facilitiessignificantly reduces school performance. According to (Lidonde ,2005) about 1 in 10 school ageAfrican girls do not attend school during menstruation or they drop out altogether at pubertybecause of a lack of clean and private facilities. The lack of private sanitary facilities for girlsat schools will also contribute to there being fewer women teachers to encourage girls toattend schools (Bista, 2004).

If the schools in rural areas do not provide adequate sanitation facilities for girls'special hygienic needs during their period, homes will become primary cleaning places forgirls. For example,(Oster and Thornton, 2009) find girls in general come back home fromschool to wash their rags and involve self cleaning activities during their period. If girls donot have clean and safe water sources either at home or school, they may find it difficult toremove the odour and

spot resulted from menstruation and may thus be subject to physicaland sexual abuse from boys and even male teachers (Bista, 2004).

Consequently, in areas where there is poor access to water parents do not feel safesending their girls to male-dominated environments, e.g. schools, during their period (Kirk, 2005). This reality indicates the existence of a typical psychic cost on parents' side as well ason the girls' side to prevent the girls from attending school during their period for safetyconcerns. Furthermore, in rural India, menstruating girls are often subject to certain taboos.Girls are asked to remove themselves from public spaces such as classrooms and thus suffertheir schooling during all the menstruation period (Nahar, 2006). This phenomenon is common to girls in the study area. Most often girls are seen going home from school. When asked why, the response is always 'I am soiled'. They usually go home to clean up with clean water and most of them stay away from school until the period is over.

The arguments above boil down to the possibility that the education of girlswho are menstruating suffer due to the greater time, distance walked to collect water, health, menstruation and psychic costs associated with pooraccess to clean water. All these costs induced by the interaction of the poor wateraccess and menarche are likely to make girls drop school early.

However, while economistsare beginning to consider the role of the menstrual cycle in economic outcomes (e.g., Ichinoand Moretti, 2009, link the cycle to women's absenteeism), only (Field and Arbus, 2008) and(Oster and Thornton, 2009) have so far considered the link with education, but withoutconsidering the all-important interaction with access to water. In this study, poor access towater is defined as having no access to tap water, since water from other sources

(e.glakes,wells) are found to be contaminated and is a source of infectious and parasite disease in ruralChina (Wu, 1999).

2.16Importance of Access to Potable Water on Girls Education.

A 2002 UNICEF study of rural household in 23 sub-Saharan African countries found that a quarter of them spent 30 minutes to an hour each day collecting and carrying water, and 19 % spent an hour or more. With closer water comes greater self-esteem, less harassment of women and better school attendance by girls – three things spontaneously mentioned by people in Ethiopia, Ghana, Tanzania and India in a different study.

Access to potable water, to the girl child would be a blessing because less time will be spent and short distances walked to search for water. Both time and distance gained will be pent on schooling.The review above indicates that lots of productive working days are gained when potable water is accessible to reduce the incidence of water borne diseases. These enormous days can in schooling by girls for both human and national development.

The task of water search will reduce with better access to potable water by girls making them able to have ample time to go to school. It is therefore important to provide people with potable water in order to prevent the incidence of water borne diseases, thereby ending up spending more money to treat diseased victims.Access to potable will reduce both distance walked and time spent to collect water and so improve on school attendance and possible academic performance of the girl child. This is supported by the review below;Cairncross et al. (1998) found that a school sanitation programme in Bangladesh increased girls' enrolment by 11 per cent. Many

more girls are likely to keep going to school in developing countries when sanitary facilities are available as in Bangladesh as stated in the above review.

Recent estimates attribute 1.5 million child deaths each year to unclean water, inadequate hygiene, and a lack of adequate sanitation (UNICEF, 2010). The provision and accessibility of potable water will drastically reduce infections due to the consumption of unclean water and reduce infant mortality. This is backed by literature the following literature;

Lack of clean water and adequate sanitation is the leading contributor to diarrheal diseases in children (Gamper-Rabindran et al. 2007), which account for 19 percent of total child deaths (Boschi-Pinto et al. 2008). Improving access to piped water and sanitation has been shown to significantly reduce infant mortality rates (Gamper-Rabindran et al. 2007, DaVanzo 1988).

The provision and accessibility of potable water will help improve upon the health of the girl child reduce infant mortality so that children can be in school.Increasing female education is an important policy priority in many developing countries. Girlslag behind boys in schooling attainment, and female schooling is thought to be important for avarietyof developmental outcomes (Behrman and Rosenzweig 2002; Behrman and Wolfe 1989; Wolfe and Behrman 1987; Glewwe 1999).

Improving access to potable water will drastically have a positive impact on girls schooling.Water influences greatly all aspects of life. Water plays a crucial role in the implementation of right to education. Lack of proper supply of water forces children to walk long distances, often several times a day – thus missing school- to provide their families with

water (UNDP1996).Regular supply of clean drinking water can help reduce the frequency of water search by school going children so that they can be able to go to school early.

Globally, diseases associated with poor water and sanitation has considerable public health significance. In 2003, it was estimated that 54 million disability-adjusted life -years (DALY) or 4% of the global DALYs and 1.73 million deaths per year were attributable to unsafe water supply and sanitation, including lack of hygiene Prüss-Üstün et al (2004). During the 1980s and 1990s there was considerable investment in the provision of water supply and sanitation in developing countries. In 2004, however, still a significant proportion of the world's population remained without access to safe drinking water and improved sanitation JMP (2005).

Knowledge of the health benefits of water supply and sanitation improvements is important not only for a cost-effectiveness analysis, but also for a cost-benefit analysis as some important economic benefits depend on estimates of health effects. Over recent decades, compelling evidence has been gathered that demonstrates significant and beneficial health impacts associated with improving population access to and use of improved water supply sources andimproved sanitation facilities(Cairncross S and Vaimanis ,V2006);(Esrey and Hughes ,1985); (Fewtrell et al, 2005).

According to UNICEF (2002), girls formed the majority of the 120 million children who never go to school in the developing world. To improve upon girl's education impediments that create a gap in schooling between them and boys, such water collection needs to be improved. Potable water accessibility needs to be improved to put such girls into the classroom.This is because access to both education and water are human rights and not privileges.Potable water

accessibility will help to reduce both time and distance covered to collect water and so more time for school attendance.

Food and agriculture are by far the largest consumers of water. They require one thousand timesmore than we use to drink and one hundred times more than we use to meet basic personal needs,with up to 70 percent of the water we take from rivers and groundwater going into irrigation.

Global food production has kept pace with population growth in recent decades; yet nearly 800million people remain undernourished, and the population shift from rural to urban environmentswill certainly increase the pressure and problems associated with food security.

All forms of life needs food for survival again the role of water in food production and preparation can not be left out in human life.

2.17 Conceptual Framework

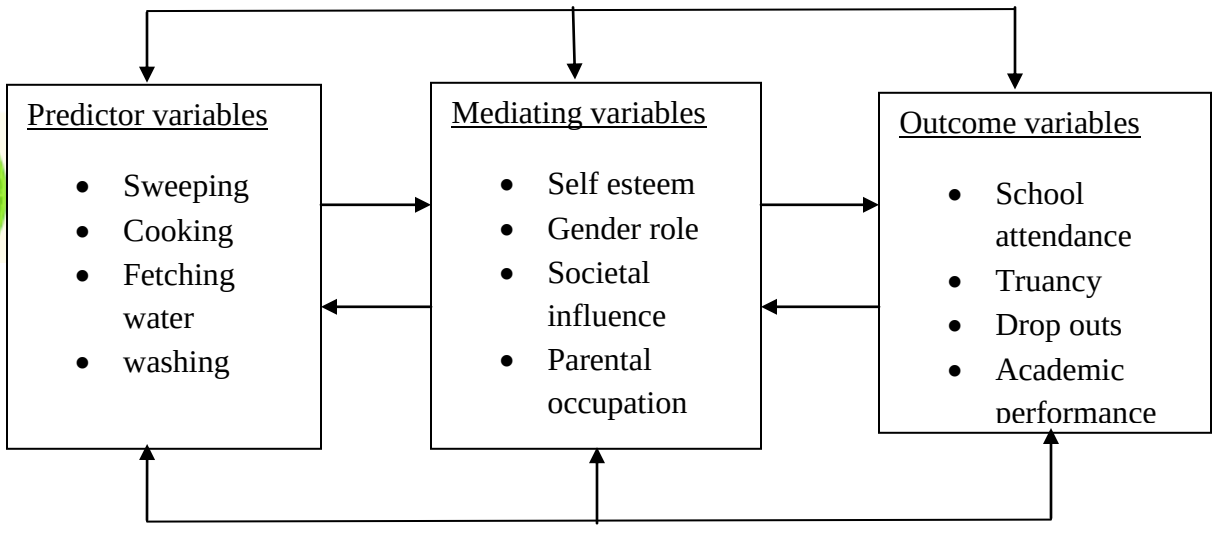
A conceptual framework explains, either graphically or in a narrative form, the main things to be studied, including the key factors and the presumed relationships among them (Miles and Huberman, 1994).

Performance of girls being low or high involves multiple variable factors each exerting an influence in different ways. Therefore the present study employed the interaction system of analysis to explain how girls' participation in the collection of water at home influenced their school attendance and academic achievement. For instance, (Sule, 2002) who conducted a study on the relationship between socio-cultural dynamics and academic achievements of secondary

school students in the Plateau State of Nigeria observed that both favourable and un-favourable nature of socio-cultural dynamics of gender, family size, family location, family structure and socio-economic status, did not meaningfully determine the directions of academic achievement levels. The interaction of the socio-cultural dynamics had an insignificant effect on the academic achievement levels of the students.

However, the schools as socialization institutions could have levelled off the assumed socio-cultural differences between the majority of the students and so insignificant differences emerged in the academic achievements of the students in respect of the other factors that were considered. In this regard, the school was perceived in the study to be the most important predictor of school achievement.This study drew some insights from Bloom (1982) and Omari (1995), who focus on three dimensions, namely the predictor variables, mediating variables and outcome variables to illustrate the conceptual framework.

Figure 2.1 Conceptual Framework of the Study



Source:Bloom (1982) and Omari (1995).

Predictor variable is a variable whose values are usedto predict the values of the outcome variable. Outcome variable is the one whose values are to be modelled and predicted by the other variables. Mediating variable is the variable that facilitates or interacts with predictor variable to influence the outcome variable.

Figure 2.1 summarizes the three categories of variables that guide the framework of this study. The predicting variables include types of household chores that girls in the study area perform before going to school in the morning.The girlmediating variables include self-esteem, parents'occupation, gender role and societal influence. The outcome variables include school attendance, participation in the teaching and learning process and academic performance.

It will assume that, although the mediating variables may influence the impact of predicting variables on girls' participation in teaching-learning activities and/or academic performance, lack of their precision will not assist the researcher directly. The predictor variables will be assumed to be more stable and thus will use as factors that contribute to school attendance, participation in the teaching and learning process and academic performance of girls in the secondary schools

2.18Conclusion

The significant role that the presence of potable water plays in girls schooling has been clear from the above review. Potable water inaccessibility at home and school exerts a water search pressure on girls.

Long distances are walked sometimes in the early hours of the morning, at the expense having enough rest to go to school. Such distances vary within Sub – Saharan Africa as well as in Asia. Enormous time is spent during water search as evident from the review. Persistent walking to and from the source of water, spending of lots of time both result in the immense lost of energy by girls such that they prefer to stay at home rather than go to school. If they do go to school, they are inattentive.

The health status of these otherwise water fetching girls is at stake. Physical weakness as a result carrying water and the contraction of water related diseases such as typhoid cholera, diarrhoea, guinea worm disease and a lot more, will render them medically unfit, and so unable to school.

The component of menarche has also reviewed because water and sanitation can not discussed separately. At menarche, most girls stay away from school mostly because they feel naturally unclean and neither has clean water nor an appropriate place to clean and change sanitary pads. A psychic component of the effect of the onset of menarche becomes worrying to girls and tends to prompt them to stay away from school.

Access to clean water can minimize the amount of time children spend collecting water and allow more time for education. At the same time, availability of sanitation facilities at schools can help with school completion rates among girls (WA, 2000).The important role that water plays in girls' education has been stressed below Mr. Kofi Annan Secretary General of the United Nations in New York, 28 April 2004;

"Water is intimately linked with education and gender equality. Girls who have to spend time gathering water for the family tend not to be in school. And where schools have sanitation,

attendance is higher, especially for girls. Water is connected to health, since millions ofchildren get sick and die every year from water-borne diseases and for lack of basic sanitation and hygiene."

CHAPTER THREE

STUDY AREA AND RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents the profile of Wa Municipality where the study was conducted. It highlighted the physical attributes, local economy, and social characteristics of the area. The methodology employed in conducting the research was also spelt out. Research can not be carried out without using the right methods and techniques (Osuala, 2007: Yin, 1994: Bacho, 2001). According to Potter(1996), methodologies are perspectives on research that set out a vision for what research is and how it should be conducted.

3.2 Location and Size

Wa is the capital of the Upper West Region, it lies within latitude 1^{o} 40''and 2^{o} 45'' north and longitude 9^{o} 32'' and 10^{o} 20'' West. To the East of the Municipality lies the Wa East District, to the West is Wa West District, to the North is Nadowli District and to the South is Tuna – Sawla – Kalba District. It has a landmass area of about 23,474 square kilometers, which is about 6.4% of the region. Wa Municipality is bordered to the north by the Nadowli District, to the east by Wa East District, to the West by Wa West District and to the South by both Wa East and West Districts. It has a landmass area of approximately 23,474 square kilometers, which is about 6.4% of the total national land area.

Fig 3.1 Map of the study area

Source: Adopted and modified from Wa Municipal Assembly May 2016

3.3 Selection of study area

The study area is the Wa Municipality in the Upper West Region in the Republic of Ghana. The researcher chose this area for study by taking into consideration the topic and the set ofobjectives to be attained. The study area was selected due to the persistent erratic water shortages, unending haulage of water by girls of school going age, late arrival to school by most girls, lack of attention in class, poor academic performance by girls and a host more. Most girls attribute both their poor attendance to school andacademic performance to the execution of house hold chores of which water search is prominent before going to school in the morning.On the average, the literacy rate of the study area is 15.8% compared to a national average of 39.8% (MEO, 2010).This prompted the researcher to conduct the research in the study area to ascertain the realities of the situation.

More importantly, females are lagging in education perhaps due to socio – cultural beliefs and biological reasons, since females drop out of school is mostly due to premature pregnancy. While 7 out of 10 males can be said to be literates, only 4 out of 10 females are literates (GSS, 2010).

3.4 Demographic Characteristics

3.4.1 Demography

According to the 2000 Population and Housing Census (PHC), the Wa Municipality has a total population of 98,675 in the year 2002. Wa town alone has a population size of 66,441 with an annual growth rate of 3.4 per cent. Using the current growth rate, the projected population for the Municipality in 2010 is 137,848 with Wa town recording about 92,818. By implication, there is a

high density of population in Wa and consequently pressure on land and socio-economic infrastructure. This raises the issue of population management, specifically, Housing. Solid waste management and land-use planning are issues to be addressed.

3.4.2 The Population of Wa Municipal

Wa Municipal has a population of 107,214 inhabitants (2000, PHS).The high population concentration is as a result of a growth rate of 3.4 per cent. Natural factors and net migration have also accounted for the population increase. The rapidpopulation growth poses the challenge of matching economic development with theneeds of the population. This raises the issue of achieving the right investment mix,provision of basic infrastructure and services and promoting investment indirectly,productive and income -generating activities. The rapid population growth also has animplication for solid waste management now and in the future.

3.4.3 Age and Sex Structure

Available statistics indicate that, the youth (1 – 14) years constitutes 47% of the total population of Wa, is more than the aged (65 and above) which constitute 4.4%. Those in the economically active bracket (15 – 64) make up 48.6% of the population (population and housing census, 2010). The youthful population dominance is probably due to early marriages, polygamy and low adoption of birth control programmes as well as cultural premium being placed on children as social security during old age. It is, however, worth noting that the labour force being less than the combined population of the under 14 and above 65 (age dependency groups), indicates that there is over dependency which has a serious effect on savings and investment.

3.4.4 Ethnicity and Religion

A lager proportion of the inhabitants within the Municipality are from the Mole Dagbani lineage. They practice the patrilineal system of inheritance. According to history, the Waalas who are the indigenes migrated from various places such as Northern Nigeria and Mali and settled in their present location.

Traditional Religion, Christianity and Islam are the three main religions practiced in the Municipality. Christianity accounts for 24.7% , Islam 44.4% ,Traditional worship 27.1% and other forms of religious practice 0.1% and those who practice no religion at all 2.8% (2000 PHC). The practice of Christianity is spread in the Municipality with different denominations such as Catholic 69.3%, Protestant, Pentecostal/Charismatic and other Christian groups' forming 30.7%. Islam comprises the following sects; Ahmadiyya, ahlsunnawaljamat and Orthdox. The

Orthodox dominates the other sects both within and outside the Municipality.

3.5 Education

3.5.1 Pre- independence education in Wa

Like many parts of Africa, before the advent of formal education, traditional education wasin progress. No formal classrooms or curricular existed. Children only learnt the business of living from parents and elders. It was a means of children identifying themselves as members of their society by knowing the customs and values of the society and learning a skill which will make them have a living in the society and as useful citizens.

Besides traditional education, Arabic education was also taught. A majority of the settlers in Wa before the inception of formal education were Muslims who were very knowledgeable in Islamic literature. Imbibing Islamic norms and values and learning The Holy Quran became an important part of the indigenes. Lessons were taught in Arabic schools (Madrasats) by Arabic teachers called(Mualims). Many Arabic graduates were turned out into the community, who also established their own Madrasats, thus further expanding Islamic education.Though formal education did not start until1529 as castle schools in Ghana, it was not until the early part of the 1930's, range of 400years that formal education got to the soils of Wa.

The first school was Experimental Primary built in 1935 and was locally known as junior school. It was only from primary one to six and was called standard six. Pioneers include; Mr. MumuniHamidu alias Degunaa, Mr. SeiduBomson and Mr. SeiduKponguu all are late. These pioneers and others who came after them continued their middle school education in Tamale. History has it that graduates from standard six in Wa Travelled to Tamale on foot to enable them have access to middle school education. The first Headmaster was Mr. Haruna who was succeeded by Mr. D.T. Mahama from Tamale. Mr. Mahama was very fond of the local people because he was also a herbalist who treated mostly children. Junior school became popular under the headship of Mr. T. D. Mahama, who was buried in Wa after his demise in the early parts of the 1960's.

It was not until the 1950's that the second school was built in Wa. It was called Middle Boarding or senior school by the local which is currently Wa Senior High School. The burden of walking from Wa to Tamale for Middle School Education was curtailed. The Junior School produced graduates to feed the Middle boarding. In 1954, Jujeidayiri T. I Primary was built while

theMiddle school also put in place 10 years later (1964). Tendamba Primary was the next school to be built. All school mentioned above are still in use. Ironically, from above it has been obvious that from the on set, female education has not been a priority in the study area. This probably explains why the literacy rate of 15.8% as against a national average of 39.8%

3.5.2Reception of circular education by the Waalas

Circular education was received with mixed feelings by the people of Wa. Being engraved in Islamic values and norms, issues that concern the then average Waala man were compared with Islamic norms. Circular education was perceived as un-Islamic welcome with a lot of pessimism for the following reasons;

1.All the instructors were Christians and so, there was the likelihood that pupils would be brainwashed and converted into the white man's religion.

2. Most of the instructors were also seen taking alcohol which was against Islamic teachings and a potential treat to children.

3. Extra curricular activities like playing football was seen as a very serious crime a Muslim could commit. This is because the football was envisaged as the head of John the Baptist (ProphetYahaya) that was cut off by king Herod of Israel and given to a damsel (girl). So it was deemed to behighly against the principles and practices of Islam to kick the head of the Prophet of God.

4. Education was seen to be more European than African. Formal education was also seen as a monster because; bulling was at its peak, food was scanty, lots of work was being done by the children while in school so parents got scared enrolling their children into formal education.

Formal education was preserve of the children of women who were not loved by their husbands, orphans and people of the social class (slaves) who were sent to school by force as well the Dagaabas, people of the royal household and the traditionalists who were either Christians or traditionalists. Girls were not allowed to go to school for the reason that they will be exposed to men in their early ages but most importantly the gender role of girls in the society tied them to the kitchen and other house hold chores.As time went the Waalas came to embrace formal education after getting into contact with elites in different areas of national circles, they were already used to book and reading. Also education through radio also accelerated the acceptance of formal education, however, due to the late introduction of formal education to Northern Ghana and Wa in particular, there has been a relatively lower literacy rate of 15.8% compared with the

Nationalaverage of 39.8%.

Majority of the adults do not have higher education due to late introduction of higher education in Northern Ghana in general. On the whole, the low literacy rate is attributed to high poverty, ignorance and retrogressive cultural practices. Gender wise females are lagging in education, perhaps due to socio – cultural beliefs and biological reasons, since females drop out of school is mostly due to teenage pregnancy. While 7 out of 10 males can be said to be literates, only 4 out of every 10 females are literates (MEO 2010). This unfortunate situation has negative impact on effective information dissemination, particularly government policies and programmes and acquisition of knowledge through both print and electronic media.

However, the people of Wa have come to realize the importance of education to both human and national development. This is evident by the fact that all Arabic schools have now been converted to English and Arabic schools. Wais now one of the educational centers in Ghana with lots of educational infrastructure in the Township. These include the Wa Polytechnic and the University for Development Studies with varied faculties. About 80 %- 85% of the population has access to basic education. Recent statistics indicate that,there were six (6) Crèches , 81 Early Childhood Development Centre ,84 Primary Schools,54 Junior High School, 7 Senior High Schools, 2 Vocational/ Technical Schools, 1 Teacher Training College, workers college, adult education School for the Death and School for the Blind. Wa town has become an educational centre with all levels and kinds of educational provisions with soaring enrolment figures.

3.6 Water and Sanitation

Drinking water is considered potable if it is obtained from a treated pipe borne, deep well or a borehole either mechanized or manual. On the basis of this, greater portion of water sources within the Township can be said to be potable. However, due to urbanization the Township is growing resulting into drastic population increase. Accessing potable water has become a daunting task for women and girls. Water is supplied by the Ghana Water Company Limited, Non-governmental Organizations (NGO), Civil Society Organizations (CSO) such as Community Water and Sanitation Agency, Adventists Development Relief Agency (ADRA) and the Ghana Red Cross Society.

Water is so scares that women and children spend lots of time in looking for and collecting water for domestic use. Collection and storing of water occurs in both dry and rainy season. Bothpublic and private stand pipes are often crowded with women and girls being in queues to take their

turns to fetch water. Water services to the population are not regular and the number of public outlets is also very insufficient adding the ordeal of water search. Traditionally, girls collect water and not boys. The collection of water by girls to a large degree negatively impact on their school attendance. Insufficient sleep, weariness, lost of energy all affects girls when they look for and collect water. Water is collected using buckets and aluminum head pans and stored in plastic or metal barrels.

Sanitation is an important component of the health of a people. Consequently, their productivity and welfare are seriously affected by the state of sanitation in their environment. The sanitation situation in Wa Township needs much to be desired. Less than 5% of the total population is served with solid waste collection system and 2% are served with an acceptable house hold toilet facilities. About 95% of the population have no toilet facilities at home and so depend on public places of convenience. Of this 95%, only 60% actually make use of public toilets, while the remaining 35% resort to defecating in the bush. This renders the removal and deposition of solid waste extremely difficult. These wastes are thus wrongfully disposed of which poses a serious health hazard to the inhabitants of the Municipality (GWCL, 2012)

3.7Research Methodology

The techniques and the procedures employed to carry out the research was presented in this chapter. The chapter outlined the research approach adopted for the study, how the sampling frame and sample sizes were determined, tool(s) that were used for data gathering, and analysis as well as data requirements and sources. This section describes how field data was made suitable for presentation and analysis and the tools that were used for data presentation and analysis.

3.7.1 Research Design

The research design is like a skeletal frame work on which the research is built around, spelling out the procedures and strategies to follow in order to realise the objectives of the study. Research design forms part of the architecture of ever study and explains how the study is going to be constructed (Kumar, 2011). Similarly, according to Hassan (1995), research design is an omnibus plan of study which includes an outline of what an investigator will do from writing the hypothesis or research objectives and questions to the final analysis of data. Research design is therefore an orderly set of steps the researcher needs to follow in order to provide answers to his/her research questions or hypothesis.

The research design can be quantitative or qualitative or even both which is referred to as the mixed method by (Johnson et al, 2007:123). Both elements of quality and quantity are used in this kind of research. The study used the mixed method (Tashakkori&Taddlie, 2003), which is a procedure for collecting, analyzing and ‘’mixing’’ both qualitative and quantitative data at some stage of the research process within a single study to understand a research problem more completely (Creswell, 2002). According to Green et al (2003), qualitative and quantitative methods when combined and used, complement each other and allow for more complete analysis.

In quantitative data the researcher relies on numerical data (Chalse&Mertler, 2002). He or she then uses positive claims for developing knowledge such as cause and effects of thinking, reduction to specific variables, hypothesis and questions, measurements and observations and test theories.

Qualitative research is “an enquiry process of understanding” where the researcher develops a “complex holistic picture, analyses words, reports detailed views of informants and conducts the study in a natural setting” (Creswell, 2005). In this study, one of the popular mixed designs in educational research: sequential explanatory mixed design (Creswell, 2002) was employed.Quantitatively, numerical data was collected using questionnaires. Qualitative data was also interpreted using text data collected through individual interviews, FGD and review of documents.

3.7.2 Study population

The study population of this study consisted of JHS girls in the Wa Municipality and officers of the Ghana Water Company Limited (GWCL) in Wa.

3.7.3Sampling Population

Simple random technique was used to select schools and student girls in various schools for responding to questionnaires and also to form FGD s. According to (Twumasi, 2001) the advantage of simple random sampling is that, all the elements within the sample frame stand the same opportunity of being selected.He added that 30% of the target population gives a fair representation upon which findings can be generalized.

Based on this finding, a target sample of 30% was used by the researcher to select the sample frame because the study population was homogeneous with respect to the key characteristics which are relevant to the study. Out of 52 HJS in the Municipality, 24 of them, representing 46% of the target population were selected using simple random technique. To have a representation

of all the circuits, the names of all schools in each circuit were written on pieces of papers and roll into balls. The balls were then put into containers bearing the name of the circuit and 260 girls from 24 JHSs were selected for the FGDs. The focus is on girls because girls are solely into water collection in the study area.

Cluster sampling was also used due to its uniqueness in usage for sampling populations that are spread over a large area. Cluster sampling is usually employed when the area under study is covered by a large population and so divided into small units called primary units which are then sampled for the study. The study population is large with many schools put into clusters called circuits. There are eight circuits in the study area. The smallest circuit has five schools while the biggest has twelve schools.

Under non – probability, purposive sampling was employed and only workers of Ghana Water Company Limited were interviewed and some given questionnaire to respond to besides only student girls were allowed to respond to questionnaire since they constitute the focus of this research.This method is usually employed when researchers purposely choose subjects they think can provide the necessary information on the issues under consideration. As the name implies the method was chosen because it was intended for the purpose of providing specific information that is pertinent to the research.

3.7.4 Methodsof Data Collection

Simple random technique was used to select schools and individual girls in these schools for FGDs.The advantage of simple random technique according to (Twumasi, 2001) is that,all elements within the sample frame stand the same opportunity of being selected. He added that

30% of the target population gives a fair representation upon which findings can be generalized. Based on this finding, a target sample of30%was consideredby the researcher. Out of the 52 JHS inthe municipality, 20of them constituting 38% of target population were sampled using simple random technique.

In the selection of the 20 JHS using simple random technique, the names of all JHSin the municipality were written on separate pieces of paper and rolled into balls. These were put into a bowl and the 20 JHS were selected. The same method was used to select 260girls from the 20 JHS who responded to questionnaire. Some of the 260 girls were at the same time put into focus groups. The focus was on the girls because girls are mostly involved in household activities which are likely to have a negative effect on their education. The researcher purposively selectedfive officers of the (GWCL). These people were selected based on their knowledge on the subject matter.

The 20 randomly selected JHS, their circuits; the number of girls and their sample size are recorded on table 3.1 below:

Table 3.1 Sampled schools and their population sizes

Circuits	Selected JHS	Number of girls	Sample size
Busa	Busa	26	8
	Biihee	34	10
Konta	Tender Care	80	12

	T.I Ahmadiyya	60	12
Sawaba	Falahia	60	12
	Limanyiri	65	12
Kperisi	Kperisi	32	10
	Sagu	24	10
Tendamba	Tendamba	59	12
	Methodist	65	12
Jonga	Jujeidayiri	45	10
	Our Home	72	12
Kambali	Kambali	66	12
	St.Francis	26	10
Dobile	Catholic	56	12
	Anglican	56	12
Kabanye	Kabanye	78	12
	Methodist	65	12

Charia	Charia Presbytarian	27 74	8 12
Bamahu	Bamahu Kpongu	32 17	10 8
Mangu	Mangu Shakafatu	46 45	10 10
TOTAL		1,210	260

Source: Field Survey, May 2015

3.7.5Types of data

Data was collected from both primary and secondary sources so as to facilitate an in-depth understanding of the nature and dynamics of sanitation situation in schools. Primary data was obtained from the field through the use of field visits, observations, questionnaire, interviewsand focus group discussions. Secondary data is information which has been collected by organizations, researchers and other institutions. It is data that is readily available in various institutions.

The sources of secondary data include; journals, related research works, newspapers, books and many others. This kind of data is used with caution as indicated by (Yin, 1994; Bacho, 2001) that secondary data are used with caution by acknowledging the proper and well known sources, since not all sources of the information sourced are reliable.The study further made use of content analysis as well taking into consideration the quantitative and qualitative methods of data collection tools.

3.7.6 Sources of Data

Two types of data were used in this work namely, primary and secondary data. The primary data was collected from sampled basic schools. Secondary data were sourced from the Ghana Water Company Limited, Municipal Education Office and sampled basic schools,intensive reviewing of relevant literature from books, journals, magazines and newspapers

3.7.7Tools and Techniques of Data Collection

Primary data was collected using guided interviews, focus group discussions (FGDs) and direct observation.

Interview guide was used to collect information from a worker of (GWCL) on the history of potable water distribution before and after independence in the study area.Interview guide was also used to elicit information from five other workers of the (GWCL) who have worked in

their various schedules for several years. Fivefocus group discussions (FGD) were held in five different schools with girls between 12 to 15years to find out how the collections of water affect their school attendance and performance. Through this, children were given the opportunity to share ideas with their colleagues on issues about whether water collection affectseducation and in what ways.

A sixth (FGD) was held in a different school but this time with boy of the age rage as the girls but from southern origin. This is to find out the role of the average southern boy with regard to water collection. During the process of data collection,students' report cards, exercise books and class attendance register were directly looked through to be abreast with both degree of lateness; absenteeism by girls from school and academic output.

The secondary data were collected using questionnaires administered to workers of the (GWCL)and the Municipal Education Office (MEO). This is to further supplement the data that is gathered during the fieldwork .These data were used to facilitate an in – depth understanding of the nature and dynamics between potable water and girls education in the study.

3.8Data Analysis

Both qualitative and quantitative data were analysed. Chi – Square test was used to analyse all data with figures.Analyses are elaborated by the use of a combination of pie and bar chart to present data in a simplistic form easy for understanding.

CHAPTER FOUR

DATA PRESENTATION AND ANALYSIS

4.1 Introduction

This chapter has been focused on the presentation, findings and the analysis of data collected during the research. The findings are put into sub-headings such as demographic characteristics, some quantitative analysis of the research on challenges in accessing potable water; Effects of water fetching time on school going; Effects on potable water accessibility on girl-child

education and improving on potable water provision.The findings from the questionnaire began first followed by evidence from literature review and similar studies on the subject matter are used to support the findings.

4.2The Study Sample

Simple random sampling was employed in the study. A total of 265 respondentsin the Wa Municipality were sampled, consisting of 260 girls from various Junior High Schools and 5 members of staff of Ghana Water Company in the Municipality, as presented in table 4.1 below.

Table 4.1 Demographic characteristics of respondents

Institution	Frequency	Percentage
Student (Girls) from JHSs	260	98.0
Staff of Ghana Water Company	005	2.0
Total	265	100

Source: Field Survey, May, 2016

Table 4.1 above revealed that 260 student girls which constitute 98.4% of the population and 5 members of staff of Ghana Water Company constituting 1.6% were chosen for the study.

4.3 Age Distribution of Respondents

Respondents were of two categories. This was informed by the kind of data needed for the research and the method of data collection. The details are in table 4.2 below;

Table 4.2 Ages of Respondents

Category of respondents	**Age group of respondents**	**Number of respondents**	**Percentage**
JHS girls	12- 16	260	98.0
Officers (GWCL)	30 – 55	5	2.0
Total		265	100

Source: Field Survey, May, 2016

To achieve the objective of the research, it is important to first find out the kind of household chores girls do before going to school in the morning. Three main responses came up as in table 4.3 below.

Table 4.3: Household chores students do before going to school

Response	Observed Frequency (O)	Expected Frequency (E)	(O – E)^2	$\frac{(O-E)^2}{E}$	$X^2 = \sum(\frac{(O-E)^2}{E}$	%
Cooking	24	86.6	3918.8	45.3		9
Sweeping	75	86.6	134.6	1.6	110.800	29
Fetching water	161	86.6	5535.4	63.9		62
Total	260	260				100

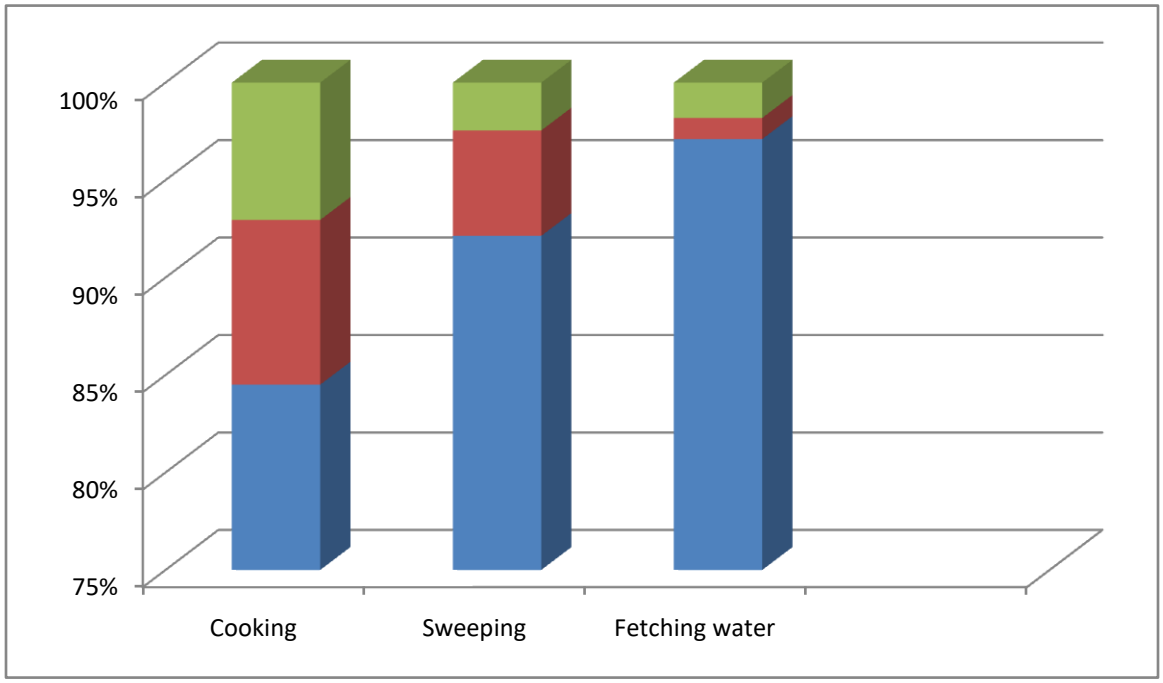
Source; Field Survey, May, 2016

Chi-square = 110.800 df = 2, p<0.05,

On house hold chores girls do before going to school, Table 4.2 shows that a larger proportion of girls 62% of them go water fetching, 29% sweep while 9% cook before going to school in the morning.The chi-square results revealed significance(X^2 = 110.800, df = 2, p< 0.05).

These activities could result in lateness to school, missing lessons, absenteeism and poor academic performance.

Fig 4.1; **Household chores students do before going to school**



Source; Author's Construct, May, 2016

The bar chart above, in fig 4.1 gives a vivid account and presentation of some of the chores most girls in the study area do in the morning before going to school. The most prominent of such are; cooking, sweeping and collecting of water. The collection of water is the most frequent event. These events are indicated by the lower shaded portion in fig 4.1.To seek the views of respondents of other origin either than the north, a FGD made up of student girls of southern origin was set up at St Pauls Methodist JHS. The leader, reported on behalf of the group as below;

We the students of the southern origin are surprised at identifying girls with certain house – hold duties like; washing of utensils, cleaning of the compound and rooms as well as looking for and fetching of water. In the southern origin both boys and girls execute these duties. This results in early school attendance. We are always therefore on time at the start of lessons; do not sleep in class like most of our colleagues from the north. [Source: Leader St Pauls Methodist JHS, May, 2016]

4.4Accessibility of Potable Water on Girl-child Education

Specifically, the research is purported to find out how potable water accessibility would affect both school attendance and performance of girls in the study area.

Analysis in the area of accessibility of potable water was done in terms of sources of potable water; distance covered to fetch water and its effect on academic performance; waiting time at water source; effect of water fetching time on school attendance and house-hold chores students do before going to school.

Table 4.4: Access to potable water and water sources

Response	**Observed Frequency (O)**	**Expected Frequency (E)**	**$(O-E)^2$**	$\frac{(O-E)^2}{E}$	$X^2 = \sum(\frac{(O-E)^2}{E}$	**%**
Well	**80**	**65**	**225**	**3.5**		**31**

Tap	**50**	**65**	**225**	**3.5**	**26.200**	**19**
Bore-hole	**90**	**65**	**625**	**9.6**		**35**
Dam	**40**	**65**	**625**	**9.6**		**15**
Total	**260**	**260**				**100**

Source: Field Survey, May 2016

Chi-square = 26.200, df= 3p< 0.05 significant

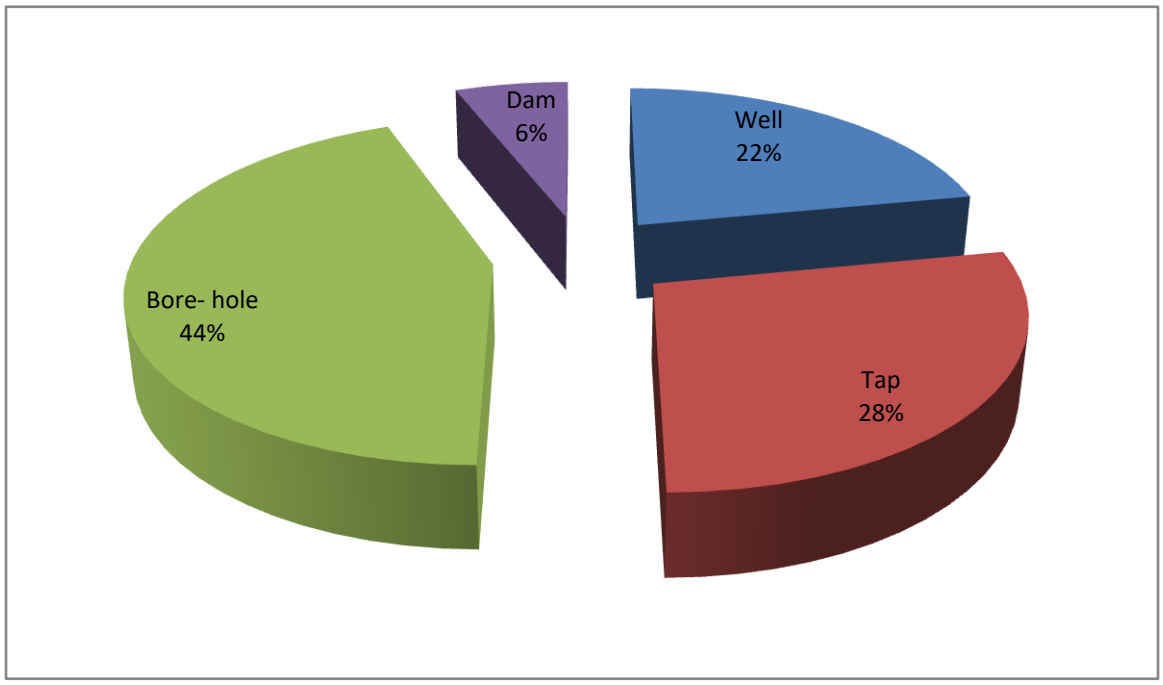
Table 4.4 above indicates that, the sources of potable water in the Municipality were significant.

(X^2 = 26.200,df = 3, p< 0.05, significant). Not all households had access to potables water. From the table above, it could be explained that, though the Government provides potable waterthrough the Ghana Water Company to towns and cities, the potable water situation in the Wa Municipal is woefully inadequate. A greater portion of 81% of respondents access water from well, bore-hole and dam whiles only 19% had potable water from tap.

This goes to confirm lack of adequate potable water in towns and cities as stated by UNESCO (2006) in literature review. It is also evident that a much larger population has no access to pipe borne water. From data above, which was collected from the field and only 19% of the population in the study area has access to tap water. This figure is a bit lower than (WHO1975) value of 22% of rural population in developing countries having access to potable water as in literature review.Findings from the field revealed that students (girls) get their sources of water

for domestic use from wells, taps, bore-holes and dams as tabulated in table 4.3 above. For simplicity, information on sources of water is presented in figure 4.2 below;

Fig 4.2 Access to Potable Water and Water Sources



Source; Authors' Construct, May, 2016

From figure 4.2 above, it is obvious that many more respondents exploit water from wells, dams and bore- holes combined which accounts for 72% of water sources while only 28% get water from taps. This goes to buttress the lack and inaccessibility of tap water and therefore the urgent need to look for and collect water in the morning.

In a FGD at Behee JHS, one of the discussants had this to say on sources of water in her village:

Sir, in our community, there is no pipe borne water though we are close to Wa. The cleanest source of water is from an old bore- hole, which is located about 1km away from the houses. Earlier on, we use to collect water from a pond. Most people in my village prefer the pond waterbecause it tastes nicer than the bore-hole water so we still collect water from it. We compete with cattle, goats and sheep for water in the dam. Water fetchers have to get to the pond before the animals toget clean water. Sometimes girls come home with dirty water .most girls in the village suffer from Guinea worm diseases and can stay away from school for almost a month.[Source: Beehee JHS, May, 2016]

Findings from the field revealed that, the distance walked daily to look for and collect water was significant. Information on the effects of walking to collect water was sought and shown quantitativelyin table 4.5 below;

Table 4.5: Effect of Walking Distance to Water Source on Academic Performance

Response	**Observed Frequency (O)**	**Expected Frequency (E)**	**(O – E)^2**	$\frac{(O-E)^2}{E}$	**X^2 =** $\sum(\frac{(O-E)^2}{E}$	**%**

Sleep in class	**30**	**65**	**1225**	**18.8**		**12**
Less time to study	**15**	**65**	**2500**	**0.5**	**75.800**	**6**
Poor performance	**113**	**65**	**2304**	**35.4**		**43**
Missing lessons	**102**	**65**	**1369**	**21.1**		**39**
Total	**260**	**260**				**100**

Source; Field Survey, May, 2016

Chi-square; X^2 =75.800, df = 3, $p < 0.05$

The chi-square analysis indicating the distances covered for potable water in Wa Municipal is significant; less than 1km; $X^2 = 25.943$, df = 1, $p < 0.05$, 1km: $X^2 = 73.636$, df = 1, $p < 0.05$, and more than lkm; $X^2 = 21.686$, df = 1, $p < 0.05$.

It is clear from the chi-square results that 43% of school going girls walk 1km every day for water before going to school which is significant. This could be due to the Government's inability to provide the Municipality with adequate potable water. It could also be the inability of inhabitants to bear cost of drilling bore-holes among others. It was agreed by most girls that walking long distances to collect water makes them tired, go to school late and that sometimes they miss school all together. School attendance is poor and so is academic work. This

phenomenon is buttressed by; Akabayashi and Psachapopoulos (1999) and UNICEF (2008), in literature review.

Finding from the field revealed that, the distance walked every day to fetch water has an adverse effect on the academic performance of students ranging from sleeping during lessons to missing lessons as shown in table 4.4. The chi-square analysis indicating the various effects of the walking distance on students' academic performance is significant; X^2 =75.800, df = 3, p< 0.05

It is clear from the chi-square results that students considered missing of lessons due to walking distance for water as more significant, followed by poor performance, less time to study and sleeping in class less significant.

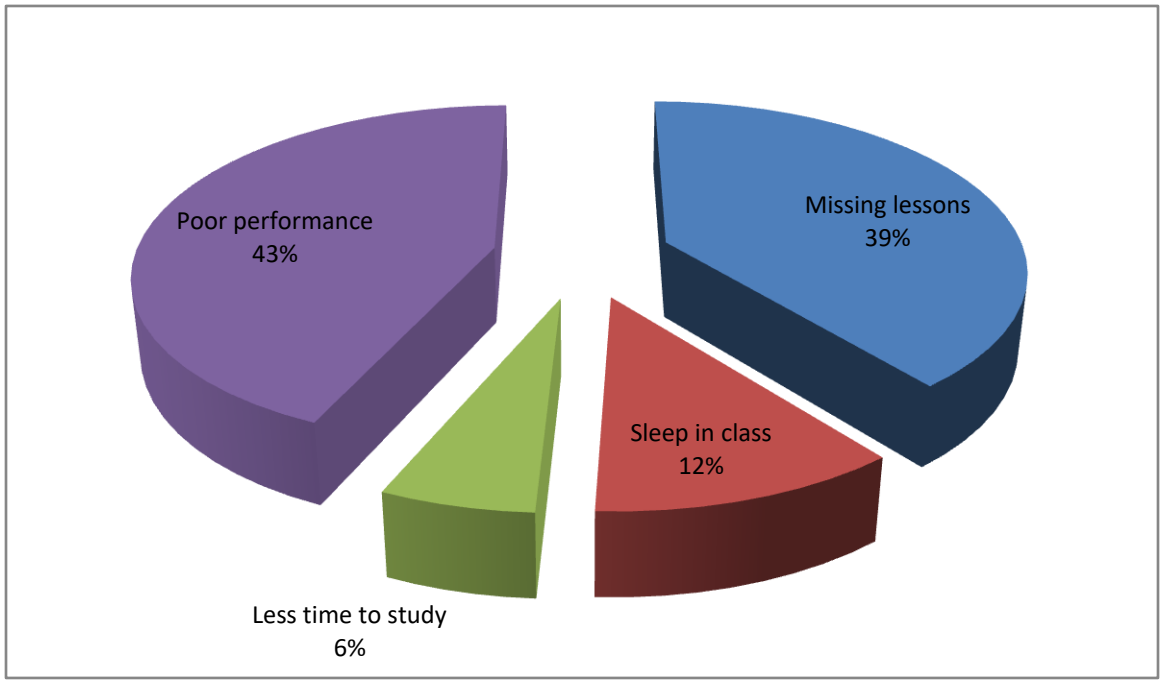
This could also be explained as a result of the long distance girls have to walk to and from the source of water coupled with the long queues they meet at the source. Ultimately, they go to school very late missing lessons which lead to poor academic performance among others.

The lack of potable water is also considered as a major factor on girls' poor academic performance. This results in less time for studies, Absenteeism and ultimately poor performance.

The Chi-square results on effect of lack of potable water on students' academic performance were considered significant at 0.05 significance level and 1 degree of freedom. Thus X^2 =36.405,

df = 1, p< 0.05. This could be associated to the long distance students had to walk in search of water leading to absenteeism, returning very tired and had less time for studies which can exert a negative effect on academic performance. A clearer picture of the trend of events is presented in fig 4.3 below;

Fig 4.3; Effects of walking distance to water sources on academic performance



Source; Author's Construct, May, 2016

From fig 4.3 above, it can be deduced that 39% of respondents miss lessons to water search which leads to a woeful 43% poor academic out put. A significant portion 12% also sleepsduring lessons due to exhaustion from the performance of early morning chores before going to school.

4.5; Time Spent at Water Collecting Points

Time spent at water collecting points could play a significant roll in the frequency with which water can be got home. In response to time spent to collect water, an interesting data was arrived at as in figure 4.6 below

Table 4.6: Waiting Time at Water Source

Response	**Observed Frequency (O)**	**Expected Frequency (E)**	**$(O-E)^2$**	**$\frac{(O-E)^2}{E}$**	**$X^2 = \sum(\frac{(O-E)^2}{E}$**	**%**
Less than an hour	40	**86.7**	**2180.9**	**25.2**		**15**
One hour	78	**86.7**	**75.7**	**0.9**	**61.400**	**30**
More than an hour	142	**86.7**	**3058.1**	**35.3**		**55**
Total	260	**260**				**100**

Source: Field Survey, May, 2016

Chi-square = 61.400, df =2, p< 0.05, significant.

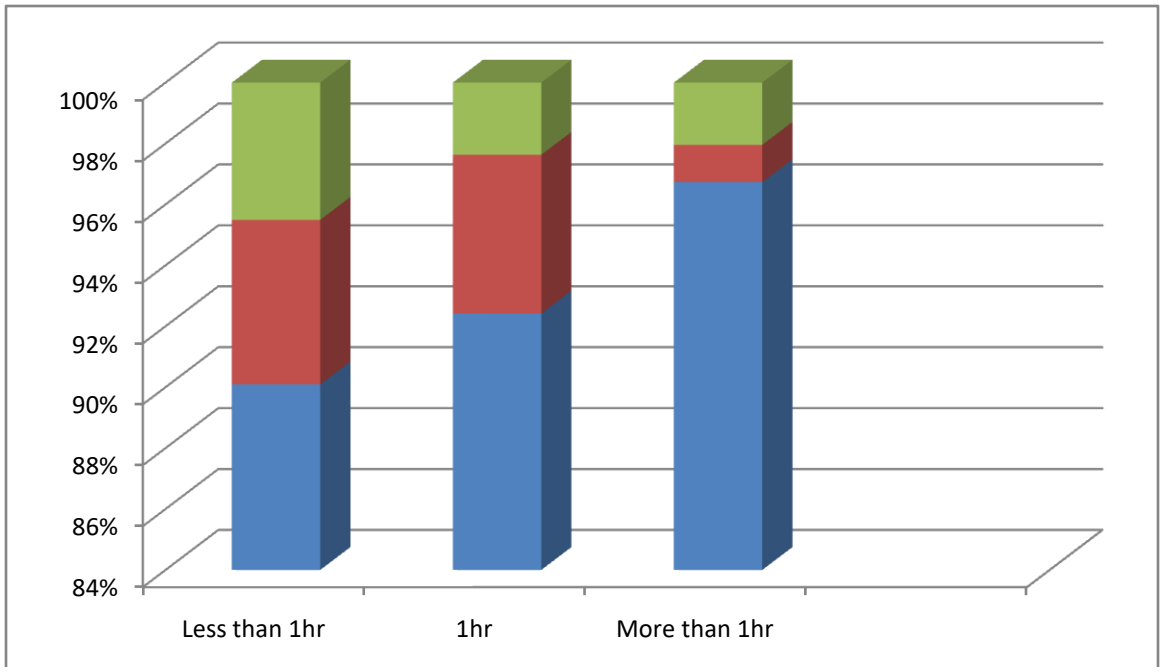
From table 4.5 above, (30%) of JHS girlsspend up to an hour at water source, 55% spend more than an hour. This indicates that a greater proportion of JHS girls 85% of them spend an hour or more at water source. The chi-square test results indicate a significance (X^2 = 61.400, df = 2,

p<0.05). The significance ofChi – square on water collection time generates a negative effect on girls' school attendance and performance.

This could be the result of the government's inability to provide adequate sources of potable water hence many people crowd at the available sources leading to students spending a lot of time in waiting for their turn to fetch water(Hill and King, 1995; Bulajie, 1998; Shamim and Salahudin, 1994) in literature review confirmed this. According to Caincross and cliff (1987) in literature review, the significance of reduction of water collection time is the increase in water consumption in Mozambique. Also World Bank(1994) has estimated that in Ghana, 700 hours are spent annually by girls in collecting water resulting in keeping them out of school.

The fig 4.4 below shows the distribution pattern.

Fig 4.4; Waiting time at water source



Source; Author's Construct, May, 2016

It is evident from fig 4.4 above that, most girls spend more than an hour in the mornings alone to look for water for domestic consumption before going to school. A reasonable number of them also spend up to an hour to look for water. It was further revealed from the field that, the time spent in fetching water had an effect on students' school attendance. Effects identified including lateness, absenteeism and poor academic performance.

The chi-square results for the effects of water fetching time on school attendance were considered significant at 0.05 significance level and 1 degree of freedom. Thus; No effect; X^2 =21.686, df = 1, p< 0.05; Lateness; X^2 = 41.000, df = 1. P< 0.05; and Absenteeism' X^2 =30.576, df = 1, p< 0.05. This could be associated with the crowd at water sources resulting in girls having to wait for their turn to fetch water hence lateness and absenteeism and eventually poor academic out put.

In a FGD at Adabiyat JHS, the group leader reported their opinion on effects of distance walked on school attendance and performance as in box below;

Every morning as early as 5.00am some girls are already out of homes to look for and collect water. Mostly we walk long distances and so spend lots of time to collect water. Even more time is spent when the water source is crowded. We report to school tired, late, sleepy and inattentive in class which finally affects our academic performance [Source: Adabiyat JHS, May, 2016]

4.6 Effects of lack of potable water on school attendance and performance

The first research objective is to ascertain how the lack of potable water would affect school attendance of girls. The other important findings of the study were; easy access to potable water; time spent in fetching water on school attendance, on academic performance and presence of potable water in schools.Time spent to and from water source has been proven to be significant. It is important therefore,to find out how easy access to potable water would affect both time at water source and school going time.

Table 4.7: Effects of easy access to potable water on time spent in fetching water

Response	**Observed Frequency (O)**	**Expected Frequency (E)**	**(O – E)^2**	$\frac{(O-E)^2}{E}$	**X^2 =** $\sum(\frac{(O-E)^2}{E}$	**%**

Less time at water source	**135**	**130**	**25**	**0.2**	**4.000**	**52**
Going to school early	**125**	**130**	**25**	**0.2**		**48**
Total	**260**	**260**				**100**

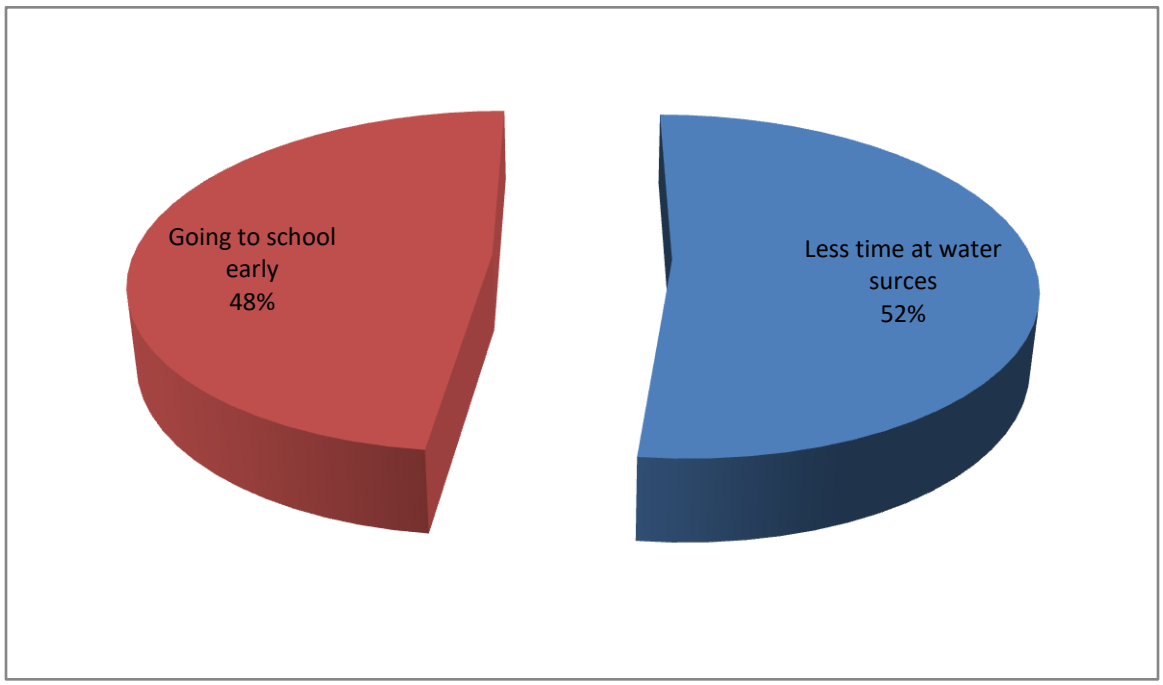
Source: Field Survey, May, 2016

Chi-square = 4.000, df = 1, $p < 0.05$

Table 4.7 indicated that 52% responded spending less time at water source while 48% responded going to school early. Further analysis was done with chi-square to confirm these results.

The analysis revealed that the effect of easy access to potable water on time spent in fetching water results in a significant reduction of time spent in fetching water and students are able to go to school early. (Chi-square = 4.000, df = 1, $p < 0.05$). This could be the result of government policy through Metropolitan, Municipal and District Assemblies to provide adequate water supply to inhabitants. It could also result from donations of bore-holes by NGOs in the water sector to communities or communities contributing to drill bore-holes at a given costs to reduce time spent by children in fetching and to facilitate their school attendance.

Fig 4.5 Effects of easy access to potable water on time spent in fetching water



Source; Author's Construct, May,2016

Figure 4.5 looks at effects of easy access to potable water on time spent in collecting water. It is obvious that with less time spent in water search, many girls are able to execute their tasks of fetching water early resulting in huge proportion of 48% going to school early. Availability of and easy access to potable water is a factor that would facilitate school attendance hence the researcher used the check list to assess the effect of easy access to potable water on school attendance. Effects identified included; going to school early. No absenteeism and no missing of lessons.

The chi-square analysis for the effects of easy access to potable water on school attendance was considered significant at 0.05 significance level and 1 degree of freedom. Thus, going to school early; X^2 =41,000, df = 1, p< 0.05; No absenteeism; X^2 = 52.509, df = 1 p< 0.05 and No missing of lessons; X^2 =38.151, df = 1, p< 0.05. This could be associated with the availability

of water and water sources hence more time is no longer spent at water source as well as crowds. It could also be as a result of government, NGOs and communities intervention to provide potable water.

Table 4.8; Easy access to potable water on academic performance

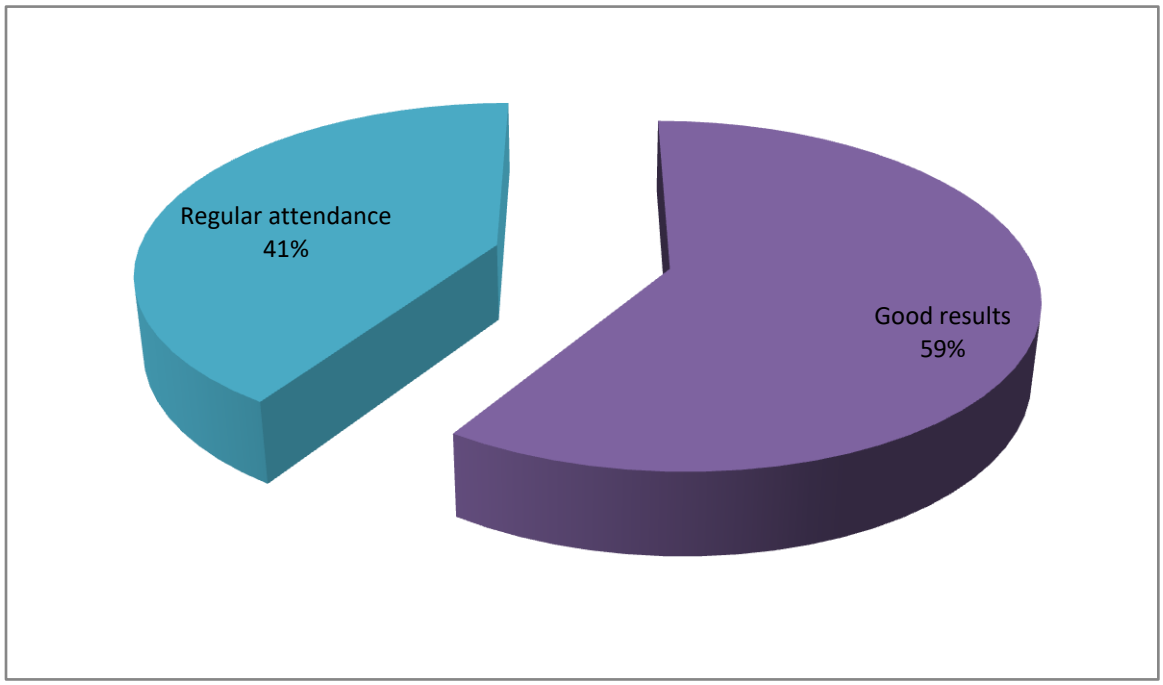
Response	**Observed Frequency (O)**	**Expected Frequency (E)**	**$(O-E)^2$**	**$\frac{(O-E)^2}{E}$**	**$X^2 = \sum(\frac{(O-E)^2}{E}$**	**%**
Regular attendance	**106**	**130**	**576**	**4.3**		**45**
Good results	**154**	**130**	**576**	**4.3**	**8.600**	**55**
Total	**260**	**260**				100

Source; Field Survey, May, 2016

Chi-square = 8.600, df = 1, $p < 0.05$

Table 4.8 indicated that 45% responded they would be regular in school attendance while 55% responded they would get good results. Further analysis was done with the help of chi-square to confirm these results (Chi-square, $X^2 = 1.000$, df = 1, $p < 0.05$). This could also be the result of government policy, NGOs and communities intervention.

Fig 4.6 Easy access to potable water on academic performance



Source; Author's Construct, May,2016

From fig 4.6 above it can be observed that if potable water is made accessible, many girls can always go to school early which can result in good academic performance.

Table 4.9; Presence of potable water in school.

Response	Observed Frequency (O)	Expected Frequency (E)	$(O-E)^2$	$\frac{(O-E)^2}{E}$	$X^2 = \sum(\frac{(O-E)^2}{E}$	%
Missing lessons	**10**	**86.6**	**5869.6**	**67.8**		**4**
Punctuality	**88**	**86.6**	**1.9**	**0.02**	**132.800**	**34**
Hygiene	**162**	**86.6**	**5685.2**	**65.6**		**62**
Total	**260**	**260**				100

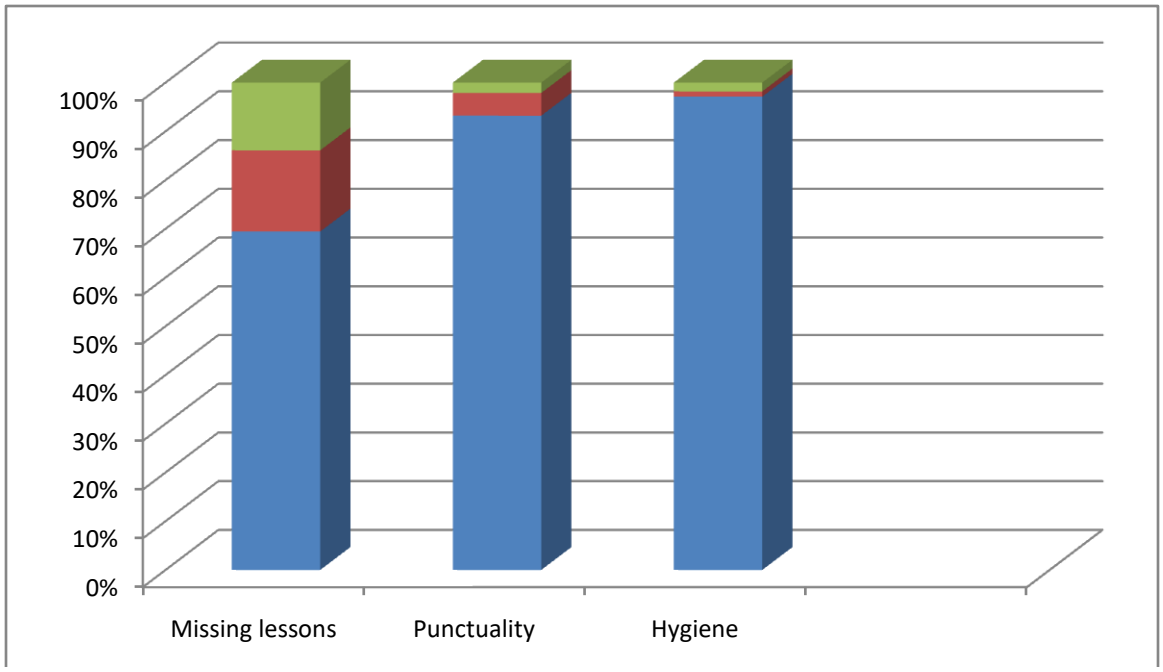
Source; Field Survey, May, 2016

Chi-square = 132.800, df = 1 $p < 0.05$

Table 4.8 indicated that 4% responded missing lessons, 34% being punctual at classes respectively as the effect of the presence of potable water at school while 66% responded on hygiene. The chi-square analysis on these responses is significant ($X^2 = 1.300$, df = 1,

$p < 0.05$). This could be as a result of students not going out of school to look for water and at the same time are able to use water for cleanliness.

Fig 4.7; Presence of potable water in schools



Source; Author's Construct, May, 2016

In fig 4.7 above, respondents have indicated that, the presence of potable water in school can lead to prompt school attendancebut most important to them is hygiene. Hygiene issues come up when they are menstruating and would have to miss school till the period is over. This is an indication for the need of potable water in basic schools. Girls would be punctual to and stay in school, get involved in lots of lessons and so likely to improve their academic performance.

This could go a long way in improving upon hygiene and sanitation of the girl-child hence retaining her in school especially when they are menstruating. Montgomery and Elimelech, (2007), Colelough et al, (2000) and UNICEF, (2010) in literature review confirmed this.

Students from Wa Model JHS made the following remarks on the presence of potable water in schools.

We the girls of WaModel, would like the Government and teachers to know that education is for both boys and girls. Girls have a peculiar problem of menstruating every month and stay out of school till it is over. Can you imagine the contact hours we miss each term? You can guise for yourself the effect on academic performance. However, if there is clean water in schools as well as changing rooms, most girls will always be in school even when they are menstruating, academic performance can be greatly enhanced [Source: WaModel JHS, May, 2016].

4.7; Improving on Potable Water Provision

The last research question worth answering was; how can the provision of potable water be improved? Analysis in this area was done in terms of; sources through which provision of potable water can be improved; the kinds of services rendered by water company on water delivery; measures put in place to improve upon potable water delivery by Ghana Water Company Limited.

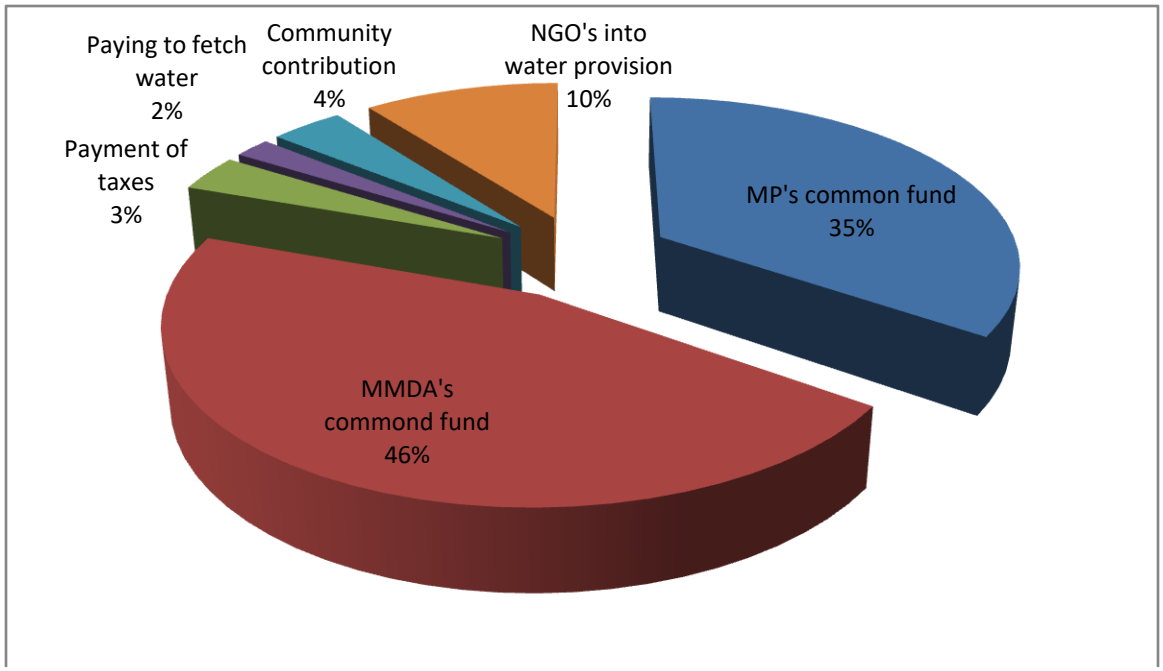
Table 4.10; Improving on Potable Water Provision

Response	**Frequency**	**Percentage**
MP's Common Fund	90	34.0
MMDA's Common Fund	119	46.0
Payment of taxes	9	4.0
Paying to fetch water	5	2.0

Community contribution	10	4.0
NGO's provision of water	27	10.0
TOTAL	**260**	**100.0**

Responses on improving on potable water provision centred on MMDA's common fund; MP's common fund and other dimensions as in table 4.8 above. From table 4.9 above, 46% of respondents entrusted the improvement of potable water provision into MMDA's common fund. This could be done by enriching the Water and Sanitation division in the Assemblies for the provision of potable water and sanitation generally. Alongside MMDA's common fund, 34% responded the MP's common fund could be used to improve upon water delivery in communities through the Assemblies. Both payment of taxes to improve upon water provision and community contribution towards self-help in the provision of potable water also attracted 8% . NGO's into potable water provision had 10% and paying to fetch water 2%. This made the improvement of potable water provision multi-sectarian. All the above mentioned institutions therefore have a role to play if potable water provision is to be improved upon. Government alone cannot bear the cost from its annual budget.

Fig 4.8; Improving on potable water provision



Source; Field Survey, May, 2016

Fig 4.8 shows a chart for the provision of potable water. A larger proportion of respondents think that the provision of potable water is the sole responsibility of government and its agencies. This is evident by the fact that, either of MP's and MMDA's common funds is much higher than the other four components added together. This indicates the degree of expectations of the people from the central government to fix the water problem for them.

On measures put in place to improve upon the provision of potable water in Wa Municipal,

Respondentsfrom Ghana Water Company Limited in the Municipality had the following;

- The Company currently is able to provide only 2,900 people with potable water through domestic, commercial (Institutions and Businesses) with standpipes and tanker services out of 66,741 which is highly inadequate.
- Drilling of additional boreholes and re-development of existing boreholes to increase the capacity of potable water delivery in the Municipality.
- The expansion and extension of pipelines distribution network to enable many settlements and communities within the study areasto have access to potable water.
- Building of surface water treatment plant on the Black Volta River in January, 2014 to enable the Company increase the volume of potable water in the Township and surrounding communities have access to potable water.

The measures stated above by the Ghana Water Company Limited need a huge capital investment to accomplish. Indications are that Government alone can not be able to provide enough water for the people in Wa Municipality and so the need for NGO's and other International Organizations to help in this direction. Considering the customers being served by the Ghana Water Company (2,900) out of a total of (66,741) inhabitants it is obvious that the potable water requirement of the study area is far from being met. This boils down to a woeful 4.4%. This goes to confirm the acute lack of potable water in the Municipality and the need to hurriedly take prudent and immediate measures to fix the problem.

A FGD on who should provide potable water at Sing JHS is presented below;

The MP's common fund, support from NGO's and government through the GWCL should be the main providers of water for the people. As for buying water from private operators it is completely out. Sir, our parents have no money. Sometimes most students in this village go to school in the morning without eating. Where will they get the moneyto be buying water all the time?

Source: Sing JHS, May, 2016

CHAPTER FIVE

SUMMARY OF FINDINGS, RECOMMENDATIONS AND CONCLUSIONS

5.1 Introduction

The primary objective of this study is to provide empirical evidence about potable water accessibility and its impact on girl – child education in Wa Municipal in the Upper West Region of Ghana. This section discussed the key findings from the study in relation to the literature and closes with recommendations to unearth the extent of potable water accessibility and its impact on girl child education in the Wa Municipal.

This study was conducted to: (a) find out the effect of potable water search by girls on their school attendance (b) ascertain how the lack of potable water affects the academic performance of the girl child (c) to examine how the provision of potable water can improve the education of the girl child(d) to come out with suggestions and recommendations on the provision of potable water to improve upon the attendance and academic output of the girl child.

5.2 Summary of Findings

This section examines the key findings of the study with regards to potable water accessibility and its impact on girl child education in Wa Municipality in the Upper West Region.

- Only 2,900 people within the study area have access to potable water through domestic, commercial (Institutions and Businesses) with standpipes and tanker services out of 66,741 which is woefully inadequate. An indication that only 4.4% of the population has access to potable water from the Ghana Water Company Limited.
- The study results further indicated that students (girls) walk an average of 2km every morning to look for and collect water before going to school.
- Further revelations from the checklist indicated that girls spent an average of 2 hrs in looking for water and waiting at water sources due to crowd.
- Also, time spent in fetching water had negative effects such as lateness, absenteeismand poor academic performance on girls' education.

- It was evident from class registers that girls are often either late or absent from school as compared to boys. This might partly be due to performing the task of collecting water.
- Further analysis of class attendance indicated that girls of northern origin were often late or absent from school, compared to girls of southern origin.
- The checklist also revealed that, the availability of potable water has a positive effect on school attendance and academic performance of the girl-child in school.
- Out of all the (FGD) discussions it was clear that only girls in the study area were responsible for collecting water for domestic use.
- Respondents did not want to bear any cost in relation to the provision of potable water

5.3 Recommendations

Recommendations of this study were made in response to the findings. The findings indicated the need for some policy interventions to address the challenges identified. The population of Wa Municipal with access to potable water, how much time is wasted to collect water, effect of walking to fetch water on girls education and the impact of lack of water in schools on girls education. In this regard the following recommendations are made to address the inadequacies identified in the findings.

5.3.1 Improving upon walking distance to reduce water collection period

One of the major obstacles to girls' education that was discovered during the research was the distance walked to water source and amount of time spent at water collection points before fetching water. The GWCL the main institution responsible for water services, needs to research

and locate points within the Municipality and put up public stand pipes closer to consumers. The closer the water source, the shorter the walking distance and so is the time spent to collect water. This will result in the increase in potable water provision. Improving upon potable water provision reduces both time and distance for searching for water so more time will be available for girls to be in school.

This emphasis on collection time was supported by a case study from Mozambique (Cairncross and Cliff 1987), which found that following construction of a new water system in one village and a subsequent reduction in collection times from 5 hours to 10 minutes, water consumption in the village increased by a factor of 2.7 and incidence of trachoma dropped to half that of a

neighbouring community.

5.3.2Widening the Services base of Potable Water

As a short time measure, more boreholes, wells, provision of water tankers to supply water ataffordable prices can be very helpful. This will further widen the water collection base within the municipality thus helping to reduce crowds, distance covered and time spent in searching for and collecting water.The construction of reservoirs as a medium term solution for the harvesting and storage of rain water during the rainy season for usage in the lean period can also help to address water shortages. The provision of additional water plants, construction of dams for water supply, decentralization and public private partnership as long term measures.

5.3.3Involving women in water issues within their communities

Despite their numbers and their prominent roles and responsibilities in relation to water and sanitation, women often have no voice and no choice in decision making about the kind of services they need or are receiving. Decisions about the design and location of water facilities should therefore be made with the involvement of the female users.

In the East-Mono region of Togo, where only 10 per cent of the population have access to potable water, a project aimed at improving access to water and sanitation facilities in schools did not adequately take a gender perspective into account. Thus, the facilities did not meet everyone's needs and fell into disuse. A new project design encouraged the participation of all villagers, boy and girl students, men and women teachers and administrators, and an action plan for hygiene promotion was approved by the schools and the villages (Alouka S, 2006).

5.3.4Change in Culture

There is the need for attitudinal change with regards to certain gender roles in the Municipality. During the FGD, it was clear that it is only in the three northern regions that only girls fetch water. Boys in the study area should also be educated on the effects of girls alone collecting water for house hold use. Boys need to help their sisters in collecting water.

5.3.5Commitment from Government

Government needs to be seriously committed to the course of providing safe drinking water by defining a minimum standard: some quantity of water sufficient for human dignity, life and health, which should be determined based on a local assessment taking into account unique geographic, climatic, cultural and other considerations. Incoming Governments need to be committed to continue and complete prudent water projects initiated by their predecessors.

5.3.7 Inclusion of Gender in the curriculum

Issues on gender must be taken into account in the curriculum as is the case in some countries. However,how and to what degree the gender perspective is included varies from one country to the next. The success of such a policy dependents on the design of the curriculum, school environment and teachers themselves.

Gender equality is an overarching principle of the curriculum in several countries. This means that the gender perspective should permeate the whole curriculum and should be taken into consideration throughout all subjects and areas.

This is particularly mentioned for Malta, Austria, Finland, Sweden, Liechtenstein and Norway. In the Maltese National Minimum Curriculum, 'gender equality is not a theme that should be treated by the school in isolation or during the teaching of a particular subject. Equality should be an interdisciplinary theme which teachers can develop within the context of their particular subject, confronting prejudice and promoting more gender-inclusive alternatives'.

Countries where the gender perspective is not expressed as an overarching principle also report that issues related to gender are taken into account.

5.3.8 Raising Awareness among Parents of Gender Equality Issues

The support of parents is vital in the promotion of gender equality in schools. However, most countries do not have specific government initiatives for making parents aware of gender equality issues, or when they do, they lack effective channels of dissemination. Gender discrimination starts from the home in the study area. Household chores especially water collection which is the subject matter, should be made a duty of both boys and girls. In certain cases, research institutions or non-governmental organisations might initiate specific awareness raising-projects, but these often remain isolated and on small scale.

In particular, teachers are not trained in gender equality issues, and therefore are not in a position to give parents any meaningful advice in this area (Lalak, 2008). However, some countries do pay attention to parental involvement in promoting gender equality in education.

In Portugal, one of the two proposed strategic objectives of the current equality plan is to promote the integration of the gender dimension into the training and professional qualification of the various stakeholders in education and training. The goal of 'raising awareness through parents' associations' is explicitly mentioned as one of the measures. In the countries that do have initiatives on parental involvement, a typical practice is for ministries to publish information materials for parents on gender equality.

In Belgium (Flemish Community), the ministry publishes a monthly magazine and a digital newsletter (Klassevoorouders) for parents and hosts a website for parents. These media channels frequently bring gender topics to parents' attention.

5.4Conclusion

This study looked at the accessibility of potable water and its impact on girl – child education in the Wa Municipality in the upper west region of Ghana. The development of any nation depends on its human resource and the youth. Rich human resource comes with education of both boys and girls. Unfortunately, the search for and collection of water has been the sole responsibility of girls in most poor countries. Potable water search by girls account for a great deal of lost time in school attendance and performance due to the difficulty in accessing potable water.

Multivariate analysis has also show a strong negative link between the distances to water sources and girls' schooling. For example, Akabayashi and Psachapopoulos (1999) have found that there is significant negative impact of distance to proximity dictates the source and use of the water, particularly or poorer and female-headed households. It has been found that distance to water source has a negative dictate to the use of water, as well as girls schooling and not boys. Comparatively therefore, girls are disadvantaged with regards to water search and school attendance.

The urgency of the water situation is further substantiated by the statement that in South Africa alone women and girls walk16 times to the moon and back collectively daily to collect water for household use. This suggests that the source of water might be quite far from home and that several such trips would have to be made to meet the water needs of the home.

When more water collection sources are available, women and girls would walk shorter distances and spend less time to collect water. This will allow girls to go to school early and women to do other productive activities.

According to the United Nations (U.N.), more than 14,000 people die daily from water-borne

illnesses. The bulk of these deaths are related to a number of infections, including: 2 billion cases of intestinal worms; 5 million cases of lymphatic filariasis and trachoma, each; 1.4 million child diarrheal deaths; and 500,000 deaths from malaria (UNWS, 2005).The health of a child is very

paramount for education. The use of unsafe water claims lots of children's life. The provision and accessibility of potable water will prevent infections on children. Once children are healthy school attendance will be drastically improved.

The possible role for menstruation in limiting school attendance has received significant attention in popular media, nearly all of which argues that menstruation is likely to be a significant factor in schooling (e.g. Kristof and WuDunn, 2009; Kayiggwa, 2007; Mawathe, 2006; BBC, 2010). Menstruation is inevitable when it is due and has been found to be a very influential factor to girls' absenteeism or not attending school. This is partly due to the absence of potable water for them to clean themselves. The provision of potable water will help to improve on girls' school attendance during menarche.

The literature also talked about the effects of easy access to potable water on school attendance.

Easy access to potable water implies walking short distances to collect water, spending less time, conserving energy, staying healthy by consuming clean water and cleaning one – self when menstruating while in school. More room will be made available for early school attendance by girls and hence improve upon academic performance.

All the negative parameters associated with potable water inaccessibility on girls education, can be remedied by the provision of potable water to the Wa Municipal. It is therefore the duty of all

stakeholders in both education and the water industry, to devise measures to provide potable water to the citizenry to salvage and improve upon the education of the girl – child.

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APPENDIX I

UNIVERSITY FOR DEVELOPMENT STUDIES

FACULTY OF PLANNING AND LAND MANAGEMENT

(DEPARTMENT OF COMMUNITY DEVELOPMENT)

INTEVIEW SCHEDULE FOR (GWCL) OFFICIALS

CONFIDENTIALITY; this questionnaire is purely for academic purposes and the information provided will be used for academic work. Both the identity and responses provided will be confidentially handled.

SECTION ' A' ; Demographic Characteristics

Place of work;

Schedule ;

Job experience ;

Age ;

SECTION 'B'; The proportion of people in Wa municipality with access to potable water.

1. What is your catchment area?
2. What kind of services do you provide to the people in your catchment area?
3. What is the current potable water demand in the Municipality?
4. What is the current amount of potable water generated per day to serve the population?
5. What is the current population of the Municipality that you serve?
6. What fraction of the population are you able to serve?

SECTION 'C'; History of potable water provision in Wa Municipality.

7. What are the sources of potable water within the Municipality?

8. Please provide a brief account on how potable water has been made available to the inhabitants of the Municipality over the years.
9. Are you satisfied with your services to the population? [YES/NO]
10. Give reasons
11. Briefly outline any steps your outfit is taking to improve upon potable water provision and accessibility in the Municipality.

THANK YOU VERY MUCH FOR YOUR RESPONSE

APPENDIX II

UNIVERSITY FOR DEVELOPMENT STUDIES

FACULTY OF PLANNING AND LAND MANAGEMENT

(DEPARTMENT OF COMMUNITY DEVELOPMENT)

QUESTIONNAIRE FOR JHS GIRLS

CONFIDENTIALITY; this questionnaire is purely for academic purposes and the information provided will be used for academic work. Both the identity and responses provided will be confidentially handled.

SECTION ' A' ; Demographic Characteristics

Name of school;

Class ;

Age ;

SECTION 'B' ; Sources and accessibility of potable water.

1. What are the sources you collect water from?
2. Which of the source(s) is/ are closer to your house?
3. How often do you fetch water in a day?

SECTION 'C';House – hold duties performed by girls before going to school.

4. Do you perform any chores in the morning before going to school? [YES/NO]
5. If (YES), list the all the chores you do.
6. Does the performance of such chores effect your education? [YES/NO]
7. If (YES), briefly state the ways in which your education is affected.

SECTION 'D'; Effects of waiting time at water collecting points and distance covered to collect water on girl's education.

8. At what time do you usually go to look for water in the morning?
9. What is the approximate distance between your house and water source?
10. How long do you wait to take your turn to fetch water?
11. Do you come home early with water?[YES/NO]

SECTION'E'; Effects of potable water provision on girl's education in schools and ways of improving potable water accessibility.

12. State how the presence of potable water in schools will affect your education.
13. List all the ways in which you think can improve on the provision of potable water in your community.

THANK YOU VERY MUCH FOR YOUR RESPONSE

APPENDIX III

UNIVERSITY FOR DEVELOPMENT STUDIES

FACULTY OF PLANNING AND LAND MANAGEMENT

(DEPARTMENT OF COMMUNITY DEVELOPMENT)

(FOCUS GROUP GUIDE FOR JHS GIRLS)

CONFIDENTIALITY; this questionnaire is purely for academic purposes and the information provided will be used for academic work. Both the identity and responses provided will be confidentially handled.

SECTION ' A' ; Demographic Characteristics of Respondents.

School ;

Class ;

Age ;

SECTION 'B'; Sources and accessibility of potable water.

1. List all the different sources of water in your communities.

2. How many of these water sources are closer to your house?
3. From which of the sources do you often collect water?
4. Why do you prefer that source of water?
5. Do you work at home before going to school in the morning?[YES/NO]
6. If (YES), write down all the chores you do before going to school in the morning.
7. How do items 1 to 6 affect your school attendance and performance?

SECTION 'C'; Time spent and distance covered to water source and back home.

8. How long does it take you to reach your water source and back home?
9. Do you have to queue for sometime before fetching water?
10. Is the water source far from your home?
11. What approximate distance do you need to cover to collect water?
12. Do time and distance to water source have any effect on your education?[YES/NO]
13. Please state how both time spent and distance to and from water sources affect you school attendance and performance.

THANK YOU VERY MUCH FOR YOUR RESPONSE

APPENDIX IV

UNIVERSITY FOR DEVELOPMENT STUDIES

FACULTY OF PLANNING AND LAND MANAGEMENT

(DEPARTMENT OF COMMUNITY DEVELOPMENT)

(INSTRUMENTS USED IN DATA COLLECTION)

Activity	Instrument	Respondents
Interviews	Interview guide	Officials of GWCL
Questionnaires	Guided interview	JHS girls
Focus Group Discussions	Focus group discussion guide	JHS girls
Secondary Data	Questionnaires	Officials of GWCL and MEOs