

## WHAT ARE THE CONDITIONS OF TOILET FACILITIES USED IN BASIC SCHOOLS? INSIGHTS FROM SOME SELECTED BASIC SCHOOLS IN THE EASTERN AND VOLTA REGIONS OF GHANA

\*<sup>1</sup> Saviour V.K. Adjibolosoo, <sup>2</sup> Joanna Dzeagu-Kudjodji, <sup>3</sup> Jacob, N. Nanor, <sup>4</sup> Issac P. Agbeko. <sup>5</sup> Cynthia Anim

<sup>1, 3 & 4</sup> Physical and Applied Science Department, Presbyterian Women's Colleges of Education, Aburi.

<sup>2</sup> Pre-vocational Skills Department, Presbyterian Women's Colleges of Education, Aburi.

<sup>5</sup> Social Science Department, Presbyterian Women's Colleges of Education, Aburi.

\*<sup>1</sup> Corresponding Author: email: adjisav@yahoo.com

### ABSTRACT

Provision of sustainable clean toilet facilities in schools is critical for good health and well-being of school children. This demand has been heightened in Sustainable Development Goal Six. However, the conditions of toilet facilities use in the basic schools in Ghana is unknown. This study explores the perceptions of pupils and teachers on the conditions of toilet facilities available to them in the basic schools. The study employed mixed methods—quantitative and qualitative approaches. Self-reported data on conditions of school toilets were collected from 400 pupils and 45 teachers in the selected schools using structured questionnaire, focus group discussions, and checklist observation. Quantitative data was analyzed using descriptive statistics and Chi-square test, and the qualitative data was also analyzed using thematic content analysis procedures. The results of the study showed that the conditions of toilet facilities used in the basic schools as revealed by pupils and teachers perceptions was very bad. This bad state of the school toilet system—inadequacy, lack of privacy, poor ventilation, inappropriate squat hole sizes, community and rodents encroachment, and inappropriate location of school toilets, constituted key situational factors preventing pupils from using the toilets. This, the study found to be both policy and situation-driven and thus, raises many questions about the health and environmental implications and level of attention the Ministry of Local Government and Rural Development (MLGRD), Ministry of Education (MOE), and Ghana Education Service (GES) give to conditions of toilet facilities in the basic schools. Bivariate test analysis showed significant correlation between pupils' perceptions and poor quality of the school toilets. (Pupils:  $r = -.122$ ,  $p < 0.05$ ). Analysis of variance showed statistically significant mean difference between teachers perception about the following: pupils queuing to use the school toilet: mean square = 4.715,  $F = .14624$ ,  $p < 0.05$ ; privacy of toilet for both sexes: mean square = 2.115,  $F = 14.675$ ,  $p < 0.05$ ; and appropriateness of toilet squat holes: mean square = 1.677,  $F = 11.816$ ,  $p < 0.05$ . The mean scores for other variables showed no statistically significant difference to report. Also, pair sample t-test showed statistically significant mean differences in toilet use by gender: mean = -1.26518,  $t = -11.937$ ,  $df = 312$ ,  $p < 0.05$ ; settings: mean = -1.46326,  $t = -14.729$ ,  $df = 312$ ,  $p < 0.05$ ; age: mean = 2.82748,  $t = 19.389$ ,  $df = 312$ ,  $p < 0.05$ . The study recommends that the MLGRD, MOE and the GES should set sanitation standards for the basic schools and also make it a national policy that schools are provided with descent toilet facilities and a strong monitoring system is put in place to check the implementation of school sanitation policies and programs. Teachers must also educate school children on proper use of toilets and the need to do so.

**Keywords:** Basic Schools, Toilet Quality, Health Implication, Ghana.

### 1. INTRODUCTION

Access to basic sanitation is considered a fundamental human right by United Nations General Assembly Resolution 64/292 (UNGA, 2010; JMP, 2014). This right has been emphasized in the Sustainable Development Goal (SDG) Six target two which states that by 2030, all nations should eliminate open defaecation through provision of basic sanitation facilities to all. However, about 2.5 billion people, representing 35% globally still do not have access to improved sanitation (JMP, 2014; Prasad, 2012; Rahman, 2010; and Peterson *et al.*, 2008). The implication of this

to the global environment in general and sub-Saharan Africa in particular, is that to achieve the 2030 SDG 6, much greater effort and commitment coupled with additional investments will be required to address inadequate sanitation challenges.

According to World Health Organization (WHO) and UNICEF JMP (2017), Ghana ranked 7<sup>th</sup> worst in the world for access to improved basic sanitation with only 14% of its population having access to basic sanitation.

Recent report by Education Management Information System (EMIS) (2017) in Ghana revealed that about 74,000 out of the 21,438 public basic schools in the country lack toilet facilities suggesting that over two million Ghanaian children in those schools alone are compelled to resort to open defaecation mostly within the immediate surroundings of their schools. Similarly, out of the 9,604 private basic schools operating in Ghana, over 1,631 have no toilets causing an estimated 430,000 pupils in private schools to defecate outside toilet during school hours.

The major negative consequences of this is that children who attend schools without toilet use that as an excuse to go home without coming back to classes. Teachers also use teaching hours to go look for a toilet facility because there are no toilets facilities available. The girls also absent themselves from school during their menstrual period; so every month female students miss classes for at least a week and this affects their studies. Besides, the practice also results in not only infections such as intestinal worms, diarrhoea, cholera, malnutrition and stunting among the school children, but it also leads to absenteeism and truancy among the school children.

In the school system, the major barriers identified to be preventing toilet use among school children include poor maintenance of school toilets, smelly and dirty latrines (Vernon *et al.*, 2003), lack of adequate toilet facilities, higher pupils toilet ratio or overcrowding (Lundblad, 2005) and lack of privacy in toilets. These factors play significant role on whether pupils will use the school toilets. Younger children, especially, felt uncomfortable and unsafe in using the school toilets in such unappealing conditions. This is unacceptable in a country like Ghana, and something agent needs to be done to change the narrative. The costs of waiting for economic growth to slowly solve the problem of poor sanitation in schools in Ghana are almost certainly very high. Ensuring proper sanitation system in schools is important in this twenty-first century as it will help promote good health and environmental cleanliness. This will also assist the country to make progress towards the realization of the post 2015 Sustainable Development Goal on sanitation.

It is against this background that this study explores the perception of pupils and teachers on the quality of toilet facilities used in their schools and suggests measures to improve them.

## 2. LITERATURE REVIEW

Globally, 2.5 billion people do not have access to an improved sanitation facility (WHO/UNICEF/JMP, 2014) and out of this 784 million people use a shared facility of an otherwise improved type whilst 732 million used a facility that does not meet minimum hygiene standards. The remaining 1 billion (representing 15% of the world population with the majority (71%) of those without sanitation live in rural areas (WHO/UNICEF/JMP, 2014) and defaecate in the open.

In Africa's perspective, the continent faces serious constraint to meeting the challenges of providing adequate and improved sanitation for its rural and urban inhabitants. During the period of last Africa Sanitation conference held in Durban, South Africa in 2008, approximately 300 million Africans were without access to basic sanitation facilities (WHO/UNICEF, 2008a). This figure, however, has increased even more since then. According to that report (WHO/UNICEF/JMP, 2008a) only 60% of the African population has access to improved sanitation services. This number further grew by about 195 million in Africa between 1990 and 2011 (WHO/UNICEF/JMP, 2013). Although this is a definite improvement, the figures are still too low to achieve the SDG sanitation targets by 2030 suggesting that more proactive and innovative strategies needed to accelerate the process.

In sub-Saharan Africa, sanitation coverage has gone through checked history. In 2010, more than 2.5 billion people still lacked access to improved sanitation (Mara *et al.*, 2010). The number of people with access to improved sanitation facilities grew by about 129 million between 1990 and 2011 (WHO/UNICEF/JMP, 2013). Despite this increase, the majority of sub-Saharan African countries have very limited access to improved sanitation, with an average of only 30% across the whole region (AMCOW, 2012). The current trend of sanitation services in sub-Saharan

Africa (SSA) which served as home to less than 10% of the global population have been very devastating. For example, information for 32 countries in the African Infrastructure Country Diagnostic (AICD) (2007) indicates that traditional pit toilets constitutes the most common form of sanitation in sub-Saharan Africa. This suggests that sub-Sahara African countries need to expedite action on provision of basic sanitation facilities to its population within the sub-region.

The state of sanitation in Ghana is not different from what pertains in Africa and sub-Saharan Africa. A study by WSP (2010) showed that the predominant use of shared toilets in urban areas is largely due to residence patterns of several households living in compound housing, but a more worrying development is the heavy reliance by many on shared sanitation facilities—public toilets.

Ghana has the fourth lowest rate of sanitation coverage on human development index grading worldwide (JMP, 2010) occupying 152<sup>nd</sup> position out of 182 nations. The average national coverage estimate for sanitation for Ghana is 55 %, with very low numbers for some regions (West Region: 50 %, Central Region: 55 %, Greater Accra Region: 80%, Volta Region: 35 %, Eastern Region: 60%, Ashanti Region: 65 %, Brong Ahafo Region: 45%, Northern Region: 20%, Upper East Region: 10%, and Upper West Region: 20 %) (GSS, 2012). While WHO/UNICEF/JMP (2013) reports showed gradual improvements over the last 20 years in access to improved sanitation in Ghana, huge challenges still remain in serving rural communities with improved sanitation. In 2015, only 15% of Ghana's population has access to improved sanitation (JMP, 2015).

The current challenge with sanitation in Ghana is largely devastating. For example, in the Greater Accra region of Ghana 25% of the population have access to improved sanitation while in the Northern region the corresponding proportion is 3% (NDPC/UNDP, 2010), suggesting that sanitation development has concentrated on urban centres and southern areas, while the poorest coverage is in the northern regions and rural communities (NDPC/UNDP, 2010). Ghana therefore continues to face low toilet use due to unhygienic conditions comprising unimproved toilet facilities, faecal waste disposal challenges as a result of poor development planning, inadequate funding for logistics, infrastructure and landfills and ineffective coordination of sanitation delivery agencies at the Metropolitan, Municipal and District levels. Recent study by JMP (2015) showed that the number of Ghanaians without improved toilet facilities stood at 18.7 million (JMP, 2015). Measured in budgetary terms as regards the allocation of public funding is largely essential if the existing proportion of the population without improved sanitation is to be covered by improved sanitation facilities.

### **Policy Framework for School Toilets Provision**

The required number of toilet cubicles or squat holes for every school depends on the school enrolment. A maximum of 40 pupils using squat hole or toilet cubicle per day is recommended in the Ministry of Local Government Act 462 of Revised 2010 Toilets Provision Policy Guidelines (MLGRD, 2010). Also, separate toilet blocks for boys and girls and changing room for adolescent girls and female teachers in each toilet block for girls is highly acceptable since this ensures adequate privacy for each gender group (MLGRD, 2010). Toilets for children should be appropriately sized to ensure that children are comfortable and feel safe in the use of the toilet (MLGRD, 2010). Foot rests for squatting units appropriately sized and positioned for age and sex. Toilet cubicle doors must have bolts which are lockable from inside in order to provide maximum security to all users. Besides this, toilets must be located at reasonable distances to the school buildings for easy accessibility, increases maximum usage, and maintenance (WHO/UNICEF/JMP, (2010). The school staff should be provided with two toilet cubicles preferably one for females and one for males (Zomerplaa & Mooijman, 2005). Again, physically challenged pupils requires separate toilet fitted with wide door and enough space inside for a wheelchair user and the provision of support structures such as a handrail and a toilet seat (Jones & Reed, 2005). This can make school toilets easily accessible to physically challenged pupils in the school system.

To ensure convenient and safe usage, toilet should be located reasonable close to classrooms with the entrances positioned to provide maximum privacy in entering and leaving and also minimizes risk of violence (Jones & Reed, 2005). The location of toilets should also take into account the need to minimize odours and avoid contamination of water supplies and food (Franceys, et al., 1992). In addition to these, toilets should be appropriate to local cultural and social conditions prevailing in the community to which the school children live (Franceys *et al.*,

1992). According to Zomerplaag & Mooijman (2005), younger children need toilets that provide comfortable, convenient and safe to use. The drop holes for example, needs to be smaller, and footrests closer together for younger children (Zomerplaag & Mooijman, 2005).

### **Sanitation Coverage in Basic School System**

Globally, statistics indicates that sub-Sahara Africa countries recorded the lowest sanitation coverage in schools according to 2015 UNICEF publication (Anon, 2015). Tanzania, for example, recorded the lowest coverage of toilets in schools, with only one in ten schools having decent toilets. Countries like Rwanda, Zimbabwe and South Sudan have recorded decline in toilet coverage in schools between 2008 and 2013. Also, a 2012 report on Sierra Leone found that most rural schools in the country did not have toilets at all. In other areas, school toilets did not have separate toilet facilities for girls and boys (Sesay and Leone, 2013). This prevented girls from attending schools, and consequently drop out of school. With the implementation of a policy of universal primary education in 2012, the report predicts further dropping out of adolescent girls.

The faecal matter management technologies used in most schools in Ghana include KVIP, water closets, pit latrines, “aqua-privies” and biofill toilets and no technology or commonly referred to as open defaecation (GSS, 2012). Whilst septic tanks, KVIP, and pit latrines are common in rural schools, water closets (WC) and “aqua-privy”, however, dominate in the urban schools. Open defaecation, which does not separate humans from faecal contact, and termed “unimproved”, is common in both rural and urban settings. These technologies, according JMP standards are unimproved and therefore cannot separate faecal matter from human contact. To be accepted as ‘improved’, a sanitation facility is required to be used exclusively by only one household (Karnib, 2014). Based on this definition, it is clear that most basic schools in Ghana are using “unimproved” sanitation facilities since more than 50 pupils depends on one squat hole (JMP, 2010). JMP (2010) defines improved sanitation as a sanitation system in which excreta is disposed of in such a way that they reduce the risk of faecal-oral transmission to its users and the environment. Specific types of improved sanitation facilities recognized by the JMP include flush or pour-flush latrine, pit latrine with a slab, ventilated improved pit (VIP) toilets and the composting toilet (Karnib, 2014).

Provision of appropriate and adequate toilet facilities to basic schools has been faced with many challenges in Ghana. Reasons for this phenomenon were the introduction of free compulsory universal basic education (FCUBE), the school feeding programme and the free school uniform concept (MOE, 2009). These programmes have resulted in an increased basic school enrolment.

Recent report by EMIS (2017) in Ghana revealed that about 74,000 out of the 21,438 public basic schools in the country lack toilet facilities suggesting that over two million Ghanaian children in those schools alone are compelled to resort to open defaecation mostly within the immediate surroundings of their schools. Similarly, out of the 9,604 private basic schools sampled over 1,631 have no toilets causing an estimated 430,000 pupils in private schools to defecate outside a toilet during school hours.

Key factors accounting for this was that the Ghana Education Service, an agency of the Ministry of Education (MOE), responsible for provision of toilet facilities to basic schools had some challenges in coordinating and harmonizing the interventions programmes resulting in various Stakeholders and Donors Agencies using their own project specific standards and strategies thus providing inappropriate toilet facilities which do not meet the defaecation preference, age and sex of the pupils in the basic schools. This situation has resulted in pupils engaging in open defaecation though they have toilet facilities. Some communities also have no toilet facilities and therefore shared toilets with the schools and this continues also had led to undue pressure on the existing toilet facilities in the basic schools. This situation compelled some of the pupils to resort to open defaecation practices in the catchment areas of their schools (GNA Report, 2015; Field Observation, 2013). The provision of sanitation facilities to schools by the GES through the MMDAs could not keep pace with increasing school and this has resulted in school children either queuing to access the limited toilet facilities or result in looking for alternative defaecation sites—bushes, forests, beaches and drains.

Previous studies had failed to account for the conditions of the toilets facilities used in the basic schools, although many new toilets built in the schools have raised the issue of poor sanitation behaviours among pupils from

the point of view of school toilets. This indicates a need to understand the perceptions of pupils and teachers on conditions of their school toilets. The objective of the study was to explore the perceptions of pupils and teachers on the quality of toilet facilities used in their schools and recommend sustainable measure to address the menace.

3. MATERIALS AND METHODS

Figure 1 shows the map of the study areas.

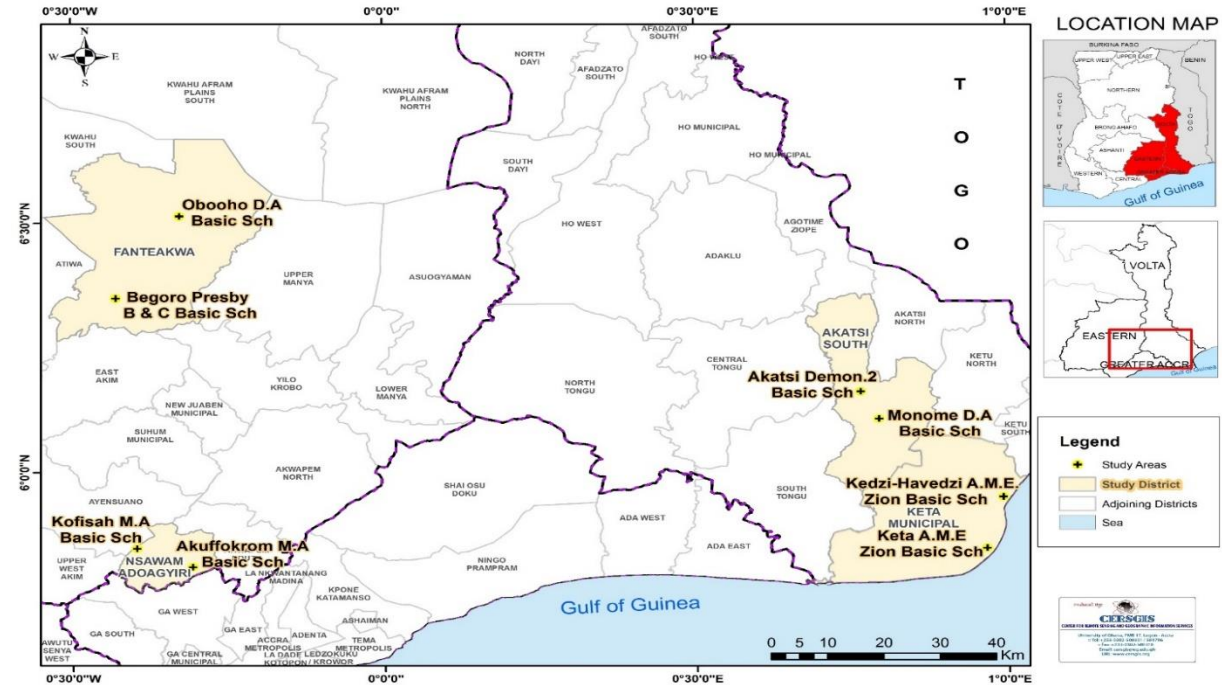


Figure 1: Map of the Study Areas Showing Districts, Municipalities, Communities and the Study

The study was conducted in eight Basic Schools comprising four rural and four urban. The schools were selected from eight communities shown in Table 1.

Table1: Study Communities and Schools

Regions	Districts/Municipals	Communities	Schools	Settings
Eastern	Nsawam-Adoagyiri	Kofisah	Kofisah M.A. Primary & JHS	Rural
		Akuffokrom	Akuffokrom M.A. Primary & JHS	Urban
	Fanteakwa	Begoro	Begoro Presby Primary B & C, & JHS	Urban
		Oboaho	Oboaho D.A Primary & JHS	Rural
Volta	Keta	Keta	Keta A.M.E. Zion Primary & JHS	Urban
		Kedzi-Havedzi	Kedzi-Havedzi A.M.E. Primacy & JHS	Rural
	Akatsi South	Akatsi	Akatsi Demons. Primary & JHS	Urban
		Monome	Monome D.A. Primary & JHS	Rural

These schools have KVIP toilet facilities ranging from two to seven sitters capacities (GSS, 2012) and irrespective of age and sex, these toilets facilities are used by both pupils and teachers. The study was school-based cross-sectional survey which sought to explore the perceptions of pupils and teachers on the quality of toilet facilities used in their schools. The study used both qualitative and quantitative approaches. The qualitative phase followed the quantitative phase to further explain the results obtained during the quantitative stage (Creswell, 2015; Klassen *et.al*, 2012).

Four hundred (400) pupils aged between 9 and 18 years (mean age =5.7; Standard Deviation = 2.055) formed the study participants. These participants were randomly selected from classes 4, 5, and 6 and JHS forms 1, 2 & 3. The sample size for the quantitative survey was determined using the statistical formula stated in Cochran (1977). Pupils in lower primary classes 1, 2, & 3 were excluded from the study because of their inability to articulate their thoughts during the FGDs and also understand the items on the questionnaire guide. In addition to the 400 pupils, 45 school authorities (teachers and head teachers) comprising both female (N=23) and male (N=32) from the eight study schools were recruited using simple randomized sampling technique. Also, four District and Municipal Education Directors were purposively recruited to be part of the study. These two categories of respondents (school authorities and Education Directors) were included in the study to provide information that were used to validate data collected from the sample population (pupils). This technique was used because they occupied positions that qualified them to provide relevant information on school sanitation system in the schools under their jurisdictions.

Two sets of structured questionnaire were constructed. The first was for the study pupils and the second questionnaire was for the school authorities. The items on the questionnaire were adapted from semantic Likert scales developed by Ajzen and Fishbein (1980); Ajzen (1985, 1991); & Taylor & Todd, 1995).

A self-developed checklist observation guide was used to assess the conditions of toilet facilities used in the basic schools. The pre-determined themes on the checklist observation guide included school toilet location and accessibility, toilet apartments, toilet hygiene, and toilet maintenance, toilet adequacy, pupil-toilet ratio, ventilation in the school toilets, and privacy and safety statuses of the school toilets. Finally, data on presence of rodents in the toilet premises and community encroachment on the school toilets and toilet suitability were also gathered using the items on the observation checklist.

Policy documents containing guidelines for provision and construction of toilet facilities and faecal matter management practices in the basic schools in Ghana were also reviewed extensively. The objective of the review was to compare the policy provisions in the framework with the physical structure of the school toilets and assess the disparity in terms of toilet type, toilet location, number and sizes of toilet squat holes and vent pipes, (if any). The appropriateness of these features was also determined from the views and opinions of toilet users (pupils) gathered from the FGDs sessions. The four District and Municipal Education Directors were interviewed using self-developed interview guide containing eleven items.

The consent to participate in focus group, and in-depth interview was sought from respondents prior to the administration of the research instruments. A verbal assent was obtained from parents or appropriate guardians of eligible sampled pupils before they were used in the study. Verbal Assent and consent for photographing, audio and/or video recording of pupils' voices were also sought from both parents and the sampled pupils respectively. Formal permissions to undertake the study in the selected schools was also sought from GES Districts and Municipal Education Directors in charge of the studied schools. Verbal consent was also sought from community leaders including chiefs, assembly men and women and other key opinion leaders to conduct the study in the schools within the communities. Finally, Ethical Clearance Certificate No. ECBAS 035/15-16 to undertake the study was given by Ethical Committee for Basic and Applied Sciences (CBAS), University of Ghana.

#### 4. STATISTICAL ANALYSIS

Test items reliability and internal consistency were determined using Cronbach's alpha statistics. The test result shows the scale reliability for all the items as: alpha value = .85. George and Mallery (2003) provided the following rules of thumb for interpreting the alpha value: [" $\geq .9$  = Excellent,  $\geq .8$  = Good,  $\geq .7$  = Acceptable,  $\geq .6$  = Questionable,  $\geq .5$  = Poor, and  $\leq .5$  = Unacceptable" (p. 231)]. Hence the alpha value obtained in this study for all the items used was good.

The data collected on each variable using the questionnaires were then coded and entered into the SPSS software version 20 (IBM) after they have been cleaned and checked for completeness and consistencies against the items on the questionnaire guide. SPSS version 20 (IBM) software (SPSS Inc. Chicago, Illinois, USA) was used to analyze the data. The quantitative data was analysed using descriptive statistics to determine the mean distribution and Standard deviation of variables in the sample. One-way ANOVA test was also applied to the data to determine the mean differences between variables. All quantitative analyses were carried out at 5% level of precision (95% confident interval) with p-values reported in two tailed significant levels. Relevant statistical tables were generated using Microsoft Excel Software version 13. The qualitative data gathered from FGD and interview sections were analysed using semantic content analysis.

#### 4. RESULTS

**Table 2: Socio-Demographic Profile of Study Participants**

Participants Demographic Profile	Frequency (N=400)	Percentage (%)	Mean	Standard Deviation
<b>Sex Distribution</b>				
Male	200	50	1.50	.501
Female	200	50		
<b>Age Distribution(Year)</b>				
9—13	183	45	5.66	2.055
14—18	217	55		
<b>Class/Level)</b>				
Primary 4—6	192	48	3.67	1.640
JHS 1—3	208	52		
<b>Religious Affiliation</b>				
Christianity	356	89		
Muslem	36	9.0	1.13	.392
Traditional	8	2.0		
<b>Locality Type (Settings)</b>				
Rural	200	50	1.35	.476
Urban	200	50		
<b>Ethnic Affiliation</b>				
Ga—Dangme	55	13.8		
Ewe	216	54.0		
Akans (Fante &Asante)	61	15.2	3.06	1.834
Akuapem	61	15.2		
Others (Moshi & Guan)	7	1.7		

## Conditions and Usage of School Toilets

**Table 4: Checklist Observation Results of Conditions of Toilets in the Basic Schools**

Frequency/Percentage Distribution of Drives in the Sample [N=Number of School =8]				
Organizing Themes	Drives Describing Condition Of School Toilets	Yes (%)	No (%)	
(A) Toilet Accessibility	Toilet is accessible to all pupils	4 (50)	4(50.0)	
	Toilet is accessible to physically challenged pupils*	1(12.5)	7(87.5)	
	Pupils use the toilet at specific school hours	0(0.00)	8(100)	
(B) Toilet Apartments	Toilet for both sexes are in same block	8(100)	0(0.00)	
	Toilet key is placed at accessible point for all pupils*	0(0.00)	8(100)	
	Toilet for the girls has changing room attached to it*	1(12.5)	7(87.5)	
	Toilet has washroom attached to it*	2(25.0)	6(75.0)	
	The school has separate toilet for Pre-school pupils*	0(0.00)	8(100)	
	The school has separate toilet for Primary pupils.	2(25.0)	6(75.0)	
	The school has separate toilet for JHS pupils	2(25.0)	6(75.0)	
	The school has separate toilet for Teachers*	0(0.00)	8(00.0)	
(C) Hygiene Status of Toilet	The pre-school, primary & JHS use the same toilet	1(12.5)	7(87.5)	
	Faeces present on toilet floor*	8(100)	0(0.00)	
	Faeces present on toilet squat holes.*	8(100)	0(0.00)	
	Faeces present on toilet feet rest*	8(100)	0(0.00)	
	Faeces around toilet premises	5(62.5)	3(37.5)	
(D) Toilet Maintenance And Cleaning	Urine present on toilet floor/squat holes/foot rests*	7(87.5)	1(12.5)	
	Teachers supervise the cleaning of the toilet	8(100)	0(0.00)	
	Pupils provide their own cleaning materials*	8(100)	0(0.00)	
	Pupils protect themselves from infections during toilets cleaning (e.g. wear nose masks, hand gloves)*	0(0.00)	8(100)	
	School has waste disposal bins in the toilet*	0(0.00)	8(100)	
Table 4.1 (Cont'd)	Anal cleaning materials packed in safe container(s)	1(12.5)	7(87.5)	
	(E) Pupils-Toilet Ratio & Pressure on use of School Toilet	Based on pupils enrolment, the number of toilet cubicles for pupils is adequate*	0(0.00)	8(100)
		Pupils queue to use the toilet*	7(87.5)	1(12.5)
(F)	Toilet has functional vent pipes	7(87.5)	1(12.5)	
	Toilet produces heat through the squat holes*	8(100)	0(0.00)	



Scent and Ventilation in School Toilets	Scent from the toilet gets to the classrooms*	7(87.5)	1(12.5)
(G) Privacy and Safety Status in the School Toilet	Toilet entrance is positioned away from the school compound.	5(37.5)	3(62.5)
	Toilet is locked during classes hours	1(12.5)	7(87.5)
	Toilet doors is locked during off—school hours	8(100)	0(0.00)
	Toilet has door (s) to every cubicle*	1(12.5)	7(87.5)
	Toilet provides adequate privacy to pupils/users	2(12.5)	6(75.0)
	Toilet cubicle doors are in good shape	5(62.5)	3(37.5)
	Toilet cubicle doors have inner locks	3(37.5)	5(62.5)
(H) Presence of Rodents in Toilet Premises	Rodents in toilet premises*	8(100)	0(0.00)
	Toilet premises is weedy	6(75.0)	2(25.0)
	Toilet is safe for all users irrespective of age and sex*	0(0.00)	8(100)
(I) Community Encroachment on School Toilets	Community also uses the school toilet*	4(50.0)	4(50.0)
(J) Technology Drive	Toilet squat holes are appropriate for pupils age and sex	3(37.5)	5(62.5)
	Toilet foot rests are appropriate for pupils' age.	3(37.5)	5(62.5)
	Toilet location is psychologically appropriate for pupils	2(25.0)	6(75.0)
	Toilets have Recommended number of vent pipes	6(75.0)	2(25.0)
	Toilets vent pipes have appropriate dimensions	8(100)	0(0.00)
	Toilets have appropriate height of vent pipes	8(100)	0(0.00)

Note: 'Yes' = means drive is present with the school toilet. 'No' = means drive is absent with the toilet. Numbers outside parenthesis in the 'Yes' column refers to number of schools in which drive is present. That of 'No' column refers to number of schools drive is absent. Numbers within parenthesis are percentage values for drives. \*= major drives associated with the school toilets.

**Table 5: Perceptions of Teachers on Conditions of School Toilets**

<b>Descriptive Statistics N=45</b>			
Categories of Characteristics/Variables	Responses Category	Response Frequency	Percentage (%)
Gender	Male	25	55.6
	Female	20	44.4
Qualification of Teachers (N=34)	Post middle	1	2.9
	Post secondary	1	2.9
	Diploma	23	67.6
	Degree	9	26.5
Toilet squat holes are appropriate for all users	Yes	35	77.8
	No	10	22.2
School toilet hygiene status (cleanliness)	Always clean	22	48.9
	Always filthy	4	8.9
	Sometimes clean	14	31.1
	Sometimes filthy	3	6.7
	Others	2	4.4
School toilet maintenance schedule is	Daily	13	30.2
	Weekly	15	34.9
	Monthly	2	4.7
	Yearly	9	20.9
	Others	4	9.3
Who provides funds for toilet maintenance/cleaning	The school	29	80.6
	Municipal	2	5.6
	PTA	4	11.1
	Others	1	2.8
Frequency of provision of maintenance fund	Daily	2	6.2
	Weekly	7	21.9
	Monthly	12	37.5
	Yearly	11	34.4
Community influence—community using the school toilet.	Yes	26	57.8
	No	19	42.2
Effects of community influence on school toilet	Makes toilet cleaning difficult	1	5.0
	Does not affect school sanitation	2	10.0
	Makes toilet dirty	16	80.0
	Others	1	5.0

Table 5 (Cont'd)

Categories of Characteristics (Items)	Descriptive Statistics N=45		
	Category Response	Response Frequency	Percentage (%)
Pupils less than 5 years also use same toilet.	Yes	29	65.9
	No	15	34.1
Pupils queue to use the toilets	Yes	6	13.3
	No	25	55.6
	Neutral n=42*	14	31.1
In your view, what is the pupils' responsibility regarding toilet cleaning?	Provide logistics/cleaning materials	8	19.0
	Only scrub the toilet	31	73.8
	They have no responsibility	1	2.4
	Others	2	4.8
What challenge does the school face in ensuring proper use of the school toilet?	n=39*		
	No challenge	3	7.5
	Funds for securing logistics	15	40.0
	Community encroachment	10	25.0
	Misuse of toilet by pupils	5	12.5
	Pupils reluctant to clean the toilet	2	5.0
Others	4	10.0	

**Table 6: Descriptive Statistics of Perceptions of Teachers on Conditions of School Toilets**

	N	Mean	Std. Deviation
▪ Gender.	45	1.444	.503
▪ Qualification of Teachers.	34*	3.177	.626
▪ Toilet accessibility.	45	1.089	.288
▪ Toilet adequacy.	45	1.467	.505
▪ Pupils queue to use the toilet.	45	2.178	.650
▪ Frequency of toilet use by pupils.	45	1.511	1.058
▪ Privacy of toilet for both sexes.	45	1.244	.435
▪ Appropriateness of toilet-squat holes well sized	45	1.222	.420
▪ Hygiene status of school toilet-cleanliness	45	2.089	1.221
▪ Toilet maintenance schedule.	43*	2.442	1.368
▪ Who provides funds for toilet maintenance.	36*	1.500	1.134
▪ When was the last time the fund was provided	32*	3.000	.916
▪ Community influence-community using the school toilet.	45	1.422	.499
▪ How does community using school toilet affect school sanitation?	20*	3.850	.587
▪ Do boys and girls use the same toilet cubicle?	45	1.889	.318
▪ Do pupils less than 5 years use same toilet?	44*	1.340	.479
▪ In your view what is pupils responsibility regarding toilet cleaning?	42*	1.929	.640
▪ What challenge does school face in ensuring proper use of the school toilet?	40*	2.975	1.405
▪ What can be done to address the challenge identified?	39*	3.872	2.067

*\*Some respondents did not respond to some of the items on questionnaire, hence N <45*

**Table 7: ANOVA Test Results of Perceptions of Teachers on Conditions of School Toilets**

		Sum of Squares	df	Mean Square	F	Sig
Pupils queue to use the toilet.	Between Groups	4.715	1	4.715	.14624	.000
	Within Groups	13.863	43	.322		
Privacy of toilet for both sexes.	Between Groups	2.115	1	2.115	14.675	.000
	Within Groups	6.196	43	.144		
Appropriateness of toilet squat holes.	Between Groups	1.677	1	1.677	11.816	.001
	Within Groups	6.101	43	.142		

*Note: Only significant variables are presented in this Table 7.*

**Table 8: Paired Samples Statistics**

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	GENDER	1.4888	313	.50068	.02830
	What prevented you from using the toilet?	2.7540	313	1.74684	.09874
Pair 2	SETTINGS	1.2907	313	.45483	.02571
	What prevented you from using the toilet?	2.7540	313	1.74684	.09874
Pair 3	AGE	5.5815	313	2.03036	.11476
	What prevented you from using the toilet?	2.7540	313	1.74684	.09874

**Table 9: Paired Samples Test**

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pair 1 GENDER - What prevented you from using the toilet?	-1.26518	1.87510	.10599	-1.47372	-1.05664	-11.937	312	.000
Pair 2 SETTINGS - What prevented you from using the toilet?	-1.46326	1.75761	.09935	-1.65873	-1.26779	-14.729	312	.000
Pair 3 AGE - What prevented you from using the toilet?	2.82748	2.57993	.14583	2.54055	3.11440	19.389	312	.000

Column 1	Columns 2	Columns3	Columns 4	Columns 5		Columns 6		Columns 7		Columns 8		Columns 9		Columns 10	
Name of School	Localities	Toilet Type	Present School Enrolment	Number of Toilet Squat Holes (s)		Squat Holes Dimensions/Size (cm)		Type of Vent Pipe		Number of Vent Pipes		Diameter of Vent Pipes (cm)		Height of Vent Pipe Above Pit (cm)	
	Rural/Urban			Reco'd	Observed	Reco'd	Observed	Rec'd	Observed	Reco'd	Observed	Reco'd	Observed	Reco'd	Observed
Kofisah M/A Primary	Rural	KVIP	170	5 (2)	4	25	25	PVC	PVC	7	7 (1 spoilt)	15	15	60	60
Kofisah M/A JHS	Rural		81												
Akuffokrom M/A Primary	Urban	KVIP	178	4 (2)	7	25	25	PVC	PVC	7	7	15	15	60	60
Akuffokrom M/A JHS	Urban		40			25	25	PVC	PVC	7	15	15	60	60	
Begoro Presby Primary	Urban	KVIP	208	5 (2)	8	25	24	PVC	PVC	6	6	15	15	60	60
Begoro Presby JHS	Urban	Pit	67		2	25	30	NIL	NIL	6	6	15	15	60	60
Oboaho D/A Primary	Rural	KVIP	173	5 (2)	6	25	24	PVC	PVC	6	6	15	15	60	60
Oboaho D/A JHS	Rural		55			25	24	PVC	PVC	6	6	15	15	60	60
Akatsi Demons 2 Primary	Urban	KVIP	499	11 (2)	4	25	22	PVC	PVC	6	5 (1 spoilt)	15	15	60	60
Akatsi Demons JHS	Urban		54					PVC	PVC	6	15	15	60	60	
Monome D/A Primary	Rural	KVIP	171	3 (2)	3	25	30	NIL	NIL	3	NIL	15	15	60	60
Monome D/A JHS	Rural	KVIP	66		2	25	24	PVC	PVC	3	3				
Kedzi—Havedzi A.M. E. Primary	Rural	KVIP	132	4 (2)	4	25	24	PVC	PVC	5	5	15	15	60	60
Kedzi—Havedzi A.M. E. JHS	Rural		84			25	24	PVC	PVC	15	15	15	60	60	
Keta A.M.E Primary	Urban	KVIP	152	6 (2)	4(1)	25	24	PVC	PVC	4	4	15	15	60	60
Keta A.M.E JHS	Urban		77			25	24	PVC	PVC	15	60	60			

Table 10: Results of Policy Documents Review and Field Observations on School Toilets Provisions in Basic Schools

Table 10: Note: Number of toilet squat holes for teachers are in parentheses in column 5; Reco'd =recommended

**Table 11: Pupil-Toilet Ratio in the Study Schools and its Bad Effect on Pupils Toilet use**

Year	Studied Basic Schools from Eastern Region								Studied Basic Schools from Volta Region							
	Kofisah M.A Basic school		Akuffokrom M.A. Basic School		Begoro Presby Basic School		Oboaho D.A Basic School		Akatsi Demons Basic School		Monome D.A Basic School		Kedzi-Havedzi A.M.E Basic School		Keta A.M.E Basic School	
	Enrolment		Enrolment		Enrolment		Enrolment		Enrolment		Enrolment		Enrolment		Enrolment	
	Acc'ble	Not Acc'ble	Acc'ble	Not Acc'ble	Acc'ble	Not Acc'ble	Acc'ble	Not Acc'ble	Acc'ble	Not Acc'ble	Acc'ble	Not Acc'ble	Accessible	Not Acc'ble	Acc'ble	Not Acc'ble
2010	175	—	139	—	141	—	68	—	397	—	154	—	148	—	155	—
2011	187	(12)	151	12	154	13	87	19	491	14	169	15	160	12	162	7
2012	211	24(36)	164	11(23)	158	4(17)	92	5(24)	513	22(36)	186	17(32)	178	18(30)	173	11(18)
2013	215	4(40)	177	7(30)	170	12(29)	105	13(37)	521	8(44)	197	11(43)	187	9(39)	185	13(31)
2014	224	9(49)	196	19(49)	162	8(37)	114	5(42)	527	6(50)	213	16(59)	191	4(43)	197	12(43)
2015	236	15(64)	203	17(66)	160	2(39)	125	11(53)	546	9(59)	224	11(70)	202	11(54)	212	15(58)
2016	251	5(69)	218	15(81)	175	15(54)	128	3(56)	553	7(66)	237	13(83)	216	14(68)	229	17(75)
Excess	<b>69</b>		<b>81</b>		<b>54</b>		<b>56</b>		<b>66</b>		<b>83</b>		<b>68</b>		<b>75</b>	
2017	<b>Nsawam—Adoagyiri Municipal =150*</b>				<b>Fanteakwa District= 110*</b>				<b>Akatsi South District = 149*</b>				<b>Keta Municipal = 143*</b>			
2017	<b>Eastern Region = 260*</b>								<b>Volta Region = 292*</b>							

Note: Acc'ble = Accessible

\* Number of Pupils Without Access to School Toilet

### Pupils and Teachers Perceptions of Conditions of School Toilets



**Filthy School Toilet (Faecal matter scattered all over the Toilet Floor.)**



**Filthy School Toilet (Papers used as anal cleaning materials scattered on the toilet floor)**

### Hygiene and Access in School Toilet

The issue of cleanliness in relation to the school toilets was a serious concern to most of the pupils and teachers. This concern was raised by discussants throughout the FGDs held in all the eight study schools. Pupils sum up the hygiene status of the school toilets as very bad. These concerns were supported by two justifications:

*“...The toilet is not clean and when you go there, you will see faeces and anal cleansing materials scattered on toilet floor”*—(Female pupil, FGDs, Begoro Presby Basic School).

*“...It is not neat because people from the town smoke there and also ease on the squat holes and footrests”*—(Female pupil, FGDs, Begoro Presby Basic School).

Teachers' perception of the hygiene status of the school toilets, however, suggest that the toilets are always clean and over 36 (80%, N=45) of the teachers expressed this view. The checklists observation results, however, strongly confirmed the pupils' views on existing conditions of the school toilets.

Closely linked to the poor hygiene status of the school toilet is the access and adequacy of the school toilets. Greater number of pupils' views on this issue are expressed in the following quotes:

*“.....it is small because I don't finish easing myself and another person comes to knock”*—(A boy, FGD, Monome D.A. Basic School).

*“...Sometimes you get pressed with the faeces but getting there all cubicles are occupied.”*— (A girl, FGD, Keta A.M.E Basic School).

*“If you go there and the toilet is full you have to wait; if you can't wait, you have to be shouting “I want to defaecate”*—(Male pupil, FGD, in Kofisah M.A. Basic School).

*“We queue to use toilet.”*— (Female pupil, FGD, Akuffokrom M.A. Basic School).

Perception of over 55% (N=45) of teachers, however, were incongruent to the pupils' views on inadequacy of the school toilets. When demanded explanation to this issue of toilet inadequacy, this was what the District Education Director had to say:



*“...when toilet facilities are being put up in the schools they consider the school enrolments; however, no complaint regarding pupils queuing to access the toilet facility or engaging in open defaecation toilets has ever reached my outfit for redress”*—(District Education Director, IDI, Fanteakwa Education Office).

### **Privacy and Safety in the School Toilets**

Privacy and safety in school toilets were seriously identified by pupils as a key issue influencing their toilet use. Pupils' dissatisfaction with the privacy and safety status of the school toilet that supported this views were expressed in the following quotes:

*“The inner lockers are spoilt as such someone can open the door and see your private parts.”*—(Female pupil, FGD, Kofisah M.A. Basic School).

*“The doors are not good, so I don't have enough privacy in the toilet; you can be seen by anyone who comes there.”* — (Female pupil, FGD, Kofisah M.A. Basic School).

### **Smells and Ventilation in School Toilets**

Pupils perceived the level of ventilation in the school toilets as very poor. The severity of poor ventilation in the school toilets are expressed in the following quotes by pupils during the FGDs:

*“...The toilet smells and you have to remove your uniforms before defaecating in the toilets*—(Male pupil, FGD, Begoro Presby Basic School).

*“...When we are asked to go and clean the toilets, we can't go there because the toilet smells”*—(Male pupil, FGD, in Kofisah M.A. Basic School).

The issue of pupils under five years also using the school toilets was also highlighted extensively throughout the FGDs held with the pupils in all the studied schools. A key justification raised by discussants in support of this thinking was:

*“Pupils under five years using same squat holes as adults; they can fall into the pit”*— (Male pupil, FGD, Kofisah).

*“The preschool children also used our toilets and defaecate on the squat holes and make the place dirty”*—(Male pupil, FGD, Akatsi Demons 2 Basic School).

This was confirmed by Deputy Municipal Education Director during the in-depth interview with him. He said:

*“...Oh, definitely, the preschool children also use the same toilets facilities as the Primary and the JHS pupils. However, they are supported by Kindergarten attendants; in schools where there are no attendants, the preschool pupils are supported by the teachers to use the toilet facilities”*—(Deputy Municipal Education Director, IDI, Keta Municipal Education Office).

The in-depth interview with the Akatsi South District Education Deputy Director has different view with reference to the issue of preschool children using the school toilets designed for primary and JHS. He said:

*“.. the preschool children do not use the same toilet designed for the primary and the JHS. They have their own toilets provided by USAID. In the old schools, however, they were coerced to use same facility with the older pupils.”*—(District Education Deputy Director, In-depth interview, Akatsi South District).

### Toilet Maintenance and Provision of Cleaning Logistics

Closely related to the poor hygiene status of the school toilet was the maintenance of the school toilets. This was another grave concern to discussants during the FGDs. The grave manner in which pupils described their experiences in providing the toilet cleaning logistics are evident in the following narratives:

*“...we need nose masks and gloves so we can clean the toilet”*—(Female pupil, FGD, Akuffokrom M.A. Basic School).

*“..We need chamber pot for the preschool children, so they don't make the toilet dirty by defaecating on the floor.”*— (Female pupil, FGD Akuffokrom M.A. Basic School).

*“We need detergents to clean the toilet”*—(Female pupil, FGD Akuffokrom M.A. Basic School).

*“...all we want is that the community should be told not to defaecate on the floor”*—(Female pupil, FGD, Akuffokrom M.A. Basic School).

The perception of teachers on this issues strongly affirmed views expressed by pupils. When asked about the source(s) of funds for school sanitation and toilets maintenance, this was what the District Deputy Director of Education had to say:

*“...funds for toilet maintenance come from the Government of Ghana (GOG) through the District Assemblies and the GES; this is in the form of capitation grants; but this is irregular. The school heads, through their own initiatives, are also expected to generate funds for ensuring proper cleaning of the toilets in their schools”*—(Deputy Education Director, in-depth interview, Akatsi South District Education Office).

### Community and Rodents Encroachment on School Toilet

The community encroachment into the school toilet system was another serious issues raised by pupils during the FGDs. Their dissatisfaction with the impacts of the community using the school toilet is reflected in the following statements:

*“..They make the toilet filthy and full quickly; they also soiled squat holes together with the feet rests; others leave their sanitary pads in the toilet”*—(Male pupil, FGD in the Akuffokrom M.A. Basic School).

*“... the ladies threw their wards diapers into the toilet causing the toilet smells badly”*— (Female pupil, FGD in Akuffokrom M.A. Basic School).

*“When school closes in the afternoon, we locked the toilet doors; but the town people come and break the padlocks and defaecate in the toilet”*—(An 18 year Female pupil, FGD in Akuffokrom M.A. Basic School).

Regarding the subject of community encroachment into the school toilet and its effects on pupils sustainable toilet use, the responses of majority of the teachers (80%, N=45) confirmed this and further indicated that the filthy conditions of the school toilet system is a composite pressure from both community residents and school inmates.

Closely linked with community influence on the school toilets was the presence of rodents in the school toilet premises. The effects of this on pupils' toilet use and psychological wellbeing were also discussed during the FGDs sections and across all the studied schools. The psychological experiences (fear and panic) pupils encountered with rodents in the school toilets were expressed in the following by discussants:

*“When I go to the toilet and see rodents, I don’t feel comfortable and I cannot even ease myself properly”*— (Male pupil, FGD, Kofisah M.A. Basic School).

*“...I don’t even visit the toilet again when I see them”*— (Female pupil, FGD, Akuffokrom M.A. Basic School).

*“Seeing them made me defaecated on the toilet squat hole”*—(Male pupil, FGD, Akatsi Demons Basic School”).

### **Toilet Suitability**

On the subject of toilets suitability, which relates to appropriateness of the toilet squat holes and toilet location in the school, views of pupils and education directors are expressed in the following:

*“...Some pupils’ defaecate around the squat holes causing the place to smell”*—(Male pupil, Begoro Presby Basic School).

*“...it is not good for me because if you don’t take care you will defaecate on the floor and on the squat hole”*—(Female pupil, FGD in Kofisah M.A. Basic School).

*“...It is not good because when pre-school children go there, they defaecate around the toilets squat holes, feet rests and clean their anus on the walls”*— (Male pupil, FGD, Kofisah M.A. Basic School).

When asked whether the preschool children also used the same toilet facilities meant for the primary and JHS pupils, this was what the Deputy Municipal Education Director had to say:

*“Yes!, they use the same toilet facility; however, the norm is that they have attendants who assisted them to use the toilets; sometimes, they are provided with chamber pots; some preschool children do visit the toilets without assistance which may pose risk; however, no report from any of the schools has ever reached my regarding any casualties; however, new projects are being design by UNICEF to cater for the preschool pupils”*—(Deputy Education Director, in-depth interview, Keta Municipal Education Office).

Again, on the issue of physically challenged pupils also using the toilet facilities meant for the non-physically challenged, this is what the Deputy Education Director had to say:

*“...they do as they need normal life like others; but per the Act 770 of MLGRD, new toilets facilities are designed to take care of the sanitation needs of physically challenged pupils. However, at present, the District has no such physically challenged pupils; those who seek school enrolment in the District are normally sent to Akropong which has facility for them.”*— (Deputy Education Director, in-depth interview, Akatsi South District Education Office).

Regarding the issue of physically challenged pupils also using the same toilets designed for the non-physically challenged pupils, this was what the Education Director of Fantekwa District had to say:

“... in some instances, they needed to be treated like the non-physically challenged pupils to avoid social discrimination within the school system; this has been proved to be very successful in some schools within the district. We are making the effort to ensure that such best practices are extended to other schools in the district where we have physically challenged pupils. He was quick to add that even though this has been the norm in the district, in some cases, they are supported by both teachers and pupils, in certain areas like the sanitation practices”—(Education Director, in-depth interview, Fanteakwa District Education Office).

## 5 Discussions

### Socio-Demographic Characteristics of Study Participants

Out of the 400 participants, 55% were aged between 14-18 years and 45% were in the age range group of 9-13 years. Regarding their educational background, 48% were in primary class 4-6 and 52% were in Junior High School forms 1-3. With participants' religion, 89% were Christians whilst the rest comprising 9% and 2% belonged to Muslim and Traditional religion respectively. This result suggests that more than two-thirds of the study participants were Christians. The ethnicity distribution of the participants was: 54% Ewes, 13.8% of Ga-Dangme extraction, 15.2% belonged to Akans ethnic group. The Akuapem were 15.2%. The remaining 1.7% were from the Moshi and the Guans ethnic groups. This result showed that majority of the study participants were Ewes, thus emphasizing the migratory pattern of the Ewes in the study areas. These findings underscored the importance of differences in ethnicity in understanding cultural and behavioural factors that influence open defaecation practices in schools.

### Conditions and Usage of Toilet Facilities in the Basic Schools

#### Hygiene and Access in School Toilet

Studies (Jenkins & Scott, 2007; Appiah & Oduro-Kwarteng, 2011) have identified some technical drivers associated with toilet facilities use in the basic school which affects their sustainable usage. These technical drivers relate to toilet design and construction, mechanisms to desludge excreta, siting of the toilets and user behaviour relating to convenience and prestige. They demonstrated that where one or combination of these factors do not meet the defaecation preference of toilet users, the facility is either misused or abandoned.

The results of this study, however, revealed that pupils were unable to use the school toilets because of the health barriers associated with them. They perceived the school toilets as unhygienic and therefore associated with diseases. This, they attributed to both lack of adequate funds to maintain the toilet facilities and inappropriate design and construction of the facilities. Studies demonstrated that when toilet maintenance system breaks down, the facility becomes unpleasant to use (Schaub-Jones *et al.*, 2006). The present study's result is also consistent with a number of school based sanitation studies in some countries. For example, a study (Vernon *et al.*, 2003) in Sweden and United Kingdom demonstrated that schoolchildren avoided defaecating in toilet because the toilets were too filthy. The low interest in toilet use by pupils reveals by this study may also be attributed to the fact that the toilet is used by large population of pupils but were poorly maintained. Studies by Cairncross & Feachem (1993) showed that if toilets are not kept clean they may be determined and become a focus for disease transmission and pupils will prefer not to use them. This underscores the importance of providing sex and age based sanitation facilities to schools. As shown in this study, the provision of sex and age based sanitation facility backed by adequate education on proper use of toilet can significantly help reduce the unhygienic conditions of toilets used in the basic schools.

From the equity perspective, improving access to adequate toilet facility is necessary for pupils' dignity, privacy and safety. Nevertheless, efforts to increase access to improved school toilets should be accompanied by schemes to promote appropriate use of the toilet facilities (Kema *et al.*, 2012). Previous studies (JMP, 2015 & Kema, *et al.*, 2012) have reported that adequate toilets encourages pupils to attend schools, particularly girls. An increase in girls' enrolment have been credited to providing separate sanitary facilities for girls.

### Privacy, Safety and Ventilation in the School Toilets

The present study identified absence of adequate privacy associated with the school toilet system as serious driver contributing significantly to non-use of the toilets. Analysis of variance shows significant difference between privacy, safety and ventilation in the school toilets and pupils toilet use, suggesting that absence of privacy and safety of the school toilets could possibly cause pupils avoid using the school toilets. The influence of inadequate privacy in toilets and its negative effect on toilet use have been documented in several studies (WATSAN, 2006 & WASH, 2012). For example, a study in Ghana (Gyekye, 2012) reported that absence of appropriate toilets that provide adequate privacy in schools for girls is a major reason parents keep their daughters from attending school. This suggests that adolescent girls attending school during menstruation require girl appropriate toilets, water supply for washing and receptacles for discarded sanitary pads (Kirk, Jackie & Marni Sommer, 2006). Without appropriate toilet facilities, adolescent girls may be unable to remain comfortably in class. In support of this assertion, one school-based study (JMP, 2013) in Ethiopia revealed that over 50% of girls missing between one and four days of school per month is due to lack of appropriate toilet that address their menstruation challenges. Integrating privacy in intervention programs to motivate pupils in the basic schools to use toilet may be considered a precursor towards achievement of target two (2) of the 2030 SDG six (6).

For adequate safety for potential toilet users, policy documents on school toilet provision recommend that toilet doors should be well fitted and lockable from inside (MLGRD, 2010; Zomerplaag & Mooijman, 2005). This study, however, discovered that about 62.5% (N=8) of the school toilet doors were not lockable from inside as most of the locks were out of order and therefore cannot protect potential users from all forms of harassment and to provide users with adequate privacy. This situation according to Franceys *et al.*, (1992) could result not only in rape and sexual violence but also lead to toilet avoidance by users.

Bad scent generated from the school toilet as a result of poor ventilation constitutes another key driver associated with the school toilets. This may be attributed to absence of desludgment of faecal matter from the toilet pits. The effect of scent on human behaviour have been reported in several studies and found to have two major behavioural effects: avoidance or approach (Fulbright *et al.*, 1998). Pleasant scents produced approach whilst unpleasant scents produced avoidance and both leave lasting effects on the person's liking or disliking of a person, place, or thing (Fulbright *et al.*, 1998). Curtis and Biran (2001) have argued that a mere universal human disgust of faeces, and one might add, of its smell, may reflect ancient biological predispositions to avoid potential sources of diseases.

The present study also revealed that school toilets in two of the eight study schools were located at distances of 25.2m and 22m from the closest classrooms as against the recommended distance of 30m (Adams, *et al.*, 2009). The influence of inappropriate toilet location on sustainable toilet use has been documented in several studies (Franceys *et al.*, 1992; & Adams, *et al.*, 2009; Curtis & Biran, 2001). These studies demonstrated that when toilets are located on the school compound where anybody within the school premises can see anyone entering or leaving the toilets, the location of such toilets, in most cases, are perceived as psychologically inappropriate and significantly affects the toilet use (Adams, *et al.*, 2009). Provision of toilets that appeal to pupils' defaecation preference and creating a supportive environment for all girls to be able to manage their menstrual challenges hygienically, safely, in privacy and with dignity could be one of the targeted ways of reducing open defaecation practices and school dropouts' rates found to be associated with the open defaecation phenomenon. Lack of adequate privacy associated with the school toilets as a result of inappropriate location of toilets can therefore be a strong psychological barrier that prevents pupils, particularly girls, from using the facility (Adams, *et al.*, 2009).

Besides, toilets that are sited close to the classrooms do not only allow bad scent from the toilet pits to the classroom to interfere with learning, cognitive functioning, decision making and assimilation of concepts, but it also reduces contact teaching and learning hours since teachers and pupils had to battle with the bad smell amidst teaching and learning respectively. A study found that bad scent interferes with the enjoyment of activities (Krishna, 2011), causes stress and anxiety (Smeets *et al.*, 2008), nausea, headache, tightening of the chest or other allergic reactions such as frustration mood induction (Epple & Herz, 1999; Herz *et al.*, 2005; Cameron, 2007). This study strongly

recommends that a formative study is conducted in the basic schools to determine the negative effects of bad odour on human health and learning in order to address this situation in the school system.

### **Community and Rodents Encroachment on the School Toilets**

The community encroachment increased pressure on toilet use and resulted in filthy conditions of the school toilet and making daily cleaning very difficult. This finding confirmed what was reported in a study by Gyekye (2012) that lack of communal toilet facilities can result in community members encroaching into any readily available toilet facilities and increasing their daily maintenance costs and cleaning burden. The community encroachment on the school toilets has resulted in low toilet use among the pupils. This assertion was confirmed by teachers. They reported that the greatest source of pressures on the school toilets system was lack of toilet facilities in the communities. Absence of community toilets has caused residents to resort to the use of the school toilet thus increasing pressure on the facility. This situation was, however, identified to be absent in schools where the communities had toilet facilities nearest to the schools. For example, in Oboaho District Assembly Basic school in the Fantekwa District, the community encroachment on the school toilet was virtually absent because the community had toilet facility. This suggests that when CLTS programmes, which operates on principle of “shock” and “shame” psychological foundation, are extended to such communities without toilet facilities, it will help address the sanitation challenges in the communities where basic schools are located. This means that any intervention strategies should target communities in which the sampling points (school) are located by increasing access to credit with easy terms that could be accessed by households to construct their own toilet facilities.

Closely linked to the community encroachment on the school toilet system is invasion of school toilet premises by rodents. This constitutes another major barrier and threats revealed by checklist assessment results. The risk of rodents in dwelling places has been documented in one literature reviewed by this study (Gratz, 1994). Dangerous rodents such as snakes, lizards, wall gecko, spiders, mouse, rats, cockroaches, and houseflies, caused myriad of psychological stress ranging from fear and panic and sometimes health hazards to humans. The importance of rodents’ prevention through good hygiene, management and exclusion practices should be emphasized. Teachers as well as the pupils in charge of hygiene in the school have the day to day responsibility of ensuring a rodent management programme is maintained. Nevertheless, research is strongly needed to understand the health and psychological implications of presence of rodents in the school toilet premises and their impacts on pupils’ toilet use and learning.

### **Technology Drive**

The technological drive relates to the physical structure and design of the toilet facilities and consisted of dimensions of squat holes and siting of the toilet in relation to walkways within the school compound. According to Zomerplaag & Mooijman (2005), children under five years require toilet of different squat hole dimensions than do older children and adults. Specific features need to be taken into account to make the toilet easy, safe and comfortable to use. For example, the squatting holes in a KVIP toilet need to be smaller, and footrests may need to be closer together for younger children thus making it safer, secure and risky free for use by children.

The result of this study, however, revealed that most of the KVIP toilets used in the study schools have squat holes being either larger or smaller than recommended in the toilet provision policy document (Table 8). In Begoro Basic School for example, the squat holes of the KVIP used by JHS was 30cm in diameter as against the 25cm dimension recommended in the Ghana’s Environmental Sanitation Policy Framework (MLGRD, 2010). Similar observation was made in Kofisah Primary and JHS where the squat holes of the school toilet have smaller dimensions (24cm) compared to what policy recommended (25cm). Larger squat holes may cause fear of falling into the squat holes when using the toilets, and smaller squat holes may make it difficult for toilet users to direct the faecal matter into the pits through the squat holes, thus resulting in soiling the squat holes areas with faeces and making the toilet filthy and unhygienic. Since school pupils are often powerless to bring improvement in these aspects of their lives, they are largely affected more than the adults. This is a wakeup call for sanitation stakeholders and policy makers including MOE, GES, School Management Committees (SMCs), Parent Teacher Associations (PTAs), as well as

MMDAs to ensure that proper, adequate and appropriate toilets are provided for pupils in the basic schools. To this effect, this study strongly suggests a holistic assessment regime of conditions of toilet systems currently used in the basic schools in order to improve their quality, convenience and comfortability.

### ***Pupil-Toilet Ratio***

The pupil-toilet ratio refers to the number of pupils per squat hole. The results presented in Table 9 described the current states of pupil-toilet-ratios in the studied schools within the periods 2010-2016. These results showed that the current pupil-toilet ratio in the schools are high compared to what policy recommended (Boys: 50 pupils per squat hole; girls: 40 pupils per squat hole). For example, in 2010 the toilet in Kofisah M.A Basic School was constructed to serve a population of 175 pupils. In 2011, the school enrolment increased to 187 from 175 indicating that 12 pupils in 2011 were without toilet. This number of pupils without toilet facility has increased to 224 in 2014 indicating an excess of 49 pupils with no toilet facility. In 2016, study schools in the Eastern and Volta Regions have the following number of pupils without toilets: Eastern-260, Volta-292 (Table 9). These results indicated that the pupil-toilet ratio continued to increase annually with increasing school enrolments suggesting that toilet facilities used in the study schools were inadequate. This causes pupils to queue before accessing the facility. These results confirmed the qualitative data obtained from the FGDs and checklist observation. This situation, nevertheless, is high enough to warrant open defaecation behaviours among pupils, as they (pupils) are at higher risk of acquiring communicable diseases from using the school toilets. This finding suggests that in constructing toilet facilities in schools, future increase in school enrolment must be factored into the construction process.

### **Pupils and Teachers Perception of Conditions and Usage of School Toilets**

Encouraging millions of school children to use toilets that are likely to be taken further into adulthood will contribute towards achieving the 2030 SDG Six (6) target two (2) of United Nations General Assembly (UNGA). The results of this study, however, revealed that pupils were unable to use the school toilets because they perceived the school toilets as unhygienic and therefore associated with diseases. This result is consistent with a number of school based sanitation studies in some countries. For example, a study (Vernon *et al.*, 2003) in Sweden and United Kingdom demonstrated that schoolchildren avoided defaecating in toilets because the toilets were too filthy and were perceived to be associated with diseases. In Ghana, a study conducted by WSMP (2008) to determine the factors contributing to high incidence of open defaecation behaviours among pupils found absence of clean toilets to be responsible. The low interest in toilet use by pupils revealed by the results of the present study may be attributed to the fact that the school toilets are used by large number of pupils coupled with poor maintenance. Studies (Cairncross & Feachem, 1993) showed that if toilets are not kept clean they may become a focus for disease transmission and pupils will prefer not to use them.

The influence of bad scent on toilet use has been reported in plethora studies (Nuzhat & Mohammed, 2006; Vernon *et al.*, 2003; Lundblad, 2005; Bell & Bell, 2007; Vlahos, 2007; Zaltman, 2003). Bad scent has two major behavioural effects: avoidance or approach (Fulbright *et al.*, 1998). Pleasant scents produced approach whilst unpleasant scents produce avoidance and both leave lasting effects on the person's liking or disliking of a person, place, or thing (Fulbright *et al.*, 1998). The present study found bad smells from the toilets as barrier to toilet use by pupils in the study schools. This was revealed in the quantitative study and supported by the results of the qualitative study. Pupils discussed experiences they had, challenges they faced, frustrations and difficulties they had using the school toilets due to the bad scent they (toilets) generate. For example, pupils from Akatsi Demonstration 2 and Akuffokrom Municipal Assembly Basic Schools (M.A) believed that a key disadvantage of using a toilet is the unpleasant scent they generate. Given these negative perceptions of the pupils regarding their school toilets, open defaecators would describe their behaviour as a more pleasant, convenient and comfortable experiences. This result underscored the importance of provision of user preference and appealing school toilets if pupils are to use them sustainably. Study (Sidibe, 2007) showed that provision of user preference sanitation facilities do not only ensure adequate and sustainable use of the facilities, but it also produces positive hygiene behaviours, including correct use and maintenance of facilities by users

Similarly, the results of the assessment of conditions of the school toilets showed that pupils perceived community encroachment on the school toilets as another key factor responsible for their inability to use the school toilets. The community encroachment has increased pressure on toilet use and resulted in filthy conditions of the school toilets and making daily cleaning very difficult. This finding confirmed what was reported in a study by Gyekye (2012) that lack of communal toilet facilities can result in community members encroaching into any readily available toilet facilities and increasing their daily maintenance costs and cleaning burden. The community encroachment on the school toilets has resulted in low toilet use among the pupils. Indeed, 80% (N=45) of the teachers confirmed this views expressed by pupils. They reported that the greatest source of pressures on the school toilets system was lack of toilet facilities in the communities.

Though the school authorities may have been successful in preventing community residents from using the school toilets or ensuring that they make proper use of the facility, it had more often turned into conflicts situations between the school authorities and the community residents. In Akuffokrom Municipal Assembly Basic School for instance, the conflict had resulted in transfer of a teacher from the school in 2011 due to constant threats from the community residents. This situation was, however, reported to be absent in schools where the communities had toilet facilities. For example, in Oboaho District Assembly Basic school in the Fantekwa District, the study found that the community encroachment on the school toilet was virtually absent because the community had communal toilet facility. This suggests that when CLTS programmes, which operates on principle of “shock” and “shame” psychological foundation, are extended to such communities without toilet facilities, it will help address the conflicts between the school and the community and thus increases sustainable toilet use among the pupils. This study therefore strongly suggests that any intervention strategies should target communities in which the school are located by increasing access to credit with easy terms that could be accessed by households to construct their own toilet facilities.

## **6. Conclusion**

The study has provided strong theory-based evidence on conditions of toilet facilities used in the basic schools. The situational threats preventing pupils from sustainable toilet use as the study’s results revealed included high pupil-toilet ratio, inappropriate squat hole sizes, lack of funds for toilet maintenance resulting in poor hygiene and inadequate ventilation in the school toilets, lack of adequate privacy, presence of fearful rodents in the school toilets causing psychological discomfort to pupils during toilet use; others are lack of desludging of faecal sludge from the school toilets resulting in bad smells in the toilet premises; and unresolved conflicts between the communities and the schools regarding use of school toilets by the communities. The contributions of these factors therefore provided holistic understanding of the conditions of basic school toilet facilities.

## **7. Recommendations**

Based on the major findings and conclusions of this study, the following recommendations have been made for consideration by both direct and indirect stakeholders to upgrade the quality of toilet facilities used in the basic schools. The Ministry of Local Government and Rural Development (MLGRD) must make it a national policy that existing toilet facilities in the basic schools are upgraded to meet the country’s sanitation standards. The newly constructed school toilets are provided with toilet facilities whose qualities resonates with pupils defaecation preferences. This also underscores the need for government to build a strong enabling environment through sanitation policy guidelines coupled with adequate financing arrangement for the sanitation departments of MMDAs to enable them carry out their mandate not only to the communities but also the schools within the communities. The monthly government sanitation initiative programme that aims at ensuring clean and disease free communities should be scaled up to cover the basic schools so that at least the school toilet facilities are cleaned to make them attractive, safe and disease-free environment for pupils. Again, education and motivation campaigns by school sanitation stakeholders to promote toilet usage have to be inclusive across schools and sex groups. Finally, research is strongly needed to understand the health and psychological implications of presence of rodents in the school toilet premises and their impacts on pupils toilet use.



## 8. Conflict of Interest

The authors declare no conflicts of interest.

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