

**AN ASSESSMENT OF SANITATION FACILITIES IN PUBLIC PRIMARY SCHOOLS
IN KAJIADO CENTRAL DISTRICT**

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**A Dissertation Submitted in Partial Fulfilment for the Award of the Degree of
Master of Public Health (MPH) of the University of Nairobi**

22 October 2013

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DEDICATION

I dedicate this thesis to my family; Isaac, Aimee and Bryan; your support, patience love and encouragement continually strengthens me. My parents Joan Nasimiyu and John Opiyo for all the unconditional support constantly given, and my sister Cecelia Nambengele whose mentorship and generosity has been an inspiration.

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LIST OF ABBREVIATIONS

AMREF	African Medical Research Foundation
ARIs	Acute Respiratory Infections
CWS	Church World Service
CWSA	Community Water and Sanitation Association
CLTS	Community Led Total Sanitation
CSO	Country Status Overview
DEO	District Education Officer
ECDE	Early Childhood Development and Education
EFA	Education for All
ESH	Environment Sanitation and Hygiene
EMIS	Education Management Information System
ERC	Ethical Review Committee
FPE	Free Primary Education
GAA	German Agro Action
GCN	Girl Child Network
GLAAS	Global Annual Assessment of Sanitation and Drinking Water
HH	Households
HGSF	Home Grown School Feeding Program

IRC	IRC International Water and Sanitation Centre
JMP	World Health Organisation and United Nations International Children's Emergency Fund, Joint Monitoring Programme for Water Supply and Sanitation
KDDP	Kajiado District Development Plan
KDHS	Kenya Demographic and Health Survey
KIHBS	Kenya Integrated Household Budget Survey
KII	Key Informant Interview
KNH	Kenyatta National Hospital
KPHC	Kenya Population and Housing Census
KPLC	Kenya Power and Lighting Company
MDG's	Millennium Development Goals
MoE	Ministry of Education
MoH	Ministry of Health
MoPHS	Ministry of Public Health and Sanitation
MoWI	Ministry of Water and Irrigation
NCST	National Council for Science and Technology
NESHPP	National Environmental Sanitation and Hygiene Policy
NGO	Non Governmental Organisation
NHPRRA	National Health Policy for Rural Areas

NIA	Neighbourhood Initiative Alliance
PHAST	Participatory Hygiene and Sanitation Transformation
RMI's	Repair, Maintenance and Improvement's
SHP	School Health Programme
SMC	School Management Committee
SSHE	School Sanitation and Hygiene Education
STH	Soil Transmitted Helminths
UN	United Nations
UNICEF	United Nations International Children's Emergency Fund
UoN	University of Nairobi
UPE	Universal Primary Education
USD	United States Dollars
VIPL	Ventilated Improved Pit Latrine
WASH	Water Sanitation and Hygiene
WES	Water and Environmental Sanitation
WHO	World Health Organisation
WSSCC	Water Supply and Sanitation Collaborative Council

DEFINITION OF OPERATIONAL TERMS

Basic Sanitation	One that provides privacy and separates human excreta from human contact.
Hygiene	The practice of keeping oneself and the surrounding environment clean.
Improved Sanitation	The availability and use of a simple pit latrine; ventilated improved pit latrine, pour-flush latrine, or connection to septic tank or a public sewer.
Open Defecation	The practice of defecating and/or urinating on the ground or in the bush, and not in a latrine or toilet of any type.
Vision 2030	Strategic plan of the Government of Kenya which sets the year 2030 as the time by which Kenya should have become a middle income country through a series of development plans that have to be attained by that year.

ABSTRACT

The Government of Kenya has a National School Health Policy (2009) and its corresponding guidelines National School Health Guidelines (2009), through which it aims to ensure the improved health of all school going children. The policy provides for a comprehensive school health programme which addresses various health needs of children through the formal schooling system. Through the Safety Standards Manual for Schools in Kenya (2008) school administrators have well defined parameters and process indicators to guide implementation.

The proposed study was carried out in Kajiado County, where 56% of the households defecate in the bush and 65% have boreholes as the main source of water (Kenya Population and Housing Census (KPHC), 2009). School going children spend between six and eight hours in school daily. Inadequate sanitation facilities force them to practise open defecation and prevent them from washing their hands. This exposes them to the risk of contracting faecal-oral and other sanitation related diseases such as diarrhoea, typhoid and soil-transmitted helminth infections.

Objective: The study aimed to assess sanitation standards in public primary schools within Kajiado Central District in order to evaluate the extent to which they conform to the guidelines set in the Safety Standards Manual for Schools in Kenya (2008) Ministry of Education/Church World Services.

Methods and Analysis: This was a descriptive cross sectional study carried out in a population sample of twenty public primary schools in Kajiado Central District in March 2012 during a normal school term. A structured observational assessment based on a prepared checklist was carried out as well as key informant interviews

with the head teachers and health teachers. The study area has a small urban centre Kajiado town, but the majority of the schools are in the rural areas. The study employed mixed sampling techniques to ensure proportionate representation of schools in all divisions of the district.

Results: A total of 228 pupil latrines and 57 staff latrines were observed in the study with 58% of mixed schools having boys' urinals. National standards stipulate a ratio of 25 pupils to 1 latrine but the situation in the study schools differed greatly. The overall pupil latrine ratio was 45 girls: 1 latrine with a door; for boys in schools with urinals was 71 boys: 1 urinal and 2 latrines, while the ratio for boys in schools without urinals stood at 71 boys to 1 latrine with door. The main source of water varied with 30% having water piped to the school, 20% buying from vendors, 15% respectively from community boreholes and water pans/dams, 5% own borehole and the rest from rain water harvesting. Fifty five percent of schools had designated hand washing points but water was only available in half of these, in effect only 30% of study schools had functional handwashing stations. The study found that 45% of school administrators were not aware of any type of national sanitation guidelines or standards, while 85% of health/environment teachers reported being unaware of any national standards or guidelines.

Conclusion: The sanitation facilities in public primary schools Kajiado Central District do not meet national requirements with two parameters: latrine ratios and functional hand washing points falling extremely short. In addition the school administrators and health teachers ought to be knowledgeable on the national guidelines and standards.

CHAPTER 1: INTRODUCTION

1.1 Background

Sanitation and Health

Sanitation refers to the promotion of hygiene and prevention of disease through the provision of, and access to, safe water and adequate sanitation facilities; and good individual hygiene practices. There is high morbidity and mortality related to lack of water, poor sanitation and poor hygiene globally, with the developing countries bearing the greatest load. Sanitation related diseases debilitate and kill one million Africans every year (Enoh, 2010). The number of people without improved sanitation facilities globally stands at 2.6 billion, and of these 533 million are in sub-Saharan Africa (World Health Organisation (WHO), United Nations Children's Fund (UNICEF), 2010).

The health, academic performance and retention rates of school going children is greatly affected by the availability, accessibility and quality of sanitation facilities. Studies indicate that an estimated 400 million children have diminished learning abilities due to intestinal worm infestation (Hall et al, 2008); while according to the International Resource Centre on Water and Sanitation (IRC, 2005) 75 percent of adolescent girls in marginalized areas drop out of school due to the lack of adequate private sanitation facilities in school.

Pit latrines are utilized as an effective and convenient method of on- site human waste disposal in areas not served by a sewerage system. They also serve to encourage prevention of disease, better sanitation practices and to deter open defecation. It is estimated that globally four thousand (4000) children less than five years die daily from diarrheal diseases alone, and millions of others are made sick, weakened or disabled by diarrhoea and other water-and-sanitation-related diseases (WHO/UNICEF, 2008).

Sanitation is an important aspect that is poorly addressed in developing nations and a major cause of high infant mortality and morbidity as well as morbidity in children and the general populace. The United Nations (UN) has included it as an integral part of the Millennium Development Goals (MDG's) as: MDG 7, Target 7C: 'To halve, by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation'; (UN, Millennium Development Goals Project, 2000).

Recent estimates indicate that 2.6 billion people (approximately 39% of the global population), lack access to improved facilities for the disposal of human excreta, such as a basic pit latrine, toilet connected to a septic tank or sewer system or a composting toilet (WHO/UNICEF, 2010). In several parts of the developing world sanitation lags behind in all infrastructure development. In sub Saharan Africa 66% of the population had no access to basic sanitation services in 2008 (WHO/UNICEF, 2010).

As part of the efforts to meet the Millennium Development Goals (MDG's), the UN Millennium Project and the UN Secretary General identified specific provisions for accelerated implementation to schools and health care facilities and called this 'Vision 21'. Targets promoted by Vision 21 include: 80 percent of schoolchildren educated on hygiene, and all schools equipped with facilities for sanitation and hand washing by 2015(Water Supply and Sanitation Collaborative Council (WSSCC), 2000).

International Guidelines

Guidelines for international standards of sanitation facilities in school settings require the provision of basic sanitation facilities, (separate for boys and girls); provision of water and soap (or ash) for hand washing after using the latrines and before meals, and the provision of safe drinking water. According to Adams et al, (2009), the number of toilets should be:

- One per 25 for girls and one for female staff; and
- One toilet and one urinal (or 50cm of urinal wall) per 50 boys and one for male staff. They should be hygienic to use and easy to clean as well as having convenient handwashing facilities close by.

Statistics from the Global Annual Assessment on Sanitation & Drinking Water (GLAAS, 2010),, indicate that over 2.6 billion people did not use improved sanitation facilities while nearly 900 million people did not use drinking water from an improved source (WHO/UNICEF, 2010). The same document indicates that less than half of

the rural population are using improved sanitation facilities as compared to 76% of their urban counterparts.

The lack of sanitation facilities contributes directly to soil transmitted helminth (STH) infections. Due to open defecation, helminth cysts are very easily transmitted to their human hosts leading to chronic infestation in given areas. Children are especially vulnerable as they walk and play bare foot in their surroundings, and their health and cognitive functions are adversely affected by a high helminth load. Children are estimated to represent about one third (400 million) of the global soil-transmitted helminth burden (The Task Force on Global Health, 2010)

<http://www.childrenwithoutworms.org> 24/08/10.

Kenya Government Policies

a) Government Policies

The government of Kenya through the National School Health Policy and Guidelines aims 'to provide safe water, adequate sanitation and hygiene services to all schools in the republic (National School Health Policy, MoPHS/MoE, 2009). The concept is to ensure the uptake of good sanitation habits at an early age so that they are retained for life. The children will serve as change agents in their homes and communities. Additionally there is the National Environmental Sanitation and Hygiene Policy (NESHP, 2007), and a National Health Policy for Rural Areas (NHPRA, 2007), aimed at providing basic sanitation and potable water to all citizens, especially in schools and in rural and marginalized areas. The former Ministry of Public Health and

Sanitation (MoPHS), the Ministry of Education (MoE), and the former Ministry of Water and Irrigation (MOWI), all had a role in the achievement of this goal (NESHP, 2007).

The then MoPHS had made sanitation improvement a priority; in its Specific Goals and Strategies one of its milestone indicators states; *Thrust 2.5: Increase sanitation coverage from 46% to 66% and Increase no. of households utilizing clean water by 20%*, (MoPHS Strategic Plan 2008-2012). This translates to 644,000 households with latrines and a similar number of households using treated water. This was part of the Ministry's plan in efforts to meet the government's First Term Medium Plan of Vision 2030. Implementation of a comprehensive School Health Programme is addressed in Strategic Thrust 1 which sets the target of 1800 schools successfully implementing the policy by 2012, (MOPHS Strategic Plan 2008-2012).

Further commitment from the government through 'Sessional Paper No. 1, 2005', and the 'National Action plan for Education for All (EFA)' put structures and policies in place to ensure equity in education, and elimination of gender and regional disparities. Thus since 2003 under the FPE programme, all primary schools receive Kshs.1, 020 (USD 13.6) for each child to cover for tuition, instructional material and support staff (exchange rate of Kshs. 85 to 1 USD, 2012 rates). Any additional levies have to be approved by the Ministry of Education, and have to have been ratified by the School Management Committee (SMC) and the District Education Office (Education Service Delivery in Kenya, MoE/UNICEF 2005).

b) National Guidelines

The then Ministry of Public Health and Sanitation (MoPHS) and the Ministry of Education (MoE) developed the National School Health Policy and its accompanying Guidelines to give general direction on a comprehensive school health program. The School Safety Standards Manual stipulates the number of, and required provisions for sanitary facilities, these being:

- The first 30 learners: 4 closets (holes),
- The next 270 learners: one extra closet for every 30 learners,
- Every additional learner over 270 learners: 1 closet per 50 learners, (Safety Standards Manual for Schools in Kenya, MoE, 2008).

According to the Kenya Integrated Household Budget Survey (KIHBS) in a document titled 'Well being in Kenya', water is considered safe if it is obtained from the following sources; piped water, boreholes, protected spring and protected well. It also defines adequate sanitation to include the use of flush toilet (to sewer/septic tank), covered pit latrine and ventilated improved pit latrine (VIPL), (Kenya National Bureau of Statistics, 2008).

1.2 Statement of Research Problem

During the school term school going children spend majority of the day in school, a duration of between five to eight hours for pre-school and upper classes respectively as per the school schedule set by the Ministry of Education. Thus the availability and

access of sanitation facilities which include latrines, wash basins and water for hand washing and drinking is essential for their health and well being.

Children are the most susceptible to diarrhoeal diseases with an estimated annual mortality of 2.2 million children due to unsafe water, inadequate sanitation and insufficient hygiene (WHO, 2008). Open defecation creates a situation where the children are exposed to pathogens leading to high incidences of diarrhoeal diseases, soil-transmitted helminth infections and other faecal- orally transmitted diseases.

One of the major challenges facing schools came about due to an increase in enrolment from the year 2003, brought about by free primary education (FPE) implemented as a result of election pledges during the 2002 national elections. Enrolment in public primary schools increased from 6.9 million in 2003 to 7.4 million in 2007 (a 7.7% increase), while enrolment in private primary schools increased by 251% from 253,169 to 889,192. The net enrolment rate rose from 80.4% to 91.6% in the same period (Education Management Information System (EMIS), MoE 2008). A look at government policies and publications does not indicate budgetary provisions made to match infrastructure provision including that of improved sanitation.

Accordingly the assessment on sanitation standards in public primary schools was based on the Safety Standards Manual that has comprehensive guidelines and minimum standards on various health and safety aspects for schools in Kenya. The Safety Standards Manual (2008) replaces the Ministry of Education Circular (2001)

that was previously used to define the Health and Safety Standards in educational institutions. The National School Health Policy (2007) and its accompanying National School Health Guidelines (2007) both jointly MoPHS/MoE, have general guidelines but do not have the required details for comprehensive implementation.

Research Question

Are the sanitation facilities in public primary schools in Kajiado Central District in conformity with the stipulated standards set in the , Ministry of Education, Safety Standards Manual for Schools in Kenya, 2008; policy document?

1.3 Rationale/Justification of study

Children spend most of their day in school, a duration of approximately 5-8 hours for preschool and primary classes. Thus the availability and access of sanitation facilities which include latrines/toilets and water for hand washing among others is crucial. Studies have shown that lack of adequate sanitation facilities in schools lead to high rates of absenteeism, poor academic performance and reduced retention rates especially amongst girls (Redhouse 2004, Njuguna et al 2008, Freeman et al 2011).

Public primary schools were chosen as the study population as they are the schools under the direct jurisdiction of the Government of Kenya through the MoE. They are also the schools to which majority of pupils from the surrounding community in

Kajiado Central District enrol and attend. Thus their administrators would be expected to adhere to government standards and regulations in the running of the schools.

There are 37,954 Early Childhood Development and Education (ECDE) centres and 26,606 primary schools in Kenya with an enrolment rate of 1.72 million and 8.6 million respectively (EMIS, MoE, 2009). These 10.3 million children are the focus of the health education programmes especially those in preschool and lower primary (Classes 1-4). These schools receive funding from the government through the Free Primary Education (FPE) program; and the amount disbursed per school is dependent on the number of pupils registered in the school.

In Kajiado Central District, there are no sanitation or sewerage services provided by the national or local authority; and there is also chronic water scarcity most of the year. There is a relatively small urban area being Kajiado town while majority of the area and residents are rural based. The region is classified as an arid and semi arid land area (ASAL) Appendix 1 (ASAL Map), a marginalized area in need of special intervention. The study aims to assess the status of the sanitation facilities in the selected public primary schools.

Assessing the existing situation in the area will enable acquisition of relevant data from a local perspective, and thus the necessary interventions may be initiated. The data from the study may guide future interventions. The outcome of the study

informed on the current situation in the area and its findings will be shared with the MoE and MoH to enable them evaluate the application and implementation of their sanitation policies and safety standards.

1.4 Study Limitation

The vast area of the study region (8, 141km²) with harsh terrain, poor transport infrastructure and many schools located deep in the hinterland posed a big challenge in accessibility and limited the sampling of desired number of schools. The study was time bound by the school calendar, as it had to be carried out during a normal school term, thus it could not be carried out in April, August or December. Additionally the study could only be conducted when there are no national or school examinations; and other extracurricular activities such as sports events or drama festivals going on at the school.

1.5 Objectives

The main objective was to assess the sanitation facilities in public primary schools in Kajjado Central District.

The specific objectives were:

- i. To determine the pupil : latrine ratio;
- ii. To ascertain availability and source of water;
- iii. To determine the availability of hand washing facilities;

- iv. To evaluate the state of cleanliness and maintenance of the latrines;
- v. To explore awareness of national sanitation standards and guidelines by school administrators
- vi. To compare the sanitation facilities against the set national standards.

1.6 Hypothesis

Public primary schools in Kajiado Central District meet the requirement of hygiene and sanitation guidelines as set in the Safety Standards Manual for Schools in Kenya and the National School Health Policy and Guidelines, Ministry of Education documents.

CHAPTER 2: LITERATURE REVIEW

2.1 Health in Schools

School Water, Sanitation and Hygiene Education (SWASH) refers to the collaborative efforts of various stakeholders; government, NGO'S and international institutions, to ensure safe and healthy schools through the provision of clean water, latrines for both girls and boys, and appropriate hygiene education. This is put in context as estimates indicate that 1.1 billion people worldwide lack access to improved water supplies and 2.6 billion people lack adequate sanitation (UNICEF, 2010).

Less than two thirds of the global population, an approximate 2.6 billion people do not use improved sanitation. The greatest numbers are found in Southern Asia followed by large populations in Eastern Asia and Sub-Saharan Africa. Access to water is better with 87% of the world population and 84% in developing countries getting their drinking water from improved sources. But sub-Saharan Africa fares poorly with only 60 % of its population using improved sources of drinking water, (WHO/UNICEF, 2010).

The international bodies such as UNICEF, WHO, amongst others have been active in spearheading, WASH campaigns across the world with special emphasis in developing countries in Asia and Africa. Studies indicate that annually 272 million school days are lost by children due to diarrhoea (Hutton et al, 2004). This has

obvious detrimental effects on academic performance. The availability of water and sanitation facilities in schools has been shown to reduce diarrhoea and hygiene related diseases amongst school children (Curtis et al 2003; Pruss-Ustun et al, 2008).

An estimated one in three school-aged children in the developing world is infested with intestinal worms (Savioli et al, 2002). A more recent study estimates that 400 million school children and 47 percent of 5-6year olds in the developing world are affected by worms (Hall et al, 2008). The same study indicates that 100 percent of annual soil transmitted worm infestation cases are attributable to inadequate sanitation and hygiene. The reduction of open defecation through adequate latrine provision especially at schools; may definitely reduce and eventually break the cycle of infection and re-infections.

Where sanitation is poor and water supply is inadequate and unsafe, outbreaks of disease with severe health consequences tend to occur. Water and sanitation related diseases include diarrhoea, cholera, typhoid, dysentery, hepatitis A, Poliomyelitis, acute respiratory infections and soil-transmitted-helminth infections. The global Disability Adjusted Life Years (DALY's) for diarrhoeal diseases is estimated to be 4.1 percent and it's also estimated to be the cause of death for 1.8million people annually (WHO, 2010), most of them being children in developing countries.

Other than providing adequate latrines, the availability of water and soap for hand washing further enables the reduction of diarrhoeal disease and respiratory infections. Studies indicate a 30 percent reduction in diarrhoea cases when hand washing is practised in day care centres and primary schools (Ejemot et al, 2008). In addition other studies also indicate washing hands with soap could reduce acute respiratory infections including pneumonia, which is the highest cause of child mortality, by 25 percent (WHO, 2008).

Availability of latrines and water improves school attendance and is especially important for adolescent girls who are menstruating as they require the privacy of separate latrines and also water. When this is lacking there is consistent absenteeism during their monthly period and this can reach up to twenty percent of school time (IRC, 2005). Many times such girls drop out all together from school especially as they also face challenges accessing sanitary towels due to its cost.

2.2 Challenges in Developing Countries

Developing countries face challenges in the provision of sanitation facilities and this is markedly more so in schools. A study in India evaluating the environment and sanitation in a rural government school as compared to national guidelines found that only 50% of the schools had adequate latrines for boys and 60% had adequate latrines for girls, while only 10% had adequate handwashing points with soap (Majra et al, 2010).

In Bangladesh a UNICEF study on sanitation facilities in primary schools (UNICEF, 2004) showed an average of one latrine for 152 pupils, with 25% having one latrine, 44% with two latrines, 13% with non functional latrines and 6% having none. The same study also indicates that 19% of all schools had no water facilities, 28% having non functional water sources and 53% with functional water sources. There are no national guidelines on sanitation facilities in primary schools in the country (Nahar et al 2006).

The situation of inadequate sanitation facilities in schools is replicated in Africa. Many times those entrusted with school administration are neither adequately informed nor knowledgeable on the policies in place. A study on Knowledge and practice of School Health Programmes in a local government area in Nigeria reported that 27.7% of the schools had no toilet facility, 33% had pit latrines while 40% had water closets. Only 25.6% had handwashing facilities. Additionally none of the head teachers had adequate knowledge on the school health programme (Ofovwe et al, 2007).

In Ghana a study carried out to determine the conditions of the existing sanitation facilities indicated that out of 30 selected schools, 53% were without toilet facilities while 83% were without safe water on site (Gyabaah et al, 2009). The Ghanaian education policy requires all schools to have adequate sanitation and safe water facilities with a required ratio of 50 persons per squatting hole set by the Community Water and Sanitation Agency (CWSA) 2004).

In South Africa, twenty three percent of the population is without access to basic sanitation while nine percent lack access to safe water. In regards to school sanitation, the government of South Africa aims to ensure that all schools have adequate sanitation facilities by 2014 (Global Water Challenge, 2010).

2.3 Intervention Impacts

The WASH concept incorporates the aspect of child-friendly facilities to enable pupils easily and safely utilise the latrines and hand washing points provided. This requires that the facilities constructed should take into consideration and be adapted, to fit children's smaller size and not just construct 'standard' latrines. Thus the latrine squatting hole and foot rests should be customized with children in mind as well as the height and location of the taps at hand washing points. A study in Tanzania showed a 12 percent increase in school attendance when water is available within a 15 minute walk (Redhouse, 2004).

Availability of sanitation facilities on the other hand, leads to improved health outcomes for children and keeps girls in school. An evaluation of WASH in schools in Kenya showed that girls were less absent in schools where there was more hand washing and high toilet use, and there were reduced incidences of diarrhoeal diseases and helminth infestation (Njuguna et al, 2008).

Using children as agents of change not only within their schools but especially in their communities is one of the driving points in the school WASH programme. A study carried out in rural western Kenya showed that when children are actively engaged in WASH they lead to community adoption of good hygiene behaviours and adoption of sanitation technologies (Onyango-Ouma et al, 2009). This in turn leads to improved health both at individual and community level (Bowen, 2007).

A randomized impact evaluation of a deworming programme in western Kenya demonstrated that the worm burden in children contributed to 25% of overall school absenteeism rates, (Poverty Action Lab, 2007) The Ministry of Public Health and Sanitation has recognised the impact of helminth infestation and has active deworming campaigns carried out every quarter in schools by the area public health officers. The data is tracked and monitoring indicators in percentage for the number of school children properly dewormed in the catchment area on an annual basis is regularly recorded (MoPHS Strategic Plan 2008-2012, 2009).

A recent cluster randomized trial of school-based WASH on pupil absence in Nyanza Province of three arms: water treatment and hygiene promotion, sanitation improvement, and control; indicated a 58% reduction in absence for girls (Freeman et al, 2011). Another analysis of a SWASH + project in the same region resulted in a 60% reduction in diarrhoea in the schools that were receiving comprehensive WASH interventions (Brooke Keen et al, 2011). In addition it also exposed challenges in maintenance operational budgets as well as the role of individual administrators' initiative in the status of sanitation in schools.

In the school environment, teachers input and cooperation is crucial as they serve as role models to their pupils and also to the community. Supporting and encouraging good hygiene behaviours is an additional task outside of standard teaching duties and thus finding ways to keep the teachers motivated to continue with this effort is important.

CHAPTER 3: METHODOLOGY

3.1 Study Design

This was a descriptive, cross sectional study. The study assessed the standards, maintenance and physical structures of the sanitation facilities in public primary schools in Kajiado Central District. Sanitation facilities in the context of the study refer to toilets/latrines, washstands/handwashing stations, and water for - drinking, hand washing and cleaning the toilets/latrines. Public primary schools were chosen because these are schools which are under the jurisdiction of the Government of Kenya through the Ministry of Education (MoE). They are also the schools in which the majority of pupils are found. These schools receive funding from the government through the Free Primary Education (FPE) programme. The amount of funding is dependent on the number of pupils registered per school. The sanitation facilities in the study schools were assessed to establish their conformity with the Safety Standards Manual for Schools in Kenya, MoE/CWS 2008.

3.2 Variables

The exploratory variables in the study were:

1. Availability of latrines
2. Accessibility/Usability of latrines
3. Availability of water
4. Adequacy of the sanitation facilities
5. Cleanliness of the latrines

6. Privacy of the latrines
7. Availability of handwashing stations
8. Type of school-rural or urban
9. Boarding or day school
10. Funding for sanitation facilities and type/extent of funding

3.3 Inclusion and Exclusion Criteria

Inclusion Criteria

Schools included in the study were;

- i. Public primary schools funded and administered by the Ministry of Education.
- ii. These could also be mixed/co-ed (both boys and girls), or single sex (only girls or only boys) in composition
- iii. May be day and/or boarding schools.

Exclusion Criteria

Schools that have private ownership and exclusively privately funded were not part of the study

3.4 Confounders

There are public schools that have received funding and donations for sanitation projects. These were in the form of direct financial aid for specific sanitation infrastructure or material donation of structures such as water tanks. They thus had better facilities than others that did not receive such funding. Thus a section of the questionnaires enquired about the extent and type of donor funding and addressed the findings in the analysis.

3.5 Study Area

Administration

The study was carried out in Kajiado Central District, which is in Kajiado County in the south-eastern area of the Rift Valley Province in Kenya, (ASAL Map Appendix 1). Kajiado Central covers an area of 8,141.9km² (Kajiado District Commissioners Office 2008). Kajiado was originally one vast district covering total of 21, 902.9m² and situated between longitude 36⁰5' and 37⁰5' east and between latitudes 1⁰0' and 3⁰0' south. It was divided into 3 districts Kajiado North, Kajiado Central, and Loitokitok in the period 2009-2010 for easier administration (Kajiado District Development Plan 2009).

The district comprises of the divisions of Central, Enkorika, Bissil and Namanga which were among 7 divisions in the former larger Kajiado district. The district borders the Republic of Tanzania to the south west; Kajiado North district to the

East; Kibwezi and Nzau districts to the southwest, and Narok North and Narok South districts to the west. The district has two local authorities- OI Kejuado County Council and Kajiado Town Council (Kajiado District Development Plan (KDDP) 2008-2012, 2009).

The Central Zonal Education Office which is in the centre of Kajiado town, houses the Home Grown School Feeding Programme (HGSFP). The HGSFP had measured and recorded the distance from its office to every school in the district for the purposes of accounting for mileage when distributing food. The schools in the study closest to, and furthest from this reference point, were 5kms and 180kms away respectively.

General Population

During the recent census, the population in the district was found to number 162,278 (Kenya Population and Housing Census (KPHC), 2009). The percentage of households with latrines was 30% out of which 60.0% being simple pit latrines (KPHC, 2009). The district had 22 public primary schools with a total population of 12,345 pupils as of June 2010 (District Education Office, Kajiado, 2008) but at the time the study was carried out the number of schools had risen to 85. The estimated population of under fives was 35,163 while for school age going children (6-13) was 11,348.8 (District Statistics Office Kajiado, 2008).

Culture

In the area under the study, communities are still largely rural and the Maasai who are the majority live a pastoral nomadic lifestyle with deep held cultural practices and beliefs. Fifty six percent of HH in the district deposit their human waste in the bush (KPHC, 2009). Hygiene and sanitation education at school and community level has been the major approach used to attempt to bring about change. Participatory methodologies such as Community Led Total Sanitation (CLTS), Participatory Hygiene and Sanitation Transformation (PHAST); as well as Water, Sanitation and Hygiene Education (WASH) programmes; have been carried out in communities and schools. This has been in an effort to drive acceptance and sustained change through active community participation in sanitation and hygiene practices.

Climate

Kajiado district is one of the arid and semi-arid lands (ASAL) with livestock keeping being the predominant economic activity. Most of the land is non-arable (92%) with only 8% able to sustain subsistence farming. During the period 2003-2007 there was a terrible drought with the district losing over 70% of its livestock population. The government currently runs a school feeding program in the district to enable keep children in school (KDDP, 2009).

The district is water deficient with few permanent rivers that are along the border with other districts. The alternative water sources are pans (400) and dams (5) and many boreholes. Currently there are 300 private, 264 institutional and 436 Government of

Kenya (GoK)/community boreholes, but due to low management capacity only 60% of the community boreholes are operational. Households with access to piped water stand at 30%, while those with access to potable water are 10%.The average distance(km) to the nearest water point during the dry season is 10km and 5km during the wet season (KDDP,2009).

Infrastructure

Kajiado district has 2 district hospitals, 3 nursing homes, 11 health centres, 51 dispensaries and 27 private clinics. There is low acceptance of family planning methods at only 14%, while immunization has attained over 80% coverage. HIV/AIDs prevalence is at 6.25 which is higher than the national rate of 6.1% (KDDP, 2009).

There are 4 tarmac roads in the district with a total of 288kms. These are Namanga-Athi-River, Isinya-Kiserian, Magadi-Mbagathi and Kiserian-Ngong. However, most areas are served with either gravel roads (609.7km), or earth roads (619.9km). Railway length is 147 km with 5 airports/strips and mobile network coverage of 60%. There are 8 post offices and 3 sub post offices (KDDP, 2009).

3.6 Study Population

The study population's sampling frame consisted of all the public primary schools in Kajiado Central district, registered at the District Education Office. The education

sector is administered from the District Education Office and is divided into 2 divisions Central and Namanga. These divisions are further divided into 5 zones, with each being supervised by a District Zonal Officer who reports to the District Education Officer (DEO). The DEO is the administrative head of all the public schools in the district.

There were 85 registered public primary schools in Kajiado Central District at the time of the study (March 2012), Seventy seven percent of the schools (n=65) were previously community run schools and had only just joined the MoE during the period 2010-2012 since the introduction of FPE. The parameters' under assessment were the sanitation facilities in these schools; these included the latrines, the water supply/main water source and hand washing facilities/stations. There were two key informants interviews in each school for data collection, and these were the Head teacher (or deputy or senior teacher) and the health/environment teacher.

3.7 Sampling Procedure

The **Sampling Frame** was drawn from the public (government run and funded) primary schools in Kajiado Central District, duly registered at the District Education office. There was close collaboration with the District Education Office (DEO) of Kajiado Central district as they are the office mandated to oversee all the public schools in the area. The DEO availed a list of the divisions, zones, and all the schools in each zone which the Investigator utilized for sampling purposes. At the time of data collection there were 85 schools in the district with a mixture of both

urban and rural schools (Table 1). Seventy seven percent of these schools (n=65) had been community schools and only just become part of the MoE family during the period 2010-2012 since the introduction of FPE in 2003.

Sample Size Determination

Purposive sampling was applied in selecting the number of schools to be assessed in the study due to the vast size of the district with schools scattered up to one hundred and eighty kilometres apart. While taking cognizance of the need for adequate district representation into account, the sample size was also influenced by resource limitations. The sampling unit was the public primary schools in Kajaido Central District. The district has 2 divisions and 5 zones and on assessing the sampling frame provided at the District Education Office (Table 1), this would translate to approximately 3 schools sampled from each zone, with additional schools included in zones having higher numbers of schools.

The sampling type was a simple systematic random sampling where study schools were randomly chosen from the sampling frame with the first and every subsequent fifth school on the list being selected (i.e. every 1st, 5th, 10th school etc). As such zones with higher numbers of schools had a higher representation as more schools were included in the study (Table 1) making a total of 20 schools selected for the study. There was thus a proportional representation of each zone amongst the sampled number of schools.

Table 1: Educational Divisions and Schools in Kajiado Central District

Education Divisions	Educational Zones	Number of Schools	Schools Sampled
Central	Kajiado	18	4
	Enkorika	17	4
	Elangata Wuas	11	3
Namanga	Il Bissil	26	6
	Namanga	13	3
Totals			
2	5	85	20

3.8 Data Collection

The researcher carried out the data collection in all the schools and this was done during a normal school day. The investigator first introduced herself to the head teacher, deputy head teacher, or teacher on duty, briefed him or her on the study before requesting for permission for the study to be carried out in the school. The respective teacher in attendance then signed two consent forms, with one copy being left at the school. Data collection was done using interviewer administered questionnaires and structured observation checklist. The format for the both the structured observation checklist and the questionnaires were developed using the

Safety Standards Manual for Schools in Kenya, MoE (2008), as the guiding document. Due to the large size of the district and rough terrain there were challenges faced in reaching many of the schools but once at the schools, full cooperation was experienced from all the school staff with a 100% response rate. All schools consented to participate in the study. The survey instruments comprised of Head teacher questionnaire, Health/Environment teacher questionnaires, and structured observation checklist.

Key Informant Interviews

Key Informant Interviews (KII) were carried out to solicit information from the staff using interviewer administered questionnaires. In each school information on the administrative issues in regards to water and sanitation was sought from; a school administrator (head teacher or deputy; or in their absence the senior teacher, teacher on duty, or any other teacher delegated the task). The second KII was the school health/hygiene teacher or environment teacher or WASH club teacher/patron. Flexibility was given because schools have different names for the teacher in charge of the cleanliness, hygiene and sanitation matters. Thus from each school data were collected from two key informants (Table 2 and Appendix 3) making a total of 40 filled questionnaires from this group.

Structured Observation Checklist

A structured observational survey was carried out in each of the schools to assess the status of sanitation facilities in place. Thus, the numbers of forms for purposes of

recording data on were 20, equal to the number of schools. Direct observation of the sanitation facilities in the schools was carried out by the Investigator (Table 2 and Appendix 3) using a defined checklist. Handwashing points were designated as any contraption used to dispense water for the purpose of washing hands and included but were not limited to: regular sink with taps, tank and tap, tippy taps or other.

Table 2: Summary of Data Collected

Survey Instrument	Expected Response	Actual Response
Head Teacher KII	20	20
Health/Hygiene/Environment or WASH Teacher KII	20	20
Observation Checklist	20	20
Total	60	60

Quality Assurance

To ensure accurateness and completeness in data collection, back checks and cleaning-up of study tools was done in the field to ensure all the required data were sufficiently captured before leaving a school. In addition observation of the sanitation facilities was carried out over the same period of time each day i.e. between 12-3pm to ensure that pupils had had a chance to use the facilities.

3.9 Data Processing and Analysis

The data was entered into and analysed using Microsoft Excel®. The questionnaires to key informants were coded and tallied for easier and comprehensive analysis. There were 111 variables under consideration for each school, making a total of 2,220 variables for analysis. Analysis and interpretation of the results was done using descriptive statistics – ratios, percentages frequency tables and charts.

3.10 Minimization of Errors and Biases

Prior to commencement of the study, a study pre-test was carried out at a local public primary school in Kajiado, which was not part of the study sample. The pre-test was carried out during a week day in the school term when all pupils and staff were available. The pre test and its results were used to fine tune the survey instruments and to make any necessary adjustments to address any shortcomings and challenges prior to conducting the actual study. The schools studied were all public primary schools both day and boarding as was the case, to ensure that the resources, facilities, structures, staff and students were as similar as possible.

3.11 Ethical Consideration

The study was jointly approved by the Kenyatta National Hospital and; University of Nairobi, Ethical and Research Committee (KNH/UoN-ERC)(Appendix 6).

Additionally, authority and permission to carry out the study was sought from the National Council of Science and Technology (NCST), the District Education Officer and the District Commissioner, Kajiado Central (Appendices 7, 8 and 9). Once at the selected school, permission to carry out the study was requested from each head teacher (or relevant representative) and once given an informed consent form was signed, then the interviews and observations commenced. (Appendix 2).

CHAPTER 4: RESULTS

The results are compared to the standards set in the Safety Standards Manual for Schools in Kenya (MoE, 2008) under the topic *Sanitation Standards* on pages 22-24.

Demographic Characteristics

The total pupil population in the study schools was 10,052, with 4,827 boys and 5,225 girls; amongst these preschool pupils were 1,852 (901 boys and 951 girls). The average number of pupils per study school in the district was 503 with these being 254 boys; and 261 girls, while the range in gender population in the schools varied from 58 – 501 boys, and 42 – 714 girls. The staff both teaching and support numbered 304, these being 134 males and 170 females. There were 86 special needs pupils in thirty percent (n=6) of study schools.

Table 3 : Gender Distribution in Study Schools

Parameter	Boys	Girls	Total
Pupil population in study schools	4,827	5,225	10,052
Number of preschool pupils in study schools	901	951	1,852
Average number of pupils in study schools	254	261	503
Staff - teaching and support	134	170	304

4.1 Determination of the Pupil Latrine Ratio

All the schools had pit latrines which were mainly ordinary and ventilated improved pit latrines (VIP). A total of 228 pupil latrines were present in the study schools and were subjected to an observational assessment. The National recommendations are that latrines should be a minimum of 10 metres from tuition and boarding facilities and these were met in all the study schools. The distance measured in the study schools from the tuition block to the latrines, ranged from a minimum of ten metres to a maximum of seventy five metres; while that of schools with boarding facilities was a minimum of fifteen metres to a maximum of forty five metres from boarding block to the latrines and ablution block. Any latrine that had been constructed and had a hole/aperture in the ground for disposal of urine or faeces was termed 'latrine hole', while a latrine with a hole in the ground and a door was classified 'latrine with door'.

4.1.1 Preschool Latrine Facilities

Out of the schools sampled 85% (n=17) had a Preschool (nursery) section, but out of these only 29 % (n=5) had separate latrines for the preschooler boys and girls. The preschooler latrines all had doors with the exception of one girl's preschool latrine. In only one school (6% of schools) were the preschool latrines designed with the small latrine holes in consideration of the smaller sizes of the pupils.

4.1.2 Pupil latrine ratio

The average ratio of pupils to latrines was found to be 39 girls to every latrine (hole), and 45 girls to every latrine with a door. Forty two percent of mixed schools had no

urinals for boys and in these schools the pupil latrine ratio was 48 boys to every latrine (hole) and 71 boys to every latrine with a door (Table 4). The distinguishing of these two (latrine hole and latrine with a door) is due to practicability of use as latrines with no doors pose challenges in regards to privacy in utilization. The National Standards ratio is '*25 pupils to 1 closet*' the ratios above clearly indicate an acute inadequacy in latrine provision in the schools clearly in contravention of the required standards. In addition all mixed schools with the exception of one, had separate latrines for boys and girls and therefore met the requirements.

4.1.3 Urinals

Fifty-eight percent of mixed schools (n=11) had urinals and all these met the minimum wall length requirements of 42cm, with a majority actually longer. The ratio for sanitation facilities for these schools with urinals stood at 1 urinal and 2 latrine holes per 61 boys; and 1 urinal and 2 latrines with doors per 71 boys (Table 4). The national standards are: "*one third of the fittings for boys should be closets and the rest urinals*". Therefore these should be 1 urinal and 2 latrines per 75 boys and the existing status though mildly in breach are encouraging in these schools with urinals for boys.

4.1.4 Staff Latrines

There were a total of 57 staff latrines in the study schools out of which 33% were funded by donors. Staff sanitation in the study schools in the district met the required ratios of "*at least one closet for 12 persons*" set in the Safety Standards. On the

other hand it fails in that 65% of schools had shared staff facilities, yet the standards require that there should be separate male and female facilities. The average ratio of staff to latrines was 4 males per latrine, 7 females per latrine and 6 staff per shared latrine (Table 4). The ratios of pupil and staff latrines in the study schools takes into consideration the total number of pupils both in primary and pre-school as well as factoring in urinals in the schools that had them (Table 4).

Table 4: Latrine Ratios in Study Schools

	Study Findings
Boys	1 urinal and 2 latrine holes : 61 boys 1 urinal and 2 latrines with doors : 71 boys (schools with urinals)
	1 latrine hole : 48 boys 1 latrine with door : 71 boys (schools with no urinals)
Girls	1 latrine hole : 39 girls
	1 latrine with a door : 45 girls
Staff	1 latrine : 4 males
	1 latrine : 7 females
	1 shared latrine : 6 staff

4.1.5 Special Needs

Thirty percent of schools had learners with special needs; and of these special needs pupils (n=86) 44% were hearing impaired. Other special needs children present were physically challenged and visually impaired (but not totally blind). No school had any provision for the special needs learners contrary to set requirements.

4.2 Availability and Main Source of Water

Water Source

The provision of piped water to schools occurred in 30% of study cases. These schools also had the most reliable water supply and visible presence of water availability. Water was piped by the local water authority from a central borehole to the schools. Some schools relied on rainwater as the main water source despite the fact that the area is semi-arid and rains are usually poor. Pupils bringing water daily to school in 20 litre jerry cans was prevalent in 15% of schools and this was a mandatory activity.

Boreholes as the main water source was mentioned by twenty percent of the school administrators, with these being both community and school own boreholes. In many instances water sources was shared by the school and the surrounding community. The main water sources in the study schools are as depicted in Figure 1.

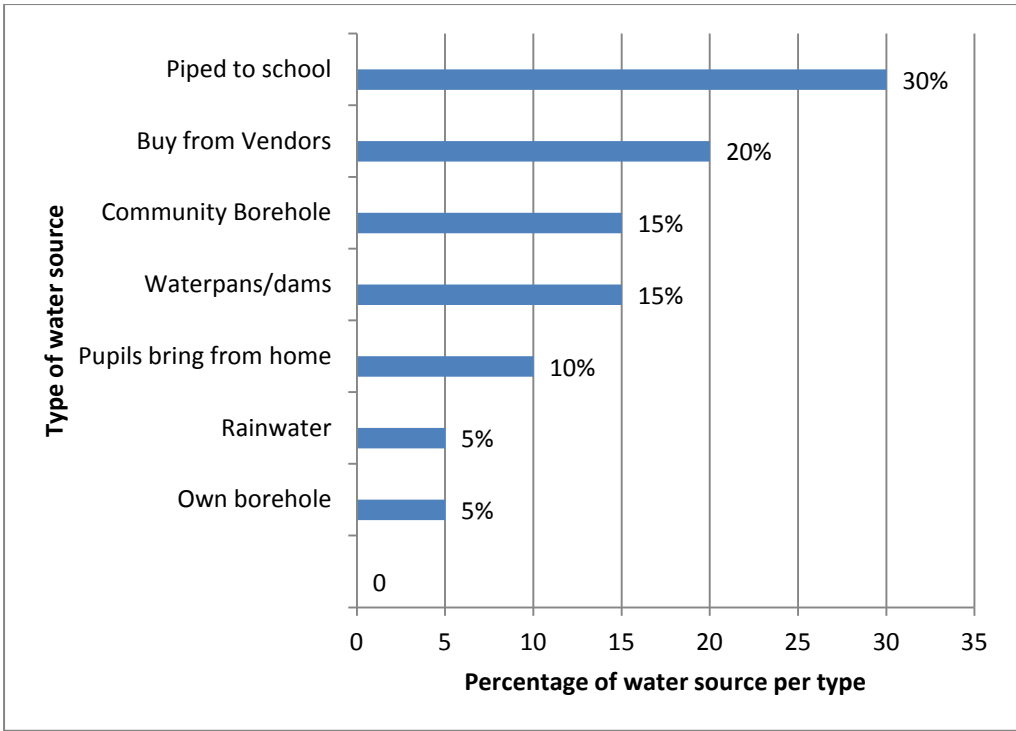


Figure 1: Main Source of Water for Schools (n=20)

Although all schools had several water tanks only 25% of these tanks had water in them at the time of the study, 75% of the tanks were empty. The installed capacity of the water tanks in all the study schools was 309,200litres; out of this a capacity of 299,200litres was from tanks donated by NGOs. Water was not visibly present and available in majority of the schools at the time of the study, but in the 20% schools with water, it was plentiful and pupils were observed freely accessing it. All schools had fixed gutters on the classroom roofs and installed water harvesting tanks as additional water sources but in only one school was this (water harvesting) declared the main source of water.

4.3 Availability of Hand Washing Facilities

Hand washing points

Forty five percent of schools had no designated handwashing points of any kind (Figure 2). This is despite the fact that schools are required to have “soap and tap water or water cans fitted with taps outside the toilets for washing hands after the use of these facilities” (Safety Standards Manual, 2008). The hand washing points in the schools that had them, consisted of a mixture of small tank and tap, tippy- tap, large jerry can with tap as well as sink with tap connected to a main tank.

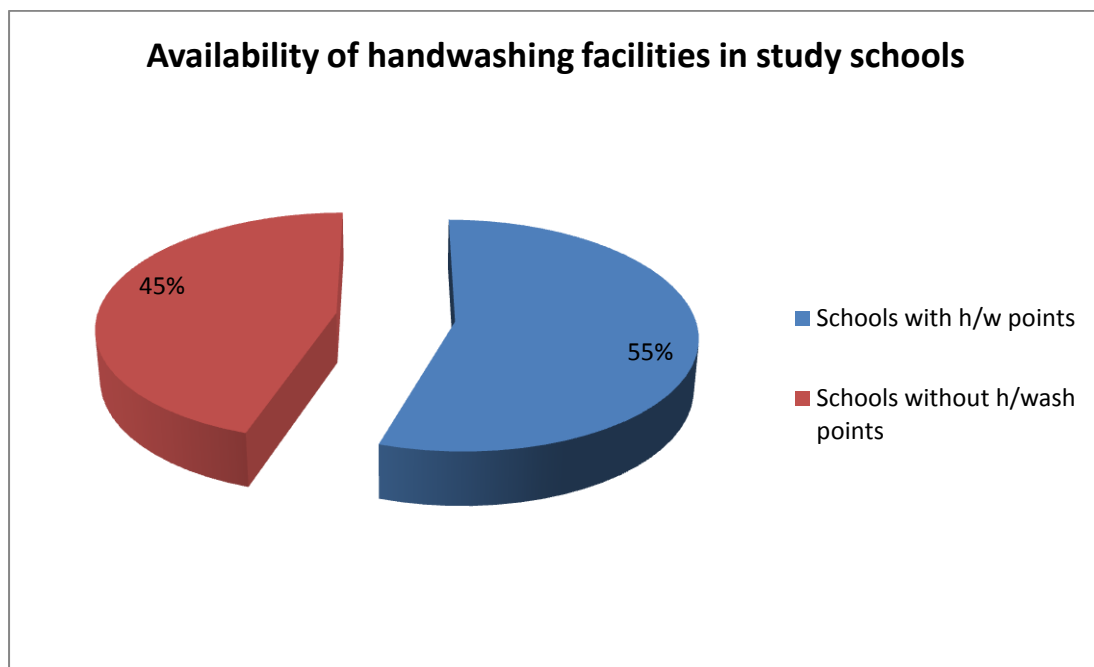


Figure 2: Percentage of Schools with Handwashing Points (n=20)

Water availability at handwashing points

In the fifty-five percent of schools with handwashing points, only half(55%) had water available at the points (Figure 3). Twenty-seven percent of the handwashing facilities in these schools were funded by donors other than government. The hand washing points in these schools with water available consisted of very large tanks(<10,000l) with a tap connected to it ,as well as sinks with taps connected by pipes to a large central tank. A functional handwashing point/station is one where there is a sink and tap, tank and tap or tippy tap with water available. Thus in the district only 30% of schools had functional handwashing facilities, with 70% having either no handwashing facilities or non functional handwashing facilities. Figure 3 depicts the schools with functional handwashing stations. Soap or ash for handwashing was seen in only one school while none of the existing hand washing points for girls was behind a wall or screen as stipulated in the requirements.

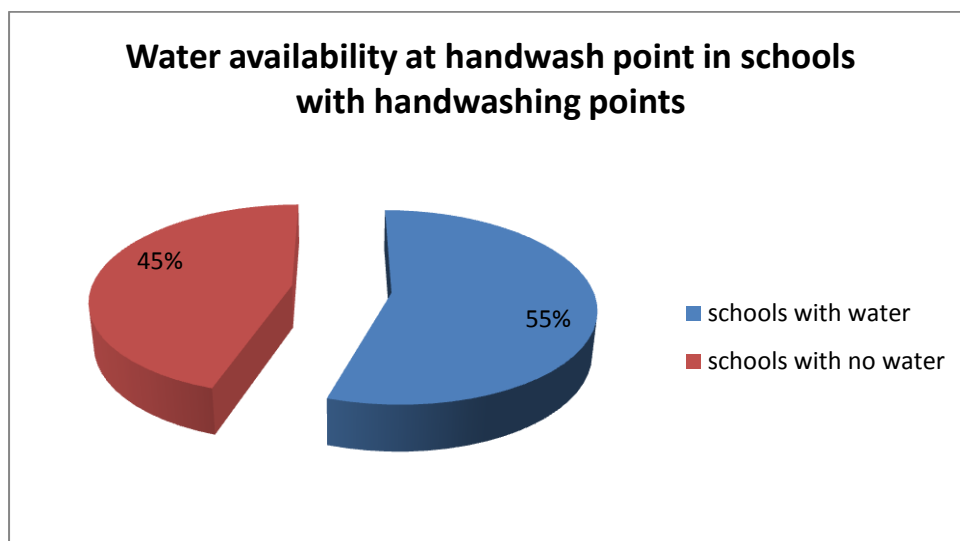


Figure 3: Percentage of Schools with Water Present at Handwashing Points (n=11)

4.4 Cleanliness Status and Maintenance of the Latrines

Cleanliness was defined as lack of faeces and or urine in and around the latrines. The cleanliness of the latrines varied with majority of schools having mixed status i.e. some latrines clean while others were dirty with faecal matter present in/or around latrines. There were a total of 228 pupil latrines in the study schools. Eighty three percent of all latrines had doors with this being 87% of girls latrines and 80% of boys latrines, while all the preschool latrines had doors. Majority of the latrines were constructed with iron sheets and there were no cracks observed in any of the walls. When assessing the presence of urine and/or faeces in and around the latrines, it was found that urine was present in twenty percent and faeces fifty percent of the latrines observed during the study (Figure 4).

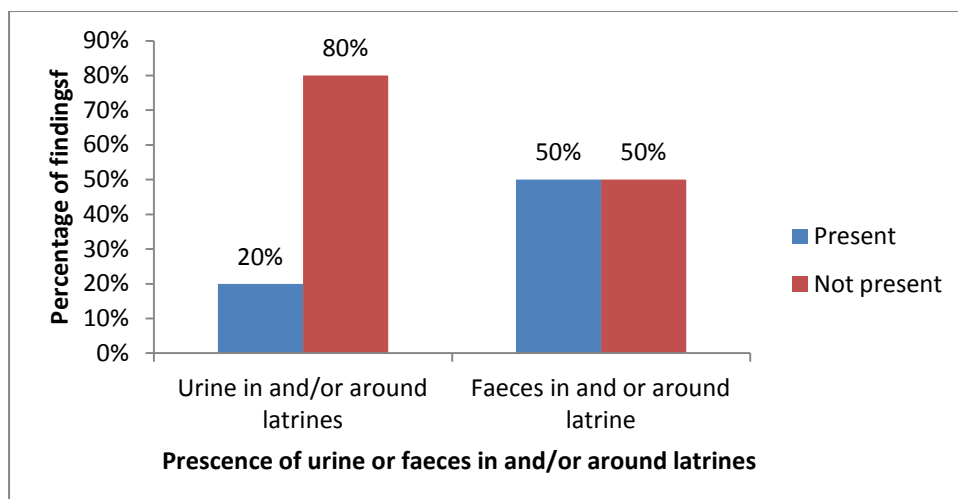


Figure 4: Presence of Urine or Faeces in and/or Around Latrines (n=228)

The study assessed the general status of cleanliness of latrines and found that 50% of schools had a mixture of clean and dirty latrines, in 20% of schools all observed

latrines were clean, in another 20 % of latrines were dirty and in the other ten percent of schools the latrines were clean but had wet floors (Figure 5).

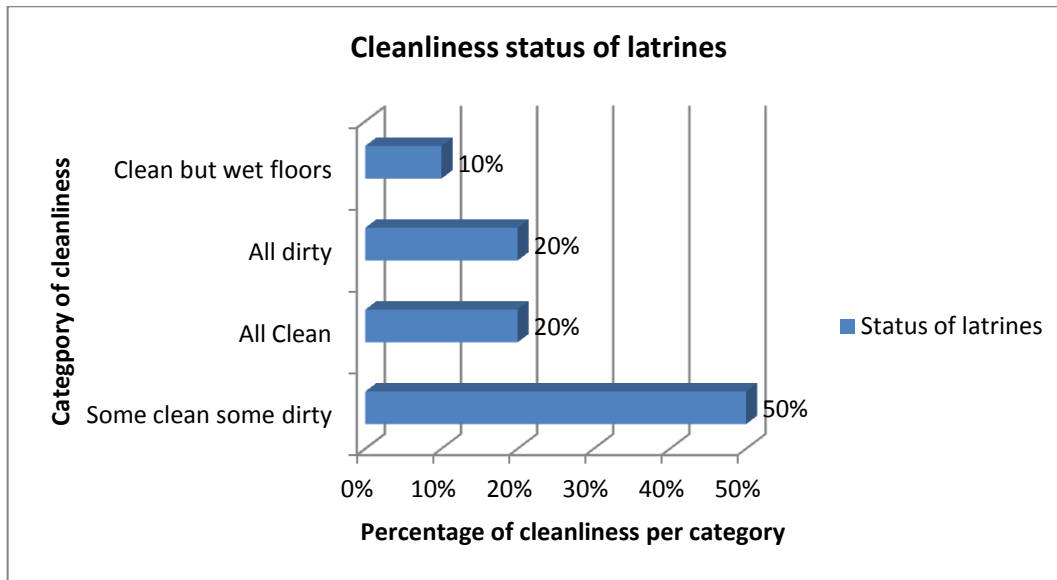


Figure 5: Cleanliness Status of Latrines (n=228)

The latrines in the schools were generally not very well maintained but majority were well constructed while those on the extreme were in a very poor state. Thirty five percent of the schools had latrines cleaned three times a week while only five percent had latrines cleaned twice a day. Figure 6 depicts the frequency in which school latrines were cleaned.

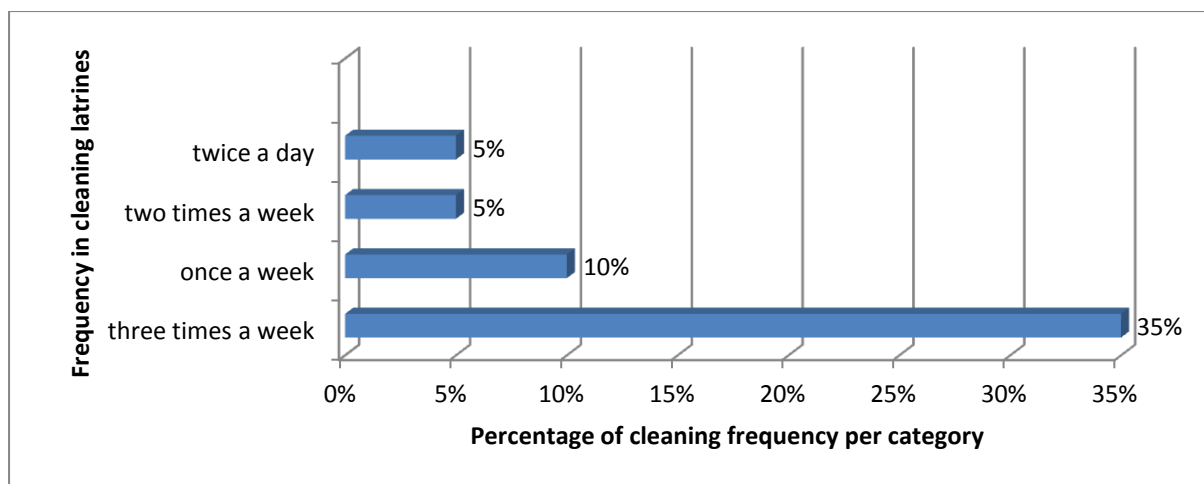


Figure 6: Frequency in Cleaning of Latrines (n=20)

Pupils were responsible for keeping the latrines clean in 90% of the schools but they were not provided with any protective gear for this purpose. The guidelines indicate that “*when pupils are responsible for cleaning latrines protective gear should be provided*”. The cleaning of latrines was scheduled by the health/environment teacher or the prefects and was based on a duty roster for pupils from classes 4-7, or for the environment/WASH club. In only one school was this different and there cleaning the latrines was a punishment for those who flouted school rules. Cleaning of the latrines was mainly done using water and a broom or twigs in 45% of the schools, while another 45 % used water soap/ash and twigs/broom and ten percent used broom with twigs/ashes. The types of cleaning materials used are depicted in (Figure 7).

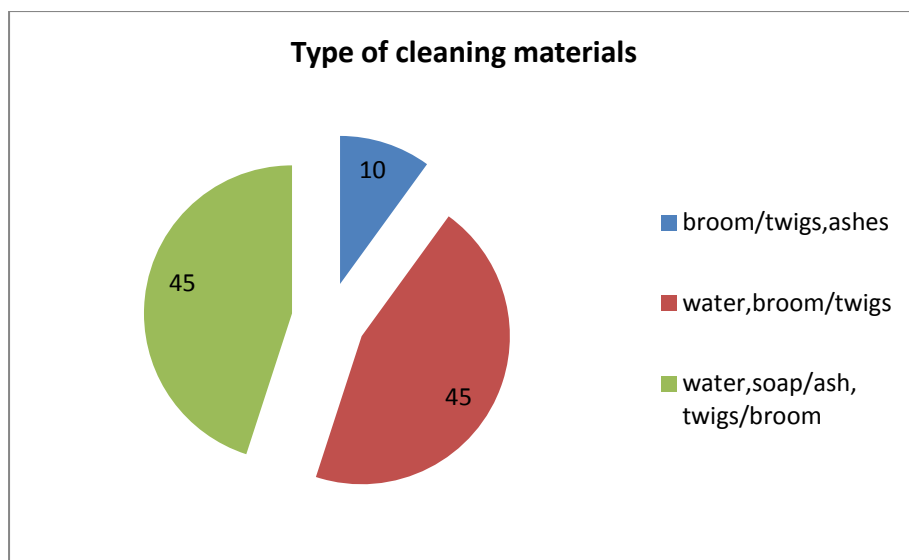


Figure 7: Type of Materials Used in Cleaning Latrines (n=20)

4.5 Awareness of School Administrators on National Standards

The researcher interviewed twenty head and twenty health teachers on what they used as a guide for the sanitation in the school (Appendix 3 and 4)). The study enquired from the key informants on their knowledge/awareness about four guideline documents, two released by the Ministry of Education and another two published jointly by the Ministries of Education and Public Health and Sanitation. These were: 'Safety and Hygiene in Schools' Circular (2001) Ministry of Education; School Health Policy Standards (2009) Ministry of Education/Ministry of Public Health and Sanitation; School Health Policy Guidelines (2009) Ministry of Education/Ministry of Public Health and Sanitation; and Safety Standards Manual for Schools in Kenya (2008) Ministry of Education.

The school administrator's awareness of the national standards was wanting with: 45% of head teachers having no knowledge of any sort of national standards; 15%

were aware of all the above listed documents, 20% were aware of the Safety Standards Manual for Schools, and 20% aware of the Ministry of Education circular of 2001. The health teachers fared worse with 85% not aware of any sort of government guidelines (Figure 8).

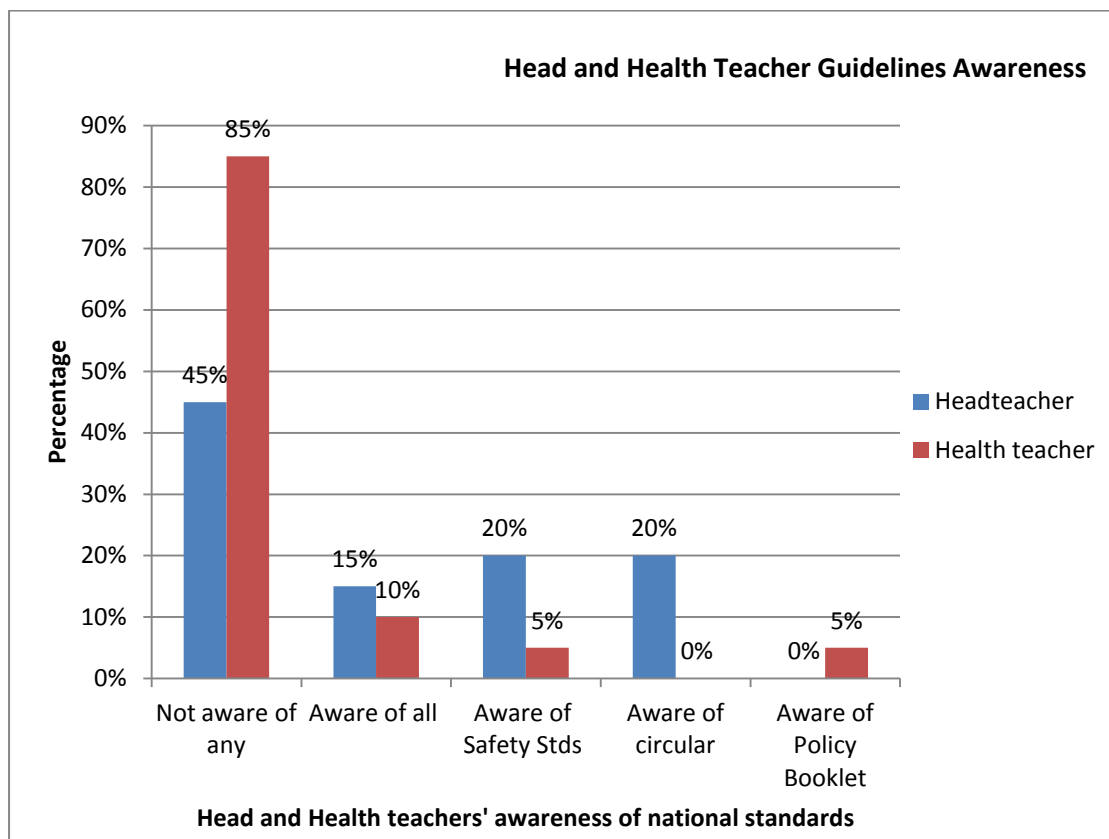


Figure 8: School Head & Health Teachers’ Awareness of Published Standards (n=40)

4.6 Comparison of the Study Schools’ Sanitation Facilities against the Set National Standards

The status of sanitation facilities in Kajjado Central district was below the required national standards as detailed in the Safety Standards Manual for Schools in Kenya

(2008). The standards indicate that: “In construction of sanitation facilities, the following must be observed in relation to numbers:

- The first 30 learners : 4 closets(holes)
- The next 270 learners: one extra closet for every 30 learners
- Every additional learner over 270 learners: 1 closet per 50 learners “
- At least one third of the fittings for boys should be closets and the rest urinals. If a urinal is a trough, then 0.6m (2ft) of the trough is equivalent to one fitting.

The study findings ratio of pupils to latrines was much higher than the “25 pupils: 1 closet” recommended and greater as well than the 1 urinal and 2 latrines: 65 boys recommended (Table 5).

Table 5: Comparison of National Standards and Study Schools’ Latrine Ratios

	Standards	Study Findings
Boys	1 urinal and 2 closets for 75 boys 1 closet :25 learners	1 urinal and 2 latrine holes : 61 boys 1 urinal and 2 latrines with doors : 71 boys (Schools with urinals)
		1 latrine hole : 48 boys 1 latrine with door : 71 boys (Schools without urinals)
Girls	1 closet : 25 learners	1 latrine hole : 39 girls
		1 latrine with a door : 45 girls
Staff	1 closet to 12 persons With separate facilities for males and females	1 latrine : 4 males
		1 latrine : 7 females
		2 shared latrines : 6 staff`

CHAPTER 5: DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1 Discussion

This study is unique and exceptional as it is the first of its kind where the sanitation facilities in schools are assessed based on standards set by the Ministry of Education of the Government of Kenya. Other studies evaluating sanitation have been carried out on the basis of outcomes of various interventions implemented by interested non-government parties in study and control schools. The studies have thus been influenced by interventions and situations based on the researchers' own interest and objectives. This study on the other hand, evaluates the situation in public primary schools as they normally are, and it thus gives a realistic depiction of the status of our schools as they truly are.

Health Impact

Sanitation is the most basic of health issues, yet in many parts of Kenya it's greatly disregarded and neglected. The progress of the modern society at the time of the industrial revolution was actualized when sanitation and sewerage systems were aggressively implemented. Prior to this hundreds of thousands perished in the many cholera epidemics across Europe and the Americas. In Kenya we still experience frequent cholera epidemics - a clear indicator of poor, inadequate and/or non-existent human waste disposal systems. In addition the existing networks of sewerage systems, even in the main cities and towns are inadequate and do not cater for the majority of the population. Across the country, latrines and septic tank

connections serve the needs of majority of the population whereas in many other areas open defecation is the norm.

Water and sanitation related diseases in school going children are mainly contracted by the faecal-oral route. These diseases include diarrhoeas, dysentery, typhoid, various helminth infections as well as trachoma. These diseases significantly affect the population in the study area and children are especially vulnerable. In addition acute respiratory infections (ARIs) are prevalent in school settings and it's a common expectation for mothers that once schools are in session children inevitably experience colds and flu's.

Studies indicate that in developing countries 272 million school days are lost annually due to diarrhoea (Hutton et al, 2004), and 400 million school children and 47% of 5-6 year olds are affected by worms (Hall et al, 2008). These factors lead to poor academic results in affected children as the train and flow of learning is interrupted when lessons are missed. More importantly a helminth burden is associated with reduced cognitive function and this may cause long term damage to a child's intellect and future academic prospects.

Ensuring the proper disposal of human waste is imperative to prevent faecal oral infections and improve the quality of life for children. The availability of water and sanitation facilities in schools reduces diarrhoea and hygiene related diseases (Curtis et al 2003, Pruss-Ustun et al 2008, Njuguna et al 2008, Brooke Keen et al,

2011). The provision of these facilities is a big step in ensuring hands and mouths do not come into contact with faeces. In addition adequate sanitation facilities create a conducive environment for study and increases school retention rates and academic performance, (Redhouse 2004, Njuguna et al 2008, Freeman et al 2011).

In majority of schools the Key informants expressed dissatisfaction and frustration with Ministry of Health officials who are rarely seen in the schools and only appear when a major adverse health event occurs. According to the National School Health Policy the MoE and the MoH are responsible for ensuring that all schools are provided with adequate sanitation and hygiene services. The Ministry of Water and Irrigation has the overall responsibility for the provision of water and sewerage while Public Health and Sanitation staff are required to carry out water quality surveillance and monitoring twice per term in all schools to ensure water safety as well as organize hygiene education at least once every four months. Based on the facts on the ground and the KII views all these ministries have failed the policy stipulations.

Latrine Ratios

The total number of pupil latrines across the study schools was 228, with 41 % (93) of these funded by nongovernmental organisations. The study schools ratio of learners to sanitation facilities of 45 girls: 1 latrine; 47 boys: 1 latrine and for boys is above the recommended levels of 25 pupils :1 latrine. This is further compounded by latrines lacking doors as due to the dire situation every latrine that's not functional makes a bad situation worse. The inadequacy of the latrines leads to urination and

defecation around the latrines and this becomes a breeding ground for faecal-oral diseases and helminth infections. The lack of latrines and water for cleaning is particularly distressing to menstruating adolescent girls who exhibit frequent absenteeism and end up dropping out of school (IRC, 2005; Poverty Action Lab 2007, Njuguna et al, 2008).

Some schools allocated a latrine to each class in an attempt to ensure easier access; this creativity is laudable but still falls short of meeting pupils' needs. In some regions poor soil types led to the collapse of several latrines and this is a clear indication of lack of guidance and advisory services from public health and public works officials. The MoE directive for boys urinal and latrine ratios should be simpler and more precise than they currently are – *'one third of all fittings for boys should be closets and the rest urinals'* which required tedious calculations and the possibility of errors. The MoE should in my humble opinion instead adopt the international standards which simply states *'one toilet plus one urinal(or 50cm of urinal wall) per 50 boys'* (Adams et al , 2009).

On the contrast availability of adequate sanitation facilities improves school attendance and retention. There should thus be increased efforts by County government and the community to provide potable water and adequate sanitation facilities in schools especially in marginalized areas such as the where the study was carried out and where children face additional challenges due to cultural practices. The schools in the area should work closely with the parents, County government

and other education stakeholders to provide adequate sanitation infrastructure and ensure constant water supply.

As part of the FPE and to ensure smooth transition to primary school, the government directed that all primary schools should have a pre-school section. Eighty-five percent of schools had a preschool section but only 29% of them had separate facilities for the pre-schoolers thus creating a challenge for the young learners when using them. An additional factor noticed when carrying out the research but which was not one of the study objectives was the special needs learners. There were no provisions for special needs students in any of the schools; this is despite the fact that 30% of schools were integrated schools with 15% of all schools having physically challenged pupils. The government recommends provision of facilities for these pupils and should support schools to achieve this.

The situation in some sixty-five percent of schools where teachers shared latrines contrary to the expected norm is also of concern. Teachers also require dignified sanitation facilities to enable them carry out their duties with peace of mind. On the brighter side though the facilities were shared they ratios were lower than the recommended standards and staff latrines were more than sufficient.

The fact that the majority of schools (77%) were previously community schools meant that there was a lot of interaction with the school community and the external population in the community. This posed challenges in utilization of sanitation

facilities as the community members tended to access and use the sanitation facilities at will. Majority of the schools had fences of different kinds but 25% had no fence of any kind, 45% were securely fences with barbed wire while the remaining 30% were poorly and or partly fenced with twigs. In the schools that were securely and properly fenced, the sanitation facilities were in a much better state and were better maintained than those with poor fencing.

Handwashing Facilities

Hand washing facilities were completely lacking in 45% of the schools and this is of very great concern as it creates situation where pupils are vulnerable to contracting faecal-oral diseases. The schools with handwashing points also had challenges as only 55% had water available at the hand washing points. Greater effort needs to be made by the District Public Health and Water officers as well as the School Health Department of the Ministry of Education to remedy this situation. Studies indicate that availability of water and sanitation facilities in schools reduces diarrhoea and hygiene related diseases amongst school children (Curtis et al 2003; Pruss-Ustun et al 2008, Njuguna et al 2008, Brooke Keen et al 2011, Freeman et al, 2011).

Water sources and availability

Water availability in the region is a challenge with 40% of schools having a somewhat consistent water supply. All schools were well equipped with water tanks and in the total capacity of installed water tanks was 309,200 litres out of which a capacity of 299,200 litres was from donors. The water sources in the schools were

varied with majority relying on seasonal and unsafe water sources. About twenty percent relied on water pans and rainwater yet the region is semi arid with little and unpredictable rainfall, another 20% relied on own or community borehole with another 20% purchasing from vendors.

The Ministry of Water should be mandated to provide boreholes to serve schools and this will translate to better health and better education for the school going children(Curtis et al 2003, Pruss-Ustun et al 2008, Redhouse 2004, Njuguna et al 2008, Onyango-Ouma et al 2009, Bowen 2007, Freeman et al 2011, Brooke Keen et al 2011).The existence of several water tanks in all schools was encouraging but this was negated by the fact that 75% of these tanks being empty. The Ministry of Water in conjunction with the Ministries of Education and Health should devise methods through which water bowsers deliver water to schools on a regular basis. With the devolution of government, the Kajiado County Governor can ensure that water provision to schools is a priority for this area.

It may be claimed that the poor sanitation situation in the study area is due to the semi-arid nature of the area and the pastoral nomadic culture of the majority community. This assertion is factually incorrect because studies carried out in other regions of Kenya such as Nyanza and Western provinces which receive plenty of rainfall all year round, indicate poor sanitation facilities and inadequate water availability and non functional water sources in schools there (Bowen 2007, Onyango-Ouma et al 2009, Freeman et al, 2011, Brooke Keen et al 2011) . Additionally in these regions the same health challenges such as diarrhoea, helminth

infection and adolescent girls absence from school are experienced in a similar fashion as that in the region of the study schools.

Cleanliness

The assessment of the study school's latrines cleanliness showed mixed results amongst and within schools. As noted in the results pupils were responsible for latrine cleanliness in 90% of the schools with this mainly being scheduled as a duty roster. Only in one school was latrine cleaning a punishment and this is something that needs to be discouraged. Making pupils clean latrines as punishment does not encourage positive adoption of good habits as this will forever be etched in the minds of the punished student and all other pupils in the school that latrine cleanliness is an undesirable thing.

More encouraging were the majority of schools where it was a duty performed on rotation by any student and thus not a cause for shame or ridicule. Also commendable were the Health/Environment/WASH clubs where members took it as their privileged duty to ensure all the latrines as well as the entire school compound were kept constantly clean.

Guidelines and Standards

The role of the MoE school inspectors in regards to compliance and enforcement of regulations is queried. There is a very clear chain of command in the MoE from

headquarters to the zones with a District education office in each district and a zonal education officer overseeing all schools in a zone. The lack of awareness of national standards by 45% of the school administrators' and 85% of health teachers is a cause of great concern as school administrators cannot implement and enforce standards that they are unaware of.

This could be an indication of failure in the oversight functions of the various MoE officers on the ground. Alternatively it is not clear whether the booklets are out of print or just reserved for special persons as their availability and distribution appear constrained. Studies indicate a similar situation as well as inadequate sanitation facilities in other developing countries such as Bangladesh, India, Nigeria and Ghana (UNICEF 2004, Nahar et al 2006, Ofovwé et al 2007, Gyabaah et al 2009)).

On the other hand getting the Standards booklet was a great challenge to the study investigator as the department in the MoE at Jogoo House in charge of school sanitation did not have it and the officers there claimed to have no knowledge of any such standards. (The same response was received from officers in the then Ministry of Public Health and Sanitation.) What was available and freely given were the National School Health Policy and Guidelines booklets but these are general information booklets and do not give any practical and usable details on required standards. Numerous fruitless and frustrating visits eventually led to the investigator seeking for help from higher floors and by sheer luck the officer bumped to in the corridors was well versed with the particulars required for the study and availed his

own copy thus enabling the finalization of the study and eventual commencement of data collection.

Head and health teachers will be unable to champion for provision of adequate sanitation facilities in their schools with insufficient information and knowledge on existing standards. The Ministries of Health and Education should ensure that these documents are available in every school and the administrators and all teachers are knowledgeable on them.

There are many Nongovernmental organizations (NGOs) that are very active in the area and in 85% of schools latrines, water tanks and health education initiatives were funded and organized by them. In addition thirty percent of health and head teachers reporting that they used guidelines given by NGOs to implement sanitation standards in their schools. The NGOs include AMREF, World Vision, German Agro Action (GAA), Girl Child Network (GCN), Neighbourhood Initiative Alliance (NIA) as well as UNICEF. These NGOs play a very important role in the region and their proactive and positive impact on the community should be lauded..

5.2 Conclusion

The status of sanitation facilities in the study region based on the results obtained, indicate that the amenities in public primary schools within Kajiado Central district do not meet the required standards set by the Ministry of Education in the 'Safety

Standards Manual for Schools in Kenya (2008)'. Awareness of the standards amongst school administrators and the health teachers who are responsible for sanitation and hygiene in the schools is also very low.

- Sanitation facilities in the study schools are severely strained with the average pupil to latrine ratio exceeding the required national standards by 150 -240 % for both boys and girls.
- Water supply to the majority of schools was inadequate made worse by the fact that the region is semi arid.
- Functional handwashing points were present in only 30 percent of all study schools. Handwashing points were not found in some schools with only 55% of schools having them. In the schools that did have hand wash points only 55% of these had water available.
- In general the majority of latrines were in a poor hygienic condition with urine and faecal matter visible.
- Awareness of the national sanitation standards as set by the Ministries of Education and Health amongst the school administrators was low, with 45% being completely unaware of any sort of national standards or guidelines.

5.3 Recommendations

- The Ministries of Education, Public Works and Health through their officers in the districts and counties should ensure that as schools are built, the required sanitation facilities should be constructed alongside the classes. Enforcement of the set public health and health and safety standards and guidelines should

be made part of the performance contracts of the officers to ensure vigilance and enable adherence. Provision should be made for special needs pupils and staff to ensure their needs are catered for.

- The Safety Standards Manual for Schools being a Ministry of Education publication should be availed to all school heads. This can be easily done during the annual school heads meetings and in addition the Education Officers in the counties should ensure those unable to attend get copies.
- Water availability is a great challenge for schools in the region, thus the Ministry of Water should ensure water is availed just in the same way as the Ministry of Energy through KPLC has plans to ensure all schools have electricity.
- The Ministry of Education in collaboration with the MoH, MoWI and other partners should ensure there is a specific vote for water and sanitation so that this important aspect is properly catered for. The County government and the local community should also increase their support for school infrastructure especially sanitation facilities.
- Further in depth studies should be carried out in this and other parts of the country to inform the status of sanitation facilities in schools in Kenya. This will enable the country know where we stand in regards to the Millennium Development Goals as well as Vision 2030.

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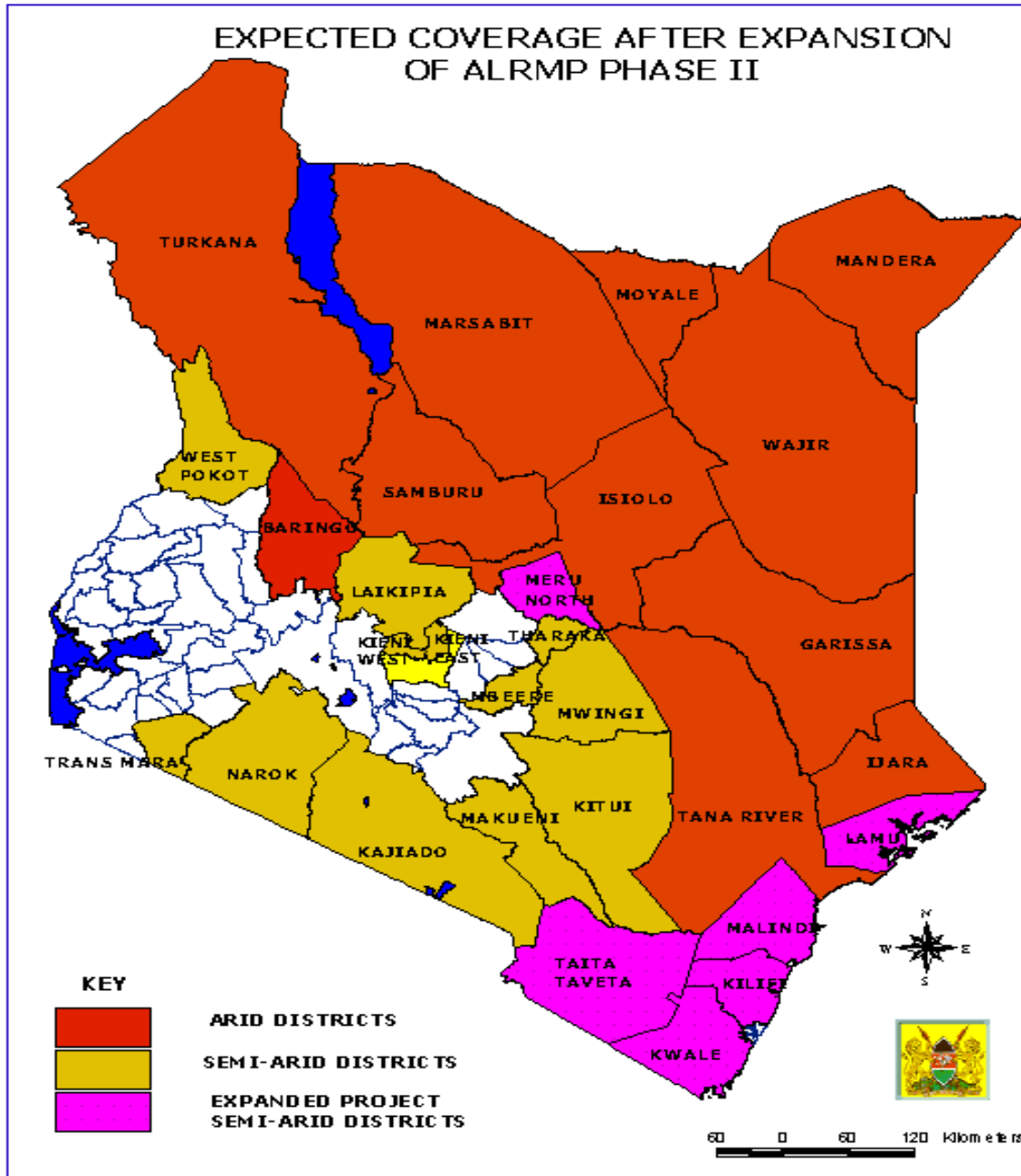
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Appendix 1: Map of Arid and Semi Arid Lands in Kenya



Source: Ministry of Lands

Appendix 2: Informed Consent Explanation Form

Study Title: An Assessment of Sanitation Facilities in Public Primary Schools Kajiado Central District.

My name is Annette W .Gisore, a postgraduate student in the School of Public Health, University of Nairobi. I would like you to participate in a research study whose aim is to assess the sanitation facilities in public primary schools, Kajiado Central District. Schools were randomly selected for the study from the register at the District Education office. You will be required to respond to questions related to the status of sanitation facilities in the school, to help us understand the situation of the sanitation facilities in public primary schools in the district.

Participation through the filling in of a questionnaire is entirely voluntary. Your confidentiality will be safeguarded: your identity and records relating to your participation will remain confidential; no names of participating schools will appear in the final reports or publications resulting from this study. Giving accurate information will enable us derive correct conclusions and help us in accurate interpretation of the research findings. You do not need to provide your name as the Key Informant in this study.

If there is any part of this consent explanation that is not clear, you are free to ask the investigator before signing below. In case of any problem or concern, you may either contact my supervisors in the School of Public Health, University of Nairobi on the following number 020-2724639/2723251 or the KNH Ethics and Research Committee at P.O. Box 20723; Tel 020-7293000 Nairobi Kenya. I can be reached on 0733944591 for any queries.

PARTICIPANT: I have fully understood the objectives of the research and hereby sign as an indication of consent for the school to participate in this study.

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

Appendix 3: Key Informants Interview Guide and Structured Observation Checklist

Section A: Key Informant Interview 1 - Head teacher

Head Teacher Questionnaire		Yes	..No	..Code
	School: Registration Number:			
1.	Is this a public primary school solely funded by the government of Kenya?			
	Has the school been funded by donors to improve the sanitation facilities?			
	Can this be quantified – indicate the facilities provided by this funding			
	Is the school urban or rural?			
2.	What is the current enrolment figure of pupils in the school?			
	Total enrolment primary:			
	Primary Boys :			
	Primary Girls:			
	Preschool total enrolment:			
	Pre-school boys:			
	Pre-school girls:			
3.	What is the total number of staff in the school?			
	Teaching staff:			
	Support staff:			
	Male staff:			
	Female staff:			
4.	What are the designated school break times?			
5.	At what times are students allowed to use latrines.			

Section B: Key Informant Interview 2 – Health Teacher

Health Teacher Questionnaire				
Name of School: Registration no.				
		Yes	No	Code
1.	Is sanitation and hygiene part of the school curriculum?			
2.	Does the school have an active health club?			
3.	Who cleans the latrines in the school?			
	Students:			
	Staff:			
4.	How many times are they cleaned? Tick answer. Once a day: <input type="checkbox"/> Twice a day: <input type="checkbox"/> Every other day: <input type="checkbox"/> Once a week: <input type="checkbox"/> Other (state):			
5.	If pupils clean the latrines how is the cleanup organised?			
	According to class?			
	If above, which classes?			
	Is it a punishment?			
	State other:			
6.	Is protective gear provided for cleaning?			
7.				

Section C: Structured Direct Observation

	Direct Observation Checklist	Yes	No	Code	Comment
	<p>Type of sanitation facilities</p> <p>a) Ordinary pit latrine'</p> <p>b) Ventilated Improved Pit (VIP)</p> <p>c) Water closets</p> <p>d) Other(specify(</p>				
1.	Are the latrines at least 10 metres away from				
	a) Tuition and				
	b) Boarding facilities?				
2.	Are the latrines on the windward side				
3.	Are the latrines at least 15metres (50ft) away from a borehole or well or water supply point				
4.	In mixed schools are the girls sanitation areas separate from the boys?				
	Do they offer complete privacy?				
5.	How many latrine doors are present for	<u>No. of</u>			
	a) Girls	<u>doors</u>			
	b) Boys				
	c) Female staff				
	d) Male staff				
	e) Shared staff				
6.	Is there a urinal present for boys?				

	Direct Observation Checklist	Yes	No	Code	Comment
7.	Is there a provision for learners with special needs?				
8.	Is there provision for very young learners in pre-unit and lower primary?				
9.	Are the latrines clean? (i.e. free from visible faeces on floor and walls?				
10.	Are they well ventilated? i.e. do they have a vent pipe?				
11.	Are they well maintained? i.e. How many have doors? a) Girls latrines				
	b) Boys latrines				
	c) Female staff latrines'				
	d) Male staff latrines'				
	e) Shared staff latrine				
12.	How many lack doors? a) Girls latrines				
	b) Boys latrines				
	c) Female staff latrines'				
	d) Male staff latrines				
	e) Shared staff latrine				
13.	What is the condition of the latrine floors? a) Wet				
	b) Dry				
	c) Have faecal matter				
	d) Clean				
14.	What is the condition of the walls? a) In good condition				
	b) Have cracks				

	Direct Observation Checklist	Yes	No	Code	Comment
15.	Who cleans the latrines?				
	a) Pupils				
	b) Staff				
	Do they have protective gear for cleaning?				
16.	Is there a handwashing point?				
	If yes, what type is it?				
	a) Tippy tap?				
	b) Tank and tap?				
	c) Piped to tap?				
	If yes, how many are available				
	a) Near latrines				
b) Near feeding area					
	c) Near classrooms				
	d) Other area				
17.	Is water available at the handwashing points?				
	Is access restricted?				
18.	Is there soap or ash for handwashing?				
19.	Is there a separate wash point for girls?				
	If yes, is it behind a screen or wall?				
20.	Is the area around the latrines bushy?				

	Direct Observation Checklist	Yes	No	Code	Comment
21.	Is there evidence in the area around the latrine of a) Urination?				
	b) Defecation?				
22.	Are there health messages (talking walls) in the school?				
23.	Is the school environment well kept i.e. clean, neat and free from litter				
24.	Is there a school feeding programme?				
25.	Is there a handwashing facility next to the feeding area?				

Appendix 4: Budget

ITEM	Rate	Days	Amount
Fieldwork Stationery(Printing/Photocopy)			50,000
Data Collection - travel and accommodation	9500	9	85,500
Communication	300	9	2,700
Review (printing and binding)			35,000
Miscellaneous			5,000
Total			<u>178,200</u>

Appendix 5: Work plan

Month 1	Month 2	Month 3	Month 4	Month 5 - n
Data Collection				
	Data Entry and Analysis			
				Review and defence

Appendix 6: Approval from KNH/UoN - Ethical Review Committee



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14th November 2011

Annetta Wairera Gisore
H577/1445/07
School of Public Health
College of Health Sciences
University of Nairobi

Dear Ms. Gisore

Research Proposal: "An assessment of Sanitation Facilities in Public primary schools Kajjado Central District, Kajjado County"
(P370/09/2011)

This is to inform you that the KNH/UON-Ethics & Research Committee has reviewed and approved your above revised research proposal. The approval periods are 14th November 2011 - 13th November 2012.

You will be required to request for a renewal of the approval if you intend to continue with the study beyond the deadline given. Clearance for export of biological specimens must also be obtained from KNH/UON-Ethics & Research Committee for each batch.

On behalf of the Committee, I wish you a fruitful research and look forward to receiving a summary of the research findings upon completion of the study.

This information will form part of the data base that will be consulted in future when processing related research study so as to minimize chances of study duplication.

Yours sincerely


PROF. A. N. GUANTAI
SECRETARY, KNH/UON-ERC

c.c. The Deputy Director CS, KNH
The Principal, College of Health Science, UON
The Director, School of Public Health, UON
The HOD, Medical Records, KNH
Supervisors: Prof. M.A. Mwanthi, School of Public Health, UON
Ms. Mary Kinoti, School of Public Health, UON

"PROTECT TO DISCOVER"

Appendix 7: Approval from National Council for Science and Technology

REPUBLIC OF KENYA



NATIONAL COUNCIL FOR SCIENCE AND TECHNOLOGY

Telegrams: "SCIENCETECH", Nairobi
Telephone: 254-020-241349, 2213102
254-020-310571, 2213123.
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When replying please quote

P.O. Box 30623-00100
NAIROBI-KENYA
Website: www.ncst.go.ke

Our Ref:

Date:

NCST/RCD/12A/012/28

1st March 2012

Annette Warero Gisore
University of Nairobi
P.O.Box 30197
Nairobi.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on "*An assessment of sanitation facilities in public primary schools, Kajiado Central District*," I am pleased to inform you that you have been authorized to undertake research in **Kajiado Central District** for a period ending *31st April 2012*.

You are advised to report to **The District Commissioner and the District Education Officer, Kajiado Central District** before embarking on the research project.

On completion of the research, you are expected to submit **two hard copies and one soft copy in pdf** of the research report/thesis to our office.


DR. M. K. RUGUTT, PhD, BSC.
DEPUTY COUNCIL SECRETARY

Copy to:

The District Commissioner
The District Education Officer
Kajiado Central District.

Appendix 8: Approval from Ministry of Education - Kajiado Central District

MINISTRY OF EDUCATION

Tel: 020-2018859

When replying please quote:

Ref: KJD/GEN/VOL.1/4

Date: 5th March, 2012



REPUBLIC OF KENYA

DISTRICT EDUCATION OFFICE
KAJIADO CENTRAL DISTRICT
P.O. BOX 33
KAJIADO.

All H/Teachers
Primary Schools
KAJIADO CENTRAL

RE: AUTHORITY FOR ANNETTE WARERO GISORE

The above named post graduate student of University of Nairobi has authority from this office to visit your school for the purpose of conducting Research on sanitation facilities for a period ending 31st April 2012.

Kindly accord her the necessary co-operation.

DISTRICT EDUCATION OFFICER
KAJIADO CENTRAL

S. D. ODHIAMBO
DISTRICT EDUCATION OFFICER
KAJIADO CENTRAL

Appendix 9: Approval from Office of the President – Kajiado Central District

OFFICE OF THE PRESIDENT

Telegrams : "DISTRICTER", Kajiado
Telephone : 0202591937
Fax: 0202064415
E-mail: districtcentral@vsnl.com
When replying please quote



THE DISTRICT COMMISSIONER
KAJIADO CENTRAL DISTRICT
P.O BOX 1
KAJIADO

Ref: ED/1/34

Date: 6th March, 2012

The District Officer
Central Division

The District Officer
Namanga Division

The District Officer
Enkorika Division

The District Officer
Bissil Division

RE: RESEARCH AUTHORIZATION: ANNETTE WARERO GISORE

The above named has been authorised to carry out research on 'an assessment of sanitation facilities in public primary schools, Kajiado Central District' for a period ending 31st April, 2012.

Please accord her the necessary assistance.


WILLIAM KAKIMONI
FOR: DISTRICT COMMISSIONER
KAJIADO CENTRAL

C.C.

Annette Warero Gisore

