

PRESBYTERIAN UNIVERSITY COLLEGE, GHANA

FACULTY OF DEVELOPMENT STUDIES

DEPARTMENT OF RURAL AND COMMUNITY DEVELOPMENT

EFFECTS OF ACCESS TO WATER, SANITATION AND HYGIENE FACILITIES ON
ACADEMIC PERFORMANCE OF FEMALE STUDENTS' IN SENIOR HIGH
SCHOOLS

Dissertation submitted to the Department of Rural and Community Development of the
Faculty of Development Studies at Presbyterian University College, Ghana in partial
fulfillment of the requirements for the award of Master of Arts degree in International
Development Studies

BY
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SEPTEMBER 2019

DECLARATION

Candidate's Declaration

I hereby declare that this dissertation is the result of my own original research and that no part of it has been presented for another degree in this University or elsewhere. Work of other people cited in this dissertation have been duly referenced.

Candidate's Signature.....Date.....

Name: Lydia Lartebea Abosi

Supervisor's Declaration

I hereby declare that the preparation and presentation of the thesis were supervised in accordance with the guidelines on supervision of dissertation laid down by the Presbyterian University College, Ghana.

Supervisor's Signature.....Date.....

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ABSTRACT

Understanding Water, Sanitation and Hygiene (WASH) in schools from gender perspectives is fundamental in development. This study sought to investigate the effects of access to water, sanitation and hygiene facilities on academic performance of female students in senior high schools in the Akuapem South District of the Eastern Region of Ghana. The study was a descriptive survey. The views of 120 respondents comprising 40 female students from each of the three (3) selected senior high school within the Akuapem South District were sought using a self-developed questionnaire. Primary and secondary sources of data collection method were used and data collected from the field was processed and analysed. The study revealed that respondents' knowledge and understanding of WASH facility is skewed as majority (73.3%) believed that WASH facilities to be the availability of clean and potable water. Two-thirds (66.3%) of the students were not satisfied with the WASH facilities available in the various schools visited. This has an impact on the academic performance of students. Only few female students (26.7%) believe that the absence of WASH facilities do not impact on their participation in co-curricular activities. Evidence of the impact of school-based WASH programs in reducing student absence from class was mixed. Ensuring access to safe and sufficient water and sanitation and hygiene promotion in schools has great potential to improve health and education and to contribute to inclusion and equity. This affirms the importance of providing adequate supply of WASH facilities in second cycle schools to facilitate educational efficiency and progression of female students in the senior high school.

ACKNOWLEDGEMENTS

First, I am grateful to the almighty God for giving me the wisdom, knowledge and life to pursue my studies successfully.

I want to express my gratitude to my supervisor Dr. Richard Amfo-Otu for his guidance in every step of the study. Indeed, his suggestions in making the study better will forever be remembered by me. May the Almighty God bless you sir.

I am also grateful to my husband Mr. Thomas Danso Mensah for his support and encouragement throughout my study.

I would also like to thank my sister Mrs. Gloria Adubea Aboagye for her encouragement when I wanted to give up along the way when things became tough for me.

My sincere appreciation also goes to Miss. Mariam Nyameye Penrose of Akropong Akuapem for your time spent with me to help cater for my children during my absence due to lectures.

I also appreciate the work done by my colleagues and friends especially Mr. Patrick Owusu and Fuad Tanimu for the support they gave me in checking my document.

I also extend my most sincere appreciation to the respondents in the various schools who participated in this study and to the teachers for their kind assistance and tolerance without which this study would not have been successful.

DEDICATION

To my children, Abena Ofosua Danso-Mensah and Kwaku Essah Danso-Mensah.



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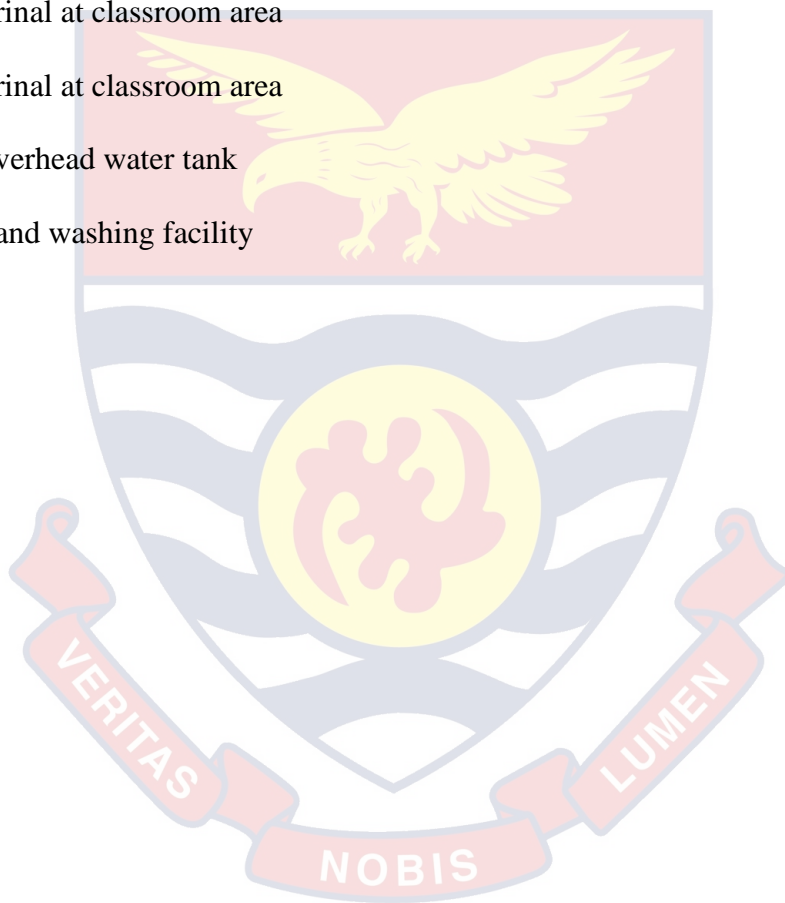
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CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Adequate water, sanitation and hygiene are essential components of providing basic health services. Similarly, adequate access to water, hygiene and sanitation (WASH) is every human's and child's right (Grossi, Klimschak, Rachenburg, Shinee & Schmoll, 2016). The provision of WASH in educational institutions help promote health and wellbeing of students by preventing infections and spread of diseases. Availability of WASH facilities protects students and staff and uphold the dignity of vulnerable populations such as school going girls.

Children across the world deserve an opportunity to have their education in a safe and healthy environment. Safe drinking water and a safe place to use such as bathroom are as important as teachers, classrooms, and books. A study conducted in developing countries revealed that about half of the number of schools were without water and sanitation facilities (WASH Advocates, 2019). When such basic amenities such as clean water, toilets and hand washing facilities are not available at a school, students spend most of their school time collecting water. These deficiencies in WASH affect the privacy and dignity of students especially girls, student's attendance and overall performance, their health and wellbeing, and gender relations (WASH Advocates, 2019).

According to the UNICEF/WHO (2018), 69% of schools globally, had an improved source of drinking water with water available and were therefore classified as providing a basic drinking water service. A further 12% of schools had an improved source but water was unavailable at the time of the survey so they were therefore counted as providing a limited service. 19% of schools worldwide had no service, meaning they either relied on unimproved sources, such as an unprotected dug well, unprotected spring or surface water, or had no

facility at all. This means nearly 570 million children worldwide lacked a basic service and had either limited or no drinking water service at their schools.

On Sanitation, 66% of schools had improved single-sex sanitation facilities usable at the time of the survey and were therefore classified as providing a basic sanitation services. A further 12% of schools had improved facilities that were either not single-sex or not usable and were therefore counted as providing a limited service. About 23% of schools worldwide had no service, and either relied on unimproved facilities, such as pit latrines without a slab or platform, hanging latrines or bucket latrines, or had no sanitation facility at all. On this basis it is estimated that over 620 million children lacked a basic service and had either a limited or no sanitation service at their school (UNICEF & WHO, 2018).

On hygiene 53% of schools worldwide had hand washing facilities with soap and water available at the time of the survey and were therefore classified as having a basic hygiene service. 11% had hand washing facilities but no soap available at the time of the survey so they were counted as providing a limited service. 36% of schools had no hand washing service. It is therefore estimated that over 850 million children lacked a basic service and either had a limited or no hand washing service at their school (UNICEF & WHO, 2018). In Eastern and Southern Africa, 49% of schools lack access to adequate water source and 55% lack adequate sanitation facilities (Chatterley, & Thomas, 2013). In Sub-Saharan Africa, many female students encounter challenges in managing their menses out and within the school environment. Such challenges include: inadequate water and sanitation facilities, with many schools having insufficient numbers of private, safe and clean toilet facilities; lack of access by schools to clean water within or near the toilet facilities for washing menstrual stains from clothes and uniforms; and inadequate mechanisms in schools for the disposal of used menstrual materials or menstrual waste. Adequate disposal facilities include those within

the latrine or toilet stall/block itself (such as a dustbin) and a system for safe, culturally and environmentally appropriate disposal of the collected waste (Sommer, Vasquez, Nancy, & Sahin, 2012).

Research has proven insufficient WASH facilities has a high influence on adolescent school girls' punctuality in school, protection against harassment at school, knowledge, attitudes and skills on issues related to personal hygiene and health (Save the Children, 2015). These are due to the fact that girls among other things, undertake more sanitation and water-related tasks than boys, and are disincentivized to be in environments which have inappropriate hygienic conditions to meet their needs during menstruation (Save the Children, 2015). According to UNICEF (2012), girls adapt their behaviours to cope with the fear, shame and teasing they experience while managing menstruation. Feelings of fear and shame, and attempts to avoid teasing, permeated ssdecisions girls made related to menstruation and impacted how they engaged with peers and participated in school. The report further suggests that as a result of such WASH challenges they faced at school, girls experience negative education- and health-related impacts and are at risk for additional negative consequences.

1.2 Statement of the problem

Sanitation and hygiene have become an important issue to the global world and the school context in particular. Inadequate or unimproved sanitation facilities, lack of safe drinking water, lack of hygiene education especially for girls, contribute to low attendance of girls in the SHS because girls often feel uncomfortable in class if they cannot find a convenient place to change their sanitary pads and clean up as a result of this, they stay away from school during menstruation. This situation has compelled girls to device their own strategies to cope with the inadequate facilities in schools. UNICEF & WHO (2008) had priority for WASH interventions in sixty (60) countries. Out of these countries, only 46% of

schools had access to water facilities and 37% sanitation facilities. Globally, an overall, 2.5 billion people lack access to improved sanitation, more than one billion in Asia and another half a billion in sub-Saharan Africa. Open defecation continues to be practiced by almost half the population in Southern Asia and more than a quarter of those living in Sub-Saharan Africa (UN, 2008).

Despite the several yearly programs organized for girls to educate them on their health needs, much attention has still not been given to the state of water, sanitation and hygiene in senior high schools within the Akuapem South District. There is paucity of information on the effects of access to water, sanitation and hygiene facilities on female students in senior high schools in academic literature which has created knowledge gap on the subject. This study is being carried out to contribute to address the knowledge gap identified.

1.3 Research objectives

The overall objective of the study is to evaluate the effects of access to water, sanitation and hygiene (WASH) facilities on female students in some selected Senior High Schools in Akuapem South District Assembly, Specifically, the study seeks to:

1. assess the state of existing WASH facilities in selected senior high schools
2. assess the accessibility of female students to WASH facilities
3. examine the impact on female students' academic performance
4. examine the effects on girls' participation in extra curricula activities.

1.4 Research questions

1. What is the state of existing WASH facilities in the selected senior high schools?
2. How accessible are the WASH facilities to female students?
3. What is the impact on student girls' academic performance?

4. What is the impact on the student girl's participation in extra curricula activities?

1.5 Significance of the Study

WASH in schools is very essential for the health and wellbeing of students, teachers and staff in educational facilities. For student girls, the peculiarity of the reproductive system demands that safe and healthy WASH facilities are made available to enhance their ability to go through natural cycles such as menstruation without suffering any negative impact on their health, academic performance and their ability to be involved in social activities. The value of this study is in its contribution to knowledge on the barriers such as WASH that limits the ability of girls to achieve their full academic potentials. Again, this study is significant for the purposes of providing relevant information for decision makers to make adequate investment in providing essential services to improve the health and wellbeing of students especially girls.

1.6 Limitations

The study is limited to the effects of access to water, sanitation and hygiene facilities among female students and it is based on data collected from sampled senior high schools within the Akuapem South District. The study focuses on three senior high schools since all senior high schools within the district cannot be used.

1.7 Delimitations

This study confines itself to interviewing female students in selected Senior High Schools within the Akuapem South District. The selected schools are Presbyterian Senior High Technical School at Aburi, Adonten Senior High School also at Aburi and Diaspora Girls' Senior High School at Obodan all within the Akuapem South District. Due to financial and time constraints, the study is limited to only these three schools.

1.8 Organization of the Study

This dissertation is organized into five chapters. Chapter One introduces the dissertation topic. Chapter Two reviews literature on WASH in senior high schools and its impact on girls globally and locally. The conceptual framework underlying the study is also presented in this chapter. The third Chapter presents the methodology used for the study. In Chapter Four, the empirical results are first presented and then discussed. Chapter Five ends the study with a brief summary, conclusions and policy recommendations.



CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1 Introduction

This chapter deals with review of relevant literature related to the subject matter under study. Areas covered are water, sanitation, hygiene, access to water, sanitation and hygiene facilities, impact of WASH on student girls' academic performance and impact of WASH on student girls' participation in extracurricular activities.

2.2 Water

Water plays indispensable role in supporting economic development. However, its quantity and quality are determining factors in influencing the function it provides for environment, economy and social needs (Garcia, 1998; Young, Dooge & Rodda, 1994). The water problems are becoming increasingly more and more complex and interconnected with other development sectors like agriculture, energy, industry, and also with social, economic, environmental, health, educational, legal, and political factors at local and national levels and sometimes at regional and even international levels (Biswas, 2004).

Water is essential for economic, environmental and social needs (Garcia, 1998) and therefore, the right to access to clean and fresh water is the basic right of human (Samra & Fawzi, 2011). However, most rural areas of the developing countries have no improved water supply and the impact was further aggravated as a result of high population growth (United Nations, 2010). The World Health Organization estimated that 84 % of the world population are without access to an improved sources of drinking water in rural areas. In rural areas of poor countries, water supply is more of physical labor to obtain water or to lift water from a well and to carry it a considerable distance from the sources. Furthermore, it consumes a significant proportion of the time (Cherutich, Timothy & Quinter, 2015).

Access to safe drinking water is a basic human right and essential for achieving gender equality, sustainable development and poverty alleviation. Yet, at the end of 2004 still some 1.1 billion people, or 18% of the world's population, lacked access to safe drinking water, while 2.6 billion or 40% of the world's population lacked access to improved sanitation services. Providing physically accessible clean water is essential for enabling women and girls to devote more time to the pursuit of education, income generation and even the construction and management of water and sanitation facilities (Alouka, 2006).

Each year, water-related diseases take the lives of 3.4 million people worldwide, the greater part of whom are children (Dufour *et al.*, 2003). Waterborne diseases are caused by the drinking of water polluted by pathogen bearing urine or faeces. They include typhoid, bacillary and amoebic dysentery, cholera and other diarrhoeal diseases. Water-based diseases come about as a result of bad personal hygiene and some skin and eye contact with contaminated water. Example, Freeman *et al* (2012) found that local water availability affected the impact of school-based WASH interventions on diarrhoea rates among pupils. Pupils attending 'water-scarce' schools (in which there was no dry-season water source within 1km) that received WASH intervention (including water-supply improvement, hygiene promotion and water treatment, and sanitation improvements) reported a reduction in diarrhoea incidence and days of illness.

Cholera is a severe illness caused by bacteria that affect the intestinal tract resulting in serious dehydration diarrhoea that can be fatal without instant treatment. Cases of cholera are reported world-wide especially in emergency situations like areas affected by natural disasters. Good food and water hygiene can prevent it. There are 500 million cases of malaria worldwide each year resulting in 1.3million deaths (90% of whom are infants under 5years) and mostly the morbidity is in Sub-Sahara Africa (SSA). Irrigation dam construction and

other water development projects are the causes of the burden of the disease but reducing mosquito populations in the household and eliminating stagnant water or covering up water containers can be essential in minimising malaria episodes. About 200 million people are infected with schistosomiasis (also known as bilharzia), 20 million of whom experience grave consequences like liver, intestines, lungs and bladder damage. Tens of thousands of people die every year, mostly from SSA due to bilharzia. It is caused by parasitic worms or their eggs that live in some freshwater snails and human hosts. The worms can enter the skin of swimmers or those washing things in polluted water. Sufficient water supply and sanitation lessen the use of polluted surface water and could reduce infection rates by 77% (WHO, 2009). The quality of water supply and sanitation services in a country, region or urban settlement is an important indicator of its stage in economic development. The most common indicator used to rate the water and sanitation situation is the percentage coverage of adequate water supply and sewerage.

However, there are different interpretations as to what is adequate. Also, the level and quality of water and sanitation services are, politically charged, which makes it prone to the use of data and the drawing of conclusions that do not reflect the actual situation. Statistics seem to include regular overestimations of “safe water supply and adequate sanitation cover” and data are often deficient due to inaccuracy and the use of inappropriate criteria to define what is “safe” and “adequate” (UN-Habitat, 2001). This is a serious difficulty when assessing current situations and improvement plans for water provision and sanitation in the developing world. Also, different institutions use different definitions of what is safe and what is adequate (Satterthwaite and McGranahan, 2007). Evidence for inaccurate use of statistics comes from comparisons of official data with detailed city case studies.

2.3 Sanitation

Sanitation remains one of the Sustainable Development Goals' (SDGs') poor performers, especially in urban areas where global coverage for 'safely managed sanitation' (WHO/UNICEF, 2016) is only 26%. Solving this problem is expensive. If the world is to reach the 2030 goal of providing safely managed sanitation for all, there is the need to spend \$49.3 billion each year until then (Hutton & Varughese, 2016). Ignoring this problem has an unquantifiable human cost for future generations, as poor sanitation remains a leading cause of diarrhoea and stunting, especially in dense urban spaces (UNDESA, 2014).

There must be a change or a broadening understanding of the term sanitation. Sanitation can best be defined as the way of collecting and disposing of excreta and community liquid waste in a germ-free way so as not to risk the health of persons or the community as a whole (Cotton & Saywell, 2002). Ideally, sanitation should end in the seclusion or destruction of pathogenic material and, hence, a break in the transmission pathway. Wherever humans gather, their waste also accumulates. Progress in sanitation and improved hygiene has greatly improved health, but many people still have no adequate means of appropriately disposing of their waste (Bastien, Hetherington, Hatfield, Kutz, & Manyama, 2016). This is a growing nuisance for heavily populated areas, carrying the risk of infectious disease, particularly to vulnerable groups such as the very young, the elderly and people suffering from diseases that lower their resistance. Poorly controlled waste also means daily exposure to an unpleasant environment (Bastien *et al.*, 2016).

Hence, inadequate sanitation is a major cause of disease world-wide and improving sanitation is known to have a significant beneficial impact on health both among female students, in households and across communities (Alabi, 2010). The word 'sanitation' also refers to the maintenance of hygienic conditions through services such as garbage collection

and waste-water disposal. Environmental sanitation according to World Health Organization is the control of all those factors in man's physical environment which exercise a deleterious effect on his physical development, health and survival. It could also be seen as the principle and practice of effecting healthful and hygienic conditions in the environment to promote public health and welfare, improve quality of life and ensure a sustainable environment (Alabi, 2010).

Large investments will be needed to provide and maintain adequate sanitation systems to serve these growing cities. In addition, most urban growth is projected to occur in small and medium-sized cities (with populations of less than 1 million and 1.5 million, respectively) in developing regions (Seto, Parnell & Elmqvist, 2013). In low- and middle-income countries especially, these smaller cities receive less support for infrastructure investment compared to major cities and capital cities.

Mara, Lane, Scott, and Trouba (2010) assert that adequate sanitation, good hygiene and safe water, are fundamental to health and social economic development. Having access to improved sanitation results into, lower health system costs, fewer days lost at work/school through illness and care for the sick, reduced queue time at shared sanitation facilities, and eliminating open defecation (Mara *et al.*, 2010). With approximately 215 million people practicing open defecation and SSA shoulders the greatest water and sanitation challenges (Galan, Kim, & Graham, 2013). Poor sanitation, hygiene, and water accounts for 50% of the consequences of childhood and maternal underweight and death, because it strengthens the synergy between diarrheal diseases and under nutrition. This means that the exposure to one condition, increases vulnerability to the other (Bastien *et al.*, 2016; Mara *et al.*, 2010).

Globally, about 2.5 billion people are without improved sanitation and around 1.1 billion of those, mostly living in rural areas, still practice open defecation (WHO/UNICEF

2010). Between two to three million people die every year because of inadequate sanitation, insufficient hygiene, and contaminated food and water and most of these people reside in rural Asia and Africa. In Bangladesh the progress in sanitation, particularly in the rural areas, was rather slow during the 80s and 90s; the sanitation coverage growth rate was merely 1% per annum (WHO/UNICEF 2010). A national Baseline Survey conducted by the Government of Bangladesh in October 2003 to assess the extent of sanitation coverage revealed that out of a total number of over 21 million households in the country, only 33% were using hygienic latrines, 25% unhygienic hanging latrines and 42% did not have any kind of latrine and were resorting to open defecation (WHO/UNICEF 2010). This poor coverage led the government to launch the National Sanitation Campaign to achieve rapid progress in sanitation in the country and the national sanitation goal was set initially to achieve 100% Sanitation for all by 2010 that was subsequently revised to achieve “100% sanitation for all by 2013” (WHO/UNICEF 2010).

Since launching the National Sanitation Campaign in 2003 the government of Bangladesh has taken several policy and operational decisions to promote sanitation. The National Sanitation Secretariat was formed and Task Forces were established from national to grassroots level to support and institutionalize the interventions (Rahman, 2011).

2.4 Hygiene

Previous literature has shown considerable studies regarding the effects of lack of appropriate water facilities, hand washing, and hygiene practices on child health outcomes. Impaired cognitive learning and learning performance are long-term outcomes of the negative effects of infections such as diarrhea, worm infestations, and dehydrations which are largely attributed to poor water, sanitation, and hygiene conditions (Gottfried, 2010). Diarrheal incidences in children during their first few years of life have been shown to limit their

growth by about 8cm and cause an IQ point reduction when they progress to about 7 or 8 years of age (Guerrant, Deboer, Moore, Scharf & Lima, 2013). Studies have shown that about 75% of all school absences are illness related (Lau, Springston & Sohn, 2012). Information regarding absenteeism from middle and higher income countries has shown that poor academic and social development, high dropout rates, and reduced learning performance are attributed to school absence in children (Bener, Kamal & Shanks, 2007; Reid, 2003).

Health is the capacity to function efficiently within one's surroundings. Our health as individuals depends on the healthiness of our environment. A healthful environment, devoid of risky substances allows the individual to attain complete physical, emotional and social potential. Hygiene is articulated in the efforts of an individual to safeguard, sustain and enhance health status (Drangert, 2004).

2.5 Access to Water, Sanitation and Hygiene (WASH) facilities

The poor access to water supply is a prevalent issue in over 850 million people worldwide with over 2.5 billion limited by access to sanitation facilities (World Health Statistics, 2009). The global burden of disease and mortality rates could be reduced by about 9.1% and 6.3%, respectively, if rapid success is attained in facilitating access to water, sanitation, and hygiene facilities (Pruss-Ustun, Bonjour & Corvalan, 2008). A large proportion of these diseases are related to diarrhea incidences which contribute to the mortality rate of about 1.9 million and new diarrhea cases estimated at 4 billion annually especially among children under five years old (Boschi-Pinto, Velebit & Shibuya, 2008). Developing countries account for around 19% of those mortality rates (Boschi-Pinto *et al* 2008).

Safe and adequate water supply and sanitation in schools are pre-requisites for the right to basic education for school children (Mooijman, 2012). The provision of adequate

water, sanitation and hygiene (WASH) facilities in schools has been linked to the achievement of the Millennium Development Goals (MDGs) on universal primary education, gender equality and child mortality, and more recently to the achievement of the Sustainable Development Goals, and in particular Goal 6 on clean water and sanitation by 2030 (UN General Assembly, 2015). Academic research suggests that access to adequate WASH services in schools may contribute to improved education and health of children by reducing the number of days missed in schools due to menstrual periods, or providing more time for learning tasks (Freeman *et al.*, 2012 Jasper, Le & Bartram, 2012). Adequate WASH in schools could also prevent diarrhoea and gastrointestinal diseases (Lopez-Quintero, Neumark, & Freeman, 2009; Jasper *et al.*, 2012). It is estimated that 94% of the causes of diarrhoeal diseases are attributed to environmental factors, which include unsafe drinking water, poor sanitation and hygiene (Prüss-Ustün & Corvalán, 2006). For example, in 2012, out of the total 1.5 million diarrhoea-related deaths that were reported, an estimated 502,000 and 280,000 deaths were associated with inadequate water and sanitation, respectively (Prüss-Ustün *et al.*, 2014). An all-inclusive access to improved water and sanitation has also been estimated to result in 1.9 billion school days gained due to a reduction of diarrhoeal diseases among students (Hutton & Haller, 2004).

Despite the potential contribution of improved WASH in schools to students' education and health, evidence shows that these benefits can be extremely heterogeneous (Freeman *et al.*, 2012), as they depend on the availability of basic inputs and consumables such as soap, water and anal cleansing materials (Saboori *et al.*, 2011). It is also notable that the success in sustaining these inputs is linked to the presence of an enabling environment that includes government oversight and commitment, provision of adequate funding and an established supply chain, clear roles and responsibilities, monitoring and accountability

(Saboori *et al.*, 2011). Experiences from Zambia have shown that poor WASH affects girls and females disproportionately (Kasongamulilo, 2013; USAID, 2014).

Moreover, in 2015, 56% of the population in Tanzania had access to an improved drinking water supply and only 16% to sanitation, which made Tanzania off track to meet the MDG's target for sanitation (WHO & UNICEF, 2015). With school WASH (SWASH), 40% of the 14,000 primary and secondary schools in Tanzania have no access to a water supply.

Additionally, 84% of schools have no functional hand washing facilities (HWFs), while one latrine serves an average of 56 pupils (Ministry of Education, Science and Technology (MoEST)-SWASH Strategic Plan). In an effort to improve access to improved WASH infrastructures, the Government of Tanzania launched a National Sanitation Campaign (NSC) in 2012 to stimulate demand for sanitation, hygiene and improved water supply in rural areas of Tanzania using community- and school-led total sanitation and sanitation marketing approaches.

2.6 Impact of WASH on student girls academic performance

Discourse on access to WASH in institutions, such as schools, has evolved rapidly and scholarly contributions reflect a strong focus on the interconnections between WASH and education (Sommer, 2010; Bhanumathi & Carmel, 2011; Crofts & Fisher, 2012; Jasper *et al.*, 2012; Chatterley & Thomas., 2013; Jewitt & Ryley, 2014; Deroo, Walter & Graham, 2015). They highlight the mediating role that WASH plays between health and education and the need to ensure access to adequate water supplies and sanitation in schools as a strategy for promoting favourable environments for learning (Sommer, 2010; Jewitt & Ryley, 2014).

Whilst these are useful observations, more still needs to be done, including a full recognition that access to water and sanitation is driven by a whole range of socio-economic, cultural and environmental factors that underpin gender inequalities within the context of

WASH in Schools (WinS). For example, access to WASH in schools by students, whether female or male, goes beyond availability, quantities, location, distance and functionality, as widely debated (e.g. Jasper *et al.*, 2012; Garn *et al.*, 2014; Jewitt & Ryley, 2014; Deroo *et al.*, 2015). Access is also about understanding demand needs and responses by different grades and age groups in schools. Hence more studies are necessary that seek to understand linkages between access to WASH and educational efficiency through a disaggregate analysis of the different ages and grades.

Interventions that deliver hand-washing promotion and point-of-use water treatment have reported reductions in student absence of between 21% (Blanton *et al* 2010) and 61% (Alexander, Odour & Nyothach 2014) with one study specifically identifying reduced absence among girls (i.e., 58% reduction in the odds of absence for girls) (Deroo *et al.*, 2015). A school-based water and hygiene intervention in public primary schools in Kenya found a decrease in student absence of 35% relative to baseline as compared to a 5% increase in neighbouring schools (O'Reilly, Freeman, Ravani & Migele, 2006).

Jasper *et al* (2012) identified a 21% reduction in school absence from all illnesses (e.g., diarrhoea, conjunctivitis, influenza) as a result of an intensive hand-washing campaign in Egypt; absences caused by influenza-like illness, diarrhoea, conjunctivitis, and laboratory-confirmed influenza were reduced by 40%, 33%, 67%, and 50%, respectively. A small pilot study in Ghana entailed provision of sanitary pads and puberty education to adolescent girls in both intervention and control schools, with the intervention found to significantly improve attendance (Montgomery, Ryus, Dolan, Dopson & Scott, 2012). Evaluation of a comprehensive WASH intervention in schools in Bangladesh—using a non-experimental survey design—reported a 9–12% reduction in school absence among girls (varying between schools) (Jasper *et al.*, 2012). A trial of school-based WASH interventions in Kenya found

that cleanliness of latrines was strongly correlated with recent student absence (Dreibelbis, Greene, Freeman, Saboori, Chase & Rheingans, 2013). And a study of hand-washing intervention in Chinese primary schools found that the expanded intervention (standard government education plus hand-washing program, soap for sinks, and peer hygiene monitors) reported 42% fewer absence episodes and 54% fewer days of absence, and the standard intervention (handwashing program) reported 44% fewer absence episodes and 27% fewer days of absence (O'Reilly *et al.*, 2006).

2.7 Impact of WASH on student girl's participation in co-curricular activities

Co-curricular activities are the sources that have been an integral part of the education system; students participate in these kinds of activities and they do not fall into the sphere of normal curriculum and instructional methods. Students at all levels participate in these activities, of all age groups and standards. The areas that come under extra-curricular activities include sports, games, art, music, drama, poetry, student newspaper, clubs and governance. Participation in all these activities or just one of them of student's own interest has been connected to social and academic success; on the other hand, over-participation may be quite demanding and may consume much of their free time and thus interrupt with their academic curriculum as well (Annu & Sunita, 2013).

There are different outlooks of what is considered a co-curricular activity. A few examples of activities outside the school may include activities such as dances, team sports, and performing arts, while inside the school involvement activities may include intramurals, and academic clubs (Annu & Sunita, 2013). Different levels of activity involvement and participation may positively impact future success for those who participate; individuals who render their wholehearted contribution towards the performance of co-curricular activities do

achieve success and sometimes even opt for that activity as their career or profession (Massoni, 2011).

Holloway (2000) found that a relationship exists between the participation of students in co-curricular activities and a decrease in the rate of early school dropouts for both boys and girls. For marginal or at-risk students, participation in co-curricular activities provided opportunities for establishing positive and voluntary connections to their school. In general, participation in co-curricular activities contributes toward the overall development of the individual- personal, social, mental, and physical (Holloway, 2000). The degree to which the high school system offers a variety of learning experiences remains a critical issue. More specifically, for a large percentage of students, particularly those who live in rural school districts, the high school experience serves as the primary, and final forum for learning personal and professional skills in a formal public school environment. One factor contributing to a reduction in the percentage of high school graduates who pursue a college education is the economic realities of this endeavor. In spite of a flourishing economy during the 1990s, the economic disparity in the American workforce continues to widen. The public school system, therefore, plays a critical role in the lives of children. In addition to delivering an overall quality education, high schools, in particular, are positioned as the last chance for the public school system to "level the playing field," and thus, to reduce inequities that impact students' opportunities for achieving success in life (Massoni, 2011).

2.8 Gender issues related to WASH

The need to consider gender issues in the provision of water supplies and promotion of sanitation and hygiene in development has been emphasised for many years (UNICEF, 2003). Research and experiences continue to show that a gender perspective in water, sanitation and hygiene (WASH) is complex in nature reflecting multiple and difficult issues such as equality,

vulnerability and risks, access, rights and entitlements (Cotton *et al.*, 2013; Dreibelbis *et al.*, 2013; Alexander *et al.*, 2014; Gelaye *et al.*, 2014; Hirve *et al.*, 2015). Poor availability and access to water and sanitation are a major health concern and constitute a principal barrier to the achievement of quality education in schools (Sommer, 2010; Jewitt and Ryley, 2014). Evidence from Sub-Saharan Africa has shown that poor WASH is a common phenomenon within the school environment, particularly emphasising the everyday challenges that many school going girls face in managing their menstrual hygiene where there are inadequate water and sanitation facilities or no service at all (Jewitt and Ryley, 2014). For example, empirical work in Kenya and Tanzania has shown that lack of access to sanitation creates an unfavourable learning environment for teenage girls due to increased risks of menstrual leaks, discomfort and stigmatisation (Nzengya, 2015).

Recently, a paper was published in WASHDEV with a similar analysis (Agol, Harvey & Maíllo, 2018); however, the discussion on this analysis is narrow and lacks contextualisation of gender and development in the WASH sector. This analysis deepens the existing conceptualisations of gender inequalities which are inherent in WASH, drawing attention to the theories of access, vulnerability and empowerment (Bhanumathi & Carmel, 2011; Mbatha, 2011; Klasen, Lechtenfeld, Meier & Rieckmann, 2012) and the ways these are embedded in the broader gender and development discourse. The starting point is the entrenched belief that development programmes need to consider gender in the provision of water supplies and promotion of sanitation and hygiene (Giné-Garriga *et al.*, 2017). Universally, there remains a strong focus on how the different needs of men and women determine access to, and power and control over access to, water supply, sanitation and hygiene facilities and services (Mbatha, 2011). In many parts of the world, particularly in developing countries, poor access and availability of water and sanitation tend to compromise

women's practical needs putting them in disadvantaged positions compared to men (Gelaye et al., 2014; Jewitt and Ryley, 2014)

An important theory which surrounds gender inequalities in poor WinS situations is vulnerability (Jewitt and Ryley, 2014). Within the framework of vulnerability, a growing evidence base draws attention to the various risks and dangers associated with lack of access to WASH by women (Hirve *et al.*, 2015). In vulnerability terms, these dangers range from physical to psychological risks such as diseases, bodily harm, harassment and sexual abuse (Agol & Harvey, 2018). In schools, the interactions between adolescent girls and boys in WASH-deficient conditions can create unsafe spaces for sexual harassment and instil fear in young girls (Jewitt and Ryley, 2014). In Kenya, for example, poor access to sanitation was found to be a significant barrier to girls' mobility and it is therefore quite understandable when girls miss schools during their menstrual cycle (Agol & Harvey, 2018).

Poor WASH is particularly problematic for teenage girls who often face difficulties in managing their menstrual hygiene (Sommer, 2010; Crofts & Fisher, 2012). Hence efforts to provide adequate water supplies and sanitation services would be much more beneficial to girls from the ages of 13 compared to boys of the same age range due to the critical need of girls for personal hygiene (Hirve *et al.*, 2015). Experiences across the world show that the lack of water and sanitation has far-reaching impacts on women's health and livelihoods; access to clean potable water and good sanitation can make a difference for mothers and babies (UN Women, 2018). In rural Nepal, menstruation is a taboo and girls face the risk of sexual harassment and exploitation with potential to be absent from school.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This Chapter looks at how data was gathered for the research, the research method employed in the study, the data collection techniques used and the target population, the sample size and the sampling technique and data analysis method used.

3.2 Profile of the study area

The Akuapem South District is one of the districts in the Eastern Region of Ghana. It was established on 6th February 2012 by an Act of Parliament (Legislative Instrument 2040). The district was carved out from the old Akuapem South Municipality. The district has Aburi as the capital, and it is about 20km from Accra, the national capital and has a population of 37,501 (Ghana Statistical Service, 2014).

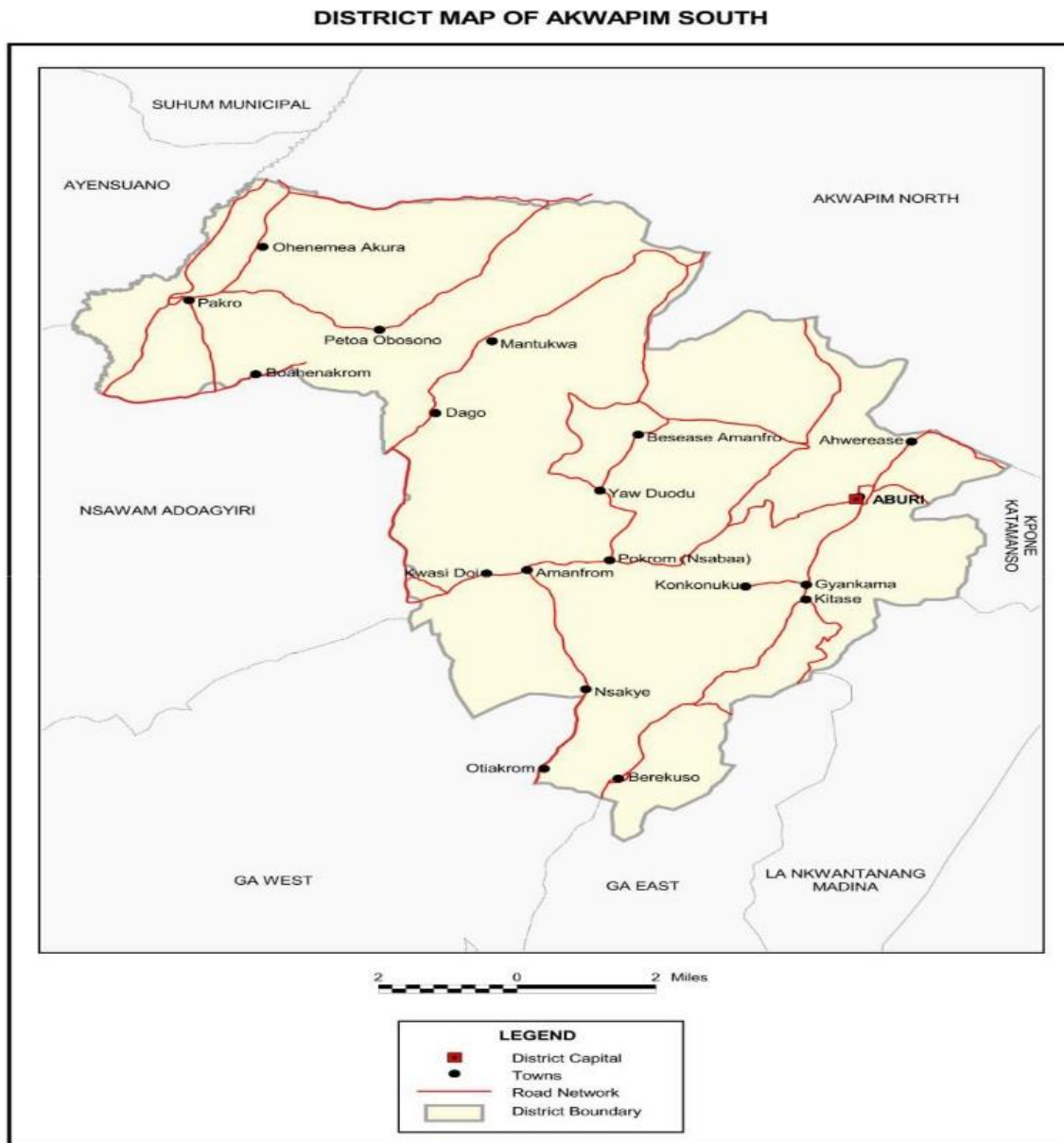
The weather condition in the district is generally cold. The relief of the district is generally categorized into two main zones. These are the Akuapem-Togo Ranges and the Accra Plains. The plains constitute a potential for irrigation and mechanized farming. The hills provide a good view of the Accra Plains which is an attractive site for tourism development and first class residential estate development. Quarrying activities taking place at the foot of the ridge supply aggregates for the construction industry in the district and in Accra.

The District can boast of the following educational facilities: 33 public and 27 Pre-schools, 32 public and 27 primary schools, 27 and 10 public and privates JHS respectively, 4 public and 1 private SHS and one College of Education. The main source of water in the District for drinking is borehole constituting 33.7 percent with 18.3 percent of households drinking from rivers and streams. There exist only 15 public KVIP facilities to households in

the district. These available toilet facilities in the district are skewed towards the urban communities (Akuapem South District Assembly, 2016).

Source: Ghana Statistical Service, GIS

Figure 1: Map of the Study Area



3.3 Research design

The study employed descriptive research design by collecting, organizing and summarizing data from the selected Senior High Schools in order to answer the research questions. Qualitative and quantitative approach were also used for the study. The methods used under the qualitative approach include field visits, observation and questionnaire. Field visits were undertaken prior to data collection using the questionnaire.

3.4 Target population

The entire Senior High School Girls population in public senior high schools of Akuapem South District was taken as the population universe of this study. This is because the aim of this research is to examine access to water sanitation and hygiene facilities among SHS girls, therefore, every SHS girl within the district qualifies to give information on the topic. Due to the large size of the population of SHS girls in the district, a target population from three (3) Senior High Schools within the Akuapem South District was considered.

3.4.1 Sample and sampling procedure

The Simple random technique was used to select three senior high schools out of the four and individual girls in these schools. The advantage of this method is that all elements within the sample have an equal chance of being selected (McLeod, 2014). A lottery was used in the selection. The researcher wrote YES and NO on pieces of paper and put them into a basket. Students were made to pick the pieces of papers from the basket. Those who picked YES were the students selected as respondents for the study.

3.4.2 Sample size

A total of 120 respondents were selected for this study. This was made up of forty (40) respondents each from the three selected schools. Form masters and mistresses were contacted to help get the respondents. These respondents were selected based on their availability and willingness to partake in the study.

3.5 Data collection instrument

A questionnaire made up of both open and closed ended questions was used to gather data for the study. The questionnaire was developed by the researcher based on the research objectives. In all, the Close-Ended questions dominated the questionnaire. This was deliberately done to make the answering of the questionnaire easy for the respondents. The questionnaire was structured based on the objectives of the research and a section for socio-demographic information on respondents.

3.6 Data collection method

The questionnaire was used for data collection. The questionnaire was pre-tested to ensure its suitability to collect the required data to answer the research questions. It was tested with five students from one of the selected senior high schools.

The researcher sought permission from the school authorities of the selected senior high schools before administering the questionnaires. The researcher went to classes chosen by the school authorities to administer the questionnaire. The students who chose YES during the sampling were given the questionnaires and were taken through the questionnaire.

The questionnaire was distributed personally with assistance from some teachers in the selected schools. After two days the researcher went to the selected schools to collect the completed questionnaire.

3.7 Data analysis

Data analysis consists of getting meaning out of the data collected in a particular study. Data analysis includes the usage of statistical procedures to analyze and summarize the data collected to derive a meaning. Data cleansing began immediately after data collection. This the researcher did by going through each questionnaire to find out if all the questions have been answered before entering the data into the management tool. The data was coded after the cleansing to facilitate categorization and analysis by transforming the data into suitable format for computer-aided analysis. Descriptive statistics including frequency tables and simple percentages were computed. This analysis was done using Statistical Package for Social Sciences (SPSS) software and Microsoft Excel.

3.8 Ethical issues

The study considered the need to protect the dignity and privacy of respondents. The consent of was sought from management of the selected schools to use their schools for this study. Respondents consent was also sought before data collection. Assurances were given to the respondents that their identity will be protected.

CHAPTER FOUR

RESULTS AND DISCUSSIONS

4.1 Introduction

The purpose of the study is to assess the state of existing WASH facilities in selected Senior High Schools, accessibility of female students to school WASH facilities and examine the impact on female students' academic performance and their participation in co-curricular activities. This chapter presents the findings from the study and analyses them vis-à-vis the objectives. This chapter is structured into two sections, the first section summarizes, the general information about the respondents while the second section concentrates on the presentation of data relating to the research questions. The discussion of the findings was attached to the data analysis.

4.2 Demographic characteristics of respondents

The demographic characteristics were very important as these could have influence on the research questions and thus, could help explain views and opinions on issues expressed in the study. The demographic characteristics of respondents used in this study included gender, age, form, religion and program.

Figure 2 shows that 58.3% of the respondents are in SHS 2 while 41.7% of them are in SHS 3. This shows that majority of the respondents in this study are in SHS 2. None of the respondents are in SHS 1 because at the time of data collection, the SHS 1 students have not reported to school.

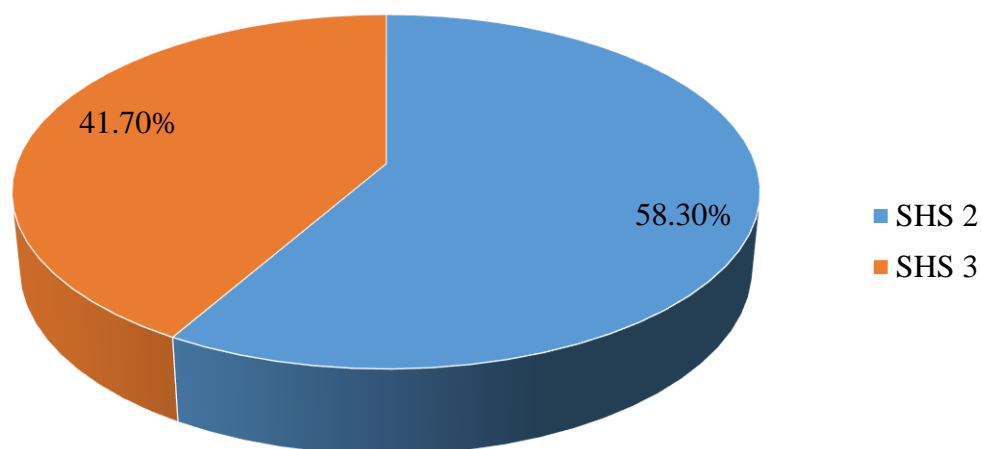


Figure 2: Class/Level of Respondents

Source: Field survey, 2019

The Table 1 talks about the religion of the respondents of which 101 (84.2%) of the respondents are Christians while the 19 (15.8%) are Muslims. This shows that majority of the respondents are Christians. Since these two religious groups are dominant, their responses about water, sanitation and hygiene conditions of the school would be well represented reflecting their practices and requirements.

Table 1: Religious background of respondents

Religion	Frequency	Percentage
Christianity	101	84.2
Islamic	19	15.8
Total	120	100

Source: Field survey, 2019

Table 2 looks at the age category of the respondents where 15 (12.5%) of them falls within the age bracket of 14-15 years with majority of them (79.2%) within the category of 16-18 years while the rest (8.3%) falls within the age of 18-21 years. This indicates that majority of the respondents are in the age bracket of 16-18 years. This is not surprising because that is the average age of students in SHS.

Table 2: Age respondents

Age range	Frequency	Percent (%)
14-15	15	12.5
16-18	95	79.5
19-21	10	8.3
Total	120	100

Source: Field survey, 2019

Table 3 shows that majority of the respondents are General Arts students. It is evident from the table above 51.67% of the respondents are General Arts students while 26.67% are Visual Arts students. In addition 14.16% of the respondents are also Business students with other 7.5% being General Science students. General Art course has been the favorite subject for most SHS students.

Table 3: Programme of study pursued by respondents

Course of Study	Frequency	Percent
General Arts	62	51.67
Visual Arts	32	26.67
Business	17	14.16
General Science	9	7.5
Total	120	10

Source: Field survey, 2019

4.3 Students knowledge about WASH facilities

In table 4 the researcher seeks to find out how the students understand WASH facility. 73.3% of the respondents understand the WASH facility to be availability of clean and potable water while 18.3% respondents said that the availability of toilet facilities is the meaning of the WASH facility. Finally the remaining 8.3% said they understand the WASH facility to be availability of hand washing facilities. The researcher can then conclude that the respondents have an idea of what a WASH facility is.

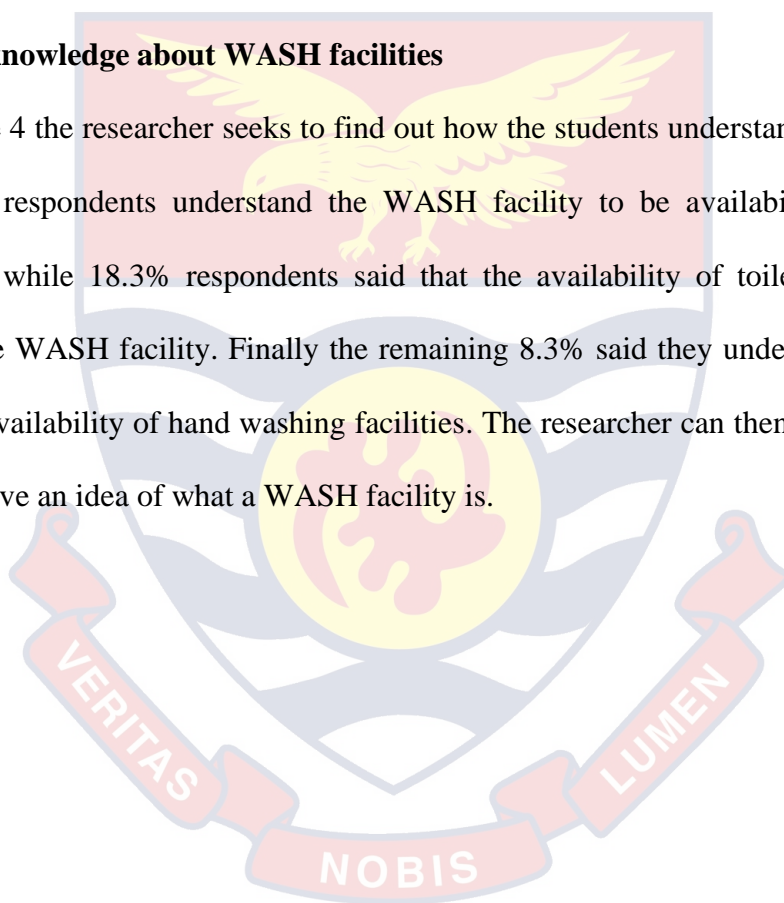


Table 4: Respondents understanding of Water, Sanitation and Hygiene (WASH) facilities

Variable	Frequency	Percent (%)
Availability of clean and potable water	88	73.33
Availability of toilet facilities	22	18.33
Availability of hand washing facilities	10	8.33
Total	120	100

Source: Field Survey, 2019

4.3.1 Availability of WASH facilities in schools

In table 5, 73.3% of the respondents said that they have WASH facilities in the school while the remaining 26.7% said that they do not have the facilities in their schools. This can be concluded that the most of the schools have the facilities in their schools. This contradicts a study by WASH Advocates (2019) which indicated that half of the number of schools in developing countries were without water and sanitation facilities.

Table 5: Availability of WASH facilities in schools

Variable	Frequency	Percent (%)
Yes	88	73.3
No	32	26.7
Total	120	100

Source: Field survey, 2019

4.3.2 Types of WASH facilities in school

The Table 6 shows the number of respondents who said ‘Yes’ to the preceding question. 56.8% of the respondents said that potable water, toilet facilities and Hand washing facilities are available in their school while the rest of the respondents (43.2%) also said that potable water and toilet facilities are available in their school. This shows that majority of the respondents have the basic facilities in their schools. This result is confirmed by UNICEF/WHO (2018) which indicates that 69% of schools globally, had an improved source of drinking water with water available and were therefore classified as providing a basic drinking water service and 66% of schools had improved single-sex sanitation facilities usable at the time of the survey and were therefore classified as providing a basic sanitation services.

Table 6: Types of WASH facilities in school

Variable	Frequency	Percent (%)
Potable water, toilet facilities and Hand washing facilities	50	56.8
Potable water, toilet facilities	38	43.2
Total	88	100

Source: Field survey, 2019

4.3.3 Absence WASH facilities in school

Table 7 talks about the students who said they do not have the WASH facilities in their school. 84.4% said that that they fetch water from the community whiles the remaining 15.6% also said that they use personal hand sanitizers for hand hygiene. This is to confirm what the respondents said in question 7. This result is in line with UNICEF &WHO (2018) which said that 19% of schools worldwide had no service, meaning they either relied on

unimproved sources, such as an unprotected dug well, unprotected spring or surface water, or had no facility at all and also about 23% of schools worldwide had no service, and either relied on unimproved facilities, such as pit latrines without a slab or platform, hanging latrines or bucket latrines, or had no sanitation facility at all.

Table 7: Absence WASH facilities in school

Variable	Frequency	Percent (%)
Fetch water from the community	27	84.4
Use personal hand sanitizers for hand hygiene	5	15.6
Total	32	100

Source: Field survey, 2019

4.3.4 Satisfaction with the WASH facilities

Although the WASH facilities are available in most of the schools the respondents believed that they are not satisfied with their schools' WASH facilities. This is evident when 66.3% of the respondents said that they are not satisfied with the facilities in their schools while 36.7% of the students said that they are satisfied with facilities available. This shows that much must be done in the schools to improve upon the WASH facilities to make it suitable and supportive of student learning, especially the girl child. This has been presented in Table 8

Table 8: Satisfaction with the WASH facilities

Variable	Frequency	Percent
No	76	66.3
Yes	44	36.7
Total	120	100

Source: Field survey, 2019

4.4 Ideal WASH facility

In Table 9, the researcher sought to find out from the respondents who said they are not satisfied with their schools' wash facilities what their ideal wash facilities are. Thirteen respondents representing 17.11% said that their ideal WASH facility should be the availability of clean water within the school whiles 45 of the respondents representing 59.21% also said that their ideal WASH facility is availability of toilet facilities within the school. The remaining 18 respondents representing 23.68% also agreed that the availability of hand washing facilities within the school is their ideal WASH facility. This indicates that the availability of toilet facilities within the school is what is considered as the ideal WASH facility.

Table 9: Ideal WASH facility

Variable	Frequency	Percent (%)
Availability of toilet facilities within the school	45	59.21
Availability of clean water within the school	13	17.11
Availability of hand washing facilities within the school	18	23.68
Total	76	100

Source: Field survey, 2019

4.5 Frequency of use of WASH facilities in school

Table 10 was in relation to how often respondents use WASH facilities in the school. Thirty two of the respondents representing 26.7% use the WASH facility once a day while the remaining 88 respondents representing 73.3% do use the WASH facility twice a day. This shows that at least the respondents do visit the facilities. This confirms a report by Upadhyay, Mathai & Reed (2008) that meeting the required toilet per student ratio is necessary, as evidence indicates that students are likely not to use the toilets when there is a queue, particularly during the planned breaks.

Table 10: Frequency of use of WASH facilities in school

Variable	Frequency	Percent
Once a day	32	26.7
Twice a day	88	73.3
Total	120	100

Source: Field survey, 2019

4.5.1 Maintenance of the facilities

Respondents were asked to give reasons to the answers given above. 73 respondents representing 60.83% said that the facilities are not enough with 40 respondents representing 33.33% also said that the environment around the facilities is not clean. In addition 7 respondents representing 5.84% also said that the facilities are not in good shape. This clearly shows that the facilities in the various schools are not enough. This results is affirmed by (Galan, Kim, & Graham, 2013) who indicated that Sub-Saharan Africa has the greatest water and sanitation challenges. This has been presented in Table 11 below.

Table 11: Maintenance of the facilities

Variable	Frequency	Percent
The facilities are not enough	73	60.83
The environment around the facilities is not clean	40	33.33
The facilities are not in good shape	7	5.84
Total	120	100

Source: Field survey, 2019

4.6 Access to WASH facilities outside the dormitory during classes' hours

Table 12 indicates that the respondents have access to WASH facilities outside the dormitory during classes' hours every day. This is evident as 77 respondents representing 64.17% said that they have access to the WASH facilities outside the dormitory during classes hours every day while 13 respondents representing 10.83% also said the they do have access once a week. Finally, 30 respondents representing 25% said they have access to twice per week.

Table 12: Duration of access to WASH facilities outside the dormitory during classes' hours

Variable	Frequency	Percent
Every day	77	64.17
Once in a week	13	10.83
Twice per week	30	25
Total	120	100

Source: Field survey, 2019

4.7 Academic performance of students

The Table 13 seeks to rate the performance of students. 15 respondents representing 12.5% said that their academic performance is excellent while 44 respondents representing 36.67% said that their performance is above average. Also 61 respondents representing 50.83% said that their performance is average. This shows that the respondents used for the study is average.

Table 13: Academic performance of respondents

Variable	Frequency	Percent (%)
Excellent	15	12.5
Above Average	44	36.67
Average	61	50.83
Total	120	100

Source: Field survey, 2019

4.8 Non-availability of WASH facilities in school

Table 14 below shows that the non-availability of WASH facilities in school has effect on the academic performance. This is evident when 73.33% of the respondents said that the non-availability of WASH facilities in their school has effect on your academic performance while the remaining 26.67% of the respondents says otherwise. This shows that the non-availability of WASH facilities in schools has effect on their academic performance. This result confirms a study by (Sommer, 2010; Jewitt & Ryley, 2014) which found out that poor availability and access to water and sanitation are a major health concern and constitute a principal barrier to the achievement of quality education in schools.

Table 14: Non-availability of WASH facilities in school

Variable	Frequency	Percent (%)
Yes	88	73.33
No	32	26.67
Total	120	100

Source: Field survey, 2019

4.9 Effect of non-availability of WASH Facilities on academic performance

In Table 15, students showed how the lack of wash facilities affected their academic performance. Majority of the respondents said that they do not attend classes on time. This is evident when 62.5% of the respondents said that they are not able to attend classes on time with 11.36% staying away from class when they soil themselves during menstrual period. Finally, 26.14% said that they do get tired after searching for water. The results shows that many contact hours are lost by students for attending class late and staying away from class when they soil themselves during menstrual period. Students who go to class tired are also not able to concentrate in class. All these affect the academic performance of female students negatively. This result confirms scholarly contributions which reflects a strong focus on the interconnections between WASH and education (Sommer, 2010; Bhanumathi & Carmel, 2011; Crofts & Fisher, 2012; Jasper et al., 2012; Chatterley & Thomas., 2013; Jewitt & Ryley, 2014; Deroo et al., 2015).

Table 15: Effect of non-availability of WASH facilities on academic performance

Variable	Frequency	Percent (%)
Not able to attend classes on time	55	62.5
Stay away from class when I soil myself during menstrual period	10	11.36
Get to class tired after searching for water	23	26.14
Total	120	100

Source: Field survey, 2019

4.10 Participation in co-curricular activity

The Table 16 below shows that the respondents participates in the co-curricular activity. 70.83% respondents said that they participates in the co-curricular activity while the 29.17% said they do not. This is shown in Table 16 below:

Table 16: Participation in co-curricular activity

Variable	Frequency	Percent (%)
Yes	85	70.83
No	35	29.17
Total	120	100

Source: Field survey, 2019

4.10.1 Kind of co-curricular activity

In Table 17, the respondents were asked to indicate whether they engage themselves in any kind of co-curricular activity. About 45.45% respondents engaged themselves in the sporting activities while 22.73% also said that they belong to the Drama group. Furthermore,

31.82% of the respondents also said that they belong to the debating club. This shows that all the respondents engage in various co-curricular activities.

Table 17: Kind of co-curricular activity

Variable	Frequency	Percent (%)
Sports	40	45.45
Drama	20	22.73
Debating	28	31.82
Total	120	100

Source: Field survey, 2019

4.10.2 Absence of WASH facilities and its impact on students participation in co-curricular Activities

The Table 18 shows that the absence of WASH facilities in the various schools affect the performance of the respondent ability to participate co-curricular activities. This is evident when 73.33% of the respondents believe that the absence of WASH facilities in their school has affected their ability to participate in co-curricular activities. The remaining 26.67% believe that the absence of the WASH facilities has not affected them.

Table 18: Absence of WASH facilities and its impact on students' participation in co-curricular Activities

Variable	Frequency	Percent
Yes	88	73.33
No	32	26.67
Total	120	100

Source: Field survey, 2019

As to how the absence or inadequacy of WASH facilities affect the students, the responses from them shows that, the absence of the WASH facilities affect their ability to participate in the co-curricular. Sometimes they stain themselves especially when they are in their mensuration period. They also feel uncomfortable when they do not get water to bath which eventually prevents them from participating in the co-curricular activities. Although some of the respondents said that without the WASH facilities they are able to participate in the co-curricular activities but failed to give a specific reason to that effect. This means some of the respondents might just feel comfortable even though there are no adequate facilities.

4.11 Ways to improve WASH in schools.

Respondents were asked to identify ways that WASH facilities can be improved in schools. Fifty students representing 41.67% of the respondents said that more wash facilities should be provided with (25%) of respondents saying renovating the existing facilities will improve WASH in schools. Fifteen students representing 12.5% of respondents said water storage facilities should be cleaned regularly while 4.17% said disinfectants should be supplied regularly with 16.67% of respondents saying hand washing facilities should be provided. This shows all the above mentioned facilities should be available in order to improve WASH in schools. This is presented in Table 19.

Table 19: Ways to Improve WASH in Schools

Variable	Frequency	Percent
Provide more wash facilities	50	41.67
Renovate existing WASH facilities which are not in good shape	30	25.00
Regularly clean water storage facilities	15	12.50
Regular supply of disinfectants to clean toilet facilities	5	4.17
Provision hand washing facilities	20	16.67
Total	120	100.00

Source: Field survey, 2019

Students indicated that it is important to make adequate WASH facilities available in the schools so that students can have access to it at any given time of their choice. With adequate facilities available, one can say that having access to it may not be a challenge for them.

State of existing WASH facilities in selected senior high schools

The researcher embarked on a number of field visits to get acquainted with the water and sanitation situation in the selected senior high schools. There were a lot of observations made during these visits. During the visits to the schools to assess the state of the existing WASH facilities, it was found that the selected schools had basic water, sanitation and hygiene facilities. Some of the selected schools had toilet facilities, mechanized boreholes which pumped water into storage tanks and a few hand washing facilities. Some of the facilities had broken down over a period of time especially the toilet facilities.

It was realized that the wash facilities are inadequate compared to the students' population. The few hand washing facilities were not closer to the toilet facilities as such some of the students do not wash their hands after using the toilet facilities. There were no soap available for students to use to wash their hands. The urinals outside the dormitories (those at classroom area) had no dustbins in which female students can dispose their used sanitary pads after changing. Some of the urinals at the classroom area had no doors which made privacy during its usage non-existent.



CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter summarizes and concludes the study. It offers some policy recommendations. The first aspect deals with summary of the findings of this study; the second section provides the conclusions of the study. Finally, the last section presents recommendations based on the findings from the topic.

5.2 Summary of findings

The purpose of the study is to assess the state of existing school water, sanitation and hygiene facilities, assess the accessibility of the water and sanitation facilities to female students, examine the impact on their academic performance and the effects on their participation in extra curricula activities among girls in Presbyterian Senior High Technical School, Aburi, Adonteng Senior High School, Aburi and Diaspora Girls Senior High School, Obodan. Both quantitative and qualitative approach was also used for the study which involved collecting and analyzing the data gathered in succession. The qualitative data was collected and analyzed in the sequence to help explain, or elaborate on, the quantitative results obtained in the first phase. The researcher used several methods under the qualitative method to collect information for the study. These methods includes, field visits, observation and questionnaires. The researcher was keen on observing and taking notes of important issues on the topic under investigation. Field visits were embarked on prior to data collection to have firsthand information on issues pertaining to sanitation and hygiene.

It could be seen that majority of the respondents understand what a WASH facility is. 73.33% of the respondents understand it to be availability of clean and potable water, while 18.33%

understand it to be availability of toilet facilities with the remaining 8.33% understanding it to be availability of hand washing facilities. Most of the schools also have the basic facilities in their schools as 73.3% answered yes to the question if they have WASH facilities in their school while 26.7% answered no. It was realized that some of the respondents (27) fetched water from the community where their school is located while five (5) use personal sanitizers for hand hygiene since they do not have WASH facilities in their school.

Furthermore, most of the respondents (66.3%) are not satisfied with the WASH facilities in their school but other respondents (36.7%) are satisfied with their facilities. Seventy six percent (76.3%) of the respondents who are not satisfied with the WASH facilities in their school indicated that the availability of clean water and toilet facilities within the school is considered as their ideal WASH facility with the remaining 23.7% indicating the availability of hand washing facilities within the school as their ideal WASH facility. The respondents again said even though the facilities are not adequate or enough yet they do use the facility. Seventy-three percent (73.3%) use the facilities twice a day while 26.7% the facilities once a day.

Additionally, although the respondents have access to WASH facilities outside the dormitory during classes' hours, only 64.17% have daily access, 10.83% have access once in a week and 25% have access twice in a week. The facilities are not adequate to cater for their need.

The respondents again said that they normally attend classes late because sometimes they have to queue to use the WASH facilities. In a related development, the respondents said that the inadequate WASH facilities in the various schools affected their performance and their ability to participate in co-curricular activities. Finally, the respondents said that the adequate provision of the following facilities (provide more wash facilities, renovate existing WASH

facilities which are not in good shape, regularly clean water storage facilities, regular supply of disinfectants to clean toilet facilities) is considered as ideal WASH facility.

5.3 Conclusions

Based on the findings the following conclusions can be drawn. From the observations made during field visits, the researcher can conclude that most the existing WASH facilities in the selected schools are in good condition. However, some of the facilities have also broken down or are in poor state. Some of the schools using water closets have some of them not fully functioning as students have to fetch water with their buckets to flush the toilets. Dustbins are also not adequate especially on the toilet facilities. Schools that use mechanized borehole to pump water into overhead tanks also suffer from water shortage when the lights go off for days.

Female students have access to WASH facilities in their schools. This conclusion is based on the fact that 73.3% of respondents have WASH facilities 88 respondents representing 73.3% use the WASH facilities in their schools twice a day while 32 respondents representing 26.7% use the facilities once a day. The availability of WASH facilities have an impact on the academic performance of students. The non-availability or inadequate facilities have a negative impact on the academic performance of female students. This conclusion was reached as 73.3% of the respondent said the non-availability of has effect on their academic performance. Out of this number, 62.5% are not able to attend classes on time while 26.14% get to class tired after searching for water. The remaining 11.36% stay away from class when they soil themselves during their menstrual period. All these affect the academic performance negatively.

Most of the respondents (97.33%) believe the absence of WASH facilities have effects on their ability to participate in co-curricular activities. This is because they feel uncomfortable when they do not get water to bath. This eventually prevents them from participating in co-curricular activities.

5.4 Recommendations

Based on the findings of the study, several recommendations that have important policy ramifications have been identified and are stated for the various stakeholders to act on them.

For Ghana Educational Service and Development Partners

1. Adequate WASH facilities should be provided to the senior high schools to meet the sanitary and hygiene needs of students especially the girls' schools because it is important to understand that females have specific needs when it comes to water and sanitation issues.
2. Hygiene lessons should be integrated on the school time table to make room for the effective teaching and learning of topics that will again cater for the differential needs of students instead of teaching hygiene at assemblies.

For School Management Authorities

3. The schools should partner with NGO'S to support them with the basic WASH infrastructure.
4. The schools should allocate resources to maintain and renovate the existing WASH facilities. This can be done through internally generated funds which accrue from renting out their schools to campers.

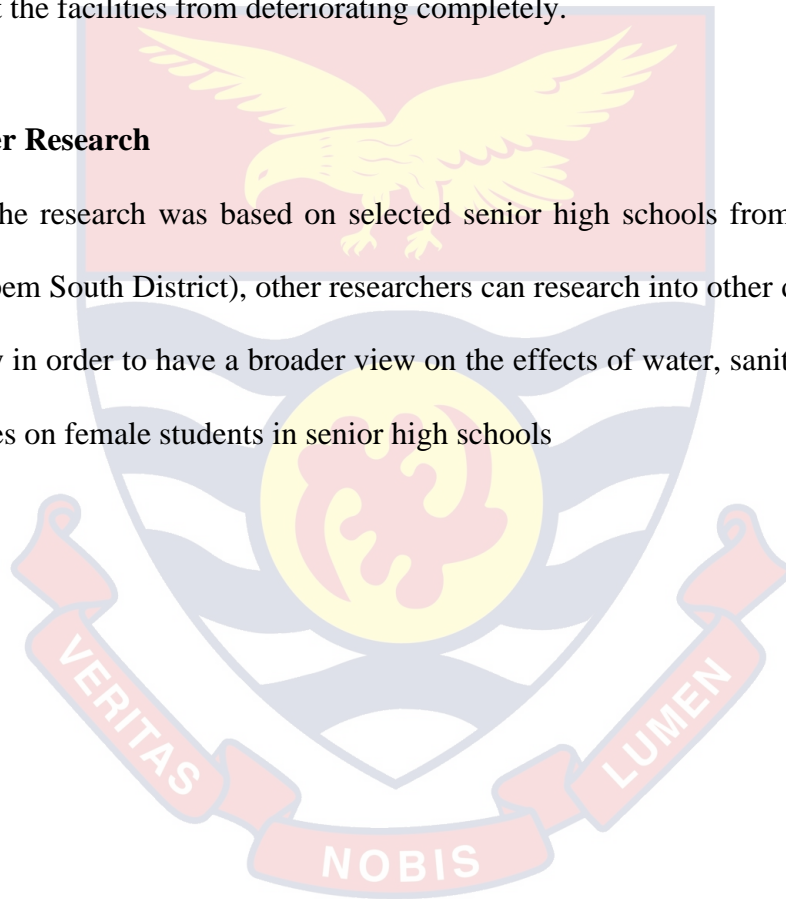
5. Encouraging the involvement of stakeholders in education including NGOs, and community members (PTAs) in the provision of sanitation and hygiene facilities for schools to meet the hygiene needs of students in schools.

For Students

6. Students should take good care of the few WASH facilities available in their schools. Any breakages and leakages should be immediately reported to school authorities to prevent the facilities from deteriorating completely.

For Further Research

7. Since the research was based on selected senior high schools from only one district (Akuapem South District), other researchers can research into other districts within the country in order to have a broader view on the effects of water, sanitation and hygiene facilities on female students in senior high schools



REFERENCES

- Agol, D. & Harvey, P. (2018). Gender differences related to WASH in schools and educational efficiency. *Water Alternatives 11*(2): 284-296
- Agol, D., Harvey, P. & Maíllo, J. (2018). Sanitation and water supply in schools and girls' educational progression in Zambia. *Journal of Water, Sanitation and Hygiene for Development 8*(1): 53-61.
- Alabi, J. O. (2010). Nigeria and Environmental Sanitation
http://Nigerianmasterweb.com/.../indexphp/2010/10/05/title_10.
- Alexander, K., Oduor, C. & Nyothach, A. (2014). Water, sanitation and hygiene conditions in Kenyan rural schools: Are schools meeting the needs of menstruating girls? *Water 6*(5): 1453-1466.
- Alouka, S. (2006). Integrating gender into the promotion of hygiene in schools. New York, United Nations (in press).
- Annu, S., & Sunita, M. (2013). Impact of extracurricular activities on students in private school of Lucknow District. 2(6), 92-94. Retrieved September 16, 2014 from [http://www.ijhssi.org/papers/v2\(6\)/Version-1/O0261092094.pdf](http://www.ijhssi.org/papers/v2(6)/Version-1/O0261092094.pdf)
- Bastien, S., Hetherington, E., Hatfield, J., Kutz, S., & Manyama, M. (2016). Youth-driven innovation in sanitation solutions for Maasai Pastoralists in Tanzania: Conceptual Framework and Study Design. *Global Journal of Health Education and Promotion, 17*(1).
- Bener, A. Kamal, M. & Shanks, N. J. (2007). "Impact of asthma and air pollution on school attendance of primary school children: are they at increased risk of school absenteeism?" *Journal of Asthma*, vol. 44, no. 4, pp. 249–252, 2007.

- Bhanumathi, D. & Carmel, M.R. (2011). Poor access to water and sanitation: Consequences for girls at a rural school. *Agenda* 25(2): 27-34.
- Biswas, K.A. (2004). Integrated water resources management: a reassessment a water forum contribution. *International Water Resources Association* 29(2):248–256
- Blanton, E., Ombeki, S., Oluoch, G., Mwaki, A., Wannemuehler, K & Quick, R. (2010). Evaluation of the role of school children in the promotion of point-of-use water treatment and handwashing in schools and households–Nyanza Province, Western Kenya, 2007. *American Journal of Tropical Medicine and Hygiene*. 2010, 82, 664–671.
- Boschi-Pinto, C., Velebit, L & Shibuya, K. (2008). “Estimating child mortality due to diarrhoea in developing countries,” *Bulletin of the World Health Organization*, vol. 86, no. 9, pp. 710–717, 2008.
- Chatterley, C. & Thomas, A. (2013). Snapshot of wash in schools in eastern and southern Africa: a review of data, evidence and inequalities in the region.
- Chatterley, C., Linden, K.G. & Javernick-Will, A. (2013). Identifying pathways to continued maintenance of school sanitation in Belize. *Journal of Water Sanitation and Hygiene for Development* 3(3): 411-422.
- Cherutich, J., Timothy, M., & Quinter, O. (2015). Water access and sustainable rural livelihoods: a case of elementaita Division in Nakuru County, Kenya. *International Journal Science, Technology and Society* 3(1):9– 23.
doi: 10.11648/j.ijsts.20150301.12
- Cotton, A. and Saywell, D. (2002). “On-plot sanitation in low-income urban communities”. Water Engineering and Development Centre (WEDC), Loughborough University, Leicestershire, UK. pp 13 - 30

- Cotton, A.; Adams, J. & Shaw, D. (2013). Improving water supply and sanitation programme effectiveness: Lessons from WaterAid's outcome evaluation studies. *Water and Environment Journal* 27(1): 1-9.
- Crofts, T. & Fisher, J. (2012). Menstrual hygiene in Ugandan schools: An investigation of low-cost sanitary pads. *Journal of Water Sanitation and Hygiene for Development* 2(1): 50-58.
- Deroo, L., Walter, E. & Graham, J. (2015). Monitoring and evaluation of WASH in schools programs: Lessons from implementing organizations. *Journal of Water Sanitation and Hygiene for Development* 5(3): 512-520.
- Drangert, J.O. (2004). "Norms and attitudes towards ecosan and other sanitation systems". EcoSanRes Publication Series. Report 2004-5. SEI; Stockholm, Sweden. Available from www.ecosanres.org.
- Dreibelbis, R., Greene, L.E., Freeman, M.C., Saboori, S., Chase, R.P & Rheingans, R. (2013). Water, sanitation, and primary school attendance: A multi-level assessment of determinants of household-reported absence in Kenya. *Int. J. Educ. Dev.* 2013, 33, 457– 465.
- Dufour, A., Snozzi, M., Koster, W., Bartram, J., Ronchi, E., & Fewtrell, L. (2003). "Assessing microbial safety of drinking water: Improving approaches and methods." WHO Drinking Water Quality Series, IWA Publishing, London. www.who.int/water_sanitation_health/dwq/wsp0506/en/index.html.

- Freeman, M. C., Greene, L. E., Dreibelbis, R., Saboori, S., Muga, R., Brumback, B. & Rheingans, R. (2012). Assessing the impact of a school-based water treatment, hygiene and sanitation programme on pupil absence in Nyanza Province, Kenya: a cluster-randomized trial. *Tropical Medicine & International Health* 17, 380–391.
- Galan, D. I., Kim, S.-S., & Graham, J. P. (2013). Exploring changes in open defecation prevalence in sub-Saharan Africa based on national level indices. *BMC Public Health*, 13(1), 1.
- Garcia, L. (1998). Strategy for integrated water resources management. env-125 sustainable development department, interamerican development bank. Washington, DC
- Garn, J.V., Caruso, B.C., Drews-Botsch, C.D., Kramer, M.R., Brumback, B.A., Rheingans, R.D. & Freeman, M.C. (2014). Factors associated with pupil toilet use in Kenyan primary schools. *International Journal of Environmental Research and Public Health* 2014 (11): 9694-9711.
- Gelaye, B., Kumie, A., Aboset, N., Berhane, Y. & Williams, M.A. (2014). School-based intervention: Evaluating the role of water, latrines and hygiene education on trachoma and intestinal parasitic infections in Ethiopia. *Journal of Water Sanitation and Hygiene for Development* 4(1): 120-130.
- Ghana Statistical Service. (2014). 2010 Population and Housing Census. District Analytical Report. Akuapem South District pp2
- Giné-Garriga, R., Flores-Baquero, Ó., Jiménez-Fdez de Palencia, A. & Pérez-Foguet. A. (2017). Monitoring sanitation and hygiene in the 2030 Agenda for Sustainable Development: A review through the lens of human rights. *Science of the Total Environment* 580 (Supplement C): 1108-1119.

- Gottfried, M. A. (2010). "Evaluating the relationship between student attendance and achievement in urban elementary and middle schools: an instrumental variables approach," *The American Educational Research Journal*, vol. 47, no. 2, pp. 434– 465, 2010.
- Grossi, Klimschak, Rachenburg, Shinee and Schmoll (2016). The situation of water, sanitation and hygiene in schools in the pan-European region. Retrieved from http://www.euro.who.int/__data/assets/pdf_file/0020/322454/Situation-water-sanitation-hygiene-schools.pdf?ua=1
- Guerrant, R. L., Deboer, M.D., Moore, S.R., Scharf, R. J & Lima, A.A. M. (2013). "The Impoverished gut—a triple burden of diarrhea, stunting and chronic disease," *Nature Reviews, Gastroenterology and Hepatology*, vol. 10, no. 4, pp. 220–229, 2013.
- Hirve, S., Lele, P., Sundaram, N., Chavan, U., Weiss, M., Steinmann, P. & Juvekar, S. (2015). Psychosocial stress associated with sanitation practices: Experiences of women in a rural community in India. *Journal of Water Sanitation and Hygiene for Development* 5(1): 115-126.
- Holloway, J. H. (2000). Extracurricular activities: The path to academic success. *Educational Leadership*, 57(4), 1-3.
- Hutton, G & Haller, L. (2004). Evaluation of the Costs and Benefits of Water and Sanitation Improvements at the Global Level. *Water, Sanitation, and Health, Protection of the Human Environment*, World Health Organization.

- Hutton, G & Varughese, M. (2016). 'The costs of meeting the 2030 Sustainable Development Goal targets on drinking water, sanitation, and hygiene', summary report. Water and Sanitation Programme, World Bank Group
- Jasper, C., Le, T.T & Bartram, J. (2012). Water and sanitation in schools: a systematic review of the health and educational outcomes. *International Journal of Environmental Research and Public Health* 9, 2772-2787.
- Jewitt, S. & Ryley, H. (2014). It's a girl thing: Menstruation, school attendance, spatial mobility and wider gender inequalities in Kenya. *Geoforum* 56 (Supplement C): 137-147.
- Kasongamulilo, S.H. (2013). Gender and water management: Its implications on women empowerment. Master thesis on Integrated Water Resource Management (MSc. IWRM). University of Zambia, Lusaka, Zambia.
- Klasen, S., Lechtenfeld, T., Meier, K. & Rieckmann, J. (2012). Benefits trickling away: The health impact of extending access to piped water and sanitation in urban Yemen. *Journal of Development Effectiveness* 4(4): 537-565.
- Lau, C. H., Springston, E. E & Sohn M.W. (2012). "Hand hygiene instruction decreases illness-related absenteeism in elementary schools: a prospective cohort study," *BMC Pediatrics*, vol. 12, article 52, 2012.
- Lopez-Quintero, C., Neumark, Y & Freeman, P. (2009)."Hand washing among school children in Bogotá, Colombia." *Am. J. Public Health American Journal of Public Health*.
- Mara, D., Lane, J., Scott, B., & Trouba, D. (2010). Sanitation and health. *PLoS Med*, 7(11), e1000363. doi:10.1371/journal.pmed.1000363
- Massoni, E. (2011). Positive effects of extracurricular activities on students. ESSAI:

- Mbatha, T. (2011). Addressing girls' challenges of water and sanitation in a rural schooling context in Swaziland. *Agenda* 25(2): 35-42.
- McLeod, S. A. (2019). Sampling methods. Simply Psychology.
<https://www.simplypsychology.org/sampling.html>
- Montgomery, P., Ryus, C.R., Dolan, C.S., Dopson, S & Scott, L.M. (2012). Sanitary pad interventions for girls' education in Ghana: A Pilot Study. *PLoS ONE* 2012, 7, e48274.
- Mooijman, A. (2012). Water, sanitation and hygiene (WASH) in schools: A companion to the child friendly schools manual. UNICEF.
- Nzengya, D.M. (2015). The impact of a school-based hygiene education intervention on student knowledge in Kenya. *Journal of Water Sanitation and Hygiene for Development* 5(2): 271-278.
- O'Reilly, C.E., Freeman, M.C., Ravani, M & Migele, J. (2006). The impact of a school-based safe water and hygiene programme on knowledge and practices of students and their parents: Nyanza Province, western Kenya, 2006. *Epidemiol. Infect.* 2008, 136, 80–91.
- Prüss-Üstün, A & Corvalán, C. (2006). Preventing disease through healthy environments. World Health Organization, Geneva.
- Prüss-Üstün, A., Bonjour, S & Corvalán, C. (2008). "The impact of the environment on health by country: a meta-synthesis," *Environmental Health*, vol. 7, article 7, 2008.
- Prüss-Üstün, A., Bartram, J., Clasen, T., Colford, J.M., Cumming, O., Curtis, V., Bonjour, S., Dangour, A. D., De France, J & Fewtrell, L. (2014). Burden of disease from inadequate

water, sanitation and hygiene in low-and middle-income settings: a retrospective analysis of data from 145 countries. *Tropical Medicine & International Health* 19, 894–905.

Rahman, M. (2011). People's perception about sanitation.

Reid, K. (2003). "A strategic approach to tackling school absenteeism and truancy: the PSCC scheme," *Educational Studies*, vol. 29,no. 4, pp. 351–371, 2003.

Saboori, S., Mwaki, A., Porter, S., Okech, B., Freeman, M. & Rheingans, R. (2011). Sustaining school hand washing and water treatment programmes: lessons learned and to be learned.

Samra, S.C.J & Fawzi, S.C.M. (2011). The right to water in rural Punjab: assessing equitable access to water through the Punjab rural water supply and sanitation project. *Health Human Rights* 13(2):36–49

Satterthwaite, D. & Mcgranahan, G. (2007). Providing clean water and sanitation. State of the world 2007: Our urban future. L. Starke. New York/ London, Earthscan: 26-47

Seto, K.C., Parnell, S., & Elmqvist, T. (2013). A global outlook on urbanization. In urbanization, biodiversity and ecosystem services: Challenges and opportunities; Elmqvist, T., Fragkias, M., Goodness, J., Güneralp, B., Marcotullio, P.J., McDonald, R.I., Parnell, S., Schewenius, M., Sendstad, M., Seto, K.C., et al., Eds.; Springer:

Sommer, M. (2010). Where the education system and women's bodies collide: The social and health impact of girls' experiences of menstruation and schooling in Tanzania. *Journal of Adolescence* 33(4): 521-529.

- Sommer, M., Vasquez, E., Nancy, W., & Sahin, M. (2012). WASH in Schools Empowers Girls' Education: Proceedings of the Menstrual Hygiene Management in Schools Virtual Conference. Retrieved from https://www.unicef.org/wash/schools/files/WASH_in_Schools_Empowers_Girls_Education_Proceedings_of_Virtual_MHM_conference.pdf
- UN Women. (2018). SDG6: Ensure availability and sustainable management of water and sanitation for all. www.unwomen.org/en/news/in-focus/women-and-the-sdgs/sdg-6-clean-water-sanitation.
- UNDESA, Population Division (2014) <https://esa.un.org/unpd/wup/>
- Un-Habitat, (2001). Cities in a globalizing world: Global report on human settlements 2001, United Nations Human Settlements Programme, Nairobi. Available at:URL:<http://www.unhabitat.org/content.asp?typeid=19&catid=555&cid=5374>
- UNICEF (United Nations Children's Fund). (2003). *Gender mainstreaming in water and sanitation*. New York: United Nations Children's Fund.
- UNICEF and WHO, (2008). Progress on Drinking Water and Sanitation: Special Focus on Sanitation, p.6-22.
- UNICEF (2012). WASH in Schools Empowers Girls' Education in Rural Cochabamba, Bolivia An Assessment of Menstrual Hygiene Management in Schools. Retrieved from https://www.unicef.org/wash/schools/files/Bolivia_MHM_Booklet_DM_15_Nov_single_0940_Bolivia.pdf
- United Nations General Assembly. (2015). Transforming Our World: the 2030 Agenda for Sustainable Development. United Nations, New York.

<https://sustainabledevelopment.un.org/post2015/transformingourworld> (accessed 12 November, 2017).

United Nations. (2010). United Nations Sustainable Management of Water Resources Vital to Achieving Anti-Poverty Goals Delegates Told as General Assembly High Level Dialogue Marks World Water Day; General Assembly GA/10925; United Nations: New York, NY, USA. Available online: <http://www.un.org/News/Press/docs/2010/ga10925.doc.htm>

United Nations, (2008). Universal Declaration of Human Rights. Geneva: United Nations Organization. University of North Carolina Press.

United Nations Children's Fund (UNICEF) & World Health Organization. (2018). Drinking water, sanitation and hygiene in schools: global baseline report 2018. New York

Upadhyay, V., Mathai, J. & Reed, P. W. (2008). Primary school children: access to toilets. *Acta Paediatrica* 97, 1546–1549.

USAID (United States Agency for International Development). (2014). Baseline survey: School WASH facility assessment in Zambia. Zambia, USAID Publication http://washplus.org/sites/default/files/splash-baseline_survey2014.pdf Vol. 9, Article 27. Retrieved September 14, 2014 from <http://dc.cod.edu/cgi/viewcontent.cgi?article=1370&context=essai>

WASH Advocates (2019). *WASH and Schools*. Retrieved from <https://www.washadvocates.org/learn/schools/>

WHO/UNICEF. (2010). Progress on sanitation and drinking water: 2010 Update, WHO/UNICEF Joint Monitoring Programme for Water Supply and Sanitation

WHO & UNICEF. (2015). Progress on Drinking Water and sanitation: 2015 Update. World Health Organization, Geneva.

- WHO/UNICEF. (2016). Pre-SDG consultations by the WHO/UNICEF Joint Monitoring Programme and the UN-Water Wastewater Taskforce established consensus on the need to go beyond access to a sanitation facility and address safe management of excreta right along the sanitation chain. Therefore, the proposed SDG indicator 6.2.1 states that safely managed sanitation services comprise an improved sanitation facility, which is not shared with other households, and where excreta are either safely disposed of in situ or treated off-site. Source: GEMI – Integrated Monitoring of Water and Sanitation Related SDG Targets Step-by-step monitoring methodology for indicator 6.2.1 V1 21 October 2016
- WHO. (2009). Water, sanitation and hygiene standards for schools in low-cost setting. In: Adams J, Bartrana J, Chartier Y, Sims J (eds), WHO press, Geneva 27
- World Health Statistics. (2009). “Percentage distribution of causes of death in under-5 children, 2004,” 2009, http://www.emro.who.int/cah/pdf/under5_deaths_egy_04.pdf. www.washwatch.org/en/countries/zambia/summary/statistics/
- Young, G.J., Dooge, J.C.I & Rodda, J.C. (1994). Global water resources issues. Cambridge University Press, Cambridge

APPENDICES

A. QUESTIONNAIRE

PRESBYTERIAN UNIVERSITY COLLEGE, GHANA

FACULTY OF DEVELOPMENT STUDIES

M.A (INTERNATIONAL DEVELOPMENT STUDIES)

RESEARCH QUESTIONNAIRE

This questionnaire is aimed at finding the effects of water, sanitation and hygiene facilities on female students in senior high schools. It is purely an academic exercise aimed at fulfilling part of the requirement for the award of a Master of Arts degree in International Development Studies.

Your objective opinion will go a long way to make the research successful. Kindly answer the questions below to the best of your ability. You are assured that this questionnaire will be used solely for the purpose stated above and the information gathered would be treated with utmost confidentiality. Thank you in advance for your cooperation.

Instructions: Most of the questions are multiple choices with probable answers given. Kindly (√) your preferred answer.

A. DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS

1. Class:
 - a. SHS 1 ()
 - b. SHS 2 ()
 - c. SHS 3 ()
2. Religion: a. Christianity () b. Islam () c. Traditional d. Others (specify).....
3. Age of respondent.....
4. What course are you pursuing?
5. Sex of respondent ... a. male b. female

B. STUDENTS' KNOWLEDGE ABOUT WASH FACILITIES

6. What do you understand by Water, Sanitation and Hygiene (WASH) facility?
 - a. Availability of clean and potable water
 - b. Availability of toilet facilities
 - c. Availability of hand washing facilities
 - d. Soap for hand washing
 - e. All of the above
 - f. Other, specify.....
7. Do you have any of these facilities in your school?
 - a. Yes ()
 - b. No ()

If Your answer to question 7 is Yes, continue from Question 8, if No, go to Question 9

8. If your answer above is yes, which of the following facilities do you have in your school?
- I. Potable water
 - II. Toilet facilities
 - III. Hand washing facilities
 - IV. Soap for hand washing
 - V. All of the above
- a. I and II
 - b. I, II and III
 - c. I, II and IV
 - d. V
9. If your answer to question 7 above is No, how do you manage yourself without WASH facilities in the school?
- a. Fetch water from the community
 - b. Use the bush around the school for toilet
 - c. Use personal hand sanitizers for hand hygiene
 - d. Any other (specify).....
10. Are you satisfied with the WASH facilities in your school? a. Yes () b. No ()

If Your answer to question 10 is NO, continue from Question 11, if Yes, go to Question 12

11. If your answer to question above is No, indicate your ideal WASH facility
- a. Availability of clean water within the school
 - b. Availability of toilet facilities within the school
 - c. Availability of hand washing facilities within the school
 - d. Any other (specify)
12. How often do you use the WASH facilities in your school?
- a. once a day ()
 - b. twice a day ()
 - c. once per week ()
 - d. others (specify)....
13. Give reasons for your answer to question above.
- a. The facilities are not enough
 - b. The environment around the facilities is not clean
 - c. The facilities are not in good shape
 - d. Any other (specify)
14. How often do you have access to WASH facilities outside the dormitory during classes hours?
- a. Everyday ()
 - b. Once in a week
 - c. Twice per week ()
 - d. others (specify)
15. How do you rate your academic performance?

- a. Excellent () b. Above average () c. Average () d. Below average ()

16. Does the non-availability of WASH facilities in your school has any effect on your academic performance? a. Yes () b. No ()

If Your answer to question 16 is Yes, continue from Question 17, if No, go to Question 18

17. If your answer above is Yes, indicate how it affects your academic performance. (select as many as applied)

- a. not able to attend classes on time
b. stay away from class when I soil myself during menstrual period
c. get to class tired after searching for water
d. Others (specify)

.....

18. Do you take part in any co-curricular activity?

- a. Yes () b. No ()

19. If your answer to question 15 above is Yes, indicate the kind of activity.

- a. Sports () b. Drama () c. Debating () d. Any other (specify).....

20. Do you believe the absence of WASH facilities in your school affect your participation in co-curricular activities?

- a. Yes () b. No ()

21. If your answer to question above is Yes, indicate how it does.

.....
.....
.....

22. If your answer to question 18 is No, what are your reasons?

.....
.....

23. What do you think can be done to improve WASH facilities in your school?

- I. Provide more wash facilities
II. Renovate existing WASH facilities which are not in good shape.
III. Regularly clean water storage facilities
IV. Regular supply of disinfectants to clean toilet facilities
V. Provision hand washing facilities

- a. I only

- a. II,III and IV
- b. III, IV and V
- c. I,II,III, IV and V

24. How do you recommend girls are helped in access to WASH in schools?

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B. Pictures of WASH Facilities in selected schools



Figure 3: Toilet facility

Source: Field survey, 2019



Figure 4: Toilet facility

Source: Field survey, 2019

NOBIS



Figure 5: Toilet facility

Source: Field survey, 2019



Figure 6: Urinal at classroom area

Source: Field survey, 2019



Figure 7: Urinal at classroom area

Source: Field survey, 2019



Figure 8: Overhead water tank

Source: Field survey, 2019



Figure 9: Hand washing facility

Source: Field survey, 2019