

ASSESSING THE EFFECTIVENESS OF WATER, SANITATION AND HYGIENE PROGRAM IN PRIMARY SCHOOLS IN THYOLO DISTRICT, MALAWI

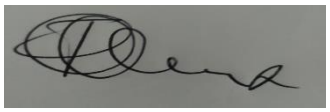
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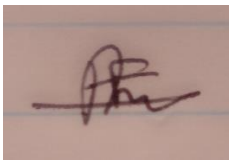
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ABSTRACT

The provision of safe water, sanitation and hygiene in schools has been established to improve health, boost educational achievement and promote gender equity which has a positive impact on the society. The United Nation's Sustainable Development Goals include the target of ensuring access to water, sanitation and hygiene (WASH) and quality education for all however, there are no documented studies that assessed comprehensive primary school WASH services in T/A Bvumbwe, Thyolo district. The purpose of the study was to ascertain the state of WASH program in primary schools in traditional authority of Bvumbwe in Thyolo district. The research involved quantitative research design and a representative of nineteen primary schools out of total twenty six primary schools across three zones in T/A Bvumbwe were selected using systematic random sampling technique. Research was conducted using a questionnaire applied to school staff members based on WASH principles and it was administered to students to identify WASH challenges and observation was made to assess the state of the schools' physical environment. The assessment of WASH services was based on WASH indicators which includes availability, acceptability, accessibility and quality services of water, sanitation and hygiene as well as the operation and maintenance plan of WASH facilities. Data was analysed in SPSS software using descriptive statistics and t-tests and presented in charts using Microsoft excel. Comparison of results with the standard for WASH in schools by UNICEF and WHO guidelines was used as the guiding principles to evaluate the adequacy of the various WASH components. Water quality analysis was conducted for quantification of faecal coliform. All the schools did not conduct any water treatment and 53% of schools indicated the presence of faecal contamination. The reported water complaints relating to water taste was 15.3%.The number of toilets facilities in all schools were insufficient and need to be increased to meet WASH guidelines. The overall results showed that 78.9% of schools had basic water services, 84.2% had basic sanitation services while only 25.4% of schools had basic hygiene services hence effort need to be implemented for the increase in the percentage of basic WASH services to meet the SDG 4 and 6 by 2030. Hence, overall the implemented WASH program are not fully incompliance with WASH guidelines and are not sufficient to address the water, sanitation, and hygiene challenges in public primary schools. The Ministry of Education should assume ownership of the program to ensure the sustainability of WASH services. Financial and technical support should be provided and a surveillance system to monitor, evaluate, and guide public schools should be established.

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ACRONYMS/ABBREVIATIONS

CDC	Centre for Disease Control
FC	Faecal coliforms
IAEG	International Association of Engineering Geology
JMP	Joint Monitoring Program
MDG	Millennium Development Goals
NSO	National Statistical Office
O & M	Operation and Maintenance
SDG	Sustainable Development Goals
T/A	Traditional Authority
UN	United Nations
UNICEF	United Nations International Children's Emergency Fund
WASH	Water Sanitation and Hygiene
WHO	World Health Organization

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CHAPTER 1: INTRODUCTION

1.1. BACKGROUND

Provision of adequate water, sanitation, and hygiene (WASH) services is important component for children's better health and has significant impact on children's lives and their ability to develop and thrive (Kuma, 2018). The increased burden of communicable diseases among school children due to poor personal hygiene practices and inadequate sanitary conditions remains a concern on the public health agenda. Globally around 525,000 children die each year from diarrheal illnesses in which 88% of these cases result from unsafe water supply and inadequate sanitation services(UNICEF, 2021) which increase the economic burden on families and societies due to tertiary health care costs (WHO, 2009). WASH program in schools aims to protect children's right to survival and supports equal opportunities for high quality education, healthy development of children and creating a supportive environment (WHO, 2019). Hence this enables children to become advocates of change for improving water, sanitation and hygiene practices in their families and communities (UNICEF, 2012). Access to potable water, basic sanitation, and good hygiene habits are principal factors involved in reducing the incidence of illness among school-aged children. Even with the establishment of universal rights for access to quality drinking water in adequate quantities, and to adequate sanitation (COHRE et al. 2008; UN Office of the High Commissioner for Human Rights, 2010) most schools in Malawi do not offer these conditions. The 2030 Sustainable Development Goals recognizes the importance of safe drinking water and sanitation services to achieve Goal #4 which ensures inclusive and quality education for all and promote lifelong learning with proportion of schools with access to basic drinking water, single sex basic sanitation facilities and effective learning environment and also to achieve availability and sustainable management of water and sanitation for all which is discussed in Goal #6 (UN, 2015) as related in Table 1. However, In Malawi 578 primary schools do not have potable water and around 4378 primary schools do not have supplies such as soap and other facilities which is the major challenge towards reaching the SDG targets by 2030 (Schwenk, 2020). Therefore it is essential to understand the educational and health impacts of school WASH program in order to identify effective strategies for providing and sustaining WASH services in schools with diverse needs (Kuma, 2018). However the effectiveness of WASH program over time is associated with continuous provision of necessary WASH services which enable children to practice proper hygiene, cleaning services

and have sanitation facilities as well as water supply that agrees with safety standards (Bolton, 2021). WASH programs in schools are one of the pre-requisite steps towards ensuring a safe and healthy learning environment (WHO/UNICEF, 2018), therefore this study collected information on the services of water, sanitation, and hygiene available at the school as well as operation and maintenance of the WASH facilities in primary schools in T/A Bvumbwe of Thyolo district.

Table 1: SDG targets and Indicators related to WASH in schools (United Nations Children's Fund; World Health Organization, 2016).

SDG	SDG Targets and Indicators
Goal 6: Ensure availability and sustainable management of water and sanitation for all	6.1 By 2030, achieve universal and equitable access to safe and affordable drinking water for all. 6.2 By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations.
Goal 4: Ensure inclusive and quality education for all and promote lifelong learning	4. A Build and upgrade education facilities that are child, disability and gender sensitive and provide safe, non-violent, inclusive and effective learning environments for all. 4.a.1 Proportion of schools with access to access to: (a) electricity; (b) the internet for pedagogical purposes; (c) computers for pedagogical purposes; (d) adapted infrastructure and materials for students with disabilities; (e) basic drinking water; (f) single-sex basic sanitation facilities; and (g) basic hand washing facilities (as per the WASH indicator definitions).

1.2. A PROBLEM STATEMENT

Malawi is vulnerable to infectious diseases due to challenges in both awareness and limited sanitation and hygiene practices. (Malawi Flash Appeal, 2020). In Malawi, regarding improved water and sanitation in primary schools, in 2012 to 2016 coverage was increased by 9% but since from 2017 to 2021 the coverage has only increased by 6% showing a reduction in these primary schools which may not be sufficient to achieve universal access to water and sanitation by 2030 (JMP, 2020). According to Wiyo & Kadewa (2019), Thyolo in the southern region is among of the districts which missed the MDG target on access to potable water. Moreover, Thyolo is likely to experience some of the lowest levels of improved WASH practices because it is one of the districts which was impacted by heavy rain and flooding in 2019 which led to water supplies being impacted hence resulted to people having limited access to clean and safe drinking water, lack of functioning latrines and other essential WASH facilities (ACAPS, 2019). Primary schools particularly those in rural areas often lack drinking-water, sanitation and hand washing facilities but alternatively, where such facilities do exist they are often inadequate in both quality and quantity as a result children's ability to learn may be affected by several infections which force many school children to be absent from school (JMP, 2020). Furthermore, poor environmental conditions in the classrooms and surroundings can also make both teaching and learning very difficult (Paulo, et al., 2018). Mostly, girls are more affected than boys because the lack of sanitary facilities means that they cannot attend school during menstruation (WHO, 2009). Currently no further assessment of WASH program has been done in primary schools in T/A Bvumbwe. Recognizing insufficiencies in the quantity and quality of data available on school WASH in T/A Bvumbwe in Thyolo district, public primary School WASH assessment was conducted. The comprehensive school WASH assessment in T/A Bvumbwe is the first nationally representative survey of primary schools designed to provide information about the availability of safe drinking water, adequate sanitation and hygiene services.

1.3. OBJECTIVES OF THE STUDY

The following are the objectives which were addressed

1.3.1. THE OVERALL OBJECTIVE

I. The main objective of the study is to assess water, sanitation and hygiene program in primary schools in T/A Bvumbwe

1.3.2. SPECIFIC OBJECTIVES

I. To evaluate the provision of adequate WASH services in primary schools
II. To examine the operation and maintenance of WASH facilities
III. To explore the knowledge gap of WASH facilities between staff members and pupils

1.4. RESEARCH QUESTIONS

I. What is the availability, accessibility and quality of WASH services in primary schools?
II. How are school WASH facilities operated and maintained in primary schools?
III. What is the level of understanding of WASH for both staff and students?
IV. Do WASH availability, accessibility and functionality, water quality, and hygiene practices meet minimum standards of U.N Sustainable Development Goal-4 & 6?

1.5 SIGNIFICANCE OF THE RESEARCH

This assessment provides baseline data for reporting, monitoring, and tracking progress on national and global targets including Sustainable Development Goal (SDG) targets and indicators specifically those in Goal #4 which seeks to improve the proportion of education facilities with access to an appropriate learning environment including essential drinking water, sanitation, and hygiene (Johnston, 2016). Similarly to a SDG goal #6 which points out the value of cohesive WASH systems as a whole as it seeks to ensure complete coverage and sustainable water and sanitation management by 2030 (IAEG, 2016).

It helps to fill in data gaps to inform sector programme-planning, strategies for scaling up school WASH services and policy advocacy in efforts towards fulfilling children's right to better education.

This information is vital for program improvement it would enable relevant stakeholders and policymakers to take the required measures needed to improve and sustain water, hygiene, and sanitation services in these schools.

Therefore this research will assist in coming up with theories and approaches that works best for the case of Malawi because the results help to reveal significant findings which enables the government to make decisions, formulate, revise policies and strategies to suit the case of nation. Furthermore, the study will also be used as a reference by other researchers that will do similar studies in future hence contributing to academics.

CHAPTER 2: LITERATURE REVIEW

2.1 BACKGROUND OF WASH

UNICEF/WHO has developed WASH guidelines in schools for each component of WASH. Each component has several metrics that can be used as a checklist to manage the quality of your WASH service. Schools lack the infrastructure to provide drinking water and support good hygiene practices. According to Borges-Pedro et al. (2018), the survey showed that schools were not providing adequate hygiene to students and not maintaining facilities regularly. It also showed that 84% of schools did not have soap to wash their hands and that drinking fountains and toilets were inadequate and poorly maintained. Schools are high-contact places, and poor sanitation and water quality contribute to a high-risk environment for the health of school staff and students (Adams et al. 2009). A study conducted in Colombia showed that 40% of all cases of diarrhoea in children were caused by contacts at school (Koopman, 1978). WASH and education are human rights and important to human development, so without these facilities in schools, children are more likely to get sick and stay out of education (Water Aid/Dennis Lupenga 2017). Adequate clean water, sanitation and hygiene practices in schools improve health, increase school enrollment and promote gender equality (Gross et al, 2016). Improving WASH in schools is thought to improve student health, increase school enrolment (Freeman, et al., 2014), and improve WASH practices in communities (Sibiya & Gumbo, 2013). According to the Centres for Disease Control and Prevention, WASH could prevent 9.1% of the global burden of disease and 6.3% of deaths, especially in developing countries (CDC, 2013).

A literature review adapted from Jasper & Bartram (2012) confirmed the link that exist between WASH in schools and pupil's health at the global level and the results provided evidence that a general improvement in WASH in schools has a beneficial effect as it reduces absenteeism rates. The reviews offers a solution and recommendation on the problem of School and gastrointestinal diseases thereby improving health and education (McMichael, 2019). Therefore the importance of access to safe water, improved sanitation and hygiene cannot be underscored in abating water borne illnesses, malnutrition, school absenteeism and generally improving the quality of life and learning performance in children (Joshi & Amadi, 2013).

2.2 COMPONENT OF WASH SERVICES IN SCHOOLS

2.2.1 WATER SUPPLY SERVICES

Sufficient and reliable safe water supply in schools helps to prevent spreading of infectious and waterborne diseases among pupils. Providing safe drinking water can be achieved by ensuring that water comes from an improved source or is treated prior to drinking. Water sources are generally categorized as improved and unimproved. An improved water source is one whose design and construction may prevent water contamination and provide safe water. B. Tap water, borehole or pipe wells, protected dug wells, protected springs, and rainwater. Unenhanced water sources include unprotected wells and springs, surface water (lakes, rivers, streams, ponds, canals, irrigation canals, etc.) (JMP, 2022). Drinking water performs several important functions that support bodily functions, including thermoregulation, maintenance of delicate tissues, nutrient transport, and waste disposal (Jéquier & Constant, 2009). Clean water in schools is essential to protect students from water-borne diseases that affect health and cognitive development (Cronk, Slaymaker & Bartram, 2015). Lack of access to safe drinking water can increase the risk of contracting water-borne diseases and outbreaks (UNICEF Malawi, 2017). Availability of sufficient drinking water, as well as water to keep school facilities clean, is a major concern in many parts of the world (Wolf, et al., 2014).

2.2.1.1 WATER QUALITY

Water quality determines the 'quality' of water for a particular purpose. Water tests provide information about the condition of waterways. By testing the water over a period of time, changes in water quality can be observed. Drinking water performs several important functions that support bodily functions, such as thermoregulation, maintenance of delicate tissues, nutrient transport, and waste disposal l (Jéquier & Constant, 2009). Drinking water quality must be safe for consumption. A drinking water source is considered safe if the water meets his WASH drinking water quality guidelines or national standards. Microbiologically, E. coli or coliforms (Chapman, 1996), indicators

of faecal water contamination, should not be detected in a 100 ml sample. Physically, water should not have tastes, odors, or colors that discourage its consumption.

2.2.1.2 ON-SITE DISINFECTION

The application of on-site disinfection is a precautionary measure to further prevent microbial contamination from factors affecting water distribution and storage. On-site disinfection is necessary to ensure clean water and reduce the occurrence of water-borne diseases such as diarrhoea and outbreaks (UNICEF, 2012). Chlorination was reported to be the primary disinfection method used in schools at baseline (Jurdi, 2009). It is important to maintain disinfectant residue throughout the water distribution system. This prevents recontamination and limits microbial growth problems. Other benefits of chlorination include ease of use, cost effectiveness, and reduced incidence of diarrheal disease. However, too high residual chlorine levels can lead to water repellence with undesirable tastes and odors, form harmful by-products, and become less effective in cloudy water (UNICEF, 2008).

2.2.2 SANITATION FACILITIES

Improved sanitation facilities should hygienically separate excreta from human contact (JMP, 2022). Poor school hygiene makes children sick and keeps them out of education, but better school hygiene improves health, increases attendance and promotes gender equality. (Water Aid/Dennis Lupenga, 2017).
To encourage healthy behaviour, toilet doors should always be open and, if locked, keys should always be available (Byford, 2014). It should be open and easily accessible. Students should be able to use the restroom whenever needed during class. Increased universal access to WASH in schools reduces potential differences and helps individuals feel valued (Bose, 2009). Poor sanitation practices in primary schools usually facilitate human-to-human transmission. Infectious diseases and malnutrition thus become a vicious circle, impairing the physical development of children (Meher & Nimonkar, 2018). A study conducted by Viswa (2019) shows that adding basic infrastructure such as

sanitation to schools increases enrolment rates for both girls and boys, indicating that the type of toilet is important.

2.2.2.1 TOILETS

Sufficient number of toilets should be available. Toilets should be well ventilated to eliminate bad odors. Toilets should be designed and constructed so that they are hygienic to use and do not become centres of disease transmission. When it comes to cleaning, panels are the most important part of your toilet. It should be made of concrete or other durable and smooth material. Other parts of the toilet, such as the body, can be made using inexpensive local materials. Toilet designs should include measures to minimize odor and reduce fly and mosquito breeding (Adams, Bartram, Chartier & Sims, 2009). Toilet facilities should be private and secure. Toilet cubicles must be fitted with doors to ensure privacy and all schools must have locking systems in place to ensure safety. Additionally, toilet doors and doorknobs are potential transmission sites for disease, so self-closing doors should be installed to reduce student contact with dirty surfaces (UNICEF, 2012).

2.2.3 HYGIENE

Hygiene is keeping yourself and your surroundings clean to prevent the spread of disease and disease (Bashir, 2019). Hygiene includes keeping schools and people clean through proper hand washing with running water and soap. Washing your hands is one of the most important things you should do to prevent getting sick or spreading germs to others. Children who wash their hands are less likely to report gastrointestinal and respiratory symptoms, suggesting that handwashing with soap reduces morbidity from diarrheal disease and respiratory infections (Meher & Nimonkar, 2018). . Good hygiene is a barrier to infectious diseases such as diarrhoea and skin diseases. Improving student awareness of personal hygiene is essential to reduce the risk of contracting infectious diseases that can affect performance and health (UNICEF, 2012). There are several ways schools promote hygiene among students. Placing signage and posters on good hygiene practices around toilet facilities and in strategic

locations to remind students of proper handwashing techniques, integrate hygiene education into school curricula and extracurricular activities to promote hygiene. Activities can be organized. However, the effectiveness of hygiene promotion depends on the availability of sanitation and functional facilities to put knowledge into practice (UNICEF, 2012).

2.2.3.1 WATER BASINS FOR HAND WASHING

A sufficient number of basins should be provided for students to practice proper hand washing. When water supplies are inadequate, broken or inaccessible, students are more likely to use drinking fountains to wash their hands or skip handwashing, increasing their risk of contracting diarrheal disease (UNICEF, 2012). Running water, soap and tissue should always be available to ensure good hygiene practices, a mandatory her WASH requirement to help students practice good hygiene behaviours (Adams, Bartram, Chartier, & Sims, 2009).

2.3 WASH INDICATORS

2.3.1 AVAILABILITY

The term availability describes how long a service is available and how long it takes the system to respond to user requests. It refers to the quality of a WASH system that ensures high operational performance over a period of time. These include services such as the availability of sanitation facilities and the availability of soap and water for washing hands (Bose, 2009). For toilets, the toilet door must be left open at all times. Or, if locked, the key should be available at all times (Byford, 2014). Always meet your basic needs. The availability of enough drinking water, water to flush toilets, wash hands and keep school grounds clean is also a major concern in many parts of the world. The health benefits of improved water and sanitation infrastructure and resources in schools may depend on the consistent availability of hand soap, water and toilet conditions (Bivins, et al., 2017).

2.3.2 QUALITY OF SERVICE.

Quality of Service determines whether the WASH device is functioning properly and the appropriate quality requirements are met. In addition, guarantees of cleanliness and availability of care are met, especially during peak use of WASH facilities (WHO, 2021). All surfaces of toilets and toilet facilities should be regularly cleaned to remove dirt, faeces and faeces to minimize health risks to occupants. Studies have demonstrated higher rates of infectious, gastrointestinal, neurocognitive, and psychiatric disorders when students are exposed to inadequate toilet facilities (Alexander et al., 2013).

2.3.3 ACCESSIBILITY

Accessibility means that WASH facilities should be easily accessible and hard to find. Far, always clean, age and handicap friendly (Adams, Bartram, Chartier, & Sims, 2009). Children can use equipment individually with little effort. Access to safe sanitation in schools is essential for ensuring good health and overall wellbeing of pupils (Byford, 2014). Access to hand washing facilities with water and soap facilitates good hand hygiene and plays an important role in preventing infectious diseases transmission (Bashir, 2019).To promote healthy behaviours, school toilets should always be open and easily accessible. Pupils should be allowed to use the toilet any time throughout the school day in case of need (Hooks, 2013). Improving universal access to WASH in school makes each individual feel valued and reducing possible disparities (WHO, 2019).

2.3.4 FUNCTIONALITY/USABILITY

This is to ensure that the WASH equipment is functioning properly, the construction of the WASH facility is intact, services are efficiently provided, and that the toilet door is always open. If it is open or closed with a key, it means that a key is always required. Available (Adams, Bartram, Chartier & Sims, 2009). Good hygiene behaviour requires continued facility functioning (Bashir, 2019). The way students use toilet facilities can depend on their physical quality and appearance whether they are fully functional and attractive (Koopman, 1978). Ensuring a consistently clean and functional WASH facility provides favourable conditions for promoting healthy behaviour (Bolton, 2021).

2.4 OPERATION AND MAINTENANCE

Operation and Maintenance refers to all activities necessary for the operation of water and sanitation systems. The overall goal of operation and maintenance is to ensure the efficiency, effectiveness and sustainability of water supply and sanitation facilities (WHO, 2000). Washing facilities such as restrooms are only considered usable if they are accessible to children, private, functional and clean. The involvement of all teachers, parents, students and members of the community is critical to achieving this. This is because the operation, maintenance and O&M of WASH facilities are joint responsibilities (Muhammed & Chimaa, 2016). A practical O&M plan gives schools a clear picture of the resources needed, how to mobilize them, the responsibilities of each stakeholder, and a variety of other related tasks (Szuba & Young, 2003). For example, ensuring and maintaining access to safe drinking water requires careful operation and maintenance of facilities. This is especially the case for school-controlled water sources, but also for schools supplied with municipal water. Intensive use and possibly abuse of facilities often require minor repairs, replacement of faucets and basins, and maintenance of plumbing systems. All schools should monitor their water supply and keep it in good condition

CHAPTER 3: METHODOLOGY

3.1 STUDY AREA

The research was conducted particularly in primary schools in traditional authority Bvumbwe in Thyolo district which is located in the southern part of Malawi. According to NSO, (2018) the total population in T/A Bvumbwe is 110,031 which is higher in population size among all TA's in Thyolo district. T/A Bvumbwe is divided across six village heads. There are a total of 188 public primary schools in Thyolo district in which twenty six are located in T/A Bvumbwe divided in three school zones. GPS data was collected to allow a mapping of the schools and geographical representation of the data distribution as shown in figure 1.

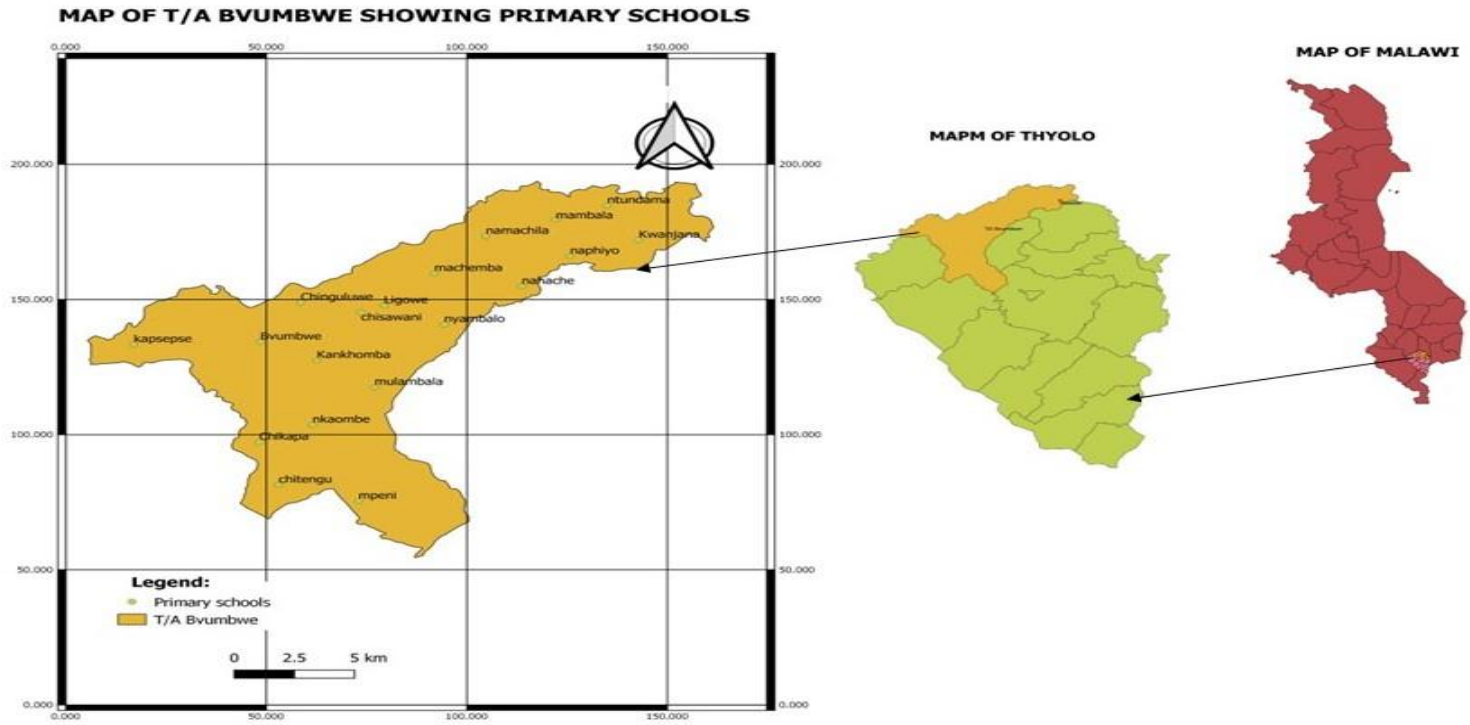


Figure 1 shows the map of study area developed using QGIS software

3.2 RESEARCH AND SAMPLE DESIGN

This study involves mixed research design. A cross sectional survey was conducted because data was collected from a sample of the targeted primary schools at a given point in time (Creswell, 2014). The survey was conducted across 19 primary schools in three school zones in T/A Bvumbwe in Thyolo District. The zones include, Thunga, Mountain View and Chisawani primary schools. The sample design of the assessment used a systematic random sampling technique. The sampling technique was accomplished by dividing the total population of primary schools in T/A Bvumbwe with sample size to find the sample interval which was found to be one and the random start on the primary schools list was number one then the primary schools were selected one after the other (Taherdoost et al., 2017). Table 2 provides details about the final sample allocation of primary schools which used the above described sampling procedure.

Table 2 shows list of primary schools selected

List of primary schools selected for sampling	Bvumbwe, Chikapa, Chinguluwe, Chisawani, Chitengu, Kankhomba, Kapsepse, Kwanjana, Ligowe, Machemba, Mambala, Mpeni, Mulambala, Nahache, Namachila, Naphiyo, Nkaombe, Ntundama, Nyambalo

3.2.1 SAMPLE SIZES

The size of the sample was calculated using formula 1 where n represents sample size, N is the population size, X^2 is the table value of a chi-square for 1 degree of freedom at the desired confidence level 0.10 which is 2.71, P represent the population proportion which is assumed to be 0.50 since this would provide the maximum sample size, e is the level of precision which is expressed as a proportion (±10%)

$$n= X^2NP (1-P)/ (e^2 (N-1) + X^2 P (1-P)) \quad .....1$$

$$n=2.71*26*0.5(1-0.5)/ (0.1^2(26-1) +2.71*0.5(1-0.5))$$

$$n=19$$

So, 19 primary schools were recruited to participate in the study through systematic random sampling.

3.3. MATERIALS AND METHODS

3.3.1 SURVEY DESIGN

The cross section study was conducted in the months of August and September 2022. Questionnaires were conducted in English and Chichewa languages. A total of 114 questionnaires were completed, 38 school teachers were interviewed using questionnaire and 76 pupils (girls and boys) were also included and observations were conducted. Primary education takes 8 years from standard 1-8 but only Pupils from standard (5-7) were targeted between age ranges of 10-14 years old. The official consent to conduct the questionnaire was obtained from district education manager and then the head teachers of schools with the first part of the questionnaire focusing on basic school information. Upon introduction, all-importance of the survey was clearly explained. Participants had a free choice to participate in the study. In the questionnaire, the only private data given was age and sex. If some aspects of the questionnaire were challenging to understand, students could ask for more clarification. If participants felt uncomfortable, they did not have to answer the questions. Moreover, the questions about menstrual hygiene were targeted only for adolescent girls and members of staffs while questions about operation and maintenance were targeted to head teachers only. The questionnaire was filled out for about one hour on each and every primary school.

3.3.2 DATA COLLECTION METHOD

Questionnaire were used as a method of data collection in School Water, Sanitation and Hygiene Assessment. Direct observations were also used to establish whether schools adhered to acceptable WASH guidelines for safe and healthy learning environments. Data was collected through direct school visits. Prior to data collection, schools were contacted to schedule field visits. Data on number of students, perceived water quality, operation and maintenance, data on number of sanitation and hand washing facilities and services were obtained from the primary school head teacher. Questionnaires were administered to each head teacher and teachers because they have a better knowledge of WASH scenarios at the school and the reason

is to examine the consistency of the students view concerning the state of the WASH program in the schools as it gives perspective on the WASH system and the types of services provided to students. Then the same questionnaire was administered to students. A pupil questionnaire reveals children's perceptions of the WASH service. This questionnaire was based on indicators of WASH in school which includes collected information mainly on availability, accessibility, acceptability, quality, operation and maintenance of water supply, hand washing stations and toilets facilities which were filled out during a visit to all forms of water supply and sanitation used by schools. The tool "Surveillance of water, sanitation, and hygiene in schools" was used to monitor the holistic view of access to WASH following WHO (2019), also Core questions and indicators for monitoring WASH in Schools in the Sustainable Development Goals-4 & 6 was used ((WHO/UNICEF, 2016). The standards for WASH in schools was used as the guiding principles to evaluate the adequacy of the various WASH components. The schools' environments were assessed to determine compliance to the UNICEF WASH guidelines.

3.3.2.1 MEASURES

The dependent/outcome variables include: water, sanitary, and hygiene services. Each variable is assessed by several indicators as follows:

3.3.2.1.1 WATER SERVICES

The schools, water supplies were assessed using indicators categorized into groups as follows: sources of water supply, presence of an improved water source or water supply within the facility used for drinking, Onsite disinfection of water supply, functionality (water was available from this source at the time of the survey), water quality monitoring activities, location of water points, number of water points, A reliable water point with a suitable alternative which is available at all the critical points within the school, the availability of water point maintenance plans and funds, accessibility of water source by young children and those with disabilities, acceptability of drinking-water for staff and schoolchildren at all times, Drinking-water from unprotected sources is treated to ensure microbiological safety and there are no tastes, odours or colours that would discourage consumption of the water (Adams, Bartram, Chartier, & Sims, 2009). The assessment of all these indicators was made through observation and questionnaire.

3.3.2.1.2. SANITARY SERVICES

Sanitary provisions at schools were assessed using indicators categorized into groups as follows: number of toilet units for males/females, toilet to student ratio, availability of self - closing toilet doors, provision of running water, soap, cleanliness, availability of cleaning materials, frequency of toilet cleaning, Sufficient toilets are available, toilets are easily accessible to all, Male and female toilets are completely separated, toilets provide privacy and security, toilets are appropriate to local cultural and social conditions, toilets are accessible for all children, toilets are hygienic to use and easy to clean, a cleaning and maintenance routine is in operation, and ensures that clean and functioning toilets are available at all times (Jurdi, 2009).

3.3.2.1.3. HYGIENE SERVICES

Hygiene promotion activities were assessed relating to: Availability of Hand washing facilities with water and soap or alcohol-based rubs at the toilets and within the facility buildings, the location and number of hand washing stations, ratio of hand washing facilities to students, positive hygiene behaviours including correct use and maintenance of facilities are systematically promoted among schoolchildren, facilities and resources enable schoolchildren to practice behaviours that control disease transmission in an easy and timely way, convenient hand washing facilities close by.

3.4 ASSESSMENT OF MICROBIOLOGICAL CHARACTERISTICS OF WATER

All the drinking water samples was collected from boreholes as the main source of drinking water (n=19).The measurements in water samples was carried out and the samples was collected in sterile bottles which was washed first with deionized water before use. To collect water samples from boreholes, water was run for 1 min before taking a sample. This ensured that any deposits in the pumps or pipes were washed out and the water sample was representative of the water in the supply pipes. These sample bottles were then rinsed three times by the water collected for analysis, the samples bottles was sealed and the samples was numbered against their location and sources. Then the water samples were stored in a dark environment in a portable cooler box at a constant temperature range of 4 to 10^{o}c to avoid any contamination and the effects of light and temperature. The water samples were transferred to the laboratory within 3 hours of collection and immediately analysis was started. To obtain microbial data,

faecal coliform was measured by using a membrane filtration method. Water quality was assessed by determining the water quality indicators recommended by WASH Guidelines relating to Microbiological characteristics: faecal coliforms analytical assessment and quality control procedures were performed following standard methods and procedures. We filtered 100 mL of each sample using sterile filter paper with a 0.45 μm pore size, applied vacuum suction, and incubated at 44 ◦C for 18 h. After incubation, bacteria were enumerated by colony count.

Microbiological Parameters

Table 3: shows method of Microbiological parameter

Analytical Parameters	Standard Analytical Method
Faecal Coliform	Membrane Filter Technique

3.5 DATA ANALYSIS

Analysis was performed using statistical package for the social science (SPSS) software and the data collected through questionnaire was compiled and analysed using frequency, percentages and proportions as the descriptive statistics method. The statistical t-tests was also used to compare the means of variables such as knowledge of WASH facilities and primary schools and pupils. The Microsoft Excel was used to interpret data into graph. Classification of WASH service and its domains into basic, limited and unimproved/no service was guided by JMP service ladders for monitoring WASH in schools. This enables comparisons with recommended WHO standards (Adams, Bartram, Chartier, & Sims, 2009) and enables if WASH services meet minimum standards of U.N Sustainable Development Goal-4 & 6.

3.6 LIMITATIONS OF THE STUDY.

The study was confined to government-owned primary schools based on the assumption that private schools of a similar level in T/A Bvumbwe are expected to have much higher service standards.

CHAPTER 4: RESULTS AND DISCUSSIONS

4.1 NUMBER OF WASH FACILITIES PRESENT AT THE SCHOOLS

The basic information was collected from the head teacher including number of girls and boys enrolled, number of water points, number of latrines and number of hand washing facilities as shown in Table 4.

Table 4 shows information on the number of enrolment and number of WASH facilities

NO	NAME OF PRIMARY SCHOOLS	NO OF BOYS ENROLLED	NO OF GIRLS ENROLLED	NO OF LATRINES FOR BOYS	NO OF LATRINES FOR GIRLS	WATER POINTS	HANDWASHING FACILITIES
1	BVUMBWE	600	685	2	6	1	7
2	CHIKAPA	311	420	5	4	1	11
3	CHINGULUWE	381	439	4	8	1	10
4	CHISAWANI	675	797	11	8	1	10
5	CHITENGU	670	770	3	3	1	10
6	KANKHOMBA	1194	1120	4	4	2	10
7	KAPSEPSE	123	155	2	2	1	10
8	KWANJANA	579	632	6	6	1	18
9	LIGOWE	1383	1349	9	2	1	23
10	MACHEMBA	1295	1340	8	10	1	12
11	MAMBALA	317	328	2	2	1	13
12	MPENI	266	294	4	4	1	20

13	MULAMBALA	586	620	3	2	-	6
14	NAHACHE	721	681	6	6	1	26
15	NAMACHILA	579	533	1	3	1	17
16	NAPHIYO	577	685	6	6	1	20
17	NKAOMBE	1001	1044	6	2	1	18
18	NTUNDAMA	450	463	13	10	1	14
19	NYAMBALO	887	900	3	6	2	25

4.2 WATER SERVICES

4.2.1 TYPE OF WATER SUPPLY

An improved drinking-water source by the nature of its construction has the potential to deliver safe water suitable for human consumption by protecting the source from outside contamination. Potentially safe (or improved) drinking-water sources may include the following types: piped, protected well (borehole), rainwater catchment, bottled water and water delivered by tanker trucks and small carts (United Nations Children's Fund; World Health Organization, 2016). Data collected shows that the major source of drinking water in 19 of surveyed public schools is the borehole water supplies as shown in figure 2. When borehole water supplies are not available, complimentary water sources mainly streams and unprotected wells are used. Such sources might be exposed to physical, chemical, and microbiological contaminants caused by sources of pollution such as sewage that impact the quality and safety of the water supplies (Korfali & Jurdi, 2009). That is why drinking water supplies in schools should be determined and routinely monitored (UNICEF, 2008). The proportion of schools with access to an improved source of drinking water was 94.7 per cent. While 5.3 per cent of schools in T/A Bvumbwe did not have any source of water but rather depend on community borehole as related to figure 3. However when water is not available, more than half of the schools relies on unprotected well and streams. An unprotected well or spring and surface water are sources that do not ensure the safety of the water quality and may pose health risks to users (Agarwal, Chaudhary, & Singh, 2015).



Figure 2 Shows primary school student drinking water from the Borehole

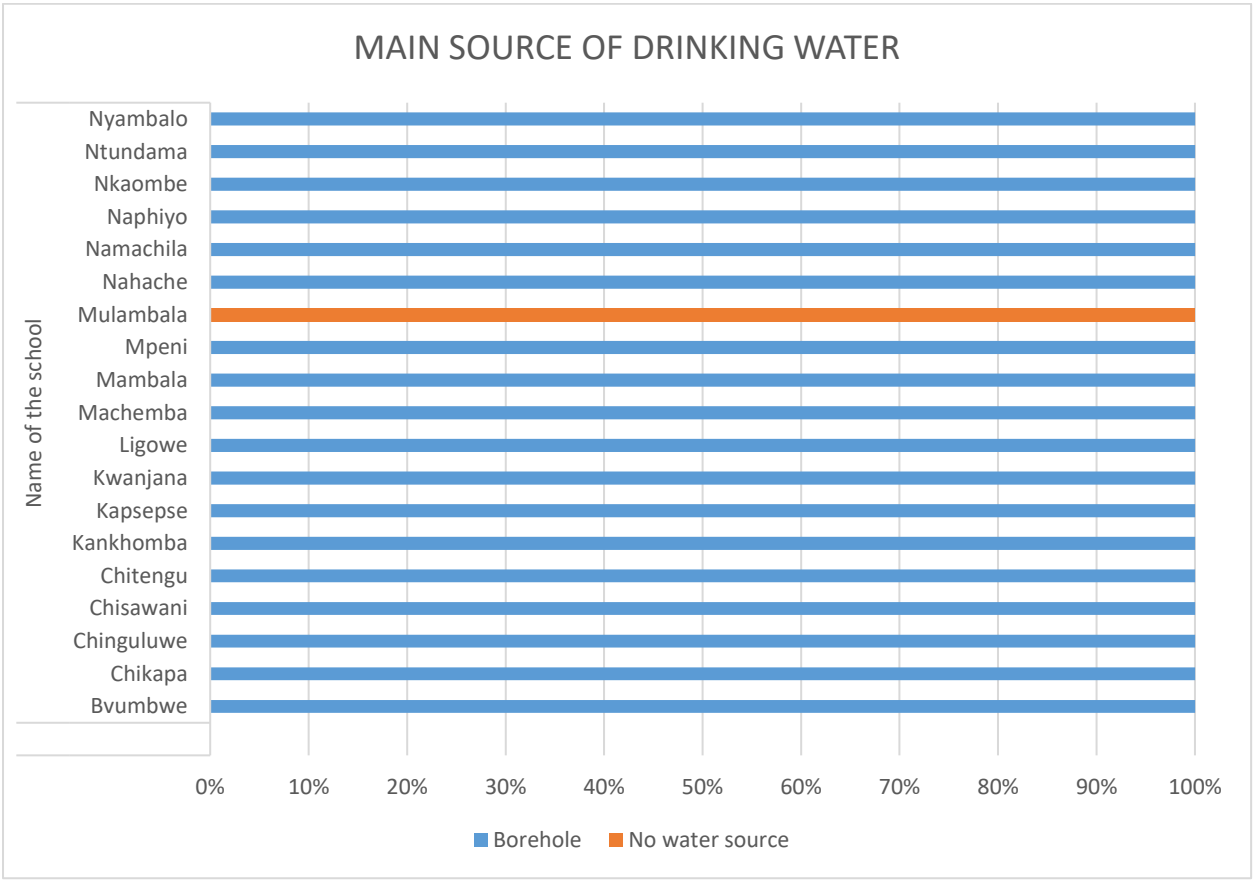


Figure 3 : primary schools with main source of water

4.1.2 DRINKING WATER AVAILABILITY FROM THE MAIN SOURCE

This part provides more understanding on the availability of drinking water from the main source of the school during the time of the survey, all days in the two weeks preceding the survey, and throughout the school academic year. About fifteen out of nineteen primary schools (83.3 per cent) in T/A Bvumbwe had drinking water available from the main source at the time of the survey as referred to figure 4 and 73.7 per cent of primary schools had drinking water two weeks before the survey. However, none of the primary schools had water from the same source throughout a school year rather there is regular or irregular interruptions all year in any of these primary schools. Regular Interruptions in water supply may be lasting for hours or even days that severely affects access to water for pupils and school staff. Irregular interruptions may indicate a localized issue in the system (Kumpel E, 2016).

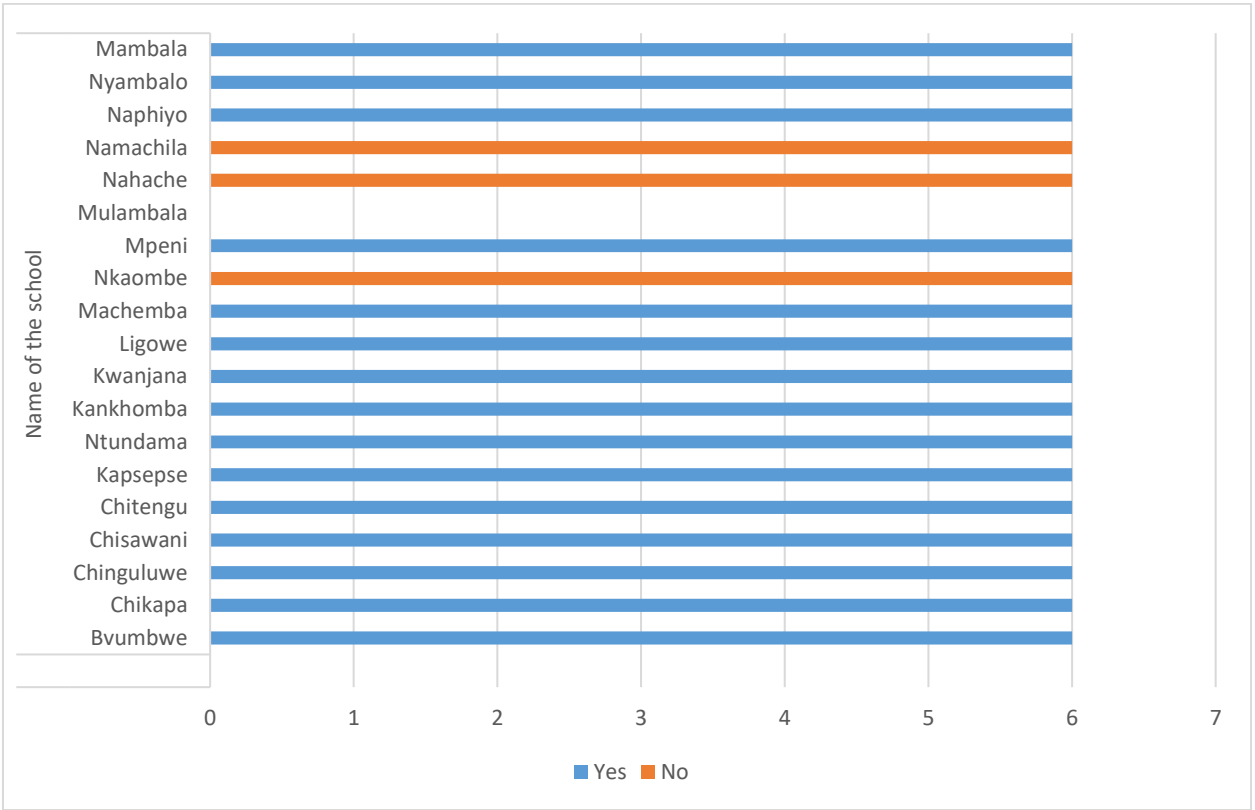


Figure 4 : primary schools with availability of running water at the time of survey

4.1.3 ACCESSIBILITY TO DRINKING WATER IN SCHOOLS

The information was collected on access to water services to the youngest children in primary schools and pupils with limited mobility for primary schools. The information was collected from the schools that had water sources. Overall, the results show that in T/A Bvumbwe, all of the nineteen primary schools with a water source had drinking water accessible to the youngest children. On the other hand, only 88.9 per cent of primary schools had water sources that were accessible to pupils with limited mobility or vision while the remaining primary schools their boreholes were not located on premises meaning the water point was not close in proximity to the classroom and they had no water storage in the buckets close to the classrooms which makes it not easy in terms of distance for children with limited mobility.

4.1.4 PERCEPTION OF DRINKING WATER QUALITY

Furthermore, in all the primary schools that had drinking water source, when questioned about the perceived quality of the water supplies, all schools indicated that the drinking water supplies were safe to bad health for consumption except that the major water complaints leading to rejection of the drinking water related to taste were 15.3% (3 schools) as shown in figure 5. Otherwise according to all schools, the perceived drinking water has no color, odor and turbidity that would discourage consumption. Despite the negative perception regarding water quality, no action was taken to identify the possible causes and mitigate the problems. Accordingly, this indicates that schools are in need to establish quality and quality control programs.

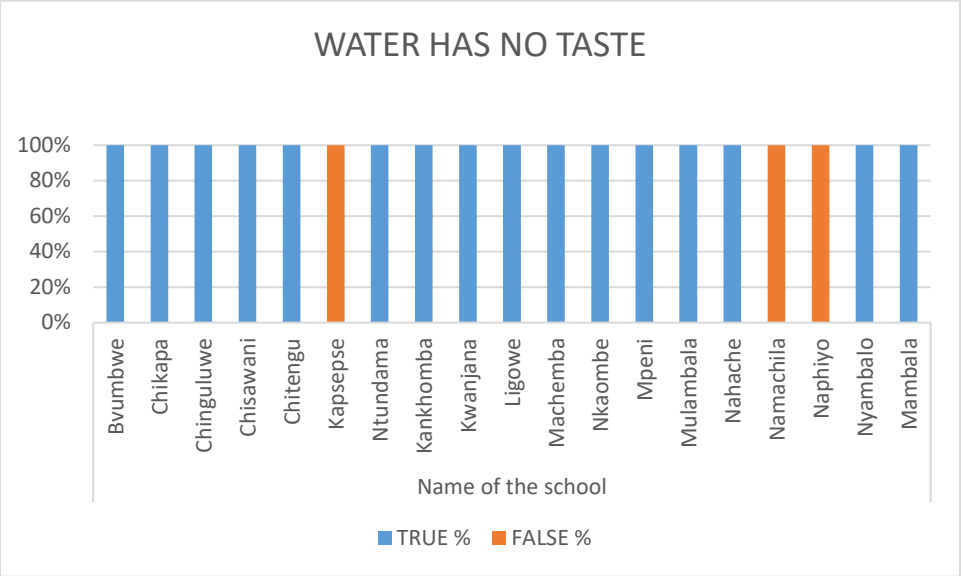


Figure 5 perception of drinking water quality

4.1.5 TREATMENT OF DRINKING WATER

Drinking-water should meet national standards. Safe drinking-water is strongly related to children's health and their physiological and intellectual development. The results of the survey showed that nineteen of surveyed public primary schools does not use any water treatment method from the main source to make water safe for drinking. This shows no any improvement in water supply services relating to the management of surveyed primary schools' water quality. Moreover none of the primary school has done water testing from the main source in compliance with the national standards for drinking water quality. Determining the microbiological quality of schools' drinking water supplies showed that faecal coliforms were present in 53% (10 out 19 schools) as shown in figure 6. The presence of faecal coliforms provides evidence of recent faecal contamination through possible breaches in water distribution system or contaminated ground water sources caused by sewage intrusion (UNICEF, 2008). According to WHO Guidelines, faecal coliforms should not be detected in the drinking water supplies in any 100ml sample (Adams, Bartram, Chartier, & Sims, 2009). As such, water supplies in these schools are not safe for consumption. As such, microbial water quality monitoring of drinking water supplies should be conducted routinely, ideally every week or once a month based on WASH guidelines and any variations from WASH guidelines should be immediately addressed and possible causes should be identified, mitigated and documented for future reference; however, this was not currently practiced in any of the surveyed public schools.

Hence, further action is required by the schools' administration, with the support of the Ministry of Education and Higher Education.

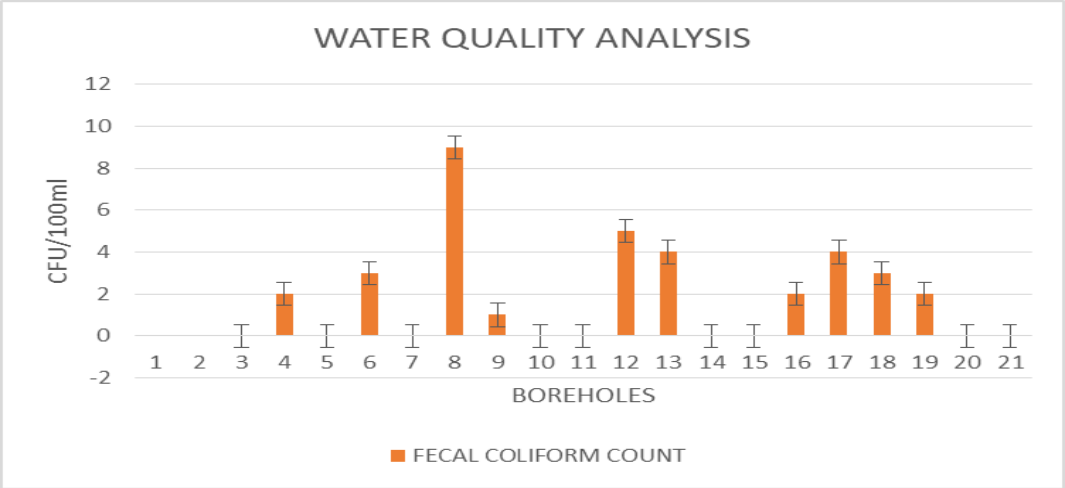


Figure 6: Number of schools with faecal coliform contamination

4.2 SANITATION SERVICES

4.2.1 TYPES OF LATRINES AND AVAILABILITY

All toilets in schools should meet national standards, including safe containment, and pay special attention to availability and accessibility of toilets, privacy and security, as well as menstrual hygiene management needs. Only improved toilets, defined as designed to separate human excreta from human contact hygienically, can be considered safe. These may include flush/pour flush toilets, pit latrines with slab and composting toilets (Munamati, Nhapi, & Misi, 2017). Information on the provision of adequate sanitation in primary schools were collected including types of toilets which are commonly used. The findings revealed that the most common types of toilet facilities in primary schools were ventilated improved pit latrines (21 %) and pit latrines with washable slabs (79%) as shown in figure 7, regardless of the quality that categorizes the facility offering basic sanitation services. The toilet to student ratio ranges from 1: 61 to 1: 300. Sufficient toilets/latrines should be available in the school to meet pupils' basic needs at all times. The results revealed ratio of pupils to toilets in all the schools which exceeds the national guidelines, for both girls and boys (UNICEF, 2019), resulting in long waiting times that discourage use and cause inconvenience. Furthermore, (11%) of the primary schools were affected by cyclone Ana which destructed many toilets resulting in few toilet facilities.



Figure 7: shows an improved pit latrine

4.2.2 ACCESSIBILITY TO SANITATION SERVICES TO THE YOUNGEST CHILDREN IN PRIMARY SCHOOLS AND CHILDREN WITH PHYSICAL DISABILITY

Accessibility of toilets/latrine facilities to the youngest children in primary schools and pupils with physical disability or limited vision in all schools contribute to increased enrolment, retention and completion for these two groups. The findings from the assessment show that more than half of the schools had at least one usable toilets that were accessible to the youngest pupils and had at least one usable toilet accessible to pupils with physical disability or impaired vision. However, only 94.7 per cent of primary schools in T/A Bvumbwe had at least one usable toilet that were child friendly. According to WHO guideline, the squatting hole in a pit latrine may need to be smaller and footrests may need to be closer together for younger children. Toilets should be safe and secure for use by children. Care must be taken for children that squat holes are not too large and there is no risk to children in using them.

4.2.3 LOCATION OF SANITATION FACILITIES

Sanitation facilities for a majority of schools in T/A Bvumbwe primary schools were located within the school buildings or outside the school buildings, but on the school premises (89.5 per cent). Only 10.5 per cent of schools were located off the premises.

4.2.4 CLEANLINESS OF TOILETS IN SCHOOLS

The respondents were asked to provide their views on how clean their school toilets were. The responses were divided into four categories – very clean, clean, and somewhat clean and not clean. Overall, as referred to figure 18, it was observed that only 31.6 per cent of school toilets were clean, 17.5 per cent were considered somewhat clean, while 50.9 per cent of the toilets were found to be not clean. Dirty toilets deter pupils from using them and foster avoidance. Frequency of cleaning the toilets should be conducted at least once a day (Adams, Bartram, Chartier, & Sims, 2009). Correctly documented cleaning schedules are a way to check the efficiency of cleaning procedures and ensure that they are carried out regularly. Those responsible for cleaning should be adequately trained on cleaning procedures, using cleaning materials such as chlorine bleach safely in the school environment and wearing protective equipment (e.g. gloves and face masks) during cleaning activities. It is important that school management provides clear directions to ensure quality and consistent procedures. The number of cleaning materials should be sufficient to clean different sanitary fixtures such buckets, gloves, mops, detergent and multiple cleaning cloths (UNICEF/WHO, 2019). If cleaning is contracted externally, a more basic set is sufficient. There are no records for cleaning schedule in all primary schools as shown in figure 19, hence children are the ones to clean when given a punishment in class but however cleaning toilets should not be viewed as a form of punishment in accordance to WHO WASH guidelines.

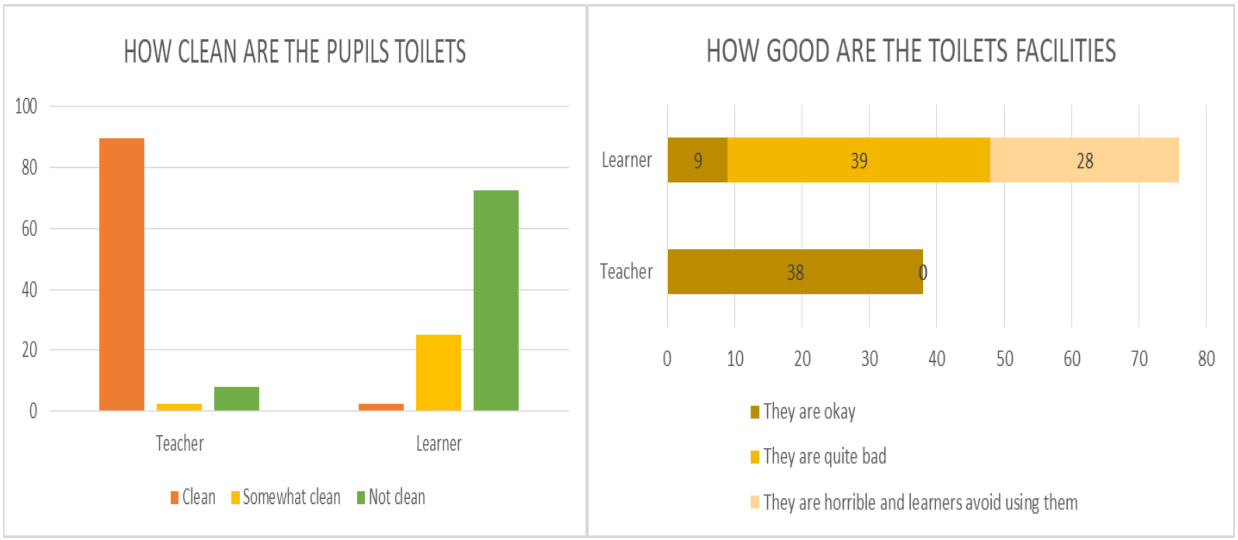


Figure 8 : Shows percentages on goodness and cleanliness of the toilet facilities.

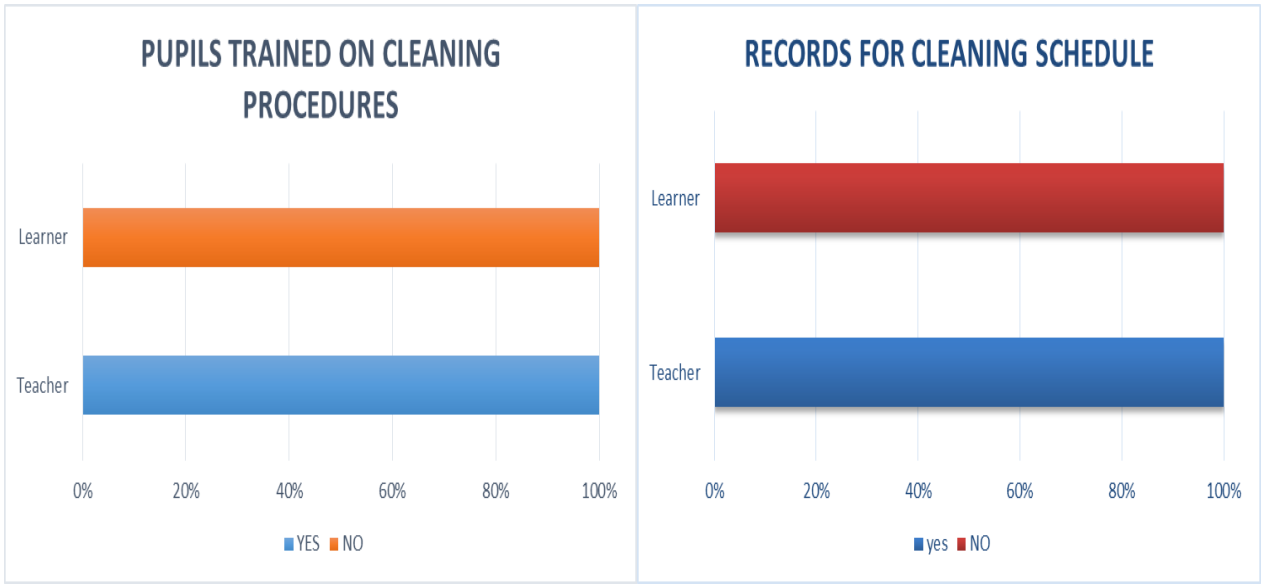


Figure 9: Availability of records of cleaning schedule and trainings on cleaning procedures

4.3 HYGIENE

4.3.1 AVAILABILITY OF HANDWASHING FACILITIES

The Assessment findings show that hand washing facilities were present in all of the surveyed schools in T/A Bvumbwe. Overall, the most common types of hand washing facilities used in all the schools were Buckets with taps as shown in figure 11. Though all of the nineteen primary schools had hand washing facilities, data from observations revealed that only (25.4 per cent) had water and soap at hand washing facilities on the day of the survey close to the classrooms, while 27.2 per cent of schools indicated having only water and 47.4 per cent of schools having neither water nor soap at their hand washing facilities on the day of the survey. Hand washing with water and soap is much more effective in removing bacteria from hands than hand washing with water only (Burton, et al., 2011). For effective prevention of infectious diseases, it is thus essential that soap is always available for hand washing. Pupils cannot be expected to wash their hands at critical times if there is no water. Figure 10 provides data on the percentages of schools

observed to have water and soap, water only, soap only and neither water nor soap at their hand washing facilities with regard to the various background characteristics.

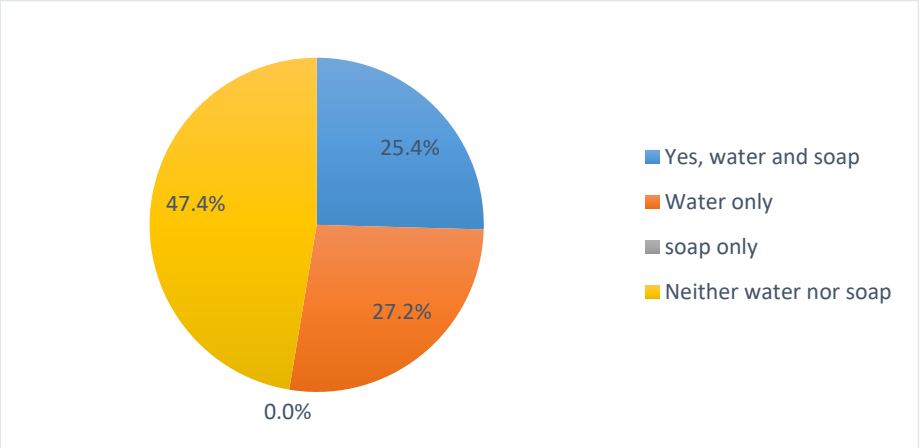


Figure 1010: Availability of hand washing facility with water and soap



Figure 11: Types of Hand washing facilities

4.3.2 ACCESSIBILITY TO HANDWASHING FACILITIES FOR THE YOUNGEST CHILDREN AND PUPILS WITH LIMITED MOBILITY

Hand washing facilities in schools should be physically accessible to everyone. Inaccessible hand washing facilities relate directly to the quality of the learning environment and may affect access to education, especially for those with limited mobility. The findings show all of the nineteen primary schools had hand washing facilities that were accessible to the youngest children and hand washing facilities were accessible to pupils with limited mobility or vision. As related to figure 12, it has been observed that most students forget to wash their hands after using the toilet according to pupil's respondents.

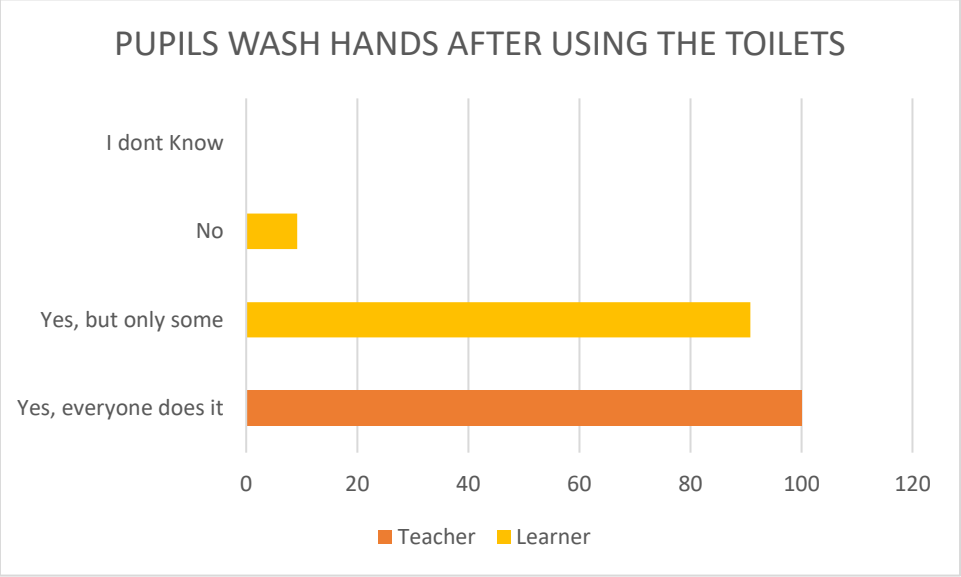


Figure 122: Hand washing behaviours

4.3.3 VISUAL PROMOTION FOR GOOD WASH BEHAVIOUR

The primary School WASH assessment observed that none of the primary schools surveyed displayed visual promotion messages for WASH at the time of the visit. School staff and teachers can play an important role in the development of healthy practices by pupils through training and setting a positive example. Update training for teachers, dedicated education inside and outside the classroom and active promotion will contribute to achieving behaviour change for

the benefit of the children and the whole school community. Age-friendly materials, hygiene billboards are placed in mostly all schools and posters or extracurricular activities such as health clubs are additional options to ensure appropriate hygiene (Brian & Hagard, 2003).

4.3.4 MENSTRUAL HYGIENE MANAGEMENT (MHM) SERVICES

Private spaces for girls may be separate from latrines and toilets, and their design may vary based on local context, but at minimum they should ensure availability of water and soap for personal hygiene in a private space (have closable doors that lock from the inside, and no holes, cracks, windows or low walls that would permit others to see in) (UNICEF, 2019). Specific provisions for MHM may vary based on the local context. Nevertheless, minimum provision should include some sort of a private area for washing private parts and/or menstrual hygiene materials, affordable or free provision of MHM products and regular education in class. The Components of MHM provided at the School as shown in figure 13 were change rooms (figure 17), sanitary pads and MHM education. The schools that provided MHM services, (14.5 per cent) provided MHM education as a component of MHM services, while only 13.2 per cent provided MHM materials (e.g. sanitary pads, etc.) and only 15.8 percent had changing rooms for girls as shown in figure 14. Results also show that all the primary schools that provided MHM services with changing rooms had changing rooms without basic amenities (water, waste bin, and soap and emergency supplies). Overall, all of the schools had neither water nor soap in private spaces for girls to manage menstrual hygiene at the time of the survey. There were absence of sanitary bins for the disposal of used menstrual hygiene products provided in girls' toilet but disposal facilities for menstrual hygiene products should be available in all age-appropriate girls' toilet as ordinary bins are not sufficient. Lack of suitable disposal facilities may create embarrassment and encourage insanitary practice (Keatman, Cavill, & Mahon, 2017).

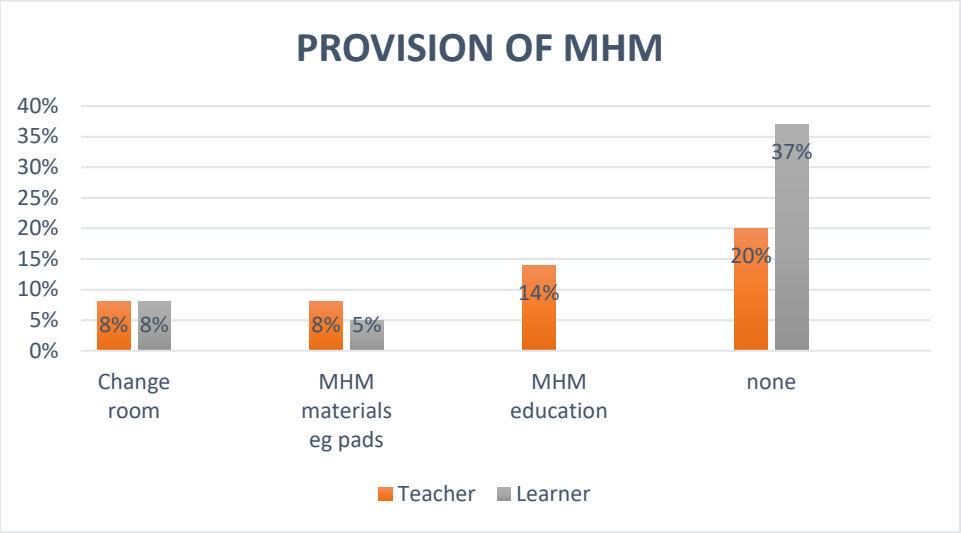


Figure 13: Component of menstrual hygiene management



Figure 14: Change room for Adolescent Girls

4.3.5 KNOWLEDGE GAP BETWEEN STAFF MEMBERS AND PUPILS ON TOILET FACILITIES

The results shows that p value < 0.05 which shows that there is significant differences in levels of WASH knowledge between staff members and pupil and WASH condition. When it comes to the level of understanding of water supply services, there is a huge gap of the knowledge between staff members and pupils. It was found that 33 percent of teachers responded that they talk to their pupils about the importance of drinking water but only 16 percent of pupils confirm

that they talked about the importance of drinking water before. When asked about what they think of the toilets facilities at their school, a significant difference was seen when all of the teachers said that the toilet facilities were okay but out of all the surveyed pupils only 9 pupils responded that they were okay while 28 pupils said they were horrible and learners avoid using them. On availability of records for the cleaning schedule of the toilets facilities, all teachers said the record were available while all pupils confirmed that the record for cleaning schedule were not available. Similarly, all pupils responded that they were not trained on cleaning procedures, safe and adequate use of cleaning materials and protective equipment but all the teachers in all primary schools responded that they did train the pupils on the cleaning procedures in toilet facilities.

On assessment of importance of washing hands, in all primary schools all teachers responded that every pupil wash hands after using the toilets but when pupils asked, only 61 percent responded yes but only some wash their hands after using the toilets where as 6 percent said pupils do not wash their hands after visiting the toilets. The reason why pupils do not wash the hands after using the toilets was found that 46.49 percent forget to wash hands, 19.30 percent of pupils do not know the reason why to wash hands, while 14.04 said there no place for washing hands and 20.18 percent said the water for washing hands were not available. There were remarkable knowledge gap in the provision of hygiene products with regard to the staff members and adolescent girl's responses. According to the provision of MHM services, 8.0 per cent of primary school teachers responded to have provision of MHM materials whereas only 5.0 percent confirmed the response of the teachers to be true. 14 percent of teachers responded to have provision of MHM education to adolescent girls but none of the adolescent girls confirmed it to be true.

4.4 OPERATION AND MANTAINANCE

4.4.1 PLAN AND FUNDING FOR MAINTENANCE OF SCHOOL WASH FACILITIES

The primary School WASH Assessment investigated the extent to which O&M for WASH in schools was being implemented and its implications for the sustainability of WASH services.in light of this, the assessment has revealed that 100 percent of primary schools has no funds to maintain and repair school WASH facilities at the time of the survey interview. Similarly, none of the schools has budget on school operation and maintenance. In terms of planning, only

one primary school currently has plan for operation and maintenance of WASH facilities (figure 15) but for instance ensuring continuous and safe water requires a functional operation and maintenance plan, which may include aspects such as regular treatment and maintenance of the water source in the case of a school-owned source (Bonn, 2017).

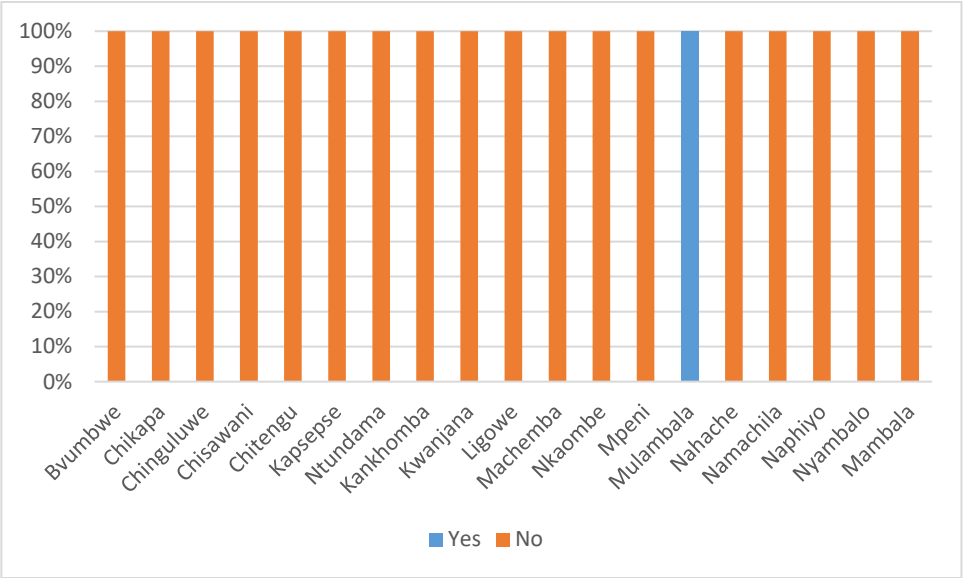


Figure 15: Operation and maintenance plan

4.4.2 RESPONSIBILITY FOR REPAIR AND MAINTENANCE OF THE WASH FACILITIES

On assessing which institutions or bodies were responsible for O&M, the survey established that 16.7 per cent of schools were responsible for repair and maintenance of their WASH facilities, while the community were responsible for the maintenance and repair of school water supply facilities in 77.8 per cent of schools.

4.4.3 SUCCESSFULLY MANTAINANCE OF WASH FACILITIES

Different maintenance procedures should be implemented at the school according to the water source, and sanitation facility. The results show that 84.2 percent of primary schools partially repaired their WASH facilities successfully when required and 15.8 percent of primary schools do not successfully repair and maintain their WASH facilities when there is need to as referred in figure 16.

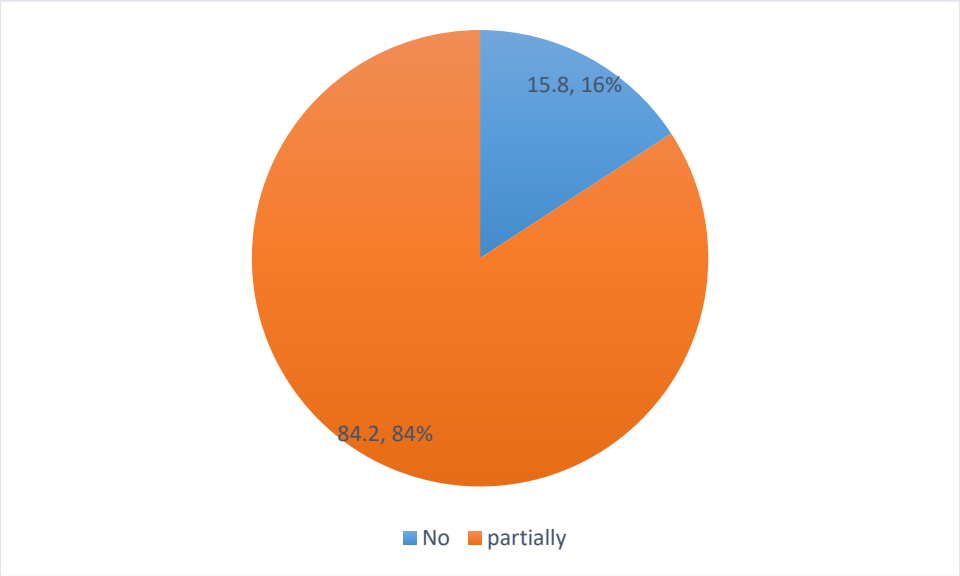


Figure 16: successfully maintenance and repair of facilities when required

4.5 AVAILABILITY OF WASH SERVICES ACCORDING TO JMP CLASSIFICATION

The primary School WASH assessment shows that more than half of schools in T/A Bvumbwe (78.9 per cent) had basic drinking water services, 15.7 per cent had limited water services and 5.3 per cent did not have any water service. On sanitation services findings show that more than half of the primary schools (84.2. per cent) had basic sanitation services, meaning that they had improved sanitation facilities that were single-sex and usable. It should be noted that almost all school toilets were single sex, therefore the largest percentage of limited sanitation is attributable to the usability of toilets, rather than to non-single-sex toilet facilities. 15.7 per cent had improved single-sex sanitation facilities but not usable at the time of the assessment and was hence classified as providing limited sanitation services. Furthermore, none of schools were classified as having no sanitation services. By using classifications of hygiene services according to the JMP, it was observed that, about 25.4 per cent schools had basic hygiene services, 27.2 per cent had limited hygiene services and 47.4 per cent had no hygiene services. The basic WASH facilities coverage in the primary schools of T/A Bvumbwe remains overall low especially on basic hygiene services in relation to SDG Indicators for WASH in Schools (UNICEF/WHO, 2022).

Table 5: SDG Indicators for WASH in Schools focus on achieving a basic minimum level of service (UNICEF/WHO, 2022)

SERVIVE LEVEL	DRINKING WATER	SANITATION	HYGIENE
BASIC SERVICE	Drinking water from an improved source and water is available at the school at the time of the survey	Improved sanitation facilities at the school that are single-sex and usable (available, functional and private) at the time of the survey	Hand washing facilities with water and soap available at the school at the time of the survey
LIMITED SERVICE	Drinking water from an improved source but water is unavailable at the school at the time of the survey	Improved sanitation facilities at the school that are either not single-sex or not usable at the time of the survey	Handwashing facilities with water but no soap available at the school at the time of the survey
NO SERVICE	Drinking water from an unimproved source or no water source at the school	Unimproved sanitation facilities or no sanitation facilities at the school	No handwashing facilities available or no water available at the school

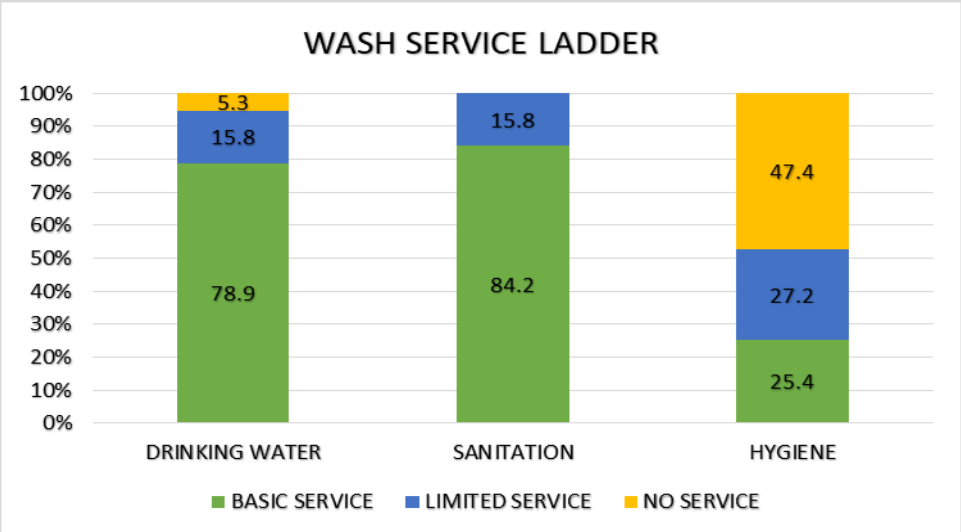


Figure 17: Basic WASH services in primary schools in T/A Bvumbwe

CHAPTER 5: CONCLUSION AND RECOMMENDATION

The Sustainable Development Goals address the provision of safe water and sanitation for all and increase schools' ability to offer an effective learning environment, including essential drinking water, sanitation, and hygiene. The objectives of the study were to evaluate the provision of adequate WASH services in primary schools, to examine the operation and maintenance of WASH facilities and to explore the knowledge gap of WASH facilities between staff members and pupils. The study reveals that the existence of the required infrastructure is not enough to turn this challenge into an opportunity. This study shows gaps in several vital aspects, such as maintenance, operation, inadequate sanitation facilities hygiene behaviour and practices as well as the poor conditions of MHM often lead girls to experience high levels of absenteeism (UNICEF, 2008). Only through the collaboration between local authorities, school administration, and parents within the community can these basic needs be met. Such cooperation will help to improve the learning environment in schools as well as achieving the SDGs. Comparing this study with other studies elsewhere, revealed that only 29.11% schools had basic hand washing facilities with soap and water (Sonika, Nazuk, & Neha, 2022) while this present study revealed only 25.4% of basic hygiene, the results are correlated as both studies hygiene standards observed at are low and manifested through a lack of the needed amenities and deficiencies in behaviour change communication modalities. Efforts to improve WASH should give prominence to hygiene service interventions in schools. Priority should be given to the sustainable provision of hygiene amenities such as soap for hand washing. Ensuring the availability of educational materials on hand washing such as posters, stickers, and signs at critical positions in the health care facilities. Overall, availability of services can be improved by institutionalization of WASH risk assessment and maintenance plans that were shown to be linked to availability of funds for maintenance. The present study results shows that the ratio of boys and girls to toilets which ranges between 1: 61 to 1: 300 exceeds the recommended guideline according to UNICEF and WHO of 1 drop hole separate for 50 boys and 25 for girls. The results are in agreement with the findings of Akoteyon & Otusanya (2022) which argued that adquate WASH provisions will improve academic perfomance and also the study done by Borges, Muller, Pinheiro, & Cecilia (2018) which revealed that the number of toilets in all schools was insufficient. The limited availability of these facilities is a concern because it can compromise hygiene practices (Joshi & Amadi, 2013). The presence of faecal contamination in water supports

the study done by Ahmed, Wong, Chan, & Zafar (2022) which ascertained the schools WASH conditions but however the present study shows that all schools did not conduct any type of water treatment which does not agree with findings by Borges, Muller, Pinheiro, & Cecilia (2018) which revealed that 74% of schools conduct water treatment. The study reveals that the present WASH facilities and practices in many of primary schools are not satisfactory. This is due to insufficient budget allocation from the government Evidence from literature reveals that these results and other findings are reflections of what is obtainable in other parts of the country. Therefore special efforts need to be implemented for the increase in the percentages of indicators of WASH in primary schools as well as on the maintenance of WASH in schools. As such, the following is recommended to support the implementation and ensure the sustainability of WASH programs in public primary schools in T/A Bvumbwe.

- Have the Ministry of Education assume ownership and commit to the development and sustainability of WASH programs in public primary schools by establishing a surveillance and management unit that will monitor, evaluate, and guide schools.
- Develop an implementation priority plan which would include mitigating maintenance and repair of WASH facilities; broken latrines and water points, and maintenance of onsite water treatment units. On the other hand, upgrading quality and quantity of water and sanitation facilities and infrastructure (number of toilet, water points and hand washing basins).
- Increase funds and allocate sustainable resources to upgrade and sustain WASH services in primary schools.
- Mobilize stakeholders local and international NGOs, water and sanitation authorities, community, and municipality to contribute to the provision and sustainability of WASH programs in public schools.

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APPENDIX 1

GENERAL INFORMATION OF SCHOOL STAFF AND STUDENTS

Village_____School:_____date: _____ time of the inspection (hh/mm): ____:____ Question No: _____

Name of school staff member interviewed: name 1: _____

Position at school1:_____

Gender of person being interviewed: staff member □male □female

Age of participant (How old are you?) _____ Years

Level of education _____

Enrolment: Total _____ Boys_____ Girls_____

WASH PROVISION

A. WATER SUPPLY SERVICES

A.i WATER AVAILABILITY

1. What is the main source of drinking water provided by the school?

Improved	Unimproved
1 Piped	5.unprotected dug well
2.tube well/Borehole	6.unprotected spring
3 Protected dug well	7.surface water (River/Lake/Canal)
4.protected spring	8.No water source

2. Is drinking water from the main source currently available at the school?

1. Yes 2. No

3. In the previous two weeks, was drinking-water from the main source available at the school throughout each school day?

1.Yes, all the time
2.No, there were irregular interruptions
3.No, there are regular interruptions
4. not applicable

4. Is drinking water from the main source always available throughout the school year?

1 Yes, always
2.No, there were irregular interruptions
3.No, there are regular interruptions (specify when)
4. No, water is never available

5. . Have students ever talked about the importance of drinking-water at the school with teachers?

1. Yes 2.No

A.ii ACCESSIBILITY

6. Is drinking water accessible to those with limited mobility or vision? 1. Yes 2. No
7. Is drinking water accessible to the youngest children in the school? 1. Yes 2. No
8. How many drinking-water points are at the school? Insert total number:_____

A.iii QUALITY OF SERVICES

9. Does the school do anything to the water from the main source to make it safe to drink?

1. Yes 2. No

10. If yes, what drinking-water treatment method is used on the premises of the school?

Boiling	1Yes ¨ 2No
Filtration	1Yes ¨2No
Solar disinfection	1Yes ¨ 2No
Ultraviolet disinfection	1Yes ¨2No
Chlorination	1Yes ¨ 2No
Other(please specify)	

11. What quality characteristics apply to the drinking-water on the premises?

Water has no color	1 True 2 False
Water has no odor	1 True 2 False
Water has no taste	1 True 2 False
Water has no turbidity	1True 2 False

12. If the water from the main source has been tested within the last 12 months, what parameters have been tested?

Escherichia coli (E. coli)	1 Yes 2No ¨ 3Don't Know
Arsenic	1 Yes 2No ¨ 3Don't Know
Lead	1 Yes 2No ¨ 3Don't Know
Nitrate	1 Yes 2No ¨ 3Don't Know
Fluoride	1 Yes 2No ¨ 3Don't Know
Other (please specify)	1 Yes 2No ¨ 3Don't Know

13. According to the latest tests, for what parameters is the water from the main source compliant with the national standards for drinking-water quality?

Escherichia coli (E. coli)	1 Yes 2No ¨ 3NA
Arsenic	1 Yes 2No ¨ 3 NA
Lead	1 Yes 2No ¨ 3 NA
Nitrate	1 Yes 2No ¨ 3 NA
Fluoride	1 Yes 2No ¨ 3 NA
Unknown parameter(s)	1 Yes 2No ¨ 3 NA
Other (please specify)	1 Yes 2No ¨ 3 NA

14. In the past 12 months, have there been complaints about the quality and/or availability of drinking-water at the school?

1Yes, about availability	2.Yes, about quality	3.Yes, about quality as well as availability	4.No

B.SANITATION SERVICES

B.i AVAILABILITY

15. What type of toilets/latrines do pupils commonly use at the school?

1.Flush/pour flush toilets connected to sewer	5.Composting toilets
2.Flush/pour flush toilets connected to onsite storage	6.pit latrines with slab
3.Pit latrines without slab	7. hanging latrines
4 No toilets or latrines	

16. How many toilets cubicles/latrines for pupils are at the school?

	Girls only	Boys	Unisex
Total number			
Number that are available			
Number that are functional			
Number that are private			
Number that are usable			

17. If toilets/latrines are not separated for boys and girls, is that a problem for you and your classmates? 1 Yes ¨2 No ¨ 3I don't know

18. Does the school have specified times when pupils are allowed to visit the toilets/latrines?

1.Pupils are free to use the toilets any time during the school day

2.any time, but during the lessons upon request for permission only
3.at specific times during the school day only (such as breaks)

A. ii ACCEPTABILITY

19. Are water and soap available in a private space for girls to manage menstrual hygiene?

1. Yes, water and soap 2.Water, but not soap 3.No water

20.. Are there covered bins for disposal of menstrual hygiene materials in girls' toilets?

1. Yes 2. No

21. . Are there disposal mechanisms for menstrual hygiene waste at the school?

1. Yes 2. No

B.iii CLEANLINESS AND QUALITY

22. How many times per week are the student toilets cleaned?

1. At least once per day	2.Once per week	3. 2–4 days per week	4.not cleaned	everyday

23.. In general, how clean are the student toilets?

1. Very clean 2. Clean 3. Somewhat clean 4. Not clean

24. In general, what do you think about the toilet facilities in your school?

1. They are nice 2.They are okay 3.They are quite bad 4.They are horrible and students avoid using them

24. Are records for the cleaning schedule of the toilet facilities available? 1 Yes 2 No

25. Have cleaning staff been trained on cleaning procedures, safe and adequate use of cleaning materials and protective equipment? 1 Yes 2 No 3 I don't know

26. Are separate cleaning cloths used for different sanitary fixtures and different surfaces?

1 Yes 2 No 3 I don't know

27. What cleaning materials are available at the school in case of need?

Buckets	¨1 Yes ¨2 No ¨3I don't know

Mops	¨1 Yes ¨2 No ¨3 I don't know
Gloves	¨1 Yes ¨2 No ¨3 I don't know
Multiple cleaning cloths	¨ 1Yes ¨2 No ¨3 I don't know
Detergent	¨1 Yes ¨2 No ¨3 I don't know

28. Is there sufficient light in the student toilets on the day of the survey/ questionnaire?

1. All toilets 2. Some toilets 3. None

29. Are latrines emptied or safely covered when they fill up?

1 Yes 2 No

B.IV. ACCESSIBILITY

30. Is there at least usable toilets that is accessible to those with limited mobility or vision? 1. Yes 2. No

31. Is there at least one usable toilets that accessible to the youngest children in the school? 1. Yes 2. No

32.. If students don't use the toilets at school any time they need to, what are the reasons?

1 Toilets are broken	7, too many pupils using them & I need to wait
2, Toilets locked all the times	8, too dark inside
3, too smelly	9.cannot lock the door of the toilet
4, too dirty	10, Other pupils can see from above or beneath the door/walls inside the cubicles
5. No, too far from classrooms	11.I don't feel safe when I use the toilets at school
6, no toilet paper	12. Not enough time to use the toilet
14.There are physical barriers on the way to the toilet	13 Toilet facilities are too cold

33. If students find a problem in the toilet area do they openly talk to a member of the school staff about it?

1. Yes, pupils usually do that on their own initiative 2 Yes, pupils are asked to report any problems in the toilet facilities ¨3 No

34. Where are the student toilets located?

1.within school building
2. outside building, but on premises
3. off premises

C. HYGIENE SERVICES

C.i AVAILABILITY

35. Total number of hand washing facilities available? Insert number

36. Are there hand washing facilities at the school? 1 yes 2 no

37. Are both soap and water currently available at the hand washing facilities?

1. Yes, water and soap 2.Water only 3.Soap only 4.Neither water or soap

38. Do pupils in your school wash their hands after using the toilet?

 Yes, everyone does it ¨2 Yes, but only some ¨3 No ¨4 I don't know

C.ii ACCESSIBILITY

39. Are hand washing facilities accessible to all pupils in the school?

1 Yes, hand washing facilities are accessible to all pupils
2 Hand washing facilities are not accessible to the smallest children at the school
3.Handwashing facilities are not accessible to pupils with limited mobility

C. iii QUALITY

40. How many times per week are group hand washing activities conducted for all students?

1. At least once per school day
2. 2-4 days / week
3. Once per week
4. Less than once per week

41. When pupils don't wash their hands while at school, what are the reasons?

1. They forget 2 no time to do it 3. Don't understand why to wash hand 4. No place for washing hands 5.no water available 6.There is no soap 7. The

queue is too long 8. Hand washing Facilities are too far away 9. Are broken 10.look dirty?

42. Have you ever talked about the importance of hand washing at the school?

1 Yes ¨2 No ¨ 3 I don't remember

43. Do you know what can happen if students don't wash their hands?

1 Yes ¨2 No

44. Is there any visual promotion of good WASH behaviour at this school (i.e. talking walls promoting WASH messages)? (Verify by observation if response is yes)

1. Yes, available and displayed at the time of visit 2. No 3. Yes, but not displayed at the time of visit

45. How is solid waste from the school disposed of?

1 collected by municipal waste system

2 Burned on premises

3 Buried and covered on premises

4 Openly dumped on premises

46. Which of the following provisions for menstrual hygiene management are available at the school?

1. Bathing areas 2. MHM materials e.g. pads 3. MHM education

D. OPERATION MANTAINANCE AND OPERATION

47. Have WASH facilities ever been renovated?

1.Yes (specify when last): _____	2.No

48. Who is responsible for the provision of WASH services on the school premises?

1.External Provider
2. School management
3.Both external provider & School Management
4.Other(Please specify)

49. Who is responsible for solid waste management?

	Collection and storage at the premises	2 Disposal

External provider	1	1
School caretaker(s	2	2
Both external provider and school caretaker(s)	3	3
Other (please specify)	4	4

50. Is there a written operation and maintenance plan? 1 □Yes 2□No

51. Who is responsible for the operation and maintenance of the WASH provision on the school premises?

1.School management/staff
2.Teachers
3.Students
4.Caretaker
5.Contracted services
6.External provider
7. Both external provider & School caretaker

52. Is there a budget for the operation and maintenance of WASH services at the school?

1.Yes, the budget covers more than 75% of needs
2.Yes, the budget covers between 50% and 75% of needs
3.Yes, but the budget covers less than 50% of needs
4.No

53. Who is responsible for providing the budget for the operation and maintenance of WASH services at the school?

1. School administration 2. Local public administration 3. Parents of the pupils

54. What entity has the primary responsibility for maintenance and repair of school WASH facilities?

1.The ministry responsible for water supply	2.Ministry responsible for education	3.District/municipal authorities	4.The school itself	5.Community	6.Another body	7.Don't know

55. Does the school currently have funds available to cover the maintenance and repair of school WASH facilities? (e.g., purchasing soap, replacing taps and pumps, emptying septic tanks)?

1. Yes 2. No

56. Are the school WASH facilities successfully maintained and repaired when required?

1. Yes 2. No 3. Partially