



EVALUATION OF THE IMPLEMENTATION OF THE SCHOOL WATER, SANITATION, AND  
HYGIENE (SWASH) PROGRAMME IN TANZANIAN PUBLIC SCHOOLS

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Theresia Paul Kuiwite

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## Approval of the Thesis

### EVALUATION OF THE IMPLEMENTATION OF THE SCHOOL WATER, SANITATION, AND HYGIENE (SWASH) PROGRAMME IN TANZANIAN PUBLIC SCHOOLS

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## Abstract

EVALUATION OF IMPLEMENTATION OF THE SCHOOL WATER, SANITATION AND  
HYGIENE (SWASH) PROGRAMME TANZANIAN PUBLIC SCHOOLS

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Improving water, sanitation and hygiene services in schools can have a positive impact on attendance, disease reduction, and cognitive development. However, achieving sustainable Water, Sanitation and Hygiene (WASH) services in schools, especially in low-income countries like Tanzania, is challenging. To accelerate access, effective strategies, cooperation from WASH actors, funding, and engagement with communities and partners, the government has initiated a specific programme for schools termed School Water Sanitation and Hygiene (SWASH). This study aimed to evaluate the implementation of SWASH programme in Tanzanian public schools. The specific objectives of the study were to assess the status of SWASH facilities in public schools, analyze the interventions and construction methods used, examine the perceptions of teachers and the community, identify challenges and opportunities for SWASH programme, and evaluate stakeholder adherence to government SWASH policies. Data collection and processing aimed to eliminate systematic errors, and questionnaires were designed to align with research questions. Informed consent was obtained to ensure participants' voluntary participation and provide reliable evidence for the research questions and responses. Around 68% of teachers believe that limited SWASH services affect school performance for both girls and boys, with 75% reporting that limited latrine facilities impact adolescent girls. Key informants reported water shortages at 74%. Challenges hindering implementation included poor planning for maintenance (93%), poor governance (88%), and low capacity of the school committee (83%). Other challenges included a high increase in student enrollment (75%), low involvement of school committees (67%), climate change impact (58%), lack of budget for SWASH (55%), and other

unforeseen calamities (42%). While the school community views the SWASH programme as a solution to current challenges, schools lack a dedicated SWASH budget, limiting programme sustainability. It is recommended to propose simple and scalable methods for implementing SWASH programme to address priority areas and expedite access to SWASH services.

### Declaration

I declare that this thesis has been composed solely by myself and that it has not been submitted, in whole or in part, in any previous application for a degree. Except where stated otherwise by reference or acknowledgment, the work presented is entirely my own.

### Copyright

I confirm that I retain the intellectual property and copyright of the thesis submitted. I also allow UNICAF University to produce and disseminate the contributions of the thesis in all media forms known or to come as per the Creative Commons BY License (CC BY).

## Dedication

This dissertation is dedicated to my husband, Dr Hurbert N. Lyimo, and our children for their patience and financial support during the study. I also know that since I started this study, my Kilimahewa Church fellowship has been persistently praying for me and therefore shares this family dedication.

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## CHAPTER 1: INTRODUCTION

### Background of the Study

Access to water and sanitation, along with the child's right to education, are fundamental human rights that must not be restricted or waived. Various agencies in different countries have different perspectives on Water, Sanitation, and Hygiene (WASH). The United States Agency for International Development (USAID) previously referred to it as water and sanitation for health (WASH). In Zambia, the term WASHE was initially used in 1987 to describe a water program, abbreviating "Water Sanitation Health Education" (Winter et al., 2021). Subsequently, international organizations involved in water supply and sanitation advocacy, such as the Water Supply and Sanitation Collaborative Council (WSSCC), the International Water and Sanitation Centre, USAID, and later the UN Millennium Development Summit, decided to adopt the acronym "WASH" to represent Water, Sanitation, and Hygiene (WSSCC, 2020). Since then, WASH has garnered increasing attention on political agendas globally (UNICEF, 2019).

In 2016, the United Nations General Assembly (UNGA) officially recognized access to clean and safe drinking water and improved sanitation as a universal human right (United Nations Children's Fund (UNICEF) & World Health Organization (WHO), 2018). This declaration underscored the critical importance of ensuring that individuals worldwide have access to essential water and sanitation services. Addressing the Sustainable Development Goals (SDGs), which encompass the achievement of quality education, promotion of gender equality, and provision of sanitation for all, necessitates

the provision of adequate water supply, sanitation, and hygiene in schools (UNICEF & WHO, 2018).

The SDGs encompass a broad range of objectives, including the promotion of universal primary education, gender equality, and reductions in child mortality rates. These goals also encompass targets related to combating severe illnesses and reducing child mortality. Sustainable Development Goal 6 and its associated targets aim to ensure improved and sustainable access to safe drinking water, basic sanitation, and hygiene practices by the year 2030.

It is essential that all individuals, including children, have access to services that promote safe and sustainable Water, Sanitation, and Hygiene (WASH) to foster a healthy living environment. Recognizing the significance of addressing water, sanitation, and hygiene challenges in educational settings, an independent component of WASH known as School Water, Sanitation, and Hygiene (SWASH) was established to specifically address these issues within schools. SWASH encompasses various components, including ensuring the availability of clean and safe water, installing proper facilities such as latrines and handwashing points, and promoting appropriate sanitation practices through behavioral change initiatives like handwashing, waste management, and infrastructure maintenance. These efforts are further reinforced by educational programs aimed at fostering knowledge and behavioral changes within school environments.

School attendance and academic performance may be affected from a lack of access to adequate water, sanitation and hygiene facilities. Additionally, in addressing child and human rights on water, sanitation and hygiene issues, commitment has been

made, basically in SDG 3 on ensuring and promoting health and well-being, SDG 4 on delivering quality education and fostering lifelong learning, and SDG 6 on providing safe, adequate, and equitable water, sanitation and hygiene services to everyone (UNICEF, 2019). However, low-income nations often suffer from inadequate menstrual hygiene management, dehydration, poor hygiene, and toilet avoidance. Worldwide countries have adopted these SDGs and their targets that have specified indicators for global monitoring, which are an inclusive and effective learning environment for all and universal access to water, sanitation and hygiene services (Ryan et al., 2017). Likewise, in a country where diarrhoea and other water and hygiene-related illnesses constitute a severe danger, there is an urgent need for action to boost access to improved water, sanitation and hygiene facilities. Moreover, lack of access to these basic needs creates a significant burden, especially for women and school children.

The Sustainable Development Goals (SDGs) have incorporated Water, Sanitation, and Hygiene (WASH) in schools, along with indicators that will be utilized worldwide to measure the progress of implementation. Embracing these global goals signifies governments' commitment to ensuring the provision of high-quality, equitable, accessible, and affordable safe and clean water, sanitation, and hygiene services to all schools by 2030 (World Bank, 2018). The 2017 Ostrava Declaration on Environment and Health also delineates actions to secure safe and accessible water and sanitation facilities on a global. Transforming every school into a health-promoting environment is crucial for attaining the objective of partnerships for the health and well-being of children, as outlined in the 2016 Paris Declaration (United Nations Educational, Scientific, and Cultural Organization (UNESCO), 2016). The global protocol of the declaration on water and

health serves as the primary implementation tool for achieving universal access to WASH in schools. The World Health Organization (WHO) has identified the importance of water, sanitation and hygiene in institutions including schools as a high priority. It is among the two of 46 impact targets for which the Organization will be held accountable by 2025 (UNICEF & WHO, 2018). Despite the already achieved progress, the year 2018 marked the first year of the implementation of WHO 2018 – 2025 strategies. Strategy, which outlines the WHO vision to substantially improve health through the safe management of water, sanitation and hygiene services in all settings (WHO, 2018). In this, WHO had committed to tackling the still unacceptably high water, sanitation and hygiene-related burden of disease. Still, WHO is not yet on track to meet the global aspirations of the SDGs to promote WASH service in the form of well-managed services and ensure access to at least basic hygiene and sanitation service levels.

The School Water Sanitation and Hygiene (SWASH) programme, globally recognized as the WASH program in schools, is widely acknowledged as a critical intervention for improving academic performance, upholding children's health rights, and promoting a hygienic environment (Andrew et al., 2017). Whale et al. (2017) noted that adequate water, sanitation, and hygiene services in schools can positively influence the development of health behaviors and attitudes across generations. The targets and indicators for SWASH aim to achieve a basic minimum level of service by 2030. The enhancement of WASH facilities in schools in developing countries has become a significant area of concern and research in light of the Sustainable Development Goals (SDG) related to WASH issues. However, as highlighted in the study by Kamara et al. (2017), challenges persist in ensuring water, sanitation, and hygiene standards in

schools, particularly in developing nations. The most significant deficiencies are observed in Southern Asia and Sub-Saharan Africa, leading to the implementation of various external assistance programs and the establishment of SWASH initiatives in these regions to tackle WASH challenges in schools (McMichael, 2019).

The SWASH programme aims to improve WASH facilities in schools, motivate children to attend schools, increase girls' participation, establish positive hygiene behaviour, introduce better WASH practices in families and communities, improve health and cognitive development (Antwi-Agyei et al., 2017; Ohwo & Agusomu, 2018). Schools are places that offer strong and unique chances for learning and spreading information and practices. Water is used for drinking, domestic uses, gardening, maintaining the cleanliness of the school grounds and in the latrines, and hand washing. Likewise, the SWASH programme aims to promote environmental health by ensuring that schools have adequate and accessible safe water supply, sanitation, and hygiene services, and improved access to sanitary and hygiene services. Good practices are being adopted by the community in which these students/pupils live and to which they become part of the community human development resource.

Because of these health and educational benefits, national governments and international organizations like the United Nations Children's Fund (UNICEF) have made regular monitoring of WASH key indicators in schools as a priority in order to target resources and programme initiatives to boost coverage (UNICEF & WHO, 2018). SWASH programme is an important intervention that provides a comprehensive protective environment to support quality education. In many low-income countries, it has been integrated into government policies, strategies and guidelines. In this case, the school

programme components touch several key actors including the ministry responsible for education, health, water, and other multilateral and international organizations. Governments have demonstrated some commitment to enhancing WASH in schools, though, there is still room for improvement especially in the country's resource allocation and monitoring system.

The Tanzania government like other developing countries is among the countries decided to sign the UN agenda for implementing the WASH goals. The action of commitment made it possible for the government to engage vast number of parties and funding commitment towards achieving UN goals and targets for universal education and others. This endorsement provides chance to emphasize the crucial role of WASH to stakeholders and promotion of many interventions to address the SWASH situation in the country (Mshida et al., 2020). WASH stakeholders believed that numbers of United National (UN) agenda's Millennium and Sustainable Development Goals including universal public education, gender equality, and child mortality reduction, and health, can be accomplished by providing adequate water, sanitation, and hygiene facilities and services in schools (World Bank, 2018).

To start implementing the UN agenda for improving WASH in the country, the Tanzanian government launched the School WASH (SWASH) programme in 2012 (Mara & Evans, 2018). The intention was to ensure that by 2030, all schools will have access to clean, safe water and adequate sanitation and hygiene services. The government commitment and initiatives involved taking WASH players on board, allocating more resources for improving WASH facilities and raising awareness in schools. Through SWASH programme it is anticipated to offers guidance for the efficient allocation of

resources for WASH in schools. Additionally, the programme strives to improve water, sanitation and hygiene facilities and practices in schools for better academic and health performance. To start with, a SWASH framework was developed as a simple tool that identifies key areas, specifies time, goals, and targeted priority actions that the government aims to follow to achieve an enhanced, equitable, and long-term SWASH service provision. The framework acts as a roadmap for SWASH programme to all WASH service providers in the nation. The programme gives room for all partners involved in the country's implementation of WASH services using various techniques and initiatives. It directs an effective allocation of resources to SWASH by establishing evidence-based priority areas. Different methods were planned and utilised, with some involving schools and communities in the implementation process, while others relied on contracts and campaigns. The effectiveness of these methods has not been thoroughly studied to date. It is crucial to assess the effectiveness of these methods to identify the most successful ones for widespread adoption when expanding the programme.

Beside the various efforts, the progress toward universal access to WASH in Tanzania, particularly for school has kept on been slow. Results of the SWASH survey conducted UNICEF and National Bureau of Statistics (NBS) in 2018 showed that very few schools met the national minimum standards of pupil. The recommended standard for Tanzanian schools is one toilet per 20 girls and one toilet per 25 boys. Only 27.5 per cent of schools surveyed met the national minimum standards, with huge variations across the country. However, it was reported that only 31.8 per cent of the schools had water services (UNICEF & NBS, 2020). This confirms that basic water and sanitation facilities are often lacking in schools, and hygiene education is quite inadequate (Bauza et al.,

2021) and it require urgent attention. According to the findings of previous study, the programme implementation remains low, little progress has been made in comparison to the needs (Mshida et al., 2020). Findings reported by UNICEF & NBS (2020) showed that 89% of Tanzanian schools lacked adequate sanitation and hygiene facilities. The availability of the facilities and services are far short compared to the needs. Many school infrastructures, including latrines and urinals, hand washing stations, drinking water storage, and unsafe sewage disposal, are currently in disrepair. Majority of schools do not have a budget and plan for the successful operation and maintenance of SWASH facilities in schools leaving the constructed facilities to deteriorate. Indeed, these studies that have being done in the country dwelled more on the availability of the facilities and not the status or the underlying principle for crippled development as such. Nevertheless, findings indicate that the rate of improvement in school WASH facilities is still below the acceptable standard. Such circumstances have been linked to poor student performance and poor cleanliness among schoolchildren by some workers (Andrew et al., 2017; Ohwo & Agusomu, 2018).

The National Bureau of Statistics (NBS) survey of 2018 found that only about 28% of Tanzanian schools had sanitation facilities that matched with the national standards. About a half (55%) could provide basically clean water. Such situation being exacerbated by the increase in the school pupil enrollment that was not commensurate with the availability of SWASH facilities in the schools. Many SWASH facilities including latrines, and urinals, hand washing stations, drinking water storage and unsafe sewerage disposal are currently disrepair. This is despite the several initiatives and investments undertaken by the government and the community at large. This suggest that there are some more



constraints underpinning the improvement planned. Probably the community perception or underrating the required investments. Based on these general observations, various strategies have been suggested to improve the situation (Kamara et al., 2017). One of the strategies was to seek more collaboration action with stakeholders to meet the WASH national targets. Another government initiative was to refrain to a School Water Sanitation and Hygiene Programme (SWASH) from the Nation Sanitation Campaign (NSC). The SWASH programme deals with possible WASH component interventions in schools alone. Several WASH players were asked to invest in school sanitation to accomplish this sub-programme. The African Development Bank, the World Bank, UNICEF, WaterAid, SNV, Concern Worldwide, World Vision, Plan International, and AFRI Care, among others, were all involved in the programme. Various prominent organizations and institutions have played significant roles in the implementation of the Water, Sanitation, and Hygiene (WASH) programme. Among these key players have been the African Development Bank, the World Bank, UNICEF, WaterAid, SNV, Concern Worldwide, World Vision, Plan International, and AFRI Care, to name a few.

The African Development Bank, known for its commitment to promoting sustainable development across the continent, contributed expertise and resources to support WASH initiatives. Similarly, the World Bank, a global financial institution, played a crucial role in funding and implementing WASH projects to improve access to clean water and sanitation facilities in various regions.

UNICEF, a leading organization dedicated to children's rights and well-being, focused on ensuring that WASH programmes in schools and communities were child-friendly and sustainable. WaterAid, a renowned international NGO, worked tirelessly to

advocate for safe water, sanitation, and hygiene for all, particularly in under served communities.

Other organizations such as SNV, Concern Worldwide, World Vision, Plan International, and AFRI Care also made significant contributions to the WASH programme. These organizations brought their expertise, resources, and on-the-ground experience to support the implementation of WASH projects, aiming to address water and sanitation challenges and promote hygiene practices in communities and schools.

Collectively, these WASH players collaborated and coordinated their efforts to maximize impact and reach more communities in need. Their dedication to improving access to clean water, sanitation facilities, and hygiene education has been instrumental in advancing public health, enhancing educational outcomes, and promoting sustainable development worldwide.

The SWASH was meant to establish a framework that identifies key areas and measures that the Tanzanian government shall follow and achieve enhanced, equitable and long-time WASH services provision in schools. Studies have shown that where well programmed and supervised, there is a high possibility of sustained facilities and practices (Mishra et al., 2017).

SWASH programme laid forth a comprehensive plan for implementing a campaign to improve school WASH environment. The programme also served as a roadmap for all partners in the country involved in implementation of WASH services. It deliberated on the fund and other resources allocation. Various approaches have been utilized some of which involved schools and the community in the implementation processes, while others relied on contracts and campaigns. Even after this, the implementation of the strategies

within the SWASH framework suggested to promote continued construction and maintenance of SWASH services, there is no solid evidence of their collective effects or the sufficiency of their aggregated presence to promote continued practices and maintenance (McMichael, 2019; Bauza et al., 2021). This is because the strategies are rather area-specific to fit and their implementation depends on various factors within a given area or region. The major ones are financial power, political influence, geographical factors, and technological advancement.

To effectively support the UNICEF and WHO through Joint Monitoring Programme (JMP) for Water Supply, the government of Tanzania, through the Ministries responsible for Education, Water and Health, has developed the SWASH strategy guidelines. These were developed jointly by engaging national and international WASH stakeholders to establish appropriate interventions and support in addressing the constraints and shortcomings of the challenge of water, sanitation and hygiene services in schools.

Overall, the SWASH Programme anticipates that communities will be supported through in-kind contributions and that pupils, teachers, and communities will be educated on how to improve their water sanitation and hygiene behaviour. Factors such as taboos and social culture may have contributed to the low implementation of the SWASH programme. The majority of communities rely on the government to install sanitation and hygiene facilities in their areas, including schools (Antwi-Agyei et al., 2017). This heavy reliance on government initiatives has led to the programme's long-term sustainability being almost entirely dependent on government actions, despite the crucial role of community involvement in its development and implementation. These circumstances justify the need for a study to assess the implementation of the SWASH programme in

public schools. The aim is to identify suitable principles, approaches, and techniques, with necessary modifications, to ensure the successful and sustainable implementation of the programme in schools.

### **Problem Statement**

The global recognition of the critical importance of Water, Sanitation, and Hygiene (WASH) services for human health and well-being is unequivocal. Safe water caters for some of the most critical students/teachers' needs in schools. The WASH programme was implemented in schools in the country since 2012 till date as a result of the Water Sector Development Programme (WSDP) (2007-2025), and the National Sanitation Campaign Programme (2012-2016).

However, within the educational landscape of the country, particularly in public schools, there exists a concerning pattern of substandard and inadequate WASH service provision, as highlighted in studies by Andrew et al. (2017), McMichael et al. (2019), and Mshida et al. (2021). The findings from the latest SWASH programme assessment in Tanzania in 2018 paint a bleak picture: a mere 27.5% of schools were found to offer basic sanitation services that align with national standards. When it comes to water provision, only 55% were providing fundamental drinking water services, with an additional 13% experiencing limited water services due to unavailability during the study period. Shockingly, approximately 32% of schools were found to have no water service at all, indicating a severe deficiency in this essential resource (UNICEF & NBS, 2020).

Despite the government's proactive measures through initiatives like the SWASH Programme, which aims to mobilize various WASH stakeholders to invest in the sector

and implement diverse strategies ranging from community-based to more sophisticated stakeholder approaches, the outcomes have fallen short of expectations. The failure to achieve programme milestones can be attributed to misconceptions within the community and reluctance among end-users to engage in the repair and maintenance of existing facilities, exacerbated by inadequate resource allocation. The repercussions of these challenges are starkly evident in the struggles faced by many schools in accessing adequate WASH facilities and a reliable water supply. Even with significant financial investments and resource allocations, the persistently unsatisfactory outcomes cast doubt on the long-term viability and sustainability of even the most modest achievements in this critical domain.

### **Research Justification**

The SWASH programme has been met with unsatisfactory results as reported by Antwi-Agyei et al. (2017). The efforts to promote proper water, sanitation, and hygiene practices in schools have not been adequately evaluated to determine the long-term viability of the intervention. Evaluations conducted so far lack sufficient data to develop methodologies for progressively implementing and evaluating SWASH initiatives. Furthermore, based on the reviewed documents, consultations with key SWASH stakeholders, and the results of a SWASH bottlenecks analysis report in Tanzania, numerous challenges and gaps have been identified that need to be addressed for future planning.

Taking into account all these limitations, the proposed goal of this study is to evaluate the implementation of the SWASH programme in public schools to identify the necessary efforts and actions required to expedite the implementation in sustainable ways, ultimately

leading to positive health and educational impacts. The challenges encountered and discussed in the programme have enabled the researcher to suggest potential solutions for adoption. It is anticipated that SWASH stakeholders and the government will utilize the proposed strategies and methods for implementation.

The information gathered from this research will serve as a valuable database for SWASH implementation in other settings. Policymakers and programme members will have the opportunity to use this database to establish policies and programmes aimed at improving water, sanitation, and hygiene practices in schools, ensuring cleanliness, and fostering sanitation and hygiene behavioral changes among students. The findings will also help in creating indicators for future monitoring and assessment of sanitation and hygiene in public schools.

With these results, it will be possible to recommend a simple, scalable, and sustainable programme and technique for establishing and implementing the SWASH programme in all primary and secondary schools. This comprehensive approach aims to address the challenges and opportunities faced and pave the way for a more effective and sustainable SWASH programme across the education sector.

### **Purpose of the Study**

The main aim of this study is to assess the implementation of the School Water, Sanitation, and Hygiene (SWASH) programme in primary and secondary public schools in Tanzania. The evaluation is considered necessary due to the sluggish progress in implementation and the unsatisfactory outcomes achieved in public schools thus far. To accomplish this goal, it is essential to gather first-hand and well-researched data from the

grassroots level. In pursuit of this objective, the research study is centered on the following specific goals.

1. To evaluate the alignment of current SWASH facilities with national school standards.
2. To evaluate the most effective interventions and construction methodologies for implementing the SWASH Programme.
3. To investigate the influence of teachers' and the community's perceptions on long-term WASH sustainability in schools.
4. To determine challenges and opportunities for water, sanitation, and hygiene services in public schools
5. To evaluate SWASH stakeholder's adherence to government policies and guidelines

These objectives were strategically developed to allow sufficient data to be collected. Data elaborated the status of WASH facilities in schools and the various challenges faced at the grassroots level. Such data had enabled the suggestion of a way forward for the programme in public schools.

## **Nature and significance of the Study**

### **Nature of the study**

The study's nature is outlined by the methods, design, data collection, and analysis procedures employed (Aspers & Corte, 2019; Creswell & Plano Clark, 2018). This research was conducted in a vast area covering approximately 10,982.8 square km. Such a large area encompasses various social, economic, and natural differences that could impact the construction, maintenance, and adoption of the programme. Rural populations

may perceive the programme differently compared to urban populations, potentially viewing sanitation and hygiene practices as normal. According to a report by UNICEF & WHO (2020), malpractice in sanitation and hygiene is more prevalent in rural settings. In the country, water sources and supply to urban areas are significantly better than in rural settings. Given that water is a major component in the SWASH programme, this difference may significantly affect programme implementation. Communities with better economic status tend to participate and contribute more compared to low-income communities (Winter et al., 2021). For low-income earners, contributing to a programme that requires time, resources, and unpaid labour is challenging. Additionally, the area is inhabited by a population with diverse political ideologies. Politicians wield the power to allocate resources for sanitation and influence people's mindset regarding its benefits and potential impacts (both positive and negative) on society and the environment. Their influence can lead to positive resource mobilization and fundraising for the implementation of the SWASH programme. Conversely, low income and inequality in accessing available resources can hinder the implementation of sanitation programmes, as reported by some researchers (Appiah-Brempong, 2018; Curtis, 2019; Winter et al., 2021). The research area is home to several ethnic tribes, each with different taboos. Some taboos consider certain sanitation and hygiene practices unnecessary or contrary to their beliefs (Sommer et al., 2019), resulting in minimal contribution, involvement, and practice.

The SWASH programme involves various stakeholders, as theorized by Mensah (2020), including symbolic, participatory, or non-participatory stakeholders, donors, and individuals. Obtaining sufficient and reliable data from different population cohorts was



necessary. This included a population of programme planners, supervisors, and facilities constructors, a population of teachers providing routine information on usage and maintenance, a population of school committees overseeing administration and resource allocation, and a population of SWASH club members.

The study employed descriptive designs to collect both qualitative and quantitative data, chosen based on the nature of the study population and the physical features of the study area. Survey methods were used for school WASH teachers, interviews for stakeholders, Focus Group Discussions (FGDs) for school committees and WASH club members, and self-intuition for personal observations. Various data collection tools were also used, including semi-structured questionnaires for surveys, checklist questions for interviews, coding, scoring, and ranking for FGDs, and record sheets for observations. The mixed design allowed for triangulation, comparing similar data collected by different methods for better validity and reliability, as suggested by Coleman (2022). Neves-Silva et al (2020) recommended this approach for obtaining accurate data with minimal effort, time, and money. The detailed plan for data gathering was guided by sampling techniques, data collection methods, and tools, serving as a roadmap to address specific research questions or test hypotheses.

### **Significance of the Study**

The significance of the study on the evaluation of School Water, Sanitation, and Hygiene (WASH) Programme Implementation in public schools is multifaceted and holds substantial implications for various stakeholders. This study aims to address the gap in comprehensive evaluation studies on the implementation of WASH programmes in public schools, as highlighted by Kamara et al. (2017).

Firstly, the health impact of assessing the WASH programme implementation is paramount. By scrutinizing the execution of these initiatives, the study can provide valuable insights into the health outcomes of students and staff. Improved WASH practices can lead to a reduction in waterborne diseases, promoting a healthier school community.

Secondly, the study seeks to explore the link between a conducive WASH environment and academic performance. Research indicates that better WASH facilities correlate with enhanced educational outcomes. By illuminating this relationship, the study underscores the importance of investing in WASH infrastructure to support academic achievement.

Thirdly, the findings of this study have significant policy implications. By offering evidence-based data on WASH implementation, policymakers can develop informed policies and guidelines aligned with empirical insights. This can aid in prioritizing funding for WASH interventions and ensuring compliance with standards, thereby enhancing programme effectiveness.

Moreover, by evaluating stakeholder engagement, policymakers can strengthen partnerships, leverage resources, and enhance the collective impact of WASH initiatives. This collaborative approach can address challenges and maximize the effectiveness of the programme.

Additionally, the evaluation contributes to establishing a robust monitoring and evaluation framework to track program progress and impact systematically. This ensures data quality for informed decision-making and guides future interventions.

Lastly, community engagement is crucial, as involving stakeholders in the assessment process fosters a collaborative approach to improving school facilities. This not only enhances WASH practices but also promotes community ownership and responsibility for maintaining a healthy school environment.

In conclusion, evaluating school WASH programmes in public schools provides insights into programme effectiveness, compliance, resource utilization, behavior change outcomes, partnership engagement, and monitoring processes. By systematically assessing these aspects, policymakers can enhance programme impact and sustainability, ultimately improving student health and creating a conducive learning environment. Identifying challenges in community involvement can lead to strategies for enhancing community support for WASH initiatives, ensuring culturally appropriate and sustainable solutions.

### **Research Questions and Hypothesis**

Vandenbroucke and Pearce (2018) described a research question as the phenomenon being studied, who is being studied, and what the researcher wants to learn about them. Fandino (2019) highlighted research questions as essential elements for a specific study addressing population, knowledge gap, and guiding the specific direction of the research. The research questions of this study are clustered according to the specific objective of the study.

*RQ1. What is the status of SWASH facilities in public schools in terms of quality and quantity ?*

*RQ2. What are the effectiveness of interventions and construction methodologies in implementing the SWASH Programme?*

*RQ3. How do Teachers' and Community Perceptions Impact School WASH Sustainability?*

*Q4. What are the existing challenges and opportunities in implementing the SWASH programme in public schools?*

*RQ5. How do WASH stakeholder's adheres towards supporting government WASH policies and guidelines?*

### *Hypotheses*

A hypothesis statement is created to explain the reasons behind a specific phenomenon.

Data is gathered and examined to determine if the the null hypothesis holds true (Ho) or not (Hi). The study aims to test the following hypotheses:

#### **Objective one hypothesis:**

Ho: The status of SWASH facilities in terms of quality and quantity are not in compliance with national school WASH standards.

Hi: The status of SWASH facilities in terms of quality and quantity are in compliance with national school WASH standards.

#### **Objective 2 hypothesis:**

Ho. The school WASH interventions and methodologies used in the construction and to maintain improved WASH programme in public schools have not shown positive impact.

Hi: The school WASH interventions and methodologies used in the construction and to maintain improved WASH programme in public schools has shown positive impact.

**Objective 3 hypothesis:**

Ho: Teachers and communities in WASH programme have perceptions that could negatively influence the construction, maintenance and sustainability of WASH practice in schools.

Hi: Teachers and communities in WASH programme have positive perceptions on the programme that could have positive influence the construction, maintenance and sustainability of WASH practice in schools.

**Objective 4 hypothesis:**

Ho: There are no challenges or opportunities available in the implementation of the WASH programme in public schools.

Hi: There are several challenges in the implementation of the WASH programme in public schools.

**Objective 5 hypothesis:**

Ho. WASH stakeholders do not support government WASH policies and guidelines.

Hi. WASH stakeholder's demonstrate adherence towards supporting government WASH policies and guidelines.

**The scope of the study**

The study investigated the compliance of SWASH facilities with national standards, the impact of WASH interventions on SWASH programs, teachers' and community perceptions regarding WASH practices, challenges and opportunities in SWASH program implementation in public schools, and stakeholders' adherence to government guidelines.

Data was collected through two main instruments: theoretical considerations and empirical observations.

Empirical data involved physically assessing WASH facilities in schools, while theoretical data captured respondents' perceptions and the conceptualization of WASH practices and theories. These aspects are interconnected and crucial for enhancing program implementation in public schools.

The study was designed as a case study focusing on three districts in the Pwani region of Tanzania. As all public schools in the country adhere to Ministry of Education policies, the study's findings are representative of the broader situation where SWASH initiatives are implemented. Any observed minor variations may be due to socio-economic factors, which can be addressed through effective pre-planning.

Data collection included qualitative and quantitative information. Statistical analysis using SPSS was conducted to generate descriptive and inferential statistics, aiding in interpreting results and drawing conclusions.

In terms of data collection tools, surveys and questionnaires gathered quantitative data on water sources, sanitation facilities, and hygiene practices, while interviews provided qualitative insights into experiences and challenges related to WASH implementation. Direct observations assessed the conditions of WASH facilities, and focus group discussions explored stakeholders' attitudes and beliefs. Document review added context to the evaluation by examining relevant documents such as school reports and WASH policies.

Quantitative data analysis tools like SPSS and Excel were used for statistical analysis, while qualitative data analysis tools facilitated thematic analysis of data from

interviews, focus group discussions, and open-ended survey responses. This mixed-method approach provides a comprehensive understanding of WASH implementation in public schools, enabling the identification of areas for improvement and the development of evidence-based recommendations to enhance WASH practices and facilities in educational settings

### **Summary of Chapter One**

The chapter emphasizes the importance of evaluating water, sanitation, and hygiene (WASH) programmes in public schools to align with Sustainable Development Goals (SDGs) 3, 4, and 6. SDG 3 emphasizes good health and well-being, highlighting the role of clean water and hygiene in reducing disease spread. SDG 4 focuses on quality education, where WASH facilities enhance learning environments and outcomes. SDG 6 targets clean water and sanitation, with the evaluation of WASH programmes contributing to achieving these goals. The study underscores the significance of assessing WASH initiatives in schools to improve health, education, and sustainable development in accordance with the SDGs. These goals aim to establish sustainable WASH services in schools by 2030. However, progress towards this target is not promising, particularly in Sub-Saharan Africa.

Despite efforts from governments and development partners, challenges in global WASH services in schools persist, leading to slow progress in meeting the SDGs' targets and resulting in adverse health and educational impacts. While government and community initiatives are widespread, the required standards remain challenging to attain. Limited and inadequate information exists on the reasons behind the sluggish implementation and sustainability of WASH programmes. A review of planning and

implementation strategies for the WASH programme could help address this gap, given its priority areas that offer guidance to implementers. The WASH sector necessitates strategies and approaches to expedite sustainable access to WASH services in schools.

Successful implementation of the WASH programme demands collaborative efforts from various WASH stakeholders, effective planning, sufficient budget allocation, and engagement with diverse development partners and communities.

### Dissertation Organization

This section provides the highlights of the five chapters of the research. Chapter one is the introductory part. The introduction explores the concept of school WASH programme implementation beginning from a global context, narrowing down to Tanzania and eventually to the Pwani Region as the area of study. The presented background information for the study explains the SWASH programme initiation, the importance of the programme, and its achievement. The chapter also covers the objective of the study, the problem statement, the purpose statement, the conceptual framework, research questions, nature of the study, the significance of the study, and the organization of the dissertation.

Chapter two explains the theoretical framework as a conceptual model that establishes a sense of phenomena and guides the research process. It includes the existing facts and background that support the intended investigation. Theories about WASH practices are also reviewed. It concentrates on various components that integrate concepts and WASH theoretical thinking. Furthermore, it includes empirical and policy reviews that are based on literature and reports that evaluate the implementation of



WASH programmes in schools. This gives empirical evidence of WASH services, challenges and possibilities, and research gaps within the study's premise.

Chapter three presents the research methodology and all the logistics involved in getting the required data for the research. It presents type of the study; research design; sampling procedure; data collection methods; study population; units of analysis; variables and their measurements; sample size and sampling techniques; types and sources of data; data collection methods; and validity and reliability of the data and data analysis techniques.

Chapter four presents research findings based on the study objectives. The information from the school survey questionnaires, focus group discussions, and key informants' interviewees are analysed and presented descriptively. The chapter begins by presenting a preliminary examination of data, such as cleaning and screening of data, and presenting general socio-economic characteristics of the sampled public schools.

Chapter five describes the discussion of the study findings. It provides the interpretation of the results as analysed in chapter four and as observed in the survey during data collection. The discussion is enriched with citations from past studies of the similar nature of WASH programme implementation. Eventually, the chapter provides the summary, conclusions, recommendations, and policy implications of the results based on the major findings of the study. As directed by the present research findings and background, several future policies are suggested.

## **CHAPTER 2: LITERATURE REVIEW**

This chapter provides a comprehensive review of the literature that underpins the current study. The review delves into the concept of Water, Sanitation, and Hygiene (WASH) Programme, with a specific focus on the School Water, Sanitation, and Hygiene Programme (SWASH) implemented in primary and secondary schools in Tanzania. The literature review encompasses theoretical frameworks, empirical evidence, and policies that shape the implementation of WASH programmes in schools globally.

The theoretical section examines existing theories related to the implementation and impact of WASH programmes, as well as the etiology of the SWASH programme. The empirical component of the review analyzes practical experiences and evidence that elucidate both the successes and failures of these programmes. Furthermore, the policy review explores international and national policies that influence the outcomes of the SWASH Programme, highlighting the significant impact of these policies on programme effectiveness.

Through the review of theories, practices, and policies related to WASH in schools, including the SWASH programme, various gaps in the existing literature were identified. These gaps informed the development of research questions and the methodology employed in the study. The review process involved an extensive search of peer-reviewed journals, textbooks, and scholarly articles in both hardcopy and digital formats. Additionally, reports from reputable institutions were consulted to gather relevant information. Proper acknowledgment of all sources is made within the text and included in the reference list for transparency and academic integrity.

## **The concept of School WASH Programme**

The School Water Sanitation and Hygiene (SWASH) programme is an intervention aimed at promoting a healthy learning environment by providing clean and safe drinking water, adequate sanitation facilities, and handwashing stations. The provision of appropriate WASH services in schools is widely recognized as a critical intervention for enhancing academic achievement, upholding students' health rights, and fostering a clean environment that can instill positive health behaviors and attitudes across generations (UNICEF & WHO, 2018).

Research conducted by Antwi-Agyei et al. (2017) and Whale et al. (2017) has demonstrated that improved WASH facilities in schools lead to increased attendance among girls, enhanced health and cognitive development in children, and the cultivation of healthy hygiene practices. Access to WASH services is considered a fundamental human right, extending to young children, adolescent girls and boys, individuals with disabilities, and adults alike (WB, 2018). Implementing a programme that encourages students to adopt optimal hygiene behaviors not only enables them to promote better sanitation and hygiene practices in their homes and communities but also empowers them to actively engage in hygiene-related activities (McMichael, 2019).

Scholars have underscored the significance of water, sanitation, and hygiene (WASH) in human growth and development, with Mensah (2020) emphasizing the importance of having adequate handwashing facilities and maintaining clean environments, which directly impact human development. In essence, human growth and development are profoundly influenced by access to clean water, proper sanitation,

effective waste disposal, and a hygienic environment, encompassing all aspects related to water management.

### ***Ideal SWASH Programme***

Golez-Rodrigo et al. (2022) emphasize the importance of advocating to educate communities and policymakers about the objectives and benefits of WASH programmes. Informing beneficiaries is crucial for the smooth and successful implementation of these programs. Transparent dissemination of national data on WASH indicators to all implementers is necessary to enhance the effectiveness of interventions.

According to UNICEF and WHO (2018), the 2018 Joint Monitoring Programme (JMP) showed an improvement in global baseline data through monitoring reports, indicating a significant increase in basic drinking water coverage for the global school-age population, which rose from 51% to 60% (WHO, 2019). Based on this data, WASH experts recommend exploring sustainable water systems to create an optimal environment, especially regarding handwashing and access to clean drinking water. However, many programmes face challenges due to top-down management approaches and external assistance.

An ideal SWASH Programme includes providing sufficient clean and safe water, adequate sanitation facilities, and promoting appropriate hygiene practices (UNICEF, 2019). By taking a holistic approach that addresses these key components, WASH interventions can effectively contribute to improved health outcomes and overall well-being within communities.

***Theoretical / Conceptual Framework Concept***

A conceptual framework serves as a logical structure that interrelates various components to identify key ideas and illustrate the relationships among them (Adom et al., 2018). Ravitch and Riggan (2017) define a conceptual framework as a valuable tool that assists researchers in shaping their worldview based on the study, ensuring generalizability, enhancing the significance of study findings, and aligning them with the research's theoretical foundations. In this context, the conceptual framework provides supported solutions to the issues raised by the study.

Mensah (2020) elaborates on how a conceptual framework supports the investigation of a research topic, a researcher's beliefs, alignment with scholars with whom they agree or disagree, and the conceptual underpinnings of their approach. Other researchers argue that the use of conceptual frameworks is typically warranted when existing theories are inadequate or inapplicable to establish a robust foundation for the investigation (Adom et al., 2018; Kivunja, 2018). By linking the research study's problem to other areas of knowledge within the discipline, a conceptual framework demonstrates mastery of related theories and their application.

The findings and analytical models relevant to the research topic necessitate a comprehensive review involving the exploration of various types of literature and pertinent research studies. Mensah (2020) emphasizes the importance of considerations such as appropriateness and explanatory power in guiding the research process when selecting a theory to underpin a study. The theoretical framework provides the factual basis and background that support the intended investigation, justifying the need to conduct a specific study to address a known issue (Adom et al., 2018; Glanz, 2017).

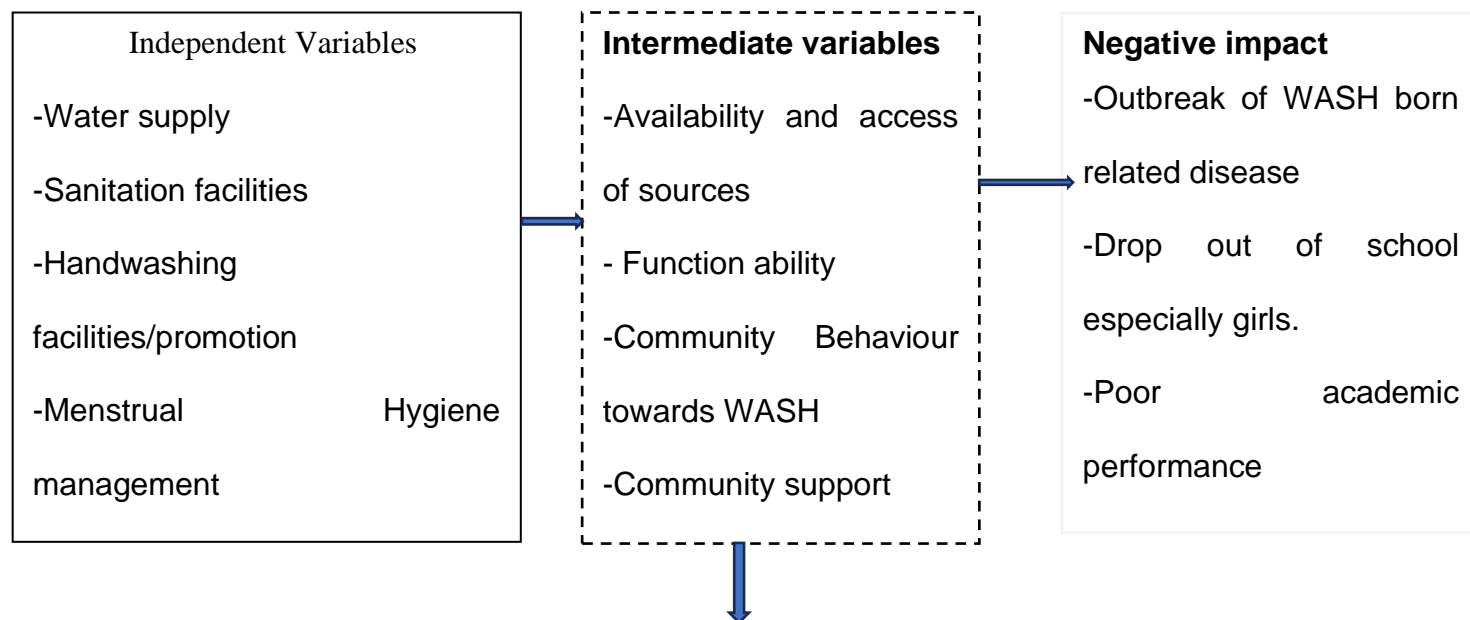
A theoretical framework comprises interconnected theories that elucidate the relationships between variables or events leading to a specific objective. As highlighted by several authors, a well-crafted research report results from a robust theoretical framework that guides all stages of the research process, from defining the research topic to formulating research questions, problem statements, study objectives, literature review, variables, sampling, data collection, analysis, interpretation, discussion, and future research directions (Adom et al., 2018; Creswell & Plano Clark, 2018; Walliman, 2018). The theoretical framework serves as a focal point for exploring the unknown in a given field, enabling the formulation of hypotheses to explain relationships between variables and guide the methodology for addressing research questions or problems. Ravitch and Riggan (2017) distinguish between theoretical and conceptual frameworks in qualitative research, with a focus on theory-building. In contrast, quantitative research utilizes conceptual frameworks to evaluate the validity of existing theories. Theoretical frameworks entail a theory-driven research approach that centers on understanding concepts, definitions, and pertinent theories to establish connections between independent and dependent variables in a research topic (Chun et al., 2019).

### ***Conceptual Framework for Evaluation of the WASH Programme***

The WASH research conceptual framework establishes a correlation between independent variables, including the availability of water sources and supply, sanitation facilities, handwashing facilities, and appropriate menstrual hygiene and management facilities, and the anticipated outcomes of improved class attendance, healthier pupils, a conducive learning environment, and a positive impact on the overall learning experience. The failure to maintain the existence of these independent variables can result in adverse

consequences such as waterborne disease outbreaks, increased school dropouts, and diminished academic performance. These independent variables are further bolstered by intermediate variables that play a crucial role in facilitating and enhancing proper and effective WASH practices. Moreover, community support and the willingness to adopt behavioral changes, alongside the presence of conducive and supportive policies that influence the dependent variables, significantly contribute to either positive or negative outcomes within the framework (refer to Figure 2.1). It is essential to recognize the interconnectedness of these variables and their impact on the overall effectiveness of WASH interventions. By understanding and addressing these interrelations, researchers and practitioners can develop more targeted and impactful strategies to improve water, sanitation, and hygiene practices within educational settings.

*Figure 2.1 Conceptual Framework for Evaluation of the WASH Programme*



**Positive impact (outputs and outcomes)**

- High-class attendance
- Improve school pupils health
- Conducive learning environment
- Positive, impact on the learning environment
- Improve school education performance



### ***Evolution of WASH and SWASH Programmes***

Various agencies in different countries have interpreted WASH as water and sanitation for health, a concept originally put forth by the United States Agency for International Development (USAID). In Zambia, the term WASHE was introduced in 1987 to refer to a water program, representing "Water Sanitation Health Education." This concept emerged due to the inadequate access to water, hygiene, and sanitation facilities, which are crucial for human survival regardless of gender or age (Winter et al., 2021).

Since 2001, international organizations engaged in advocating for water supply and sanitation, such as the Water Supply and Sanitation Collaborative Council (WSSCC), the International Water and Sanitation Centre, and USAID, have adopted the acronym "WASH" to signify Water, Sanitation, and Hygiene (WSSCC, 2020). Subsequently, WASH has garnered increased attention on global political agendas, particularly within the development sector, as evidenced by its integration into the Sustainable Development Goals (UNICEF, 2019). This objective encompasses water quality, sanitation, hygiene, and access to clean drinking water.

The importance of WASH is underscored by the staggering statistics revealing the lack of adequate sanitation facilities for approximately 2.3 billion individuals and the absence of safe drinking water for 844 million people as of 2017 (UNICEF, 2018). This deficiency exposes these populations to diseases stemming from inadequate and unsafe WASH practices, posing a significant health risk. Developing countries bear the brunt of

this burden, with an estimated 88% of diarrheal diseases attributed to unsafe water supply, inadequate sanitation, and poor hygiene practices (WHO, 2019).

A report by UNICEF highlighted that universal access to regulated piped water supply and sewage connections in households worldwide could lead to a gain of 1.9 million days of school attendance due to reduced instances of diarrheal illnesses (Adukia, 2017; UNICEF, 2018). Adukia (2017) emphasized that addressing gender inequality in underdeveloped nations could be achieved by enhancing school attendance, cleanliness, and focusing on reducing high dropout rates among girls. By providing adequate water, sanitation, and hygiene facilities, along with awareness campaigns, the issue of children's absenteeism and dropout rates could be significantly mitigated. School latrines play a crucial role in promoting health, privacy, and safety for both boys and girls.

Within the school community, water is essential for various activities such as drinking, washing, and maintaining general cleanliness. The absence or inadequate supply of water can severely impact hygiene and sanitation standards. Furthermore, in addition to having water and facilities, maintaining proper hygiene and sanitation requires a mental shift towards developing habits and practices for a clean environment. Given the habitual nature of these practices, raising awareness and conducting campaigns are vital to instigate mindset changes towards hygiene.

Behavioral change, as highlighted by some researchers (Luby et al., 2018; Null et al., 2018), takes time and effort, making it crucial in achieving positive outcomes in WASH programs. It is well established that WASH services are fundamental for the healthy development and growth of children (McMichael, 2019; Ryan et al., 2017), underscoring

the importance of ensuring access to WASH services for all, including children with disabilities and adolescent girls.

The interconnection between access to water and sanitation and various other critical issues significantly impacts children's lives and their overall development and well-being (UNICEF & WHO, 2018). Recognizing its potential, WASH was included as one of the Sustainable Development Goals (SDGs). SDG 3 emphasizes health and well-being to reduce global maternal mortality and preventable deaths of newborns and children under five years old (UNICEF & WHO, 2018). Commitments have been made to address child and human rights concerning water, sanitation, and hygiene issues, particularly through SDG 4 on delivering quality education and fostering lifelong learning, and SDG 6 on providing safe, adequate, and equitable water and sanitation for all (UNICEF, 2019). In light of the significance of WASH programs, the Joint Monitoring Programme (JMP) has developed indicators to track the progress of WASH programs, including SWASH initiatives (UNICEF & WHO, 2018). Key indicators for SWASH in schools encompass ensuring a dependable water system that provides safe and sufficient water for handwashing and drinking, as well as adequate toilet facilities that maintain privacy, cleanliness, and proper waste disposal. It is crucial to have culturally and gender-appropriate sanitation facilities to ensure sustainable SWASH practices.

Stakeholders and government departments should systematically develop WASH plans, including SWASH components, to effectively monitor resources and evaluate progress in alignment with norms and the social-physical environment. Following a scalability approach, as proposed by UNICEF (2018), in implementing SWASH programs can help improve water, sanitation, and hygiene systems in as many schools as possible, offering

basic WASH practices to a broader range of children. Cross-cutting thematic and functional aspects such as equality and inclusion, learning, monitoring and evaluation, capacity building, research, and knowledge management should be considered in SWASH programs to ensure their effectiveness and sustainability (UNICEF & WHO, 2018).

### ***WASH and Sustainable Development Goals***

The accessibility, availability, and affordability of water within our ecosystem, encompassing humans, plants, and animals, continue to pose a significant challenge to human development. Despite the pivotal role water plays in sustaining the ecosystem, many individuals still lack adequate access to this essential resource. Water is indispensable for the survival and metabolic processes of all living organisms, while industrial machinery relies on it for cooling purposes.

In addressing the pressing challenges surrounding water, global actors in the water, sanitation, and hygiene (WASH) sector, along with researchers, persist in their efforts to tackle water-related issues comprehensively, considering its profound impact on various facets such as availability, health, education, agriculture, and social and economic factors. The literature underscores a growing demand for water, particularly as the global population expands, notably in developing countries and agricultural domains (Shrestha et al., 2020). Projections indicate a staggering 40% increase in global water demand by 2050, primarily driven by economic growth across diverse sectors in developing nations (WWDR, 2019).

The significant disparity in water supply among third world countries can be attributed to several factors, including minimal participation of the most affected nations

in the planning processes. Durokifa and Ijeoma (2018) identified the lack of involvement of developing countries in shaping the Millennium Development Goals as a key reason for their failure, as the goals proved overly ambitious for these nations to attain. Similarly, Assefa et al. (2017) highlighted the shortcomings of the Millennium Goals, emphasizing issues such as coordination, accountability, commitment, engagement, and collaboration, stemming from the exclusion of key stakeholders during goal formulation. It is imperative for planners and developers of global goals to critically assess ongoing WASH interventions, addressing challenges and barriers effectively to advance progress towards achieving the Sustainable Development Goals (SDGs) (Durokifa & Ijeoma, 2018). As countries strive to fulfill their commitments, it is essential to plan meticulously for the future, taking advanced steps to ensure sustained progress and success in addressing water-related challenges and achieving broader developmental goals.

### ***The Theoretical review on School WASH Programme***

Research examines theories from various perspectives, including realism, reductionism, and instrumentalism, which are interdisciplinary constructs unique to each viewpoint (Varadarajan, 2019; Wrigley, 2019). Realism elucidates the evident aspects of a theory, bridging abstract concepts with reality, prioritizing observable variables and outcomes over theoretical postulations. Within realism, social theories are expounded from effects back to causes. Reductionism, as defined by Kivunja (2018), delves into both totalities and their constituents. Adom et al. (2018) view reductionism as dissecting a theory into minor constructs that collectively form a comprehensive whole. While the characteristics of the entire theory stem from independent components, the theory as a

whole may not mirror any single component entirely. Reductionism emphasizes the coherence of a theory's variables.

Instrumentalism encompasses two dimensions: one involving the use of instruments to assess the precision and coherence of constructs, and the other viewing theory itself as a tool to evaluate ideas, principles, hypotheses, and postulates. According to Ravitch and Riggan (2017), instruments or devices are utilized to validate variables against specific data and objects, serving as tools for verification and prediction. These three perspectives compare deterministic elements based on variables and constructs, emphasizing cause-and-effect relationships to provide solutions.

The three views contrast in their utilization of contextual variables and processes. Reductionism focuses on individual components, realism on outcomes and pragmatic processes, and instrumentalism on the accuracy and validity of instruments determining variables or concepts (Collins & Stockton, 2018). While instrumentalism in physical sciences may yield realistic results, theoretical sciences may produce more ideal outcomes. A theory should encompass four components: conceptual definitions, domain restrictions, relationship construction, and predictions, aiding in identifying knowledge gaps, developing concept models, addressing research problems, and drawing conclusions (Kivunja, 2018).

The understanding of theory varies based on the school of thought, with theories serving as frameworks for observation and comprehension, linking intangible and tangible aspects, and explaining phenomena within different fields such as social, scientific, or political realms. A theory forecasts and explains why events occur, offering specific insights to anticipate and elucidate social phenomena. Essentially, a theory describes

and predicts the relationship between variables, connecting abstract and concrete elements, theoretical and empirical realms (Wrigley, 2019).

A theory comprises concepts, constructs, linkages, and hypotheses, aiming to explain, anticipate, and understand occurrences while challenging and expanding existing knowledge. The construction of a theory involves conceptual definitions, domain restrictions, relationship establishment, and predictions, providing a framework for analysis and application to real-world issues. A good theory exhibits qualities such as uniqueness, parsimony, generality, internal consistency, and empirical riskiness, contributing to various research methods (Kivunja, 2018).

The development of a theory through research addresses gaps in knowledge, aids in model development, problem-solving, and conclusion framing, facilitating arguments for the use of proposed models or concepts and their implications. Ultimately, a theory elucidates entities within relationships, explores the dynamics linking them, and considers boundary conditions for these relationships. The clarity, precision, objectivity, and consistency of theoretical explanations are crucial, with variables within theories being definable and observable within specific boundaries. The continuous development and testing of theories within disciplines are essential to establish their contribution to knowledge.

### ***The Role of theory in the selected area of research study***

The study is grounded in social research, where both qualitative and quantitative methods are utilized. The aim of a qualitative study is to comprehend social phenomena through the investigation and interpretation of the meanings associated with them; its

primary objective is to make sense of the social world. The fundamental principles encompass subjectivity, focusing on interpretations, the evolution of a theory during and post-study, and an inductive process (Johnson & Christensen, 2017). In inductive studies, researchers commence by gathering pertinent data related to the topic of interest, proceed to analyze the data for recurring patterns, and ultimately construct a theory based on the data (Johnson & Christensen, 2017).

Conversely, the purpose of a quantitative study is to test a theory comprised of measurable variables using statistical tools to ascertain the accuracy of the theory's predictive generalization. This methodology is commonly linked with deductive processes and aligns with positivist and/or post-positivist paradigms. The cardinal principle here is objectivity, with the theory being established prior to the study, and the research objective being theory verification (Johnson & Christensen, 2017).

When a hypothesis is formulated based on an existing theory, it embodies a deductive process. This process commences with a social theory of interest to the researcher and progresses towards data-driven inferences. The research focus transitions from a broad perspective to a more targeted approach. The researcher delves into existing research findings, reviews established theories, and subsequently tests the hypothesis derived from those theories (Johnson & Christensen, 2017).

In certain scenarios, researchers may opt for a combination of methods, known as mixed methods research. This approach involves the simultaneous use of both qualitative and quantitative research techniques. In concurrent mixed methods, both qualitative and quantitative strategies are employed in parallel, while in sequential mixed methods, the latter informs the former.



### ***Theories associated with SWASH programme implementation***

Scholars' perspectives emphasize the importance of research in formulating theories by establishing relationships between dependent and independent variables to address societal challenges (Thomas, 2017). A well-crafted theory is crucial in facilitating the implementation of Water, Sanitation, and Hygiene (WASH) programs for community development (Alvarado & Bornstein, 2018), such as the School WASH (SWASH) program in educational institutions. However, inadequate theory formulation, stemming from a lack of understanding of WASH importance in schools and outdated institutional structures, may lead to insufficient SWASH service provision.

Kassim (2019) contends that there is a low level of community engagement in school activities, with a significant portion left to governmental bodies. This situation is often attributed to communities being uninformed about their roles, responsibilities, and involvement in school programs (Tsinda & Abbott, 2018). The deficiency in theory formulation for structuring policy guidelines implementation contributes to this issue. A lack of awareness regarding the significance of community participation can result in suboptimal outcomes if corrective actions are not taken. Prüss-Ustün et al. (2019) further argue that this deficiency impacts the community, affecting education and health outcomes, leading to poor school attendance, low academic performance, and WASH-related diseases.

Communities play a vital role in enhancing water supply, sanitation facilities, and hygiene practices in schools to promote cleanliness and healthy behaviors, fostering an enabling learning environment for teachers to deliver quality education to students (McMichael, 2019). Consequently, support from national and local interventions is

essential to establish equitable and sustainable access to safe water and sanitation services in schools for effective SWASH activities (McMichael, 2019).

The successful execution of programs hinges on the application of various theories that translate government policies into effective WASH initiatives to yield desired results. The Theory of Change, Threshold-Saturation Theory, Social Capital Theory, Social Cognitive Theory, and Stakeholder Theory are among the subthemes encompassing diverse theories on WASH programs. These theories are instrumental in guiding researchers to develop frameworks that align with WASH program objectives.

### ***Theory of Change (ToC) in Relation to School WASH Programme implementation***

The Theory of Change is a framework that is used in the field of programme evaluation and social change to map out the steps needed to achieve a desired outcome. It is a systematic approach that helps organizations and individuals to clarify their goals, identify the activities needed to achieve those goals, and measure the impact of their efforts (Dhillon & Vaca, 2018).

The origins of the Theory of Change can be traced back to the work of psychologist Kurt Lewin in the 1940s. Lewin developed the concept of "action research," which emphasized the importance of understanding the underlying causes of social problems in order to create effective solutions. He believed that change could only occur if individuals and organizations were able to identify and address the root causes of their problems.

Rolfe (2019) defines ToC as a methodology for researchers to evaluate client outcomes and connect them to policy results. Similarly, Dhillon and Vaca (2018) perceive ToC as a comprehensive framework encompassing actions, actors, determinants, inputs, outputs, outcomes, and impacts in interventions. It is essential that changes lead to impacts in various settings and programs to trigger further positive transformations until the ultimate long-term team goal is accomplished. This iterative process involves a series of changes categorized as short-term, intermediate, and long-term outcomes. Dhillon and Vaca (2018) emphasize that the outcomes pathway illustrates the logical progression of outcomes and their sequential flow, ensuring a coherent understanding. Detailed statements are formulated to precisely elucidate how outcomes are logically interconnected to bring about the anticipated changes.

ToC advocates for backward mapping to delineate long-term goals in intricate environments, as highlighted by Chard et al. (2019). ToC serves as a guiding framework for WASH program planning, delineating stakeholder responsibilities, and facilitating Monitoring and Evaluation processes. This structured approach is imperative for achieving planned solutions and ensuring successful implementation by aligning all involved parties and their respective activities. Chard et al. (2019) elaborate on how ToC fosters a participatory approach to analyze similar projects, programs, and objectives, thereby cultivating a conducive environment for effective WASH implementation in schools. It not only connects with analogous initiatives but also paves the way for the successful adoption of WASH programmes in educational institutions. Dhillon and Vaca (2018) observe that ToC delineates planning components, including intervention Monitoring and Evaluation, to attain predetermined targets. By identifying challenges

during the monitoring phase and engaging stakeholders in the program's design stage, potential obstacles can be addressed proactively before the program concludes.

Furthermore, the integration of the Theory of Change with other relevant theories is instrumental in the effective implementation of SWASH programmes, aimed at instigating behavioral changes among students and the broader community. Organizations leverage ToC to design activities that have a tangible impact on communities, thereby enhancing the efficacy of their initiatives.

### ***Sanitation Theory***

Sanitation theory plays a crucial role in promoting public health by focusing on the safe management of human waste to prevent the spread of diseases. Curtis (2019) highlights that proper sanitation practices are essential in avoiding diseases like cholera and typhoid that result from personal contact with contaminated waste. Winter et al. (2021) further emphasize the significance of maintaining proper sanitation to prevent health issues caused by harmful microorganisms, which can lead to infectious diseases. Additionally, Mensah (2020) underscores that diseases related to poor hygiene practices can be mitigated through effective sanitation measures.

In the context of public schools, both urban and rural areas often face challenges with basic sanitation facilities. Many schools lack adequate maintenance of WASH facilities, including toilets, handwashing stations, and clean water access. The lack of privacy in shared toilets, especially between different genders or students and teachers, poses additional challenges. Moreover, the absence of lockable facilities and doors in school toilets further hinders proper sanitation practices.

Sanitation theory offers a framework for addressing sanitation challenges in school communities. Bauza et al. (2021) explain that sanitation theory equips communities with the necessary tools to tackle sanitation issues by educating and empowering them to understand the importance of improving sanitation facilities and promoting their proper use. This theory underscores the significance of cleanliness, creating germ-free environments, and providing suitable facilities to achieve effective sanitation. Authors stress the importance of considering factors such as demand, supply, scale, and political ecology for sustainable sanitation program implementation.

Politicians play a crucial role in allocating resources for sanitation programs. They must comprehend the societal and environmental impacts of such initiatives to facilitate resource mobilization and fundraising efforts. Despite their influence, barriers like low income and resource access disparities can impede progress in sanitation programs. Advocacy for improved sanitation is crucial to motivate politicians and stakeholders to invest in sanitation initiatives. Engaging political leaders in sanitation campaigns can influence planning and implementation processes. Political ecology approaches have proven successful in influencing city planning and addressing sanitation issues in various regions.

Sanitation theory is a fundamental aspect of public health that aims to promote clean and hygienic living conditions to prevent disease transmission. It encompasses a range of practices and interventions focused on ensuring proper waste disposal, access to clean water, and the promotion of good hygiene practices. The sanitation ladder concept outlines a progression of interventions from basic sanitation to advanced systems, providing a framework for prioritizing interventions based on community needs.

The sanitation chain emphasizes the interconnectedness of sanitation components, highlighting the importance of a holistic approach that addresses infrastructure and behavior change.

Community participation and engagement are key aspects of sanitation theory, essential for the successful implementation of sanitation programs. Involving community members in planning and implementation ensures that interventions are culturally appropriate and tailored to specific community needs. Access to clean water and proper sanitation facilities are essential for preventing waterborne diseases, underscoring the critical role of sanitation theory in improving public health outcomes.

In conclusion, sanitation theory is a vital component of public health that emphasizes the importance of clean and hygienic living conditions to prevent disease transmission. By prioritizing basic sanitation practices, understanding the interconnectedness of sanitation components, and promoting community participation, sanitation theory provides a comprehensive framework for enhancing public health outcomes. Policymakers and public health officials must prioritize sanitation interventions and collaborate with communities to ensure universal access to safe water and sanitation facilities.

### **Threshold-Saturation Theory**

The threshold saturation theory aims to elucidate the interplay among three pivotal investment systems crucial to community members' well-being: water supply, sanitation infrastructure, and community health. This theory incorporates three variables within a logical framework - the community's health status, socioeconomic standing, and sanitation level. Developed by Shuval and colleagues in 1981, the theory draws from research conducted in Sweden during the Industrial Revolution, which focused on

combating infectious diseases. This research illustrates the relationship among variables, suggesting that in economically disadvantaged settings, there is a tipping point where investments in water supply and excreta disposal facilities alone yield minimal improvements in community health outcomes (Tseklevs et al., 2022). Additionally, a saturation point exists beyond which further significant health benefits cannot be attained solely by intensifying investments in conventional community sanitation facilities, emphasizing the importance of considering alternative sanitation solutions.

### ***Social Capital Theory (Eco-Social Theory)***

This theory was developed by Pierre Bourdieu in 1930. The definition of social capital entails the willingness of the people in a society to work together without imposing force (Ginja et al., 2021). The theory intends to describe how society's information is shared and emphasizes the mutual relationship as a factor for effective information dissemination and resource sharing (Ginja et al., 2021). It is assumed that proper and effective information flow brings about collective action, identity, and solidarity, and it gives the power to access the resources of the community (Ginja et al., 2021). As a leader or professional in society, for instance, one is supposed to build a positive relationship and treat members well by adding value to other people and not taking advantage of others, and this happens with how much you are informed. This will maintain a good relationship and help to connect people to a given programme and collaborate with them to build the foundation for the future. In the Social Capital Theory, capital availability is associated with the many aspects involved in improving health and the environment and hence in developing SWASH. A conceptual framework is developed where social capital and health are linked through a water-health relationship (Ginja et al., 2021; Dearing &

Cox, 2018). The framework focuses on the role that social capital plays in improving knowledge relating to water usage and conservation, attitudes, and practices of community members. The capital role is to facilitate collective action for the improvement of water access, sanitation, and hygiene.

Dearing and Cox (2018) views are contrary to popular belief that social capital has some negative contributions to society. The two authors views are explained in the fact that it is difficult for some members of society to volunteer for the benefit of the community. Voluntary work requires time for unpaid activities just because of the cohesion of the community. They continued to argue that, sanitation projects and programmes failed to achieve their goals due to little or inadequate consideration of the importance of members of the community, such as women's lack of decision-making power and variable access to resources, including land ownership, family resource allocation, and the impact of all family members using one toilet or latrine (Dearing & Cox, 2018).

### ***Social Cognitive Theory***

Hagger and Hamilton (2022) explain the Social Cognitive Theory as mutual interactions between the individual, and the environment and behavior practiced. The theory suggests that individuals' decision to engage in activities is influenced by their future perceptions of performance. Sebastian and others (2021) emphasize that behavior change is a result of performance feedback promoting learning through observation and describes the consequences of behavior through modelling. SWASH stakeholders agree that toilet building alone is insufficient for effective SWASH programme implementation,



as community-based interventions are crucial for promoting toilet use uptake. Prüss-Ustün (2019) and Yaro et al. (2017) argue that adopting toilets calls for acceptable designs, the participation of pertinent parties, a thorough comprehension of community needs, ideas, and cultures, and the customization of solutions to address culturally appropriate demands and concepts. Curtis, (2019) and Lopez et al (2019) support the argument by saying community requires incentives to build and use toilet facilities even though they possessed knowledge on hygiene and sanitation. Thus, motivation is necessary for the community to facilitate the adoption of the technology.

### ***The Toilet Tripod Theory***

The Toilet Tripod Theory developed by SWASH scholars in 2019, focuses on the adoption of toilet construction and use. It explains that successful sanitation is influenced by factors like demand, supply, and political ecology politics, affecting access to environmental resources (Curtis, 2019). The application of these assumptions depends on a country's policy, community economic status, and individual stakeholder preferences. The Toilet Tripod Theory reflects the issues of inequality, poverty, and resource unavailability, which impede the development of appropriate sanitation technology (Curtis, 2019). The adoption and use are more where the targeted population demands it, based on the level of health education, social marketing, and community action that is available to support behavioral changes and the facilitation of the initiatives of the entrepreneurs by the government (Prendergast et al., 2019). Research has shown that households and individuals are motivated to build and use toilets depending on their

preferences for comfort, privacy, convenience, dignity, and status rather than on their perception of the toilets as a public health benefit (Prendergast et al., 2019).

The theory views an individual to understand the consequence of specific health problem in the case of death due to disease such as cholera. Having this understanding, it is hypothesized that the individual will be motivated once they understand their increased risks and potential consequences of poor sanitation and hygiene. The third component is the perceived benefit, such as when an individual realizes, there are benefits to preventing or managing the causes of diseases such as cholera. The fourth component is the perceived barrier of having appropriate WASH facilities and sanitation and hygiene behaviours. This is when the individual can realize and identify potential barriers to moving out of the behavior that causes the health problem. For example, some individuals may not have the resources for water treatment or even clean water sources, or maybe a lack of education and knowledge about the health issues, so the intervention should include education.

The fifth component is advocacy. This is done through a series of actions or reminders to encourage an individual to take action towards the health issues. For instance, utilizing modern technology to send out reminders via automated text messaging promotes an individual to act. The last component is self-efficacy, when an individual is confident in their ability to act towards the health problem (Masoudiyekta et al., 2018). At this point, a person understands the importance of proper technique and can clean the environment, use clean and safe water, and notify a doctor immediately if cholera symptoms are detected. Hygiene values concerning this integrated theory are embodied in hygiene practices that understand the motivations for natives to change their

sanitation behaviors and the constraints and opportunities they may face in adopting proposed sanitation innovations (Alhassan & Anyarayer, 2017; Prüss-Ustün, 2019). It is also true that, the ability of the community to adopt toilets and the appropriate use of toilets depends on the proper time and awareness of the proper objectives (Prendergast et al., 2019).

### ***The Diffusion of Innovation Theory in WASH Perspective***

Dearing and Cox (2018) defined the diffusion of innovation as a social phenomenon where individuals learn about new evidence-based methods to improve health care, spreading through specific routes within a social system over time. The sanitation sector is having more problems than the water sector in terms of technology since water involves a lot of technology, whereas sanitation involves human behaviour. Rather than focusing on technology or science, the inventions concentrate on how to communicate with people. Technology and science have the potential to make things easier and better. Hygiene, on the other hand, necessitates encouragement in the various types of impacted behaviour. It is intangible because it involves behaviour. It's more of an opinion than a statement of fact. The cleanliness aspect is less tangible in terms of promotion and marketing. Outcomes of water and sanitation are not the same. Innovation, communication channels, time, and social structure all have an impact on a new idea or innovation. Rogers innovator curve describes that within the community their innovators (2.5%), early adopters (13.5%), early majority (34%), late majority (34%), and laggards (16%) (Zuin et al., 2019). Some people are innovators, early adopters, early majority, late majority, and laggards. Adopter awareness, curiosity, evaluation, trial, and adoption are

all factors that influence their willingness and capacity to accept new technology. For various innovations, people may fall into various categories.

Knowledge, persuasion, decision, implementation, and confirmation are all steps of adoption proposed by Rogers' theory. Current research has substantially aided our understanding of this process by providing details on the components that drive behaviour change. For reasons such as severe competition for water resources, water pollution and climate change consequences, inadequate water management practices, and unsustainable water extraction, the globe is facing a water security crisis (Alhassan & Anyarayor, 2017; Salehi, 2022). Water innovation is increasingly seen as a necessity by policymakers all over the world to address these issues. Africa and other continents are fostering water-related innovations at various levels, including organization and policies of water management system. As a result, a variety of innovative water management approaches have been introduced, ranging from decentralized wastewater management to rainwater harvesting, ecological sanitation, delegated management, wastewater reuse and recycling, sustainable urban drainage and novel water business models.

The theory hypothesizes that innovation will be accepted by a member of the community if they follow their social norms. The diffusion of innovation to the community depends on time and communication factors for the innovation to be applied in various contexts by the community (Zuin et al., 2019). Other authors continued to analyze the social system of the community and developed the diffusion model, which shows how innovation is adopted at different stages within the community over time (Bhattacharya & Singh, 2019). To trigger the majority to adopt the innovation depends on how the programme or innovation is communicated to the members of the community and how it

is perceived (Shiau et al., 2018). Normally, a few members of the community tend to accept the new idea and decide to adopt it regardless of its advantages or disadvantages, which may happen when implemented (Alhassan & Anyarayer, 2017; Shiau et al., 2018). After some time, another group, according to their persuasion, members with positive perceptions will adopt the innovation, while another group with negative ideas will resist the innovation.

Another stage is the implementation of what has been considered a positive decision, where members will start using the innovation (Shiau et al., 2018). However, due to different innovation perceptions, some of the diffusion processes in the various fields possess barriers that are likely to slow down the pace of implementation. Based on the study goal, which is to evaluate the SWASH programme implementation, the innovation diffusion looks at what the decision-makers have done to sustain the WASH programme in school. Dearing and Cox explain that diffusion of innovation theory has been applicable in the WASH Programme to influence good WASH practices, including hand washing and proper usage of toilets (Dearing & Cox, 2018). Likewise, other studies show that the theory can be applied to developing diffusion models, for example, the conceptual Sani FOAM framework for the analysis of sanitation behaviours (Shiau et al., 2018). The acceptability of the innovation by a member of the community, the mechanism should have merits for that community, be simple to apply, adhere to social norms, be replicable and can be observed (Helgegren et al., 2018).

### ***WASH Theory of Stakeholders***

The stakeholders in this study include the individuals, groups, and organizations that will be influenced by and affected by the sanitation services. The private sector, provincial organizations, and government ministries and agencies are crucial players in the sanitation sector. Hove and his colleagues define a stakeholder as a group of people in any established organization who can influence and accelerate the achievement of programme objectives (Hove et al., 2021). Mensah (2020) identified types of stakeholders that are symbolic, participatory, and non-participatory stakeholders. There are some critical remarks from different authors on stakeholders. It is very difficult to coordinate the interests of different people and reach the same compromise. In some cases, it may create conflicting interests between the stakeholders, which may hinder the progress of the programme (Bisung & Dickin, 2019). Additionally, he proposed conversation rather than cooperation as a means of engaging the stakeholders in the programme. The research aimed to solve the problem of the community. Through research, the government uses the findings for proper planning and policy formulation. This theory is a mechanism that research develops to carry out a WASH study successfully according to the intended goal.

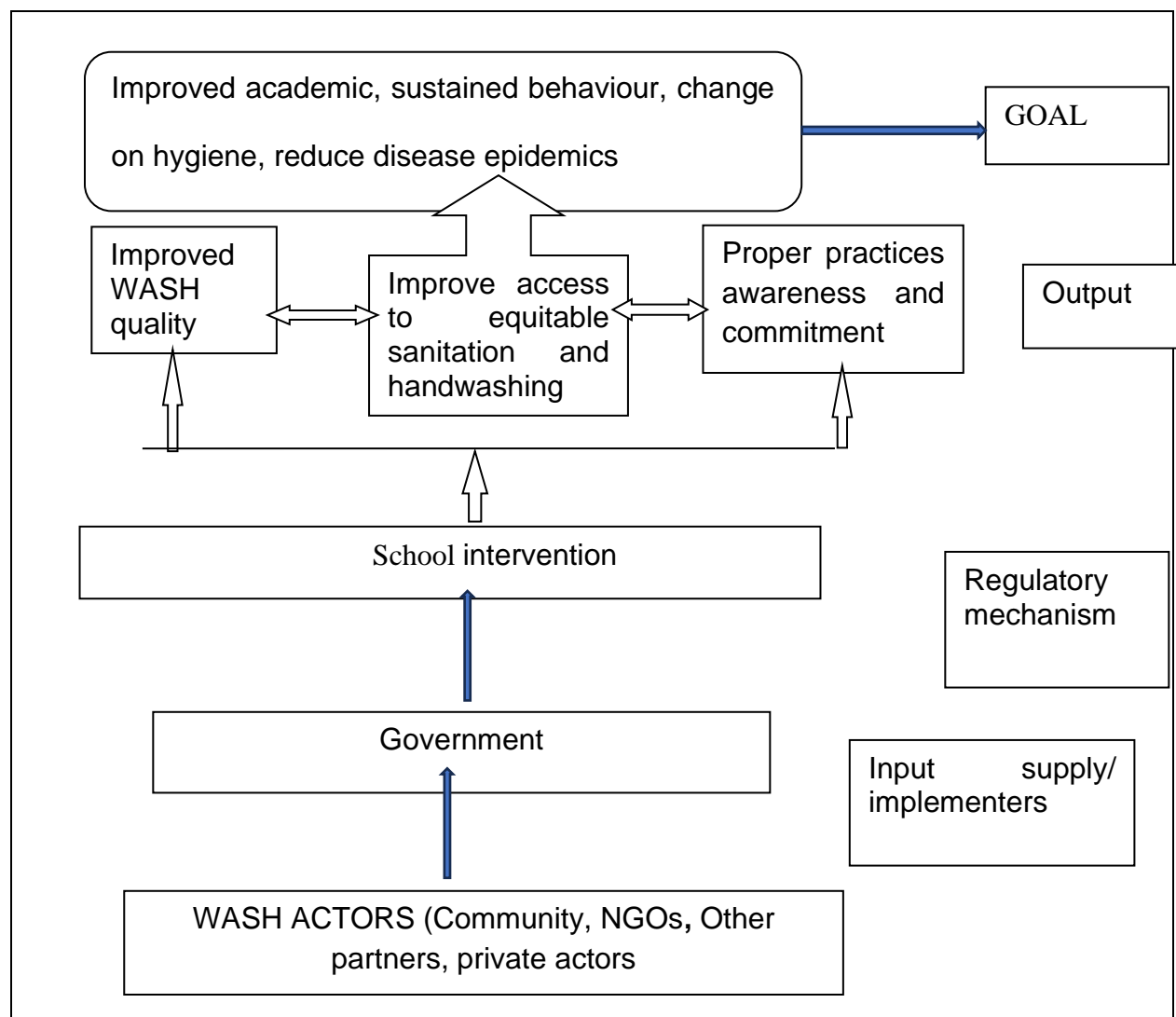
As far as the SWASH programme is concerned, different theories have been discussed above about the target community impacts and outcomes. However, depending on the research intended, each type of theory has a limitation. The theory of change has been used in the WASH sector for planning and evaluating the programme progress. Likewise, sanitation theory has been formulated to create awareness in the community on the appropriateness and necessity of using toilets to prevent sanitation diseases (Coswosk et al., 2019). Other theories, like the threshold theory, intended to

educate the community elements required for successful implementation of the SWASH programme also the stakeholders' theory, emphasize the importance of bringing different people to the programme to give their ideas and opinions. The significance of considering all these theories is to have well-articulated research for reliable results. However, there is a limit to the successful implementation of each these theories because of various factors, including community, policy, stakeholders, resources, and leadership perception, social economic factors and other environmental factors.

### ***Theoretical Framework of SWASH Programme***

The SWASH programme is based on the idea that having sufficient, excellently designed, and maintained WASH facilities contributes to a healthy school environment (Figure 2.2). The development of the facilities will be made possible by the interventions brought and encouraged by the different players, boosting access to improved sanitation, good hygiene practices, and water supply.

*Figure 2.2 Theoretical Framework of WASH Programme in School*



The theoretical framework model for WASH involves various stakeholders in the discipline of the WASH sector, which is led by the different ministries, including the Ministry of Health, Water, and Education, responsible for policies, strategies, guidelines, and funding. According to the structure of the country, the PORALG is in charge of putting all national policies from sector ministries into action. It is in charge of planning, coordination, oversight, and monitoring. The council's water and sanitation coordination teams are responsible for increasing stakeholder participation in the sector.



In the evaluation of the WASH programme implementation study, the independent variables, including the availability of water sources and supply, available sanitation facilities, hand washing, solid waste facilities, and appropriate menstrual hygiene management facilities, are theoretically related to the expected outputs and outcomes of high-class attendance, healthy pupils, a conducive learning environment, and a positive impact on the learning environment (Adom et al., 2018; Appiah-Brempong et al. 2018). Adom and his colleagues explain the frameworks following the theory of change as a series of "if-then" relationships (Adom et al., 2018). In the case where the independent variables are not in place, the expected outcome will be contrary. Failure to sustain the existence of independent variables has negative consequences such as outbreaks of waterborne diseases, school dropouts, and poor academic performance (Adom et al., 2018). The independent variables are supported by intermediate variables that facilitate or enhance proper and effective SWASH practices. These are the availability of water sources, facility effectiveness, sustainability, promotion of hygiene practices, community support, readiness to change behavior, and conducive and supporting policies (Shrestha et al., 2018; UNICEF, 2018), all of which affect the dependent variables illustrated into positive and negative outcomes.

The school WASH Programme implementation conceptual framework in this study is crucial for the following reasons. It is important because it is needed to assess existing school WASH facilities if they comply with the national school WASH Programme as well as to verify the quality and quantity in terms of functionality and usage for pupils and teachers. Secondly, it is a way to determine the extent to which school WASH interventions and methodologies are used to maintain adequate sanitation and hygiene

in public schools efficiently and sustainably. Third, it identifies and explains teachers' and pupils' perceptions and needs of sanitation and hygiene practices in public schools and the various ways used to reinforce hygiene practices for pupils' hygiene; gives a clear outline of challenges and opportunities for water, sanitation, and hygiene in public schools; and evaluates government support for WASH facilities in schools (Kaur & Kaur, 2018). The study suggests that an ideal school environment should have safe water supply, latrines, handwashing facilities, waste disposal improvements, water source protection, and proper hygiene services (Kaur & Kaur, 2018). Besides, hygiene education will promote practices that will help to prevent water and sanitation-related diseases as well as encourage healthy behavior, and it will also examine the social context of hygiene practices (Appiah-Brempong et al., 2018; Whale et al., 2017). Hygiene education programmes can support the development of new behaviours among children by creating a strong educational environment, providing access to safe and operational facilities, and reinforcement from the home. Menstrual hygiene management is in line with sustainable development. Hygiene education at school helps children to learn about water and sanitation-related behaviours and the reasons why these lead to good health and bad health. It also examines the social context of hygiene practices. The idea is that when students understand and think together about their situations and practices, they can plan and act to transform the community and make them understand the importance of practicing good hygiene (Appiah-Brempong et al., 2018). In schools, hygiene education aims to promote those practices that will help to prevent water and sanitation-related diseases as well as encourage healthy behaviour in the future adult generation (Wolf et al., 2019).

Repeating general messages about hygiene practices does not usually change behaviour, but hygiene education programmes can support the development of new behaviours among pupils and students by creating a strong educational environment, providing access to safe and operational facilities, and by reinforcement from the home (Whale, et al., 2017). Adolescent girls' WASH improvement will encourage adolescent girls to attend school and complete their education (Arya & Ambily, 2017). On the contrary, many schools in the country, both urban and rural, face challenges such as a lack of water, poor sanitation, and handwashing facilities, which harm students with disabilities contributing to unequal learning opportunities (UNICEF, 2018). For example, the lack of adequate, separate, private, and secure toilets and washing facilities may discourage parents from sending girls to school. Equally, the lack of adequate facilities for menstrual hygiene contributes to girls missing days at school, eventually leading girls to drop out of education when they reach puberty (Arya & Ambily, 2017; Coswosk, et al., 2019). An example of the result-based framework is the conceptual framework for UNICEF Nepal WASH Programme Resource Mobilization of 2018–2022, where evaluated challenges are established and way forward theories are developed (UNICEF, 2018; WHO, 2019). It can be concluded that a good conceptual frame will end up with well-defined, measurable, and accessible performance indicators and outputs of the desired research.

### **Empirical Review on WASH**

Access to clean water and sanitation facilities is a fundamental human right crucial for creating a safe and healthy learning environment in schools (UNICEF & WHO, 2018). While there have been global efforts to implement water and sanitation

programmes in schools, it is imperative to evaluate their effectiveness in achieving their intended objectives. This empirical review aims to assess the impact of such programmes' implementation in public schools in Tanzania by comparing worldwide data and evidence, analyzing outcomes, challenges, and lessons learned (Chard et al., 2019; McMichael, 2019). By identifying key challenges and proposing potential solutions, this review seeks to enhance access to water and sanitation facilities in schools and improve health and educational outcomes for students and staff.

The United Nations Sustainable Development Goal places a priority on providing services such as water and sanitation in schools, with the aim of ensuring that no one is left behind (Chard et al., 2019; UNICEF & WHO, 2018). While the Millennium Development Goal did not specifically address schools, target 7c sought to reduce by half the population's lack of sustainable access to clean and safe drinking water and sanitation by 2015. The Joint Monitoring Programme (JMP) provides guidance to each nation on the implementation of Sustainable Development Goal 6, using core questions as a framework. Schools are required to assess their Water, Sanitation, and Hygiene (WASH) status and develop strategies to enhance sustainable access to water and sanitation. A conducive learning environment is essential for students to thrive, improve academic performance, and reduce their vulnerability to water and sanitation-related diseases. This section presents practical and evidence-based findings from WASH programs implemented in various countries, focusing on both hardware and software services. The discussion includes interventions and implementation approaches by WASH actors. Additionally, a review was conducted on a separate journal's perspectives on the

implementation of the WASH Programme in schools. According to UNICEF, WASH encompasses the combined components of water, sanitation, and hygiene (Chard et al., 2019; UNICEF, 2017).

*“WASH is the collective term for water, sanitation, and hygiene. Due to their interdependent nature, these three core issues are grouped to represent a growing sector. While each (is) a separate field of work, but each is dependent on the presence of the other. For example, without toilets, water sources become contaminated; without clean water, basic hygiene practices is not possible” (UNICEF, 2017).*

### **Global Status of Water, Sanitation, and Hygiene in Schools**

Water is vital for life, but many people in developing countries rely on unreliable and unsafe sources for daily use. According to a UNICEF and WHO (2019) report, one out of three people globally lack access to safe drinking water, and 2 billion people worldwide depend on contaminated water sources for survival. People spend over half an hour daily searching for water, which could be used for productive activities. Likewise, the report confirms that globally sanitation is a major issue, with over half of the population lacking safe access to facility. Prüss-Ustün et al. (2019) described that women and adolescent girls are most vulnerable to insufficient WASH services and as result tends to limit their economic potential. They waste time travelling long distances fetching water for home consumption. Inadequate WASH services negatively impact women and young girls' economic potential, hindering their development. Encouraging worthwhile activities can boost the economy and contribute to the country's growth. Drinking water services are lacking in one out of every four primary and one in six secondary schools; 600 million

students lack access to basic water, with less than half in Oceania and two-thirds in Central and South Asia; only 66% of schools worldwide had access to basic sanitation. Over 620 million children worldwide lack basic sanitation services, equivalent to 23%. One out of every five primary and one out of every eight high schools lacks sanitation (McMichael, 2019; UNICEF & WHO, 2018). Moreover, less than half of schools in most countries have accessible latrine for students with disabilities; over 818 million children lack basic hand washing facilities in Sub-Saharan Africa; one out of every ten schools lack basic WASH facilities (Ato et al., 2018; UNICEF & WHO, 2018). This needs special attention as it is known that the most effective practices for reducing communicable and pandemic diseases such as diarrhoea and respiratory infection diseases in school-aged children are hand washing with soap. Handwashing with soap practices are still very low in middle-income countries, particularly at critical times such as before eating and after using the toilet.

Evidence from the research showed that there was a limited evaluation of school WASH programme implementation in most developing countries (Ato et al., 2018; WHO, 2018). Analysis done by various workers shows that there are several hindrances, including poor planning, insufficient allocation of budget, lack of WASH commitments, uncoordinated WASH stakeholders, inadequate engagement of committees, and insufficient software and hardware interventions in most developing countries (Arinzechukwu & Nwakile, 2017; Gizaw & Worku, 2019). Schools with inadequate water, sanitation, and hygiene (WASH) are likely to be affected by WASH-related diseases, including chronic diarrheal disease, poor hygiene behavior, and poor school attendance

and performance (Garn et al., 2017; Gizaw & Worku, 2019). This has made the JMP report of 2018 emphasize the need to address WASH services in schools worldwide.

The World Bank's 2018 report highlights that slow progress in WASH program implementation is often related to policy, budget, and planning issues. Although few studies directly link education outcomes to improvements in WASH in schools, international organizations are advocating for increased investment in WASH facilities, including those in schools. Enhancing WASH facilities in educational institutions can significantly benefit the health of schoolchildren. Healthy, educated children who understand disease prevention and can disseminate information to their communities are essential for any country. Appiah-Brempong et al. (2018) and Sommer et al. (2019) have documented the long-term impact of improved WASH facilities on academic performance, development, and the national economy.

Recognized as a human right by the UN General Assembly, WASH is a crucial aspect of public health and sustainable development. Access to water and sanitation services is considered a universal right. To ensure these rights, functional systems, funding, and well-defined institutions with specific roles and responsibilities for each community actor are necessary to drive behavioral change within the target community. The United Nations' Sustainable Development Goal for water and sanitation prioritizes the provision of services in schools, aligning with the global agenda to leave no one behind, including in educational institutions (UNICEF, 2019; WHO, 2019).

In the Millennium Development Goal, schools were not explicitly mentioned, but the global target was to halve, by 2015, the proportion of the population lacking

sustainable access to clean and safe drinking water and basic sanitation (Chard et al., 2019). UNICEF & WHO (2018) provide common definitions and targets for SDGs 4 and 6, requiring each nation to implement and monitor based on core questions for the Joint Monitoring Plan (JMP). The JMP serves as a guide for nations to consider in the implementation of SDG number 6, assessing the status of WASH in schools and identifying strategies for implementation to achieve the target of improving sustainable access to clean and safe drinking water and sanitation (Ato et al., 2018; Hutton & Chase, 2017; UNICEF & WHO, 2018).

The importance of schools meeting the criteria for an appropriate learning environment is underscored by the need for improved WASH facilities and services. As Chard et al. (2019) explain, providing such services is motivated by the fact that students spend the majority of their time in school. A conducive learning environment allows students to grow healthier, improve their academic performance, and reduce their vulnerability to water and sanitation-related diseases. The implementation of WASH programs yields various practical and evidence-based results that vary from one country to another.

### ***Access to Water and Sanitation Facilities***

The impact of inadequate water and sanitation facilities on student health, attendance, and academic performance is well-documented in the literature. Research studies have consistently shown that lack of access to clean water and proper sanitation in schools can have detrimental effects on students' well-being and educational outcomes. Magayane and Meremo (2021) along with Tsinda and Abbott (2018) conducted a study in rural schools in a developing country, revealing that students lacking access to clean



water were more susceptible to waterborne diseases, such as diarrhea and parasitic infections. These health issues not only impacted the physical well-being of students but also resulted in increased absenteeism due to illness.

Jones and Brown (2019) investigated the impact of inadequate sanitation facilities on student attendance and academic performance in urban schools, finding that students in schools with poor sanitation facilities were more likely to miss classes due to discomfort and embarrassment, resulting in lower academic achievement compared to students in schools with proper sanitation infrastructure.

Additionally, Mushota, Mathur, and Pathak (2021) discovered that an educational intervention could significantly enhance WASH and diarrhea-related knowledge among higher secondary school adolescents, with a substantial effect size. As diarrhea remains a major cause of mortality in children under five, people-centered interventions are crucial in resource-poor settings. The study suggests using adolescents as knowledge carriers for WASH interventions and recommends long-term follow-up to assess knowledge retention and behavioral changes. Their research has important policy implications for enhancing WASH knowledge dissemination in resource-limited settings.

The systematic review and meta-analysis by Wolf et al. (2019) emphasize the significance of interventions aimed at improving drinking water, sanitation, and handwashing with soap to reduce the incidence of diarrheal diseases among children in low-income and middle-income settings. This study provides essential insights for guiding evidence-based strategies to enhance child health and well-being in resource-constrained environments.

Viswanathan's (2022) research demonstrates a positive association between effective water and sanitation systems and sustainable development. While the study extensively examined water and sanitation services at national, regional, and local levels across various countries, it identified a lack of international comparisons concerning critical indicators such as service levels, available services, funding, and policy reforms. The findings from studies in India and Ghana offer crucial guidance for these nations and can serve as a blueprint for other developing countries to achieve the Sustainable Development Goal 6 targets by 2030.

Nguyen et al. (2021) conducted a study to evaluate the effectiveness of a hygiene education program implemented in schools in Vietnam. The program aimed to educate students on proper hygiene practices to prevent waterborne diseases. Through a rigorous evaluation, the researchers observed a significant decrease in waterborne diseases among students following the hygiene education program. By imparting knowledge about handwashing, clean water consumption, and sanitation practices, the program successfully enhanced the overall health and well-being of the students. This study underscores the vital role of hygiene education in curbing the spread of waterborne diseases in school environments and emphasizes the importance of integrating such programs into educational curricula to promote public health and hygiene practices.

Winter et al. (2021) conducted a study exploring the potential of school-based Water, Sanitation, and Hygiene (WASH) programming to empower children as agents of change in rural Zambian households. Their research investigated whether students learning positive WASH behaviors in school could effectively transmit this knowledge to their families, thereby fostering better hygiene practices at home. By examining the

impact of school-based WASH interventions on household behaviors in rural Zambia, Winter and colleagues provided valuable insights into the role of children in advocating positive WASH behaviors beyond the school setting.

Nyambe et al. (2022) discovered that individual participation enhances understanding of personal and community perspectives, WASH priorities, and tools. Collaborating with local communities through community-based organizations is essential for successful development, bridging the gap between government policies and WASH practices, and enabling communities to sustain interventions using local resources.

### ***Parts and Component of SWASH Programme***

According to UNICEF (2017) document, SWASH programme is divided into three components that are water supply, sanitation facilities and the sanitation practices. Each of this section has two parts of hardware and software., as defined in the UNICEF (2017) document. The specifics of each component are examined in light of its importance in schools, various developmental statuses, and how the services are provided by WASH actors, that is, their interventions and implementation approaches. Furthermore, the synthesis of views from a different report that focused on the implementation of the WASH Programme in schools is presented.. Due to their interdependent nature, these three core subcomponents are grouped together to represent a growing sector of WASH and in this case SWASH.

### ***Hardware and Software parts of the SWASH Components***

The SWASH (School Water, Sanitation, and Hygiene) framework comprises both hardware and software components to ensure comprehensive and effective implementation in school settings. The hardware components of SWASH encompass

physical facilities and infrastructure necessary to support proper water, sanitation, and hygiene practices. This includes having a reliable water system that provides safe and sufficient water for various purposes such as cleaning, handwashing, and drinking. Additionally, it involves having an adequate number of functional toilets that are private, safe, clean, culturally and gender-appropriate, and accessible for students and teachers. Other hardware facilities include properly placed urinals, special rooms for adolescent girls, rooms for people with disabilities, and appropriate waste disposal mechanisms. Water-use and hand-washing facilities should also be strategically located near toilets to promote hygiene practices. These hardware components are essential for ensuring a conducive environment for promoting proper sanitation and hygiene practices in schools.

On the other hand, the software components of SWASH focus on the behavioral aspects related to mindset change, policies, knowledge, skills, and behavior changes associated with each hardware component. This includes promoting proper water treatment and usage, maintaining cleanliness and functionality of toilets, and practicing good hygiene and sanitation behaviors. Behavioral change and personal attitudes play a crucial role in ensuring the effectiveness of SWASH interventions. Therefore, addressing software aspects is vital for instilling sustainable hygiene practices within the school community.

It is important to note that SWASH components are interconnected and rely on each other as a comprehensive package. The integration of water supply, toilets, waste disposal systems, handwashing facilities, and menstrual hygiene management facilities is crucial for achieving effective SWASH outcomes. All facilities must be designed and

maintained to allow seamless integration and accessibility for all students, including young children, adolescent girls, and pupils with disabilities.

However, studies such as the school assessment survey conducted in Tanzania by UNICEF and NBS (2018) have revealed that many schools still lack adequate sanitation services that meet minimum standards. Similar findings in other developing countries and Pan-African regions indicate that SWASH standards remain low, necessitating concerted efforts to address SWASH challenges in alignment with the Sustainable Development Goals (SDGs).

In conclusion, a holistic approach that addresses both hardware and software components of SWASH is essential for promoting proper water, sanitation, and hygiene practices in schools and improving the overall health and well-being of students and teachers.

### ***Water Services in Terms Accessibility, Functionality, and Safety***

Water services are one of the human needs in life for its health and growth. A school, like any other institution, needs water for cleaning, personal cleanliness, gardening, drinking, cooking, and other uses. However, an ample supply of water is not enough; the quality of water is also very critical and should be put into consideration. Appropriate water supply and quality needs to be sought outright during the planning of the school layout. Once sought and found able to supply sufficient water, it follows that it should be constructed and protected up to the point of use. This includes the reticulation system.

For safety reasons, the water should be regularly treated to prevent the spread of disease and cause ill health if contaminated or improperly handled and stored (McMichael,

2019). Water sources may be from pumped water, springs, or boreholes. Some sources of water, when not well maintained, may become contaminated with pathogens. Water may also be contaminated as it passes from the source to the point of use. This lowers the quality of drinking water and renders it unusable as it becomes a source of water-related diseases such as typhoid and cholera (McMichael, 2019). Research has shown that schoolchildren are at risk of getting water-borne diseases due to their limited access to clean and safe water (Townsend et al., 2017). To avoid this situation, serious attention needs to be paid to water management teams to ensure that water is always treated before reaching the end-user at the school and its route is also well maintained.

### ***The Latrines and other sanitation facilities***

Latrines are the major sanitation facilities considered in the sanitation component. Different countries have set their standards for toilets according to the number of schools children are supposed to use. For example, one pit latrine can serve a minimum of 20 girls and up to 25 boys, with consideration of a special room for adolescent girls. Consideration of standards is very crucial and should adhere to internationally laid down standards.

The major ones are that latrine blocks should be physically separate for males and females and be functional all the time (UNICEF & WHO, 2018). Regrettably, many schools in developing countries are far from reaching the required minimum block standards and drop holes. It is well documented that, appropriate design for the construction of school toilet blocks tends to motivate pupils to attend and encourage parents with disabled children to send them to schools as they are assured of getting basic services (Coswosk et al., 2019). Furthermore, Coswosk et al (2020) in Krishnan

emphasize that implementers adopt innovation with community acceptable sanitation designs. To have community acceptable designs, WASH stakeholders and researchers, including sociologists, emphasize working collaboratively in the intervention by considering social and economic factors and by involving the community in consideration (McMichael, 2019). The diffusion of innovation, including that of technology design, must involve influential and symbolic community participants and government agencies from the initial design of the facilities. The fact reiterates that by involving different stakeholders, relevant and appropriate toilet, the technology will be readily adopted Coswosk et al., 2020; Kamwenda, 2019).

Toilet adoption comes from providing the appropriate types and designs of toilets. Kamwenda (2019) emphasized the necessity of looking for locally specific solutions and understanding people's thoughts, feelings, and values concerning sanitation and hygiene to add value to the technology. This is because adoption is a factor of individual and community intrinsic values and norms. Engaging different stakeholders in the WASH project allows you to learn about the community's norms and values, the sanitation needs of the targeted populations, the approaches to be used, and the type of design required to meet the needs of the community or students from a specific cultural background. However, based on evaluation and case studies on sanitation, it is revealed that the majority of schools in low-income countries have inappropriate and inadequate construction and maintenance of their existing sanitation facilities (UNICEF, 2019). This makes it difficult to undertake appropriate cleaning. As a result, the facilities remain unattended and force students to practice open urination and defecation in the bush.

For various reasons mentioned, including lack of funds and inadequate budget but also what could imply irresponsibility, maintenance is almost lacking (Kaur & Kaur, 2018; McMichael, 2019;). Toilets were found to be dilapidated not only due to a lack of maintenance funding but also because they were not properly constructed (Arya & Ambily, 2017). Faults in sanitation design have been identified in numerous studies and have been shown to hurt WASH programme implementation. This is due to the poor quality of materials used in the construction of the block. Sommer (2019) findings reveal that the majority of sanitation facility designs are inadequate and fail to meet standards. Such toilets lack security, privacy, and amenities that endanger girls and other students with special need (Arya & Ambily, 2017; Sommer, 2019). As a result, such poorly designed or constructed toilets discourage the enrolment of girls and students with disabilities, as well as encouraging poor school attendance.

### ***Urinals facilities and Service***

Urinal facilities is another element of sanitation component. Research findings show that many schools, even those with a high population, have urinals constructed together with toilets or the same drop holes used as urinals as well (Chinyama et al., 2019). Abney et al (2021) emphasize the importance of provision of urinals. Urinals that are low-cost options can be provided to schools with a high population in a separate block or chamber. It is only a matter of technical know-how that is crucial in the construction of urinal facilities. Preferably, the facility should be built into the toilet's side wall to maintain privacy, prevent accidents, and be free of offensive odors. Having these separated from the strong rooms can help limit the number of people using the restroom during busy hours and avoid congestion and even contamination (Chinyama et al., 2019) . Based on



the research done on urinals, it was observed that 88% of pupils use toilets for urination while 12 per cent use them for defecation (Abney et al., 2021). Also, the research found that by using urinals, there is a chance to alleviate the cost of construction of latrines and maintenance (Chinyama et al., 2019).

Besides having low cost in construction and maintenance, it was observed that the use of urinals in developing countries is still low despite having schools with high populations and limited latrines. For example, a study survey report done in Tanzania by UNICEF and NBS in 2018 found that only 21.7% of schools reported having urinal facilities for boys and 2.7 per cent of schools reported having urinals for both girls' and boys' pupils (UNICEF & NBS, 2018). Due to the increase in the school population year after year in countries like Tanzania, it is worthwhile to recommend the construction of urinals to reduce congestion in the toilets. The majority of schools' provision of urinals is biased toward boys' toilets. The SWASH guidelines recommend provision of urinals for girls as well. However, practicability seems to be unavoidable due to the nature and type of latrines found in schools. It is argued that urinals should not be provided for girls because it may lead to an increased risk of genital infections if they are not constantly well cleaned. Nonetheless, due to economic constraints, it is worthwhile to provide it.

Functionality of all WASH facilities requires constant access to water, as their use is strongly reliant on water availability. Thus, water availability is crucial for their proper function to have optimal utility. The layout is important where water pressure is low to allow easy flow to pit tanks. In the Tanzanian context, the National School Water, Sanitation and Hygiene Guidelines of 2016 and the MoHSW, Sanitation Options and

Construction Guidelines of 2012 consider the presence of urinal channels to reduce the need for latrine pits by 50% for boys by providing urinals.

### ***Hand Washing Facilities***

Hand washing facilities are also considered in the sanitation component. In schools, a hand washing facility is a fixed or mobile infrastructure or facility where students can effectively wash their hands using tap water of any type. The hand washing station's design should be simple, adaptable, and long-lasting, using the least amount of water possible (Mohamed & Mahmoud, 2021; Younie et al., 2020;). These facilities range from those made of locally available materials to the expensive industrial-made ones, existing in numerous designs (Mohamed & Mahmoud, 2021). All in all given the scarce resources, it is emphasized that handwashing stations should be built with local resources to save money.

### ***Hand Washing as Hygiene Practices***

Hand washing for school children is an important hygiene intervention that significantly reduces cases of diarrhoea and stunting (McMichael, 2019). Winter et al (2021) research showed that having inadequate WASH facilities in a school can play a key role in disease transmission. This is because hands are among the major transmitters of infection pathogens from one person to another, and regular practice of hand washing provides a chance of minimizing contact infections. The report from UNICEF and WHO on WASH shows that only 51 percent of schools in low-income areas have access to water, and only 4 percent have adequate sanitary facilities worldwide (UNICEF & WHO, 2020). For

this matter hand washing is impaired and they are at high risk of disease infection and spread. Access to safe water, sanitation facilities, and water and soap for hand washing allow students to practice appropriate hygiene practices and can help pupils/students and the community at large to reduce illness transmission and promote behavioral change. Kaur and Kaur (2018), reported that many public schools with inadequate facilities had a shared handwashing facility, which encouraged disease to spread in an unsafe environment. It is easy to transmit bacteria from one child to another. Therefore, the handwashing service provides schoolchildren with the capability and motivation to develop the good habit of washing their hands at critical times. This has been noted in schools with no handwashing intervention. When such innovation was introduced, majority of pupils did not adopt to wash their hands after attending the toilets (Okello et al., 2019).

The 2017 National Sanitation Evaluation in Tanzania emphasized the need for the community to design and build hand washing facilities that will assist individuals in washing their hands before and after eating; after toilet use; and after handling dirty and contaminated materials (Okello et al., 2019). The intention here is to prevent students from contracting pathogens that cause diseases. Townsend et al. (2017) observed an increase in handwashing culture both in schools and in the community as a whole, reducing pathogens from 32% to 47%. Emphasis is on the use of locally proven technologies and designs that would reduce the cost of construction and maintenance but also be readily acceptable in the community. Positive responses to handwashing have dramatically increased in schools and households with an adequate supply of water, even if they are not properly working but conveniently located.

The challenges faced by schools in implementing effective handwashing plans for students are significant and can have serious implications for students' health. The scarcity of water and budget limitations for purchasing soap and paying water bills are among the key obstacles identified in handwashing-related studies (Chinyama et al., 2019). These challenges contribute to the inconsistent practice of handwashing in schools, putting students' health at risk.

Research studies have highlighted the consequences of inadequate handwashing practices among school children. Chang et al. (2019) found that children aged 2 to 59 months were hospitalized due to infectious diseases, such as respiratory and intestinal illnesses, which could be linked to poor hand hygiene practices. Alzaher et al. (2018) reported a global burden of nearly 400 million children suffering from worm infections, partly attributed to improper handwashing practices. Low-income countries, where handwashing is not widely practiced, are particularly affected by these health issues.

Despite being a simple and quick action that takes less than three minutes, handwashing remains a challenge in many least developed countries (Chang et al., 2019; McMichael, 2019). Studies have shown that while the majority of school students recognize the importance of handwashing before eating, the actual practice of washing hands with soap is significantly low (Ejemot-Nwadiaro et al., 2021; Wana & Mengesha, 2023), possibly due to the inability to access soap or lack of awareness.

Education plays a crucial role in promoting proper handwashing practices among students and the general public. Increasing awareness and knowledge about the importance and methods of handwashing with soap is essential for improving hygiene

behaviors. Studies have indicated that handwashing practices tend to improve with age and education level. Lack of awareness and knowledge during childhood can increase the risk of water-borne diseases, highlighting the importance of early education on proper hand hygiene practices (Almoslem et al., 2021; Wolf et al., 2019).

As children grow older and become exposed to educational campaigns about handwashing, their response to handwashing activities becomes more positive, leading to a decrease in the challenges associated with hand hygiene practices (Wana & Mengesha, 2023). Education and awareness campaigns are crucial in instilling good handwashing habits among students and fostering a culture of hygiene and health in school settings.

Handwashing with soap is a fundamental aspect of developing good personal hygiene habits, as highlighted in various studies. Research indicates that washing hands with soap can significantly reduce the risk of waterborne and contagious diseases. Studies have shown that handwashing with soap can reduce the risk of waterborne diseases by 40 to 47% (Watson et al., 2019; Wolf et al., 2019) and the risk of contagious diseases by 42–49% (Chang, 2019; McMichael et al., 2019).

Specifically, handwashing with soap, especially after contact with feces, has been associated with a reduction in diarrheal occurrences by 42-47% (Garn et al., 2017). Additionally, studies have demonstrated that regular handwashing with soap can lead to a 30% reduction in severe respiratory infections among children under 15 years (Grover et al., 2018). However, the effectiveness of handwashing practices relies on the

availability of adequate hand-washing facilities and raising awareness among users about the importance and benefits of handwashing.

Creating awareness about the necessity of handwashing is crucial for promoting good hygiene practices. Hand-washing after toilet use should be a routine activity for school children, as emphasized by Mohamed & Mahmoud (2021). Luby and colleagues (2018) noted that a complete latrine construction should include a hand-washing point with soap and water to ensure proper hygiene practices.

Furthermore, combining handwashing with face washing using clean water and soap has been shown to reduce the incidence of diseases like trachoma (Almoslem et al., 2021; Mara & Evans, 2018). This underscores the importance of maintaining facial cleanliness alongside hand hygiene practices for disease prevention.

Especially in the context of the COVID-19 pandemic, the significance of good hygiene practices, including handwashing, has been repeatedly emphasized. Proper handwashing is essential for reducing the spread of viruses and contaminants in school environments. Handwashing is a simple, cost-effective measure that can have a substantial positive impact on the health of individuals, including students (Lewis et al., 2018). Promoting regular handwashing practices, along with other hygiene measures, is crucial for maintaining a healthy school environment and preventing the spread of diseases

Teachers are key role models in the school, so it stands to reason that if they can teach students how to wash their hands properly, why they should wash, and when to imitate and practice, students will wash their hands even outside of school (Wolf et al.,

2019). Through handwashing intervention, the pathogens in the hands can be easily destroyed and removed by the proper application of water and soap. As educational institutions, schools should encourage all school communities to wash their hands with soap regularly. Doing so will have a big impact on the community's social and economic welfare and the betterment of the next generation. In brief Conversely, hand-washing education is a powerful tool for schoolchildren's education and health promotion. The health teacher is responsible for providing proper knowledge on the importance of washing hands, especially during a critical time and whenever there is a need to do so. This will help in preventing and controlling infectious diseases.

Proper education and enough time to wash hands are necessary. School WASH guidelines have stipulated when and how to wash hands. It is significantly easier to persuade people to reinforce or continue to practice these positive habits, but they have to be promoted over a longer period of time for adoption than it is to ask them to do so suddenly. Infrastructure projects must consequently be complemented with programmes that encourage appropriate hygiene behaviors such as hand and face washing, the use of latrines, and maintaining proper dressing in the facilities.

### ***Menstrual Hygiene Management Facilities and Practices***

The absence of MHH services in schools is the major source of the absence of adolescent girls in schools. MHH services in schools are viewed as a secret and a privacy issue and not as a necessity for girls in developing countries. Adolescence is a special period in a girl's life cycle of growth and development during which physical, psychological, and biological development of the child occur at an age between 10 and 19 years, and

that requires special attention (Mahfuz, et Al., 2021; Sommer et al., 2019; Tamiru et al., 2017). It is during this time that menarche occurs; as a result, menstruation begins. During this period, there is a need for safety precautions due to some experienced health effects that may accompany the condition (Kaur & Kaur, 2018). It requires the use of absorbent sanitary pads made up of various materials and technologies. Women have developed their own strategies to handle this period.

Globally, these strategies vary greatly due to personal preferences, availability of resources, economic status, cultural traditions and beliefs, education status, and knowledge about menstruation. In rural areas, with little knowledge or financial resource, they use some reusable cloth pads, while in urban areas, the preference is for commercial sanitary pads. Nowadays, many deodorized and non-deodorized sanitary products are available on the market containing antibacterial chemicals (Sommer et al., 2021). Other local materials have also been reported, including tampons, menstrual cups, bamboo fibre pads, bamboo charcoal pads, banana fibre pads, and some cheap materials (Kaur & Kaur, 2018). In any case, there should be an appropriate disposal mechanism for the used materials.

Ideal menstrual hygiene management facilities include towels/pads, soap, appropriate and private space for changing, adequate water for cloth washing, and disposal facilities for menstrual waste, including an incinerator and dust bins (McMichael, 2019). However, due to a lack of proper menstrual management facilities and probably knowledge of disposal, most women dispose of their menstrual materials in domestic solid waste bins. In many areas, toilet facilities lack disposal bins for sanitary pads and handwashing facilities. In the modern world, disposable menstrual products are mostly



flushed in toilets, thrown in dustbins or through solid waste management. In rural areas where women mostly use reusable and non-commercial sanitary materials like reusable pads or cloths, they mostly dispose of menstrual waste by burying, burning, or throwing it in garbage bins or pit latrines. In schools, menstrual hygiene management (MHM) facilities can opt to be made available. The lack of sanitary bins or incinerators will make girls dispose of their pads in toilets by flushing them in the toilets or wrapping and throwing them in the dustbins elsewhere. Sometimes they leave the pads wrapped or unwrapped in the toilet. This makes the toilets dirty and a breeding place for pathogens and disease-transmitting organisms. All this creates a nuisance and a risk of contamination to other toilet users. It also causes blockage of the sewage system and sewage backflow, resulting in poor sanitation and hygiene conditions.

Toilets designed for urine and feces only are unsuitable for menstrual management because they lack privacy and make it difficult for women to clean and change menstrual materials in private, or there is frequent blockage of the disposal pipe system, or the toilets become germ breeding points after decomposition (Sommer et al., 2019). Incinerators, or feminine hygiene bins, are crucial for disposing of menstrual waste. They can be used for sanitary pads, towels, latrines with chemical agents, or reusable cloth pads, which are easily decomposable. Kaur and Kaur, 2018 described that biodegradable sanitary product made from bamboo, banana, water hyacinth, and sea sponges are becoming a popular approach to menstrual hygiene management. Schools provide special bins and disposal bags for menstrual waste, but it is important not to dispose of it along with domestic waste. Pads should be wrapped in newspaper and thrown in dustbins, ensuring they are safe for rag-pickers and not exposing them to disease-causing pathogens. The psychological

effects of unsafe menstruation on women and girls are noticeable and should also be considered. Menstruation hygiene practices are a major source of worry since they have a health impact and can negatively impact teenagers' health if they are ignored, leading to toxic shock syndrome, Reproductive Tract Infections (RTI), and other vaginal disorders (Kaur & Kaur, 2018). Different reports suggest that there is a link between unsafe contraception during menstruation and urinary tract infections, genital warts, and other diseases (Sommer et al., 2019). According to Kaur and Kaur (2018), the menstrual period has become a significant deal due to a lack of understanding about menstruation preparedness and management or due to shyness and embarrassment. In public schools, there are many challenges encountered by girls, particularly by those with different types of disabilities and their essential need for MH management products that are not available in many schools (Wilbur et al., 2021).

Girls with disabilities, like other girls, experience these biological changes throughout their lives, and a provision for them to manage their periods should be considered as their right. Therefore, they need to be valued and have access to safe menstrual services according to the type of disability they have. Doing so will make them feel valued by the community that serves them. Lack of suitable sanitation facilities to deal with menstrual hygiene affects girls' attendance, leading to high levels of absenteeism, poor performance and dropout. Improperly maintained toilets, toilets with no change room, toilets with no door locks or with broken doors, lack of water taps, buckets, and poor water supply are reported to contribute to adolescent girls' school poor attendance. Reported menstrual hygiene practices are influenced by parental influence, personal preferences, economic status, and socioeconomic pressures, as well as a lack

of access to sanitary products, a lack of knowledge about the types and methods of using sanitary products, and an inability to afford such products due to their high cost (Magayane & Meremo, 2021; Sommer et al., 2019). Work by Sinha and Paul (2018) found that many girls were not fully informed about the realities of menstruation due to cultural expectations and constraints.

A study done by NBS and UNICEF in WASH assessment in Tanzania revealed that about 83% of the school latrines do not have MHH facilities. In this study, although every school surveyed had a sanitary facility, these necessary amenities were missing. In some reported cases, unprepared girls were reported to feel subnormal, diseased, or traumatized and hence frightened and confused at the onset of menstruation. (Sinha & Paul, 2018). This embarrassment of menarche is likely to develop negative attitudes toward menstruation (Kaur & Kaur, 2018; Michielsens & Brockschmidt, 2021) especially where there are no MHM facilities. Magayane and Meremo (2021) reported a student who committed suicide due to harassment from teachers for improper men's management. Kaur and Kaur (2018) studies on menstrual hygiene have shown that culture and norms are some of the underlying causes of poor menstrual hygiene in women and girls. Within a specific culture or religious beliefs, there are some menstrual beliefs/misconceptions and attitudes around menstruation that are linked to menstrual hygiene management (Sharma et al., 2020). Many cultural and religious ideas such as menstruation being dirty, polluting, and shameful function as roadblocks to appropriate menstrual hygiene (Sharma et al., 2020). Bathing is prohibited in some parts of India, for example, and the burial of bleeding menstrual linen is frowned upon. Clothes should be cleaned and dried in secrecy, then buried or reused (Kaur & Kaur, 2018). It was also thought that menstruation items,

such as the wrapper/cloth worn during menses, should only be laundered at night when everyone else was sleeping (Magayane & Meremo, 2021; Sommer et al., 2019). The findings of Kaur & Kaur (2018) suggest that people, both men and women, and in particular girls, should be educated on menstruation and menstrual hygiene management to inform them about the realities of menstruation. By educating both men and women regarding menstruation, we can overcome these false beliefs and taboos. Menstrual health and hygiene (MHH) require knowledge of proper hygiene and sanitation facilities that should include water and soap availability, menstrual products, safe disposal means, and education. Menstrual hygiene management campaign work has come a long way since the 1930s when products like the disposable pad and cup were first marketed (Budhathoki et al., 2018). MHH is now widely acknowledged as a human right as well as a development concern.

The School WASH Programme involves MHH interventions that aim to improve adolescent girls' school attendance, hygiene education, and practices, and enhance their academic performance. The Sustainable Development Goals (SDGs) that were developed after the Millennium Development Goals mention several goals that justify the importance of having an improved WASH programme in schools that include MHH. For example, Goal 3 (Good Health and Well-Being), Goal 4 (Quality Education), Goal 5 (Gender Equality), and Goal 6 (Clean Water and Sanitation), to mention a few, have an impact on the School WASH Programme element of MHH. All these goals depend on each other's presence. For example, without appropriate toilets with MHM, and contaminated or dirty water sources proper MHM is curtailed; without clean water, basic hygiene practices to include the MHM are not possible (UNICEF, 2018). For this matter, universal,

inexpensive, and long-term access to WASH is a key public health concern in local and international development. External influences may have also played a role in the growing focus on MHH. Currently, women have been subjected to MHH for longer periods as birth rates and the age of menarche have declined. All in all, advances in technology and experience have improved the range, quality, safety, and availability of these products (Budhathoki et al., 2018; Magayane & Meremo, 2021).

To reduce the gender imbalance in elementary school education, the focus is shifting to variables that may cause females to drop out of high school, such as inadequate MHH. It is therefore imperative to study the effects of positive social norms, policies, and health services to support the intervention. One of the reported challenges for menstruation management is gender inequality. Menstruating women are regarded as untidy and impure and are sometimes not allowed to use water and sanitation facilities, and in some cases, even excluded from their homes (Kumbeni et al., 2020). Menstruation is considered a cultural norm arising from women's voices being ignored within a given household, school, or community. This calls for comprehensive awareness creation among community members to make men, boys, and policymakers support and influence women and girls in properly managing menstruation in households, schools, work, and the community at large. In schools, it is far more important for fellow male students, teachers, colleagues, leaders, and policymakers to practice pro-menstrual management practices. Men and parents are obliged to be concerned with expenses for sanitary materials and facilities for their wives and adolescent girls, including software and hardware consideration. As observed by Sommer et al., (2021) in schools the challenges are exasperated by the insufficient water, sanitation, and disposal facilities.

Work done in Ghana and Burkina Faso in West Africa shows that girls fail to attend school due to poor management of menses, insufficient puberty education, and insufficient guidance from teachers and parents. As a result, girls feel unconfident and some decide to abscond from school (Bisung & Dickin, 2019). Other studies conducted around the same territory, indicate that SWASH infrastructures available do not support adolescent girls or female teachers in managing menstrual health with dignity in most schools (Bisung & Dickin, 2019; Sommer et al., 2021). The results from these studies on MHH show that there is limited built environment circumstances, challenges in the establishment, impact on knowledge outcomes, and varying definitions of MHH practices (Sommer et al., 2019; 2021). In places where sanitation systems were designed for urine and feces only, they usually did not support girls during the menstrual period. Sometimes girls may exercise truancy due to the lack of a disposal system, broken locks on toilets, water taps, buckets, and poor water supply (Kamara et al., 2017; Kaur & Kaur, 2018).

Access to proper MHH materials in toilets is one of the major challenges to the WASH programme's realization to its objectives and sustainability in many developing countries, such as Tanzania, Uganda, Zimbabwe, and Malawi (World Bank, 2018). In Tanzania, continuous effort has been made to address the gaps in menstrual health for adolescent girls. For example, in 2021, the launching of Adolescent Health and Well-Being: A National Accelerated Investment Agenda intends to close gaps in adolescent health and well-being in the country (World Bank, 2018). This agenda is supported by six pillars of the WB that are: HIV prevention; teen pregnancy prevention; sexual, physical, and psychological violence prevention; improved nutrition; keeping boys and girls in school; and developing skills for significant economic possibilities (World Bank, 2018).

The pillar of keeping boys and girls in school includes activities such as improving the teaching and learning environment in schools; teachers' (male and female) training to include WASH and MHH; the construction and rehabilitation of WASH facilities to include appropriate MHM components; and conducting campaigns to promote handwashing and MHH. Others are enabling local industries to produce affordable sanitary pads, activities to reduce school absenteeism, and strengthening the role of parental education in preventing school absenteeism (Coswosk et al., 2019). Accurate and timely knowledge; available, safe, and affordable materials; informed and comfortable professionals; referral and access to health services; sanitation and washing facilities; positive social norms; safe and hygienic disposal; and advocacy and policy are major factors that enable adolescent girls to remain in school and concentrate on their studies (Coswosk et al., 2019).

Teachers in schools can encourage girls and women to manage menstruation positively. School-based reproductive education assists adolescents in discovering their gender identity, protecting themselves from sexual abuse, early marriages and unwanted pregnancies, sexually transmitted diseases, and understanding physiological changes in their bodies and how to maintain personal hygiene (Chinyama, 2017; Sommer et al., 2021). When teachers' attitudes toward menstruating girls in schools aren't positive and helpful, it's difficult to persuade girls to follow proper menstrual management. According to Sinha & Paul, (2018), some parents' and instructors' perspectives, as well as cultural, religious, and societal barriers, are known to influence the education provided in schools and institutions. Sexuality education is frequently left out of school curricula, which hurts students' lives. They rely on books, friends, and the Internet for knowledge about puberty,

sexual intercourse, menstruation, and other physiological changes in the body, which may be partial or inaccurate. Teasing and taunting with harsh nicknames are frequent in schools due to a lack of understanding and social interaction (Sinha & Paul, 2018). Because it is difficult for female pupils to live in this environment, they frequently miss school. Both male and female teachers are hesitant to address menstruation and menstrual hygiene management with students in many schools. Such topics are usually avoided by teachers to avoid open classroom discussion or to avoid answering questions from students. Due to the language barrier, teachers are also hesitant to discuss such matters in class (Chinyama, 2017; Morgan et al., 2017).

To address these issues, male teachers and employees in schools and institutes should be well-informed and confident about menstruation and menstrual hygiene management so that they can support girls and women by providing a safe environment and privacy, and where possible, by providing sanitary napkins, soaps, water, dustbins for menstrual waste disposal, and separate toilet facilities for girls and boys with proper doors and locks in schools so that girls manage their menstruation comfortably (Ray & Datta, 2017; Sommer et al., 2021). Female students should also be taught how to properly dispose of spent menstrual products at home and at school, as well as the dangers of leaving them out in the open or flushing them down the toilet. SWASH clubs should hold open talks in every class to make students aware of subjects such as puberty, sex education, and menstruation. This will impinge them with the necessary information, encourage social contact, and allow them to form trusted relationships with their peers and teachers.

### ***Solid and Liquid Waste disposal***



Schools produce a large volume of waste materials, which include both solids and liquids that should be collected as trash or recycled. Close attention to managing this debris is necessary. It is the responsibility of the School management to pay close attention to ensure that this waste is properly managed. If this waste is not well managed, it becomes a breeding ground for macro and microbes that could become vectors and infection agents (Kihila et al., 2021). Students indiscriminately dispose of rubbish, such as bits of paper, junk food wrappers, groundnut shells, corn cobs, and posters. In some cases students have been reported to urinate around classroom blocks and offices, and defecate in unauthorized places (Kaur & Kaur, 2018). These actions can be avoided by close supervision, enlightening the students on the bad effects of such habits and provision of appropriate sanitation and disposal facilities. To ensure the safe management of waste materials, the school should conduct workshops and seminars to educate students and encourage them to change their attitudes toward waste disposal, and the district should improve waste disposal facilities in schools. A simple means of facility is to provide special covered containers for solid waste disposal and for menstrual waste in the girls' toilets with instructions for disposing of the waste and sanitary pads after use in these containers (Ampofo, 2020; Sommer et al., 2021). Of course education on how to dispose of menstrual waste is imperative for all adolescent girls.

Domestic wastewaters are mainly liquid wastes that are similar to those found in residential settings and are generated by students' and staff's daily activities, such as during food preparation, washing, bathing, and toilet usage (Ampofo, 2020). The amount and kind of liquid waste generated in a school are determined by several factors, including population size, the standard of living, water consumption rate, people's habits,

and climate. Sewage or effluent is a term that refers to a mixture of all of these types of liquid waste, as well as surface run-off. In a school and under normal circumstances, this sewage is collected in underground sewers and transported to sewage treatment facilities. Various physical and biological processes may be used to purify the sewage at the treatment station to make it a recyclable material. In some countries, sewage is not treated due to the cost and lack of technology for treating such sewage. Liquid wastes contain a variety of bacteria and other microorganisms derived from human waste and other sources, some of which are helpful and are responsible for the biodegradation of organic waste components (Kaur & Kaur, 2018). Others could be harmful and threaten human health. As a result, if the waste is not properly handled and kept separate from humans, or if it contaminates clean water or food, it becomes a health concern. For this matter therefore, the careful handling and disposal of any waste, including human excreta, is the most important part of sanitation and hygiene, and it is necessary to prevent infectious disease spread. As stated by Kaur and Kaur (2018) solid wastes as well as liquid wastes that are improperly managed offer several threats to human health and the environment. Water contamination (such as rivers, streams, canals, or gullies waters) , attracting insects, pests, pathogens , and rodents, and raising the danger of flooding owing to obstructed or damaged drainage pathways are all problems caused by uncontrolled dumping and inefficient waste treatment. Furthermore, it may result in risks such as flames or explosions (Kaur & Kaur, 2018).

### ***Hygiene Education and other softwares***

The definition from Peal and colleagues as quoted in Huton and Chase (2017) describes WASH software as a part that deals with and concentrates on hygiene

education practices or human development, including training to impart knowledge and capacity building for pupils and teachers on hygiene behaviours. Other SWASH-related software part include establishing a specific budgets for the provision of adequate SWASH facilities; assisting students in prioritizing their needs and establishing hygiene and sanitation behaviour change activities at school and at home; and developing and implementing sanitation and hygiene policies, strategies, and plans (Huton & Chase, 2017). The establishment of pupils' clubs at the school and supporting the pupils to conduct participatory hygiene and sanitation surveys at their schools is also regarded as part of the SWASH software.

To make effective employment of these software, teachers play a big role in planning and installing life skills software packages that have the impact of changing individuals' behaviour and developing their mindset. Teachers can help achieve this by supporting a variety of activities, such as training and conducting health campaigns, as well as inter-school SWASH competitions. Prüss-Ustün et al. (2019) emphasized that teachers stand in a better position to promote a supportive environment for learning and teaching by engaging students in the extra curriculum related to personal hygiene.

Similarly, the work done by Kaur & Kaur, (2018) showed that, school teachers can facilitate the provision of comprehensive hygiene education to enable school children to protect themselves from water and sanitation-related diseases and to know how to prevent and control the diseases by practising personal hygiene.

The School Water, Sanitation and hygiene Club (SWASH Club) is a very important intervention organ in any school to sustain the SWASH programme. The SWASH clubs

urge students to help maintain latrines and handwashing stations, as well as provide safe drinking water as needed. For example, in a school with a club, it is obvious members of the club develop alternating lists of obligations, including both boys and girls sharing sanitation and water-related chores (Antwi-Agyei et al., 2017). By doing so, it instils pride and ownership, as well as debunks the myth that these chores are reserved for women and girls or specific social groups (George et al., 2018). Therefore, the school learning environment is one of the interventions for keeping students from becoming ill informed (Prüss-Ustün et al., 2019). This is why the government of the United Republic of Tanzania, through the Ministries of Education, Science, and Technology (MOEST) and President Office Regional Administration and Local Government (PORALG), had made it clear the need for all schools to have special clubs responsible for the environment and sanitation.

Other activities undertaken by these clubs include the improvement of the school environment by planting flowers and trees around the school; having clean and safe water; and well-built toilets, to mention a few (MoEST, 2018). SWASH clubs are also emphasized in higher learning institutions where they are established with a specific mission, including providing guidance and counselling on hygiene-related support services to the community. At the time of the launching of the National Water, Sanitation and Hygiene Programme by the Tanzanian President in 2012, for example, one of the emphases was to develop WASH Clubs for students and the community for the sustainability of the programme.

Through clubs, schoolchildren will have opportunities to raise their awareness and develop skills related to water, hygiene, and sanitation through fun and practical activities. For the effective realization of the WASH programme, clubs should include teachers,

parents, and students. As discussed herein, school WASH clubs empower students to play an active role in decision-making about WASH implementation in schools. Clubs also provide students with the opportunity to improve their knowledge, attitudes, and skills for promoting hygiene behaviour, thereby improving their overall well-being. The clubs provide students with the opportunity to become agents of change in their communities by actively contributing to the advancement of WASH practices (Garn et al., 2017; UNICEF & WHO 2019). WASH clubs are ideal to teach schoolgirls about monthly hygiene management and how to control their menstruation cycles, which is still an area that needs more advocacy owing to taboos surrounding menstrual difficulties (WHO, 2019).

### ***Provision of operational and maintenance services***

Operation and Maintenance of SWASH facilities are defined as routine, preventative, predictive, scheduled, and unscheduled actions aimed at up-keeping the existing facilities. The sustainability of water, sanitation and hygiene facilities in schools needs regular inspection, cleaning, servicing, preserving, and adjusting of the facilities (Tamiru et al., 2017). A preventative maintenance programme refers to the systematic and planned execution of routine maintenance tasks. Facility operation and maintenance (O and M) is the routine maintenance of equipment or systems that includes inspecting, cleaning, maintaining, conserving, and adjusting as needed (Bauza et al., 2021; Ssekamatte et al., 2018). Purchasing soaps, replacing taps and pumps, pipe networks, water treatment, and emptying septic tanks are all part of the maintenance and repair of school WASH facilities (Buxton et al., 2019; Ssekamatte et al., 2018). Schools are supposed to have funds for purchasing soap, replacing taps and pumps, pipe networks,

water treatment plants, emptying septic tanks, and wastewater treatment plants to improve access to handwashing facilities, sanitary facilities, and clean and safe drinking water (Buxton et al., 2019). Research has found that facilities are swiftly deteriorating and failing to provide intended services due to improper operation and maintenance (McMichael, 2019). The effective operation and maintenance of WASH facilities guarantees that the intended effects are realized and capital expenditures made in building these systems are not lost.

The SWASH programme contemplates that all water, sanitation, and handwashing facilities must be clean, functioning, and well maintained. The good governance of schools' role is also to ensure that maintenance contracts are granted every year that cover regular facility maintenance, regular supply of cleaning materials, and consumables such as soap, disinfectants, brooms, brushes, and buckets, among other things (Alvarado & Bornstein, 2018). Identification of repair activities and arrangements for repair facilities may be part of the school committee. Alternatively, some local arrangements can be made, such as the appointment of local sweepers or cleaners who are provided with a regular supply of consumables by the school/district. The Education Amendment Act of 1995 as quoted by Antwi-Agyei et al. (2017) and Bauza et al. (2021) assigns responsibility for educational facility maintenance to school owners and managers, who must ensure that standard infrastructure, facility equipment, and instructional materials required for effective and optimal teaching and learning are of good quality, available in sufficient quantities, and are maintained regularly..

Referring to the educational documents in the ministry responsible for education, including WASH strategic plan, tool kits and guidelines, the operation and maintenance

of the school infrastructure, including WASH initiatives for repair and maintenance, starts at the school level. The school's management has to establish financial management for their school's development (Wilbur et al., 2021). The existing document entails the school management to prepare a financial plan before a project starts to be implemented, and the plan has to assure the operation and maintenance of SWASH facilities is incorporated (Poague et al., 2022). The financial plan aligns with the cost analysis plan that shows minimum, recurrent, and replacement expenses (McMichael, 2019). Furthermore, if the school budget is insufficient, the school management should find other opportunities available in the locality and discuss the problem with stakeholders including parents, surrounding NGOs and the local government authority.

Involving the community around the schools encourages ownership and awareness of operation and maintenance cost crises in order to find long-term solutions (Poague et al., 2022). The school administration must acknowledge and provide feedback regularly through parent meetings and the notes board. All payments in kind through the provision of soap, cleaning materials, or labor income-generating activities such as the sale of surplus water or produce from the school garden; and other activities that bring money in should be accountable and recorded and reported to the authorities. All of these cost-recovery techniques should be developed in such a way that they do not obstruct impoverished people's capacity to send their children to school. However, the SWASH programme implementation needs to be in collaboration with many sector objectives, and this is a big challenge the programme is facing in Tanzania. It is well known that financial allocation and local partner arrangements for SWASH operation and maintenance are currently insufficient (Antwi-Agyei et al., 2017). Furthermore, the exact costs of operation

and maintenance are unclear because the component is not included in project design or planning, normal operation and maintenance activities are not budgeted for, and there are no plans for infrastructure extension or replacement (Antwi-Agyei et al., 2017; Kessy & Mahali, 2017). Although at the district-level SWASH coordinators exist, they do not have decision-making authority. In developing countries, including Tanzania, many findings show how the state of SWASH facilities is often bad, with descriptions such as non-functional, dirty, dilapidated, or unavailable (Bolatova et al., 2021; McMichael, 2019). This is a sign of lack of repair and maintenance operations, that could be a result of owners irresponsibility towards maintaining the facilities on the basis of having no funds for such activity or simply ignorance.

There is a wrong perception of the community that operation and maintenance are the responsibility of the school administration, with more complicated concerns being referred to the local governments as school owners. The district, on the other hand, assumes to play a supervisory role, which is rarely implemented except in crises (Ssekamatte et al. 2018). As a result, there is a deal-dull between the LGA and parents on the operation and maintenance responsibilities because of the cost implications. Yet, there is a significant gap in government financing for SWASH activities. Given this scenario, repair and maintenance of WASH facilities is a major challenge, with even for the minor repairs undertakings. This has also been linked to the serious lack of technicians and spare parts, particularly for the water points, affecting the maintenance of WASH facilities in situations where the capacity of communities cannot resolve the situation (Ssekamatte et al., 2018; Tsekleves et al., 2022).



The study done by Ssekamatte et al (2018) shows that the challenges of poor maintenance of sanitation facilities are due to political, social, and economic drivers (Ssekamatte et al., 2018). Similarly, another study carried out by Tsekleves et al. (2022) found that there is a need to involve the community and public-private partnership in maintaining the WASH services.

### ***Stakeholders Engagement***

This review examines stakeholders involved in WASH programmes in various capacities. It examines their roles, responsibilities, contributions, influence, importance, engagement, collaboration, accountability, and networking. Despite recognition of the importance of WASH, significant gaps still exist. Available data shows that about 2.3 billion people did not have access to basic sanitation and 844 million people had no access to drinking water (Women UN, 2017) in 2015. The UN Sustainable Development Goals (SDGs) aim to focus more attention on WASH but its achievements is still hampered by many challenges but mainly financial and governments implementation strategies and guidelines . Academic performance in school depends on access to water and sanitation services in two different ways Without proper water and sanitation, adequate hygiene is not maintained, which, in turn, increases the likelihood of contracting diseases and lack of water impairs children's academic performance by reducing their cognitive capacity (Chard et al., 2019) . However, there is a disparity in the investment between the two sectors, of water and sanitation. WASH experts consumes the UN idea that was built on the previous Millennium goals, that by 2030 everyone in the world will be able to access improved WASH services (Sinharoy, et al., 2019). This is despite the fact that some of the components need huge investment and also the interest of funders.

The water sector policies have managed to attract more funders to invest in water, unlike the sanitation sector, where its policies require the community and households to construct toilets using community contributions. As a result, the standards of most of the toilets are categorized as limited service (UNICEF & WHO, 2018). Yaro et al. (2017) noted that poor coordination among stakeholders hinders the diversity of stakeholders in addressing its impact of SWASH. WASH practitioners emphasize the engagement of decision-makers to advocate for WASH facilities in schools and health facilities. Buddharaksa et al (2021) emphasize on the diversity of WASH actors and stakeholders, like governments, non-government organizations, community-based organizations, and faith-based organizations, supplies water, sanitation services, and hygiene education to schools in need. Different approaches to engaging them should be used and integrated into government plans and translated into implementation (Alvarado& Bornstein, 2018). Evidence indicates many definitions of stakeholders according to who is explaining and the organization. Stakeholders are very important to any level of the programme, regardless of what level of the programme it is. The stakeholders in the WASH Programme are obtained from the community, organizations, and funders of the programme; institutions; universities; shoppers; companies; industries; government; non-government; international organizations; faith-based organizations; civil society organizations; and others who may influence the programme. The function and role of stakeholders are to influence the programme to achieve the programme objectives. The complexity of the WASH programme requires more than one sector. This is the reason contributing to the low achievement of the Millennium Development goals of 2015 (UNICEF & WHO, 2018).

Yaro et al. (2017) emphasize the importance of mapping and analysis in selecting WASH Programme stakeholders. They suggest that selection criteria should focus on function, role, responsibility, accountability, governance, and coordination for effective global development goals implementation. Stakeholder analysis should also consider various factors that exist in the target community. Stakeholder involvement are categorized into three groups that are non participation, symbolic participation, and active participation. Active participation is the most conducive. The advantages of involving various stakeholders when creating programming is that their interests and commitments are marked. Stakeholders can recognize opportunities, weaknesses, strengths, and difficulties, and establish criteria and budgets to resolve bottlenecks. It is because of these facts that it is crucial to involve stakeholders in the planning process. Both technical and non-technical stakeholders can participate in the WASH planning process for a program like School WASH. By involving stakeholders, the sustainability of a program or initiative is significantly influenced. Low MDG achievement in water and sanitation targets shocked global WASH actors and the stakeholders in the sector started prioritization in SDGs in 2016.

The active involvement of the community in project or programme planning has a positive impact, yet it has not fully addressed the challenge of community members failing to fulfill their assigned responsibilities. Various perspectives on WASH highlight the significance of community views and contributions. To truly appreciate and benefit from community engagement, it must be considered across different sectors, including water, education, and sanitation. In the realm of education, communities are expected to possess the capacity to drive behavioral change and influence both national and

international policies. According to Huston and Moriarty (2018), the community plays a pivotal role in societal transformation by altering traditional practices, challenging outdated beliefs, and taking ownership of programs for long-term sustainability.

A community-centred approach can be effective if the planning had translated the programme of WASH by outlining the roles and responsibilities of the community and considering its social economic status. Issues of commitment, accountability, collaboration, and networking in the areas of education, water, sanitation, and hygiene are some of the community rights and need to be involved. With the involvement of the community in WASH activities, the needs and available resources in terms of material and personal will be identified easily. Although the community is facing the challenge of income, those engaged in the programme will be encouraged to support the programme in terms of in-kind, and they may also agree to volunteer for some activities. To implement the Sustainable Development Goals numbers 4 and 6, as far as SWASH is concern, Programme needs to focus on good planning, budgeting, advocating, capacitating, and collaborating with academic institutions in the promotion of appropriate technologies and designs that will suit the community's intended. As such, communication, networking, and frequency of dialogue in the area of SWASH are some of the mechanisms for changing ideas and getting more experience and learning from each other.

Engaging local builders, influential people, and religious leaders is one way to mobilize resources at the community level and take ownership of the programme. The local builders, if engaged from the beginning of the programme, may be helpful in the maintenance of the facilities when they are in need and usually their costs are rather low. Huston and Motoriarty (2018), lamented that engaging commercial people in WASH

activities has an improvement in building strong relations with those who may be convinced to contribute to the programme by making WASH services more available. The information on implementation should flow from higher to lower levels effectively. Communities feel proud of the programme when there is a mutual sharing of the information. To enable the community to comprehensively understand what is happening in the process of implementation and maintain communication concerning the progress of the programme the information sharing is important (Ekirapa-Kiracho et al., 2017; Huston & Moriarty, 2018)..

### ***Drawbacks of Stakeholder Engagement and Possible Resolutions***

Any programme's success and sustainability depends on how stakeholders are involved from the beginning to the end. The engagement of the various experts in the programme from the stage of planning is very important. However, stakeholder involvement is an issue globally (Goodman & Sanders Thompson, 2017). Knowing the attributes of stakeholders towards the programme is a challenge but will enable planners to achieve the intended goals. The failure of WASH programmes, partly is due to the cost involved during implementation, but also due to poor engagement of stakeholders in the programmes. According to Wamsler (2017), one way to avoid coordination is to effectively coordinate with every stakeholder to align the effort for programme implementation. This is not easy because stakeholders especially donors have their interest that should part with the programme interests. Stakeholders need to be involved in the planning of the implementation documents which some of the developing countries do not have are are not clear. Neither a clear mechanism for coordinating WASH programmes; some countries have water policies while lacking sanitation policies, which may result in talking

one component leaving the other behind. This demonstrates that the weight of the different component varies by country and that may make stakeholders to decline. For instance, in the study done in developing countries it was found that there is a big gap between sanitation and water issues, the part of water component is showing successive progress compared to the sanitation component (Goodman & Sanders Thompson, 2017). Kessy and Mahali (2017) described that lack of sanitation policy in the country as one of the barrier that contributes to the stakeholders to hesitate contributing to the programme and hence slow pace of SWASH implementation. Having implementation document that are reviewable can identify weak coordination and points of discouragement. In some countries including Tanzania, fund is coordinated and mobilized by the water sector for sanitation while the sanitation sector is implemented by health sector and to worsen the issue, SWASH is coordinated by the consortium of sectors. None has full mandate of funds besides having a Memorandum of Understanding (MOU) with key ministries. This is also observed in Ethiopia and Rwanda. In such cases, reviews had discovered that many programmes implementors lack confidence and the programme by itself lack ownership due to the low engagement of the various stakeholders (Goodman & Sanders Thompson, 2017). Confidence and trustworthiness in any programme are very important.

### ***Public-Private Partnerships (PPPs) in WASH Sector***

Public-Private Partnerships (PPPs) are a type of long-term collaboration between the public and private sectors in which each contributes to the planning and resources needed to achieve a common goal. Participation and approval from the community are essential for the useful implementation of such programmes (Kosycarz et al., 2019). In a public-private partnership, the project's risks and profits are shared, and the government

does not have to dedicate its resources to its development and operations. As a result, there is a shift away from traditional, tax-based financing options and toward financing through individual user payments (Kosycarz et al., 2019). The end use of the service pays for the programme. In light of sanitation as a basic human need and a basic human right, additional mechanisms for the public, private, and partnership with a social goal must be used to ensure and implement public goals, agendas, and tasks in terms of community benefit, welfare, and so on. Otherwise the community members who are essentially end users may avail from payments and look for alternative which in the case of WASH and SHWAS are rather detrimental. This does not mean that basic service provision, such as improved sanitary facilities for underprivileged people, should not be or can not be part of these public-private partnerships. When well planned and the community is well involved the outcome are appreciable (Kosycarz et al., 2019). In any case community engagement is an important aspect of providing sanitation services and its efficiency in service delivery involves may public-private partnership. Public-private partnerships are a natural progression from models of public-social-private collaboration in which all major stakeholders collaborate (Fares et al., 2020). The first step should be to acknowledge that sanitary service provision is a commercial activity, but fundamental service provision for the poorest people requires a distinct approach and implementation. In SWASH services therefore, the community and pupils' parents must back up the government's efforts to raise awareness and repair and maintenance of the facilities and service provision at school.

Public Private Partnership (PPP) means partners are collaborating to create and implement SWASH project that will have a tangible, measurable, and long-term impact

on the health and well-being of the people we serve. For example, Public Private Partnership (PPP) concept gives room for multiple members to contribute their skills to a programme (Fares et al., 2021). The partners may have different technologies, sectoral knowledge and skills. When coming together each tackle one section or provide what he/she can have. For instance in handwashing, one partner can contribute the equipments needed while the other contribute the equipments and the community provide the unskilled labour required. In such a scenario, the activity become one of the most cost-effective exercise. (Grover et al., 2018). As highlighted by some researcher, sustaining changing sanitation and hygiene behaviors necessitates a concerted effort from the WASH sectors of society to change deeply rooted bad hygiene practices (Fares et al., 2021; Grover et al. 2018; McMichael, 2019). This is why public-private collaborations work well when it comes to addressing handwashing behavior change more comprehensively (Grover et al., 2018). As a success story, the National Sanitation Campaign in Tanzania intended and succeeded to aid the development of competence in communicating the importance of soap-free handwashing and driving behaviour change by sharing skills and experiences with several partners through events and educational campaigns (Unterhalter, 2017).

The Public-Social-Private Partnership is a framework to collaborate with various partners to reach out to some of the most populated areas, in urban, rural, or any other marginal lands. Together, PPP helps to influence large-scale WASH legislation as well as large-scale Monitoring and Evaluation programmes (Obosi, 2017). The PPP, if utilized efficiently, may enhance the expansion of programmes through collaboration with the government, schools, and instructors. Partnerships like these aid in the implementation



of long-term models (Tsinda & Abbott, 2018). When carefully planned, they bring together the best of all sectors, from field practitioners to policymakers, marketing specialists to measurement experts, paving the way for truly effective interventions (Obosi, 2017). It is argued that through PPP, it is possible to create a solid awareness of consumers and the potential to create new solutions to problems when combined with strong marketing abilities (Obosi, 2017). In addition, when PPP involves NGOs, these have a deep awareness of the reality and norms on the ground and are adept at collaborating with governments through their extensive networks (Unterhalter, 2017). They have experience of working within national policy and sector frameworks to promote emerging private operators with enhanced technical and managerial competence.. On the other hand, there is a lot of benefit for governments when the entity that will design and bid on the contracts is well identified. It becomes easy to adhere to common laws of the nations, clarifying and strengthening policies and laws outlining asset ownership, legal mandates, and responsibilities for delegated contracts. In PPP, donors have a role of providing external technical and financial support for government-led PPP ventures and discussing with the government what kind of help and regulation is required to ensure that consumers get good service and are treated fairly otherwise such partnership may not have intended benefits (Unterhalter, 2017).

### ***Monitoring and Evaluation of Implementation of WASH Interventions***

Monitoring and Evaluation are key requirements for the successful implementation of any project including the WASH programmes. Monitoring and Evaluation (M&E) help to identify potential stakeholders who can be engaged in the programme. In addition, the Monitoring and Evaluation give an indication of whether the approaches used are more

effective and if they can be applied in other programmes. Monitoring and Evaluation are needed to see that desired targets and outputs are met at the expected time-bound. Developing a mechanism of monitoring from the school to the national level is very crucial to identifying SWASH constraints. According to Yaro et al. (2017), Monitoring and Evaluation will shed light on situations that need ratification due to changes in implementation requirements or where applied mechanisms have failed to achieve desired outputs. Therefore, evaluation of the implementation process and the results will assure achievement of the desired outcome, which in this strategy is improved health status and academic performance. There must be a tool for monitoring and evaluating the SWASH programme that also states both primary and secondary stakeholders as well as the expected milestones. The tool should explain how to engage this group of stakeholders and their importance at the stage of evaluation. Monitoring and Evaluation should be utilized effectively for the benefit of the intended community. The findings of the Yaro et al. (2017) study emphasize the importance of involving key stakeholders in the programme for influencing and emphasizing issues of accountability and understanding of the programme's progress and challenges during implementation. The monitoring process gives room for involving stakeholders at different stages, depending on their roles and responsibilities in that particular stage. Evaluation could be mid or end evaluation. While mid evaluation is done in between implementation period, end evaluation is done at the end of the project. Mid evaluation is done side by side by monitoring the implementation process and the observed outputs at any particular time as described in the implementation plans. End evaluation is a kind of research and is done to reveal the end output and in SWASH is the impact of the improvement of SWASH facilities in schools

education outcome (Russell & Azzopardi, 2019). Findings will stimulate the international organization to engage more or formulate strong policies for nations to decide to address the WASH institutions sector by allocating adequate resources. The literature cited show that improving WASH facilities adds value to the health sector and education but as long term outcome, development of a country requires healthy, educates and skilled people,. Healthy people can think widely and work on productive projects to increase the national economy of the nation and reduce unnecessary budgets that could be used for treatment (Redman-MacLaren, et al., 2018). School children are change agents of the community and the outcome of the SWASH programe will produce enthusiastic change ahent for sanitation and hygiene withi their communities and the country at large. Health issues are right for children, and international policies should give priority to allocating resources for improving SWASH services (UNICEF, 2018) so as to ensure that this right is not denied. Through monitoring and evaluation, additional knowledge may be generated and inform the government for future implementation. Thus, participatory monitoring is very crucial for the school's WASH programme. Despite having a Monitoring and Evaluation framework tool, most developing countries are facing several challenges, including economic, social, inadequate funding, management systems, and low knowledge (Kamara et al., 2017). Research conducted in 21 different countries and discovered that the majority of the data reported by these countries is not standard and inconsistent as a result of weakening evaluation and outcome data analysis (Headey and Palloni, 2019).

Literature reviews done by WASH researchers have highlighted that lacking WASH services do affect women and girls in performing their intended duties, including attending school and productive work, as most of the time will be used to travel a long

distance to fetch water for home consumption (Chard et al., 2019). The school of thought on WASH studies globally has shown that there is a significant difference between public and private schools in low-income countries in terms of facilities and performance (Redman-MacLaren, et al., 2018). Other studies went further in analyzing the public in rural and urban areas, and it was found that public schools in rural settings suffer more from a shortage of WASH facilities (Kamara et al. 2017). Findings from different researchers document that there are negative effects associated with inadequately improved water facilities, hand washing, and hygiene practices on school children's health outcomes (Michael et al., 2019). The presence of sanitation and water-related diseases or infection in the school environment for a long time may contribute to weakening or damage the cognitive learning and learning performance of schoolchildren and catalyze the negative effects, including diseases such as non-communicable and communicable, including diarrhoea, worm infestations, and dehydration (McMichael, 2019). Diarrheal incidences in children during their first few years of life are limited. According to WASH research, a lack of or inadequately improved WASH facilities in the school contributes to school dropouts, and the likelihood of a decrease in school performance and poor academic performance is high (Michael, 2019).

### ***Consequences of Poor WASH Services***

In schools where SWASH facilities and services are inadequate, there is a considerable bad cosequences on the health, academic and environment condition of the school population. Work done in several places discovered that there is no defined mechanism for implementing SWASH programmes particularly in in low-income countries (Chang et al., 2019; Ssekamatte et al. 2018; Tseklevs et al. 2022) that will enable exactly

the expected output.. The fund which is set aside for improving WASH services is very small compared to the demand for WASH services. Due to this, poor SWASH services are common and pupils from developing countries are experiencing unhealthy conditions including continuous succumb to diseases and anaemia as well as poor performance (Chang et al., 2019; McMichael, 2019).

Based on the previous global goals, the environment has been reported as a major hindrance to the achievement of MDG goal 2a (Assefa et al., 2017). Major environmental risks that have been reported to contribute to the high burden of diseases are poor water supply, inadequate sanitation and poor hygiene (WASH) at the household and school levels (Andrew et al., 2017; Ssekamatte et al., 2018), Given that many schools in developing countries lack adequate water supply and sanitation services, they are associated with potentially detrimental effects on health and school attendance (Shrestha et al., 2020). This is evidenced by the existing high prevalence of water and sanitation-related diseases, particularly in children, causing ill-health and sometimes death (Prüss-Ustün et al., 2019). Prüss-Ustün and colleagues study showed that the existing high prevalence of water and sanitation-related diseases, particularly in children, that cause illness or even death led to poor attendance and hence low academic school performance (Prüss-Ustün et al., 2019). Furthermore, sanitation research on the health effects done by Mshida et al, (2020) showed that children under the age of five do face more challenges.

Literature reviewed highlights that lacking SWASH services do affect girls in performing their intended duties, including attending school and academic performance especially in the low income countries. (Chard et al., 2019). Some school of thought on

WASH has shown that there is a significant difference between public and private schools in low-income countries in terms of facilities and performance (Redman-MacLaren, et al., 2018). Other studies, further stratified the public schools to rural and urban schools, and it was found that public schools in rural areas suffer more from a shortage of WASH facilities (Kamara et al. 2017). In this case they suffer more of the negative effects associated with inadequately improved water facilities, hand washing, and hygiene practices on school children's health outcomes (Michael et al., 2019). The expected outcome from SWASH programme in such schools may not eventually be realized because of the presence of sanitation and water-related diseases or infection in the school environment for a long time that contribute to weakening or damage the cognitive learning and learning performance of the school children/students (Chard et al., 2019). The number of candidates accomplishing school terms is also reduced because of the school dropout contributed by a lack of or inadequately improved SWASH facilities in the schools (Sommer et al., 2021)

To rectify the situation, McMichael, 2019 proposed that there is a need for developing countries to call for a combined action to advocate for as many as possible, the well wisher international organizations to invest in schools water, sanitation and hygiene facilities construction and services enhancement. Evidence shows that improved hygiene practices can cut the transmission routes of water and sanitation-associated diseases. Consequently, when there is no water in the school, children cannot wash their hands, making it easy for diseases to be transmitted from one child to another, especially in crowded classrooms and the general school community. Communities with, inadequate water supply, sanitation, and hygiene, often experience high disease prevalence and child

malnutrition and development issues. This has made SWASH to receive increased attention in many countries of the world as a key intervention to increase children's prospects for healthy development by contributing to a safe and healthy learning environment but also a way for both teachers and students to develop and practice positive hygiene practices (Andrew et al., 2017). There is evidence from various studies that SWASH programmes are effective in reducing pupil absenteeism by 21% to 58%, in some cases specifically for girls (McMichael, 2019). Chinyama et al. (2019) also reported a lack of proper menstrual hygiene management to be associated with school absenteeism in Zambian schools. The author reported that 44% of girls drop out of school before completing their secondary education, is because of the inadequate provision of MHH that tends to lower girls' dignity within the school community. The author concluded that improved sanitation provision in schools is correlated with high female and male enrolment ratios and reduce drop-out ratios, especially for girls and that, there is a link between adequate toilets in schools and the educational progression of girls.

UNESCO, (2017) indicated that over 620 million, 900 million, and 570 million children worldwide lacked basic sanitation, water and hygiene services, and basic drinking at their schools, respectively. These have stimulated many WASH actors to bring WASH to school as an agenda in various exposures to minimize the frequency of hygiene-related diseases; improve hygiene behavioral practices; improve school enrolment; attendance and academic performance; and induce hygiene practices for their parents and community members (McMichael, 2019). Shilunga and colleagues confirm that hygiene behaviours and practices are only made possible through a combination of hygiene education, water, sanitation, and hygiene, as well as suitable facilities (Ntambo

& Malvin, 2017; Shilunga et al., 2018). The study conducted by McMichael (2019) shows that intervention in school is more cost-effective than investing in the community whereby school children act as change agents. Children are keen to learn and adopt innovations while younger than adults, so if they are brought into the hygiene practices process while young, they can become change agents within their families and communities (Poague et al., 2022).

### ***Ideal school services and the advantages of WASH to students in schools***

*"A school is a home away from home for any student. During student life, most of any student's waking hours are spent at school, learning anything, and everything in various dimensions, from books, teachers, peers, and even the school environment. There is no denying how significant a school's role is in shaping a student's personality and holistic learning process. Like an experienced teacher and teaching, pedagogy plays a critical role in shaping students' academic life. However, infrastructure is also vital" (UNICEF & WHO, 2018).*

Every parent would like their children to attend a school that has a clean environment. A child who takes pride in his or her school and neighbourhood. Proper sanitation and hygiene practices at school empowers every child to become a change agent in their homes and communities by improving water, sanitation, and hygiene practices (Antwi-Agyei et al., 2017; McMichael, 2019). To achieve this target, school facilities, including toilets, classrooms, restrooms, and kitchens (in schools with school meal programmes), must be clean. Teaching school pupils how to carry out hygiene



initiatives to promote hygiene practices in the school is also necessary. Paghasian (2017) emphasizes the significance of raising community awareness and understanding of hygiene, hand-washing, cleanliness, and menstrual hygiene management in a healthy school environment to contribute to the children hygiene behavioural development. Likewise, to be a good learning platform, schools ought to have sufficient assets to meet hygienic standards, such as sufficient water and soap, gender-sensitive sanitation, hand-washing stations, cleaning supplies, and an effective solid waste disposal mechanism. However, awful school water supply, sanitation, and hygiene facilities and services continue to be a high-risk exercise among the most vital school students in underdeveloped nations. Handwashing with soap, invulnerable latrine utilization, and impervious water handling amid a workout are among the essential WASH items that can be used in schools for positive outcomes. There is quite essential thought that altering one indispensable hygiene practice can have a massive effect on school children, and that, hygiene practices are the best to put into effect at the lowest cost. and schools play an important role in this. In contrast, crowded and unsanitary school WASH conditions have the potential to serve as foci for disease transmission. According to best estimates by the United Nations Children's Fund, only 51% of schools in low-income settings have access to water, and 45% have adequate sanitation facilities.

Schools with poor WASH conditions and intense levels of person-to-person contact are high-risk environments for children and staff and aggravate children's susceptibility to environmental health hazards (Kabir et al., 2021). Children's capacity to learn may be affected by poor WASH conditions in several ill-health descriptions, including helminth infections, food poisoning from chemical and pathogen contamination

in water, and many other water-borne diseases. In this case, schoolchildren's attendance becomes poor and the teaching and learning environment in the classroom is depressed. Girls and female teachers are more affected than boys because lack of sanitary facilities means that they may not be able to attend school during the menstruation period (Kaur & Kaur, 2018).

Combining access to safe water, sanitary sanitation facilities, and water and soap for handwashing, with sufficient behavioral change, has the potential to limit disease transmission at the school while also encouraging improved WASH practices in future generations. Evidence shows that improved hygiene practices can cut the transmission routes of water and sanitation-associated diseases (McMichael, 2019). For instance, when there is no water in the school, children cannot wash their hands, making it easy for diseases to be transmitted from one child to another, especially in crowded classrooms and the general school community. Many schools serve communities that have a high prevalence of diseases related to inadequate water supply, sanitation, and hygiene, where child malnutrition and other underlying health problems are common. Schools in rural areas have been reported to have insufficient and some places lack drinking-water sanitation and handwashing facilities (Mara & Evan, 2018). Where such facilities do exist, they are often insufficient in both quality and quantity.

Water, sanitation, and hygiene (WASH) interventions frequently assume that students who learn positive WASH behaviours will disseminate this information to their families. This is most prominent in school-based programmes, which rely on students to act as "agents of change" to translate impact from school to home. However, there is little evidence to support or contradict this assumption. Museko et al. (2017) stipulate that

water, sanitation, and hygiene facilities in schools are important in ensuring a healthy learning environment for students and protecting them from disease and isolation. In line with this, improved SWASH creates a physically healthy learning environment that benefits both learning and health (Luby et al., 2018). The school will have healthy, well-nourished children that can actively participate in school and get the most out of their education (Null et al., 2018). Accessible school facilities are essential for students with impairments to be able to fulfil their dreams. Children with special needs are more likely to continue with school due to the presence of a conducive environment. Therefore, efficient water, sanitation, and hygiene programmes should aim to break down barriers by promoting inclusive design facilities that are user-friendly and child-friendly for all users, including adolescent girls, young children, and disabled children (Tamiru et al., 2017). It is critical to include children with disabilities in the design to ensure that facilities are accessible. Latrine and handwashing stations should be accessible and used by all students, including younger children. Therefore, water, sanitation, and hygiene facilities should focus on the design of infrastructure that considers the reality that children have a diverse range of requirements with respect usability of the facilities.

Consideration to the cost of facilities, is important such that a cost effective structures and services are provided to increase access and usability to all children. This is an issue to into the design from the start of the programme (Wilbur et al., 2021). When compared to the expense of exclusion, creating inclusive facilities is paramount. The least considered but important is the provision of hygiene education in schools that encourages the behaviour of future generations of adults by promoting activities that eliminate water

and sanitation-related diseases, such as dysentery and the COVID-19 epidemic diseases.

### ***Economic Advantages of Improved WASH Services***

Improved water and sanitation are perquisites and rights of any human being. The human body needs water for metabolic activities. The provision of reliable and sustainable WASH services will assist the country in reducing the health burden cost, reducing deaths, reducing school dropouts, reducing the time spent seeking water services, contributing to school academic performance improvement, and increasing productivity (WWDP, 2019). As pointed out by the World Bank (2018) in the report made on the WASH project done in Tanzania, water is very important for the development of the country. It is required for running industries, vehicles, home consumption, agriculture, and some other more activities. Despite its importance, many countries, especially in the sub-Saharan African countries, do not have safe and clean water, which leads to serious diseases, that cost their governments extra money to be allocated for buying drugs for treatments (WWDR, 2019). In 2018, the Joint Monitoring Programme on Water Supply, Sanitation and Hygiene (JMP) reported that 2.2 billion people still lacked access to safely managed water; 4.2 billion lacked access to safely managed sanitation; and 3 billion lacked access to basic handwashing facilities (UNICEF & WHO, 2018). The shortage of safe and clean water is among the factors which led to the high mortality rate of children under five years old (McMichael, 2019).

The importance of water has given weight globally to sustainable development goals. The provision of clean and safe water is one of the targets that have to be met by

2030 so that everyone should have access to clean and safe water throughout the year (UNICEF & WHO, 2018). Poor WASH negatively impacts vulnerable girls and women, as they spend more time fetching water for domestic use this is according to Kabir et al (2021). In some cases, adolescent girls are forced to drop out of school (Sommer et al., 2021). In another study Sommer et al. (2019) pointed out that lack of improved WASH service in school tends to increase stress on adolescent girls during their menses and they tend to miss classes (Sommer, et al., 2019). Costs due to the outbreak of preventable diseases, such as diarrhoea, cholera, trachoma, skin disease, and acute respiratory infections, are among the factors that tend to lower the economy of a country and hence slow down the country's development (Garn, et al., 2017). Furthermore, diseases tend to hamper the academic development of schoolchildren as well as overall school performance. McMichael (2019) found in her WASH review of evidence research that a poor learning environment harms children, may cause mortality, insecurity for parents, poor school attendance, unhealthy students, and accelerates school dropout. Similarly, apart from Tanzania, other studies done in developing countries such as SADC countries, India, and Central America show that, majority of public schools' WASH services are poor, with the majority being from rural areas. Majority of affected schools seem to have inadequate knowledge of the impact of WASH services. This is for both, teachers and school children alike (WHO & UNICEF, 2018). The most vulnerable groups facing such consequences are the disabled, children, and adolescent girls; (WHO & UNICEF 2018). Decision-makers gradually understand the importance of the WASH programme as a result of the National Sanitation Campaign. As such the major constraint of insufficient budget allocation is gradually handled although at a very minimal pace. For example.

Tanzania government has of recently started to allocate 1% of the total budget to address water issues in the country (Kessy & Mahali, 2017). Nevertheless, more effort is required in advocating for policymakers and planners to allocate more funds for the sanitation sector as far as they have signed the mellenium SGD protocol. To support this, WB has started to support developing countries in the funding of National Sanitation Campaign. The intention is to enable the governments to build more school toilets, but the effectiveness of the implementer is still a challenge. However, the limitation of this model is that it requires the government to contribute to build the facilities, to meets the basic requirements (Hope & Ballon, 2019).

In Tanzania, to complement the implementation, other international organizations, including UNICEF and WaterAid Tanzania, have opted to finance the sanitation sector's health promotion through behavioral campaigns to add more impact. UNICEF and NBS (2020) highlights that joint interventions are needed to address challenges in public schools. In 2020 only 28% of schools had improved toilets, the percentage increased from 11% (2009) to 28% (2019). Kessy and Mahali (2017) emphasize the significant of involving stakeholders and policymakers in the programme as far as issues of health, rights, and dignity are concerned. In reality, the government is required to take quick actions to improve SWASH facilities and services in the 14,567 puplic schools if to meet the SDG 2030 targets. With this pace, as assumed by Antwi-Agyei et al, (2017), it will require about 34 years for the public school in Tanzania to have adequate SWASH facilities. This means that it is impossible for the nation to meet the SDG 2030 targets. Antwi-Agyei et al (2017) urges the constructions of WASH facilities to go in parallel with the expansion of enrolment of pupils something which currently not happening. The

introduction of free education in the country (Tanzania) led to a shortage of facilities, especially toilets and classrooms (Antwi-Agyei et al., 2017). Advice is made to policymakers to create an enabling environment for massively enrolled learners and teachers by allocating a budget that will meet the demand of the school (Kessy & Mahali, 2017). With the philosophy of leaving no one behind, policymakers and the WASH sector should engage a variety of stakeholders to assist in the education sector in various ways. A good plan is imperative for improving the existing infrastructures as well as the construction of new infrastructures, including SWASH facilities. Without improving these facilities, vulnerable or disadvantaged communities in rural areas will suffer more. Public schools, especially the majority of rural areas, experience poor water and sanitation services regardless of having disabled, young, or adolescent girls (Kaur & Kaur, 2018) will inevitably suffer the consequences.

### **Policy review of School WASH Programme**

This policy review critically examines a range of international and national policies related to the implementation of Water, Sanitation, and Hygiene (WASH) programmes in educational settings. The review encompasses various key aspects, including the definition and significance of policies, the process of policy development and review specific to School WASH programmes, as well as an exploration of both international and national policies governing WASH initiatives in schools.

This policy review explores the role of international and national policies in shaping Water, Sanitation, and Hygiene (WASH) programmes in educational settings. It highlights the importance of these policies in guiding actions and decisions within WASH programmes, driving positive outcomes and fostering a conducive environment for WASH initiatives.

The review emphasizes the need for continuous assessment and adaptation to optimize the impact and efficiency of WASH interventions in educational settings. It also examines global guidelines and frameworks related to School WASH, aiming to elucidate standards and best practices for enhancing access to safe water, sanitation facilities, and hygiene practices in schools worldwide. Tools like the Water, Sanitation, and Hygiene Bottleneck Analysis Tool (WASH BAT) are scrutinized for their utility in identifying and addressing barriers to effective WASH programme implementation. The review provides a comprehensive overview of global analyses and assessments concerning sanitation and drinking water, offering insights and recommendations to bolster access to safe water and sanitation facilities in schools globally. It also examines specific national policies and strategies, such as the National Water Sanitation and Hygiene Policy of 2022, the National Poverty Reduction and Growth Strategy, the National Health Policy of 2017, and the National Sanitation Campaign of 2012 to mention the few.

### **What is a Policy and its Importance**

A policy can be defined as a framework used as a guide to achieve the implementation of the programme or project goal (Ginja et al., 2021). Policy models are developed to suit the organization's needs, and thus the models depend on the organization's vision and missions. The policy formulated shows the direction of the programme implementation to be able to achieve the defined goals and objectives of the organization. It should therefore include mission, vision, strategic area issues and strategies as well as the action plans to achieve smart goals. The policy can be used as a tool or mechanism to influence stakeholders and policymakers in decision-making. A programme policy is a particular document written based on a set of arguments for a



problem and the way of addressing it. The policy statement or cause of action is used by government agencies, public actors, private sectors, and other organizations to describe a range of different activities consisting of objectives, setting priorities, describing a plan, and specifying decision rules. Policies show directions on the intention of the organization on what the organization intends to achieve for its benefit or for the benefit of the nation in case of country concern at a particular time. It enables the organization to communicate its goals and objectives clearly to the implementers, community members, and other stakeholders (Ginja et al., 2021).

With time, a policy has to be reviewed to cope with global social, economic, and environment changes as well as technological development. Depending on the organization, policy analysis and review has a sequence in the course of implementation, including the introduction and identification of the challenge, exploring the policy as a limitation, and making policy recommendations (Chuang et al., 2022). In developing or reviewing a policy, the first part is to determine the intended goal, status of the challenge or problem, the history of the problem, and some of the past attempts to deal with a problem. The second part of the policy analysis is to look for the description of resolutions and goals for the policy through possible options, resources required for implementation, and the feasibility of each option. Based on the option, the researcher can develop several solutions based on the political, economic, social, and other obstacles associated with this option at organization, national, regional, and international levels (Jiménez et al., 2018). The third part is to make the policy recommendation. Look at the criteria used for choosing recommendation alternatives, and lay out the causes of actions. Examine and set strategies for implementing the new approach compared to the old approach and what

strategies are for managing the foreseen problem and its consequences as a result of the recommendation (Chuang et al., 2022).

Policy models are dependent on the organization's vision and mission and are developed to suit the organization's needs. A policy as a framework is used as a guide to achieve the implementation of the programme goal. Ginja et al (2021) argued that a policy is a structured document that guides program implementation to meet an organization's goals and objectives. It is written basing on justifications for problems and solutions, indicating the direction of the program's implementation. A policy can therefore be used as a tool or mechanism to influence policymakers for decision-making. This policy statement or cause of action is used by government agencies, public actors, private sectors, and other organizations to describe a range of different activities consisting of objectives, setting priorities, describing a plan, and specifying decision rules (Moretto et al., 2018) for their achievements. Policies show directions on the intention of the organization on what the organization intends to achieve for the benefit of the organization or nation at a particular time..

### ***Policy Development and Review for School WASH Programme***

This part explores the complexities of developing and reviewing policies designed for school WASH programmes. It emphasizes the importance of continually evaluating and adapting policies to improve the effectiveness and influence of WASH initiatives in educational settings. Various policy overviews need to be established to ensure the sustainability of the WASH program. Examples of these include regulations concerning sanitation, water, and hygiene. Given the importance and components of such policies, it is the duty of the government to develop the framework for different programmes and

guarantee their effective implementation (González-Rodrigo et al., 2022; Kessy & Mahali, 2017). The development should be participatory to involve all the stakeholders in SWASH. A policy developed without involving all the stakeholders is difficult to implement (Kessy & Mahali 2017). The efficient implementation of these policies will lead to the development of the nation. A country will have good and effective education systems and reduced disease outbreaks as a result of these policies being implemented effectively. Positive effects on the environment, the economy, and the local population depend on the department designated to implement policy SWASH programmes. The policies should serve as a framework for creating strategies and rules for carrying out the SWASH programmes (González-Rodrigo et al., 2022).

### ***International Policies on School Water, Sanitation and Hygiene***

This section is a review of international policies concerning WASH programme implementation globally. Global details of water, sanitation, and hygiene (WASH) are reviewed, and their limitations across water, health, and education sectors.

The WASH programme is globally recognized due to its significance to schoolchildren's health. A school, as a place where students spend the majority of their day getting their basic education, should be maintained as an ideal learning environment. School children, as a change of the community and an expected generation for the country's development, should be provided with clean and improved WASH services, which are their rights (McMichael, 2019). Water and sanitation policies about human life and how to implement them effectively to bring positive results to humans. McMichael,

(2019) study shows that effective implementation of the WASH programme in school has a positive impact and outcome on schoolchildren and the community. Studies and research in the WASH sector are important to address all effects and impacts that do affect human development in the development of appropriate policy that is required to show the direction to follow in the implementation of WASH activities (Tseklevs et al., 2022).

The international community has established several goals aimed at achieving self-sufficiency and adequate WASH facilities worldwide. This is observed in the Mellenium SDGs and in the UNICEF guidelines. To enhance these regulations and guideline, UNICE created the WASH Joint Monitoring Programme (JPM). The Joint Monitoring Programme of UNICEF was established to set indicators for WASH in the communities including schools and monitor water, sanitation and hygiene programmes implementation for the sake of international health and development. Emphasize of the importance of implementing WASH in schools by incorporating stakeholders from various sectors, including education, water, and health is necessary is also advocated. Political leaders' involvement is crucial for advocating WASH, as WASH programmes often fail to reach their targets due to inadequate involvement in critical sectors like finance, planning, health, education, land, construction, infrastructure, and local communities.

### ***Water, Sanitation and Hygiene Bottleneck Analysis Tool (WASH BAT)***

The Water, Sanitation and Hygiene Bottleneck Analysis Tool (WASH BAT Tool), was developed by UNICEF, to guide implementers on how to do an analysis of WASH barriers and be able to map different stakeholders to join efforts to identify barriers that hinder the successful implementation of the WASH programmes (UNICEF, 2018). WASH

BAT instructs the programme planners and implementers to involve various stakeholders, including public and private, national and international organizations, research institutions, and universities, to understand which technology is available and which designs to adopt for the programme (Tseklevs et al., 2022). The WASH BAT enables management to engage policymakers in achieving goals, ensuring budget allocation and community engagement to have team planning and implementation. Community engagement is crucial as it contributes to projects as they are the end-users. The engagement of the community in the programme will as well enable them to develop the sense of ownership and know that they are the owner of the programme. It is reported that the implementation pace of the WASH programme is still low due to the inadequate commitment and engagement of influential people (Mgoba & Kabote, 2020). Where this is lacking, regardless of the importance of the programme, it receive little or no tangible funding. Copled with weak coordination in the sector, hinders WASH programme effectiveness, and there is a significant discrepancy in public and private WASH services provision.

School WASH programme needs policy planning and decision making due to its high required investment in both hardware and software. To be able to implement programme activities, there needs to be a purposeful engagement of stakeholders at all levels, from school to national level. Advocacy planning is a mechanism used to influence policymakers by engaging stakeholders to get their ideas and views. Mgoba and Kabote (2020) put emphasize on advocacy planning to be used to educate politicians about the programme's implementation by budgeting and supporting the school's WASH programme. Political leadership has the strong power to influence the government to allocate adequate funds for the school's WASH activities. Also, advocacy it will enable

the agency to get a picture of the social values and culture of the community and how to work in harmony with them. Involvement will keep away disputes, unnecessary contracts, and delays, which may slow down the implementation of the pro-plan. According to Ekirapa-Kiracho et al (2017), effectively engaging the community in the programme has positive impacts in terms of development, environmental, economic, health, and social outcomes. Involvement enhances the dialogue mechanism between the stakeholders and the community, simplifies the discussion of WASH issues, reaches consensus agreeably, and proposes how best the programme will be implemented.

Additionally, the sustainability of the WASH programme will be achieved if there is a good strategic plan, operational plan, and joint follow-up and monitoring plan. Having all the plans, including advocacy plans, will also enhance and improve decision-making and ensure accountability to all levels. It's important to involve stakeholders throughout the planning and implementation process. Furthermore, the involvement of stakeholders assists in building trust and transparency, identifying the community's needs and promoting motivational support for the programme (Ekirapa-Kiracho et al., 2017). Through working together, key stakeholders can identify common concerns, develop common goals, and reap the benefits of the impact of a WASH project. Some stakeholders may also become involved in technical aspects, contributing to implementation, designing solutions, and providing technical advice. Involving stakeholders in this way ensures more effective outcomes.

### ***The international guidelines for SWASH***

International guidelines for SWASH are networking guidelines intended to link various stakeholders world wide. The combination of components of WASH requires the

combination of several stakeholders from various organizations in planning and policy formulation networking (Scott, 2017). The policy direction focuses on social-cultural, economic, political, governance, and environmental aspects of a respective nation known to stakeholders to enable prompt and optimal facilitation of implementation of the WASH programme.

The international directions and guidelines are translated into the national needs to achieve the intended objectives. According to Scott (2017), the monitoring report is communicated to various stakeholders to provide a room for them to share experiences and information. Sharing information has the advantage of attracting more funders and also knowing the people who are implementing the programme and join efforts. This also helps to avoid double standards. Good WASH governance, advocacy plans for stakeholders, and networking are strengthened both within and outside of countries (Goodman & Sanders-Thompson, 2017). The need of UNICEF for strong coordination and collaboration of decision-makers, funders, WASH practitioners, faith-based groups, communities, influential people from the community to the national level, related sectors, WASH actors worldwide, and sector ministries to work as a team and communicate via a proper and effective channel to fight for human WASH rights (UNICEF & WHO, 2018; Ekirapa-Kiracho, et al., 2017) can be achieved through networking. Knowledge is a powerful tool, thus involving various stakeholders and networking will facilitate the implementation of WASH activities in a sustainable way and mutual sharing of knowledge between one nation and another. Strengthening partnerships with WASH actors will stimulate and attract developed nations' world banks and international organizations to continue to invest in the WASH sector (Goodman & Sanders - Thompson, 2017).

Research evidence suggests that implementation challenges are common in water resources planning and management. Effective implementation of integrated water policies is occurring globally and is a problem that is difficult to solve (Moretto et al., 2018). Moreover, some authors indicate that fragmentation at the levels of government and among the sectors also represents an important challenge (Musoke et al., 2018). The WASH sector is facing multiple challenges, and low-income countries are most affected due to lack of capital to invest in SWASH, weak governance and accountability and a lack of political will toward the WASH sector (Moretto et al., 2018; Musoke et al., 2018).

Factors that lead low-income countries to fail to address the barriers of WASH are sometime due to inadequate information and knowledge sharing during the formulating of global goals with little resources allocated to the WASH sector compared to other sectors (Musoke et al., 2018). However, unless people are effectively engaged in the WASH sector and institutional structures are updated to make them functional, low-income countries will continue to suffer from poor services and people will continue to die, particularly children under the age of five (UNICEF & WHO, 2018). Despite the SDGs aimed at universal access to resources, this is a dream for low-income countries due to the weak implementation of policies and accountability (Moretto et al., 2018). However, to capture the pace of SDG implementation, public accountability must be strengthened, and improving regulations, legislation, and effective monitoring of water and sanitation services will improve governance and service delivery in developing countries (World Bank, 2018).

Furthermore, the World Bank study found that the WASH programme must be designed with strategies for effective implementation, emphasizing the importance of



public and private sector engagement and the provision of more equitable and affordable services, with a focus on vulnerable people, including women and children, in third-world countries (Morgan et al., 2017; Rakotomanana et al., 2020; Un Women, 2019). It is an agenda for Sustainable Development for all nations to enable people to have WASH services as explained in Goal 3 (Good Health and Wellbeing); Goal 4 (Quality Education); Goal 5 (Gender Equality) and Goal 6 (Clean Water and Sanitation) (WHO, 2018). The WASH service in schools is essentially taken on board by all of these goals. in the SDG agenda. The WASH services should be made available to schools as they are effective in places where agents of behaviour change can be attained and sustained for continued generation (UNICEF & WHO, 2018).

### ***Global Analysis and Assessment of Sanitation and Drinking Water***

Safe clean water and sanitation are prerequisites for good health and success in the fight against poverty, hunger, child mortality, and gender inequality (UNICEF & WHO, 2018). WASH Stakeholders monitoring programmes are aimed at assessing the achievements in line with the Sustainable Development Goal for water and sanitation, which is to reduce the proportion of people without access to safe drinking water and basic sanitation by 2030. Likewise, the programmes aimed to promote healthy hygiene practices in the community and schools. Knowing the importance of monitoring, WHO and UNICEF (2018) have established the Global Analysis and Assessment of Sanitation and Drinking-Water (GLAAS) for tracking the progress of WASH programme implementation.

As explained by UNICEF and WHO (2018) monitoring and evaluation report of the WASH programme, will enable accountability and transparency in the progress of the

programme undertakings. Each nation through its responsible ministry compile the survey data and submit to the GLAAS team for global compilation and producing the global report. With the GLAAS report, it is possible for the nations to evaluate and implement water and sanitation policies (UNICEF & WHO, 2018). This report provides policymakers with global information for decision-making. The GLAAS reports give lieu to policymakers to formulate an operational framework for implementation of the WASH programmes to attain the global goals (UNICEF & WHO, 2018). For example, the report of GLASS 2018/19 showed that schools within the proven sources of drinking water were only 69 per cent around the world. Moreover, about 19% of schools in the world have no access to water. 12% of schools had a better source but were unavailable at the time of the survey. They were counted as providing a limited-service. (UNICEF & WHO, 2018). With such report, global summit can realise at what component of nations to put more efforts.

If education is the key to helping children escape poverty, then access to water and sanitation is the key to helping children safely maximize their education. To neglect this is to be unconsiderate with the well-being and health of children. However, we face the uphill battle of ensuring funds are prioritized to install and maintain basic water, sanitation, and hygiene services in all schools. Jiménez et al. (2018) pointed out that the benefits of having access to an improved drinking water source can only be fully realized when there is also access to improved sanitation and adherence to good hygiene practices. This is why emphasis is important for international organizations to set policies that intend to create an enabling environment for all nations and by considering the individual nation social economic status to be able to apply and achieve the intended SDGs with a positive impact on health-wise, economically and social-cultural

improvement. UN Women had emphasized this, particularly for women and girls (UN Women, 2019).

### ***National Policies to govern the WASH Programme***

The role of the central government is to develop policies according to the vision and mission of the programme. Sanitation and education policies are supposed to deliver the right framework which focuses on the objectives and requirements of the education and health sectors. Without a policy, the chance of losing direction in implementation is high. Due to its importance in the sector, sanitation issues are supposed to be on the national agenda. The policymakers in the education and health sectors have the role of developing policies that will advocate issues of sanitation at each level of implementation, from the school to the central level. Decision-makers can be effective if they are well informed about the importance of policy in SWASH issues, which causes unsolved WASH problems to remain unsolved for a long time within the institutions and even at the household level (Appiah-Brempong et al., 2018). Effective WASH interventions are needed to address issues of health, water, and education in the country (Kessy & Mahali, 2017). This is achievable where sufficient and reliable data are available for the planners to plan for such interventions.

Reviews showed that the global agenda of WASH in Schools aimed to advocate for the improvement of WASH infrastructures and for each nation to be able to come up with policies, strategies, and guides for implementation to meet the vision of 2025 (Appiah-Brempong et al., 2018; Kessy & Mahali, 2017). This justifies the ministries responsible for the SWASH sector formulating a strategic plan for implementing the national policy to reflect the Performance by Result (PbR) global goals. For example, the

Ministry of Education Science and Technology in Tanzania had to set an Operational Plan in which every financial budget year, a percentage of the fund is set aside for rehabilitation and construction of the WASH facilities in the schools so that it can meet the global requirement of Performance by Result of the School WASH Programme (Kessy & Mahali, 2017). However, policies are more technically oriented and do not relate to codes or regulations on the use of the facilities by students, their maintenance, and most importantly, conduct and behavior that uphold satisfactory standards of hygiene in schools (Kamara et al., 2017).

Water, sanitation and hygiene in schools consideration also appears to be gaining recognition. As the population grows, more pupils are sent to schools. In some countries like Tanzania there are also some education reforms such as free access to primary school education which encourage parents to send their children to school. In this case, enrolment exceeded the capacity of the schools (Kamara et al., 2017). This has in turn forced the educational policies to place a high value on investments in school infrastructure while ignoring standards designed to protect the health of school children. The situation is alarming and WASH pro-intervention activists has started to influence government policies to reconsider it and build more or expand schools hand in hand with the SWASH facilities . WHO (2019) recommended and insisted to have a programme that has emphasis on strategic coordination of non-organization and private schools to provide clear sharing of information and orientation on national SWASH policies that have similar standards to other WASH facilities in the nation. Strong coordination, good advocacy plans, good communication, leadership and understanding of the national policy will strengthen the implementation of the such programme. The programme members should

have mechanisms that will enhance the promotion of the SWASH. The policy on SWASH should incorporate both private and faith-based schools.

Evidence from UNICEF reports shows that 11% of primary and 24% of secondary school (including private schools) children in developing countries are in missionary (UNICEF, 2018). The necessity of homogeneity in the implementation of the programme and equity for all learners is crucial in this case irrespective of the school owner or type. The characteristics of schools in developing countries are said to be overcrowded, big class sizes, and insufficient school area and infrastructures. Urban schools have high students concentration compared to rural schools. Because of this, all students are faced with inadequate SWASH facilities but the urban schools population is more disadvantaged, and affected. This has escalated the problem of school dropouts and high levels of inequality and poverty between public and private schools, (WHO, 2019). The situation in private schools are however better off and as a result, private education has increased across developing countries during the last two decades (WHO, 2019). One of the reasons being inadequate public supply and unimproved SWASH facilities which promotes parents to send their children to private schools. Of-course, this is in part due to a rise in demand for non-state education among the poor, with the fastest growth occurring in Africa and South Asia's urban areas (UNESCO, 2017).

There are several policy documents that contribute directly or indirectly to the implementation of SWASH programme including the facilities repair and maintenance. The major ones include the Education Policy (2023), Water Policy (2002), Health Policy (2003) and that of 2017, Community Development, Gender, Elderly, and Children Policy. Others are National Sanitation Campaign II (2016), National Five Year Development Plan (2020

– 2025), WASH Guideline (2012) and Strategic Plan and the SWASH Guideline (2016). For each policy there is a strategic plan and guidelines associated with it. Strategic plans and guidelines are meant to guide implementation of the policies.

### **The Education Policy (2014)**

In Tanzania, the education sector has an education policy of 2014 and a number of other related guidelines within the education sector governing education services and standards. Some are: Inclusive Education Strategy (2009–2017); Basic Education Master Plan (2000) and Secondary Education Master Plan (2001–2005); SWASH Policy and Strategic Plan for School Water, Sanitation, and Hygiene (2012); Information Communication Technology Policy for Basic Education (2011); Higher Education Development Programme and National Higher Education Policy (1999); and National Action Plan for the Elimination of Child Labour (2009). The Ministry of Education, Science and Technology has revised its policy to mainstream the national objectives. To put the policy into action, the nation created a five-year Education Sector Development Programme of 2016/17 to 2020/21. This programme is aimed at embarking on the implementation of education targets (Kapinga, 2017). The main objective of the programme is to increase enrolment after the abolition of school fees (Shukia, 2020). The government of Tanzania received it positively and many parents encouraged children to join the education programme (Kessy & Mahali, 2017). However, the expansion of basic education created some problems, including a shortage of SWASH facilities (Kapinga, 2017; Shukia, 2020). Although the intention of the government is based on global goals, number 3, 4, 5 and 6 to provide quality education in public schools, it is troubled with multiple challenges. (Kapinga, 2017; Shukia, 2020). A shortage of sanitation facilities had

contributed to a large number of dropouts, especially adolescent girls (Adukia, 2017). The most vulnerable schools are public schools in rural areas.

The Education and Training Policy of 2014 had set its mission to of making education more accessible and of improved quality. The Education and Training Policy of 2014 has identified education priorities and strategies that will be implemented within the education sector to address issues of gender equality and equity in education. These strategies are focused on tackling the root causes of gender inequality and increasing girls' enrolment in formal education at all levels. The policy gives a guide on how to implement sustainable goals. Among the issues addressed in the policy of 2014 are equity in education provision as well as supervision and management opportunities in the education sector. To put these issues into action, the government, in collaboration with stakeholders, has been ensuring that gender equality in education and training is considered. This intervention has helped to increase the number of girls enrolled in schools and other educational institutions.

Tanzania is committed to achieving access to quality education as one of the targets of the Sustainable Development Goals (SDGs). The Government has embarked on a struggle to expand education to its citizens on the one hand, while eliminating barriers to education on the other. Female students in schools, colleges, and communities are facing, just to mention a few, the inadequacy of WASH facilities as a route to acquiring education. The most affected by poor learning environments are adolescent girls and female teachers. The enabling environment includes accessibility and affordability of clean and safe water, clean toilets, and privacy for their dignity (McMichael, 2019; Adukia, 2017). Furthermore, the government released Education Circular No. 3 of 2016 to guide

how to implement free education for all. This is the government's strategy for ensuring that all Tanzanian children, including girls, have access to basic education without restrictions from school fees and other contributions that affect students. Besides, the government has developed an inclusive education strategy for the years 2018–2021 that enables education stakeholders to collaborate in implementing education provisions for students with special needs as delineated in the Education Policy. The government has also built secondary schools in every ward to reduce the walking distance to and from school for students. Long walking distances were found to be a challenge for female students.

The government has constantly been emphasizing the construction of classrooms and teachers' houses and the construction of water systems and toilets with gender consideration in school surroundings. Despite these efforts, the problem of WASH services in schools still exists due to high demand as the number of pupils has increased since the introduction of free education. This has not been the case; the education sector policies are inadequate. According to Russell and Azzopardi's (2019) research, WASH policies in school coverage range from international to national policies, despite Ministers' commitment to implementing Sustainable Development Goals 4 and 6. However, when compared to other settings such as health facilities, WASH practitioners frequently fail to advocate for WASH in schools as fully packaged in their international WASH strategies (McMichael, 2019; UNICEF, 2018).

As far as SWASH is concern it has defined clearly the standards for school sanitation facilities including the ratio of number of students (for girls or for boys) per drop hole. Besides the efforts the Ministry is making, a lot has to be done to address the



situation. However, as a result of the increased enrolment, WASH facilities, particularly latrines, were in short supply (UNICEF, 2018). As a result, actions have been taken to WASH the actors' responses to the problem. Despite all efforts, WASH services are not promising, according to a report by WaterAid, prompting the Ministry of Education to develop five school WASH initiatives as well as a guideline.

### ***The National SWASH Guideline of 2016***

The SWASH policy has being developed to include the programme's vision and mission statements set the frame for the programme goal, and for each of these objectives, some outcomes have been defined to guide the systematic implementation of SWASH. These concepts are closely aligned with the national development plan. In addition, the SWASH Programme objectives reflect the WASH Strategic Plan, and some outcome targets are aligned with the National Sanitation Campaign II and National Five-Year Development Plan. The implementation responsibility lies with the MoEST. However, the contribution of a large body of partnering organizations is essential for effective implementation. This network of partners includes the Ministry of Water and Irrigation (MoWI), the Ministry of Community Development, Gender, Elderly, and Children (MoCDGEC), and the President's Office of Regional Administration and Local Government (PO-RALG). The MOEST and other WASH stakeholders are jointly planning and deciding on resources and monitoring their use and eventually evaluating the progress made with the necessary alterations. The programme implementation follows a scalability approach with the goal of having as many schools as possible improve the WASH systems and offer access to basic WASH practices to as many children as possible. The collaboration at the national level between these public organizations was

vital to ensure sustainable mechanisms for SWASH and a reliable upscaling process. Given the decentralized system of government in Tanzania, the relevant stakeholders at the local government authority level, namely at the council and ward levels, as well as school and community levels, need to coordinate their work, align the use of resources, and plan to monitor. Pragmatic collaboration is essential for the SWASH Programme to lead to sustainable improvements on the school grounds. The quality of collaboration and effort made at these levels ultimately decides the success of a SWASH intervention.

The purpose of the WASH programme in schools (SWASH) is to guide stakeholders on how to achieve key objectives of the school WASH Strategic Plans and guidelines (UNICEF & WHO, 2018). The programme provides room for engaging various stakeholders to pull up resources and to avoid duplication of efforts and hence improper use of resources (Pruss-Ustun et al., 2019). Such stakeholders include teachers, school management communities, parents, non-governmental organizations (NGOs), community-based organizations (CBOs), education administrators, and development partners. All stakeholders must work together to improve school water, sanitation, and hygiene services. Water, sanitation, and hygiene in schools aim to have a visible impact on children's health and hygiene by improving their own, as well as their families' and communities', health and hygiene practices. It also intends to improve the curriculum and teaching methods in schools, as well as promote hygiene and community ownership of water and sanitation systems. It boosts children's health, enrolment, attendance, and retention in school, paving the way for a new generation of healthy kids. Policymakers, government officials, residents, and parents all have a role to play in ensuring that every child attends school.

The development of the SWASH programme was intended to address these challenges and promote an improved learning environment in schools. The SWASH programme also contributes to poverty reduction by lowering health expenses; increasing productive time for teachers and the school community; improving attendance in schools and learning outcomes; improving dignity and privacy; and general improvement of the immediate environment of the individual pupils and the school community as a whole. The stakeholders are supposed to be coordinated by the Ministry of Education as custodians of the WASH Programme. Investing in SWASH is considered one of the most viable approaches to WASH at all levels. Changing schoolchildren's mindsets and behaviours results in rapid transformational changes that spread beyond the school boundary into respective communities, where the acquired hygiene knowledge and skills are carried back home as a spill over effect. The challenges and gaps are closely related to the learning outcomes and the economic development of the country

### ***National Water Policy (NAWAPO 2007)***

The National Water Policy (NAWAPO) is a detailed document that shows how to address water problems and challenges facing the water sector and is a sustainable solution to water services in the country (Kabote & Nyamhanga, 2017). Because the policy is a living document that, for a certain period, depending on the needs of the government, can be updated to meet the demand of the user, the Ministry of Water has to make changes to suit the national demand (Kessy & Mahali, 2017).

NAWAPO is one of the agencies of the implementers of global development as well as the national vision of 2025 (Jiménez et al., 2018; URT, 2019). The Ministry of Water through NAWAPO does work under the principles of decentralization by devolution,

public sector and civil service reforms, under which water resources have been used effectively for the development of the nation as the people in the community have been able to manage the water source more sustainably (Kalufya & Nyello, 2021). It was found that the nation was far from tracking the Millennium Development Goals, which was a dream due to poor governance within the ministry and other key ministries. Issues of coordination were not given enough priority. This required actors to devise strategies for the effective implementation of national policies. The reversed National Water Policy of 2002 is an output of several different stakeholders: technical studies, key related ministries, consultations, universities, workshops, and research institutions both from government and non-government (Kabote & Nyamhanga, 2017; URT, 2019). It was a necessity to revise the National Water Policy to be able to embark on some challenges of water in different sectors to implement the national and global goals.

### ***Water Sector Development Programme (WSDP) Document***

The provision of adequate, safe water is the main role of the Ministry of Water and Irrigation and is implemented through the Water Sector Development Programme (WSDP). The Ministry of Water developed the National Water Policy (NAWAPO) in 2002, which led to the development of the *National Water Sector Development Strategy* to implement the Water Sector Programmes. Under the National Water Policy (2002), the responsible ministry develops the Water Strategy and the National Water Sector Development Programme, which all together act as a key opener for water actors to have a mutual understanding of the implementation of the programme's priority actions that were identified for achieving the global and national goals (Kessy & Mahali, 2017). This programme envelops three mechanisms, where water and sanitation are among the

services it deals with. Water policy is considered to be a catalyst of planned activities and conscious actions intended to govern the government, executive and measures aimed at the implementation and efficient utilization of water resources (Jiménez et al., 2018). The WSDP programme cuts across sectors of ministries in the country. Water is at the heart of the development of any nation in the world and there would be no life on earth if there was no water. Tanzania is battling to become a mid-industrial country, where small and medium-sized industries have been built in recent years and each sector needs water to meet the intended objectives. This has led to a high demand for water to run industries (Kalufya & Nyello, 2021). This has called for many changes in the water sector as well as other sectors. Due to shortages of water, voices have been raised by investors, development partners, and local governments to look for possible alternatives for the management and sustainability of water resources so that the equitability and availability of water are maintained throughout the country (Smiley, 2019).

### ***Water Sanitation and Hygiene Policy (2022)***

The Ministry of Health is responsible for developing a sanitation policy for implementation from the primary to the ministry levels. The policy's goal is to bolster the country's efforts to improve sanitation and hygiene practices. The Tanzanian Public Act specifies the standards for latrines in institutions, including schools (Kabote & Nyamhanga, 2017). The definition is clear: the school sanitation facility must ensure the hygienic separation of excreta from users. The nation should consider sanitation services to be a human dignity and right, taking into account gender equality, inclusiveness, privacy, and safety (Kessy & Mahali, 2017).

Despite the Public Act, there is a significant gap in the provision of sanitation services throughout the country due to a lack of sanitation policy. The policy serves as a tool for resolving sanitation issues in the community as well as in schools, allowing schoolchildren, including vulnerable students, adolescent girls, female teachers, and people with disabilities, to receive the services they require (Kessy & Mahali, 2017; Mara & Evans, 2018). Because sanitation is a cross-cutting issue involving multiple sectors and actors, it necessitates a policy for effective implementation in the country. However, the implementation strategy is based on guidelines and strategies developed by the Ministry of Health under the Environmental Health and Preventive section. Eventhough, due to a lack of funds in the central ministry, implementation becomes difficult. The sanitation fund is administered by the Ministry of Water.

Other actors and organs are relying on the ministry to implement and monitor sanitation facilities and hygiene practices. Although there is a Memorandum of Understanding between the Ministries of Water, Health, and Education, Local Governments, and Development Partners, as well as WASH Strategies and Guidelines, implementation is not as effective as it should be. The provision of effective and sustainable sanitation, as well as the promotion of hygiene services, necessitates strong coordination, governance, and accountability, as well as strong sector leadership (Evan et al., 2018). As previously stated, the sanitation service cuts across many sectors, posing a problem for the sector ministry. The programme's effectiveness is determined by strong coordination, accountability, and good leadership, as well as the clearly stated roles and responsibilities of all actors involved in the programme and projects at various levels (Fuente & Bartram, 2018; Weststrate et al., 2019).

Tanzanian government transfers power to policymakers, who are in charge of establishing policies, plans, and budgets for the country's several ministries who may not be concern with budget allocation. Because no budget is set aside during the programme, the programme may miss the fund for the implementation of anticipated activities if there is no policy in place. A good example is the education policy in which, even though schools require latrines, the policy does not specify how the school WASH programme would be financed and implemented. The programme's funding comes from the water sector. The sanitation service is to some extent addressed by the local government and community where implementation is to solve the immediate problem, for example, when the school latrines are full and pupils and students do not have sanitation facilities in the community. The community is forced to construct any type of latrine in ad-hoc without even following the required minimum standards due to fund constraints and other responsibilities of that community.

The education and health sectors are among the major sectors within the country in which the demand for sanitation is high; implementing WASH activities without a collaborative policy is a huge gap. For example, in the case of how solid and liquid waste will be managed from the point of production and where to conserve it, the Ministry of Health is supposed to give the directives. Otherwise, mismanaged solid and liquid waste may cause diseases that may impact human health, including students (Kessy & Mahali, 2017). Moreover, since safe management of solid and liquid wastes has financial implications, policies and regulations are necessary to give directives on how the matter in question will be handled (Kihila et al., 2021).

***National Poverty Reduction and Growth Strategy***

In the case of schools, the National Strategy for Growth and Poverty Reduction (NSGRP-II; MKUKUTA II) established a specific target of having 100% of schools have adequate sanitation in line with the National Development Vision 2025 (Kessy & Mahali, 2017; Smiley 2019). To make this happen, the Ministries of Education, Health and Water, as lead ministries in SWASH, have all emphasized the importance of school WASH and have committed to raising standards in schools by signing the memorandum of understanding where roles and responsibilities are well defined for each ministry. The necessity of safe access to WASH in schools has been highlighted in a national policy debate. The new MKUKUTA II has a particular goal of providing appropriate sanitation to all schools, as well as acknowledging that effective education necessitates improvements in physical facilities, teaching and learning materials, human resources, and school governance.

### ***National Health Policy of 2003***

The National Health Policy of 2003 is the overall policy that guides plans, operations, and the delivery of health services. The policy vision is to "improve the health and well-being of all Tanzanians by providing equitable, high-quality, and affordable basic health services, with the goal of "facilitating universal access to clean and safe water while promoting environmental health and sanitation, adequate nutrition, the control of communicable diseases, and the treatment of common conditions. With all of these guidelines in place, the country is one of the signatories to international commitments such as the UN-SDGs 3, 4, 5, and 6 of ensuring healthy lives and promoting well-being for all at all ages; ensuring inclusive, equitable quality education; promoting lifelong learning opportunities for all; achieving gender equality and empowering all women and



girls; and ensuring sanitation for all (Russell & Azzopardi, 2019; UN Women, 2019; UNICEF & WHO, 2018).

### ***The National Strategic Plan for School Water, Sanitation and Hygiene***

The National Strategic Plan for School WASH in Tanzania was initiated in 2012 by the Ministry of Education and Vocational Training with the aim of ensuring access to water, sanitation, and hygiene facilities for all schools. This plan also seeks to enhance hygiene education, provide adequate facilities for students and staff, and build the capacity of stakeholders to collaborate effectively. The National Strategic Plan for School Water, Sanitation, and Hygiene (WASH) in Tanzania underscores the importance of providing safe drinking water, adequate sanitation facilities, and promoting hygiene practices in educational institutions. However, a WASH assessment conducted in 2018 revealed that a substantial number of rural and urban public schools face challenges related to sanitation facilities.

**Challenges in School Sanitation:** The assessment highlighted that over 24% of rural public schools in Tanzania lack basic sanitation facilities or rely on inadequate options such as pit latrines without a slab. The Ministry of Education has grouped WASH interventions into SWASH Tool kits, with local government authorities responsible for awareness creation and training activities.

**Implementation Strategies:** The core function of the National Sanitation Campaign for Schools is to train Ward Education Officers (WEOs) and teachers on implementing the programme. Schools are encouraged to establish WASH Clubs supervised by teachers to promote hygiene practices. Community mobilization activities, including the

dissemination of information, education, and communication (IEC) materials, are coordinated by school WASH Clubs, WEOs, SWASH Coordinators, and health officers.

**Stakeholder Coordination:** The Ministry of Education collaborates with over 37 school WASH stakeholders through the School WASH Technical Working Group (WASH TWG) to ensure effective implementation of the School WASH Programme. The TWG convenes biannual meetings to discuss progress and challenges in WASH interventions.

To guide the implementation of the SWASH programme, various policy documents are utilized, including the SWASH Strategic Plan, SWASH Guidelines, SWASH Tool Kits, and Training Manuals. These documents provide a comprehensive framework for stakeholders to align their efforts towards improving WASH conditions in school. The National Strategic Plan for WASH in Schools was launched in 2012 by the Ministry of Education and Vocational Training. The goals of this Strategic Plan are to create an enabling environment to ensure that all schools can provide water, sanitation, and hygiene facilities, as well as hygiene education, to all students; to ensure that schoolchildren and staff, including children with special needs and adolescent girls, have adequate WASH facilities; and to build the capacity of all stakeholders, particularly teachers, non-governmental organizations, and other partners, to work as a team. Another intention of the Strategic Plan is to support and monitor the MDGs and MKUKUTA goals, as well as the upkeep and sustainability of SWASH facilities (Kessy & Mahali, 2017). Policy guidelines, programme formulation, institutional arrangements, awareness and capacity building, infrastructure development and maintenance, cross-cutting issues, financial mobilization, and management are all included in the WASH Strategic Plan. This strategic area addresses the need for policies, strategies, guidelines,

and operational manuals to ensure that school WASH services are delivered sustainably. It is also written to take into account the requirements of all relevant national policies, strategies, laws, and regulations. It is believed that the strategy could solve the problem of the gaping shortage of WASH facilities due to increased population growth. With government programs aimed at educating the country's populace, the Ministry of Education expanded its education efforts between 2002 and 2004 by developing programs that increased student enrollment. However, due to the increased enrollment, WASH facilities, particularly latrines, were in short supply (UNICEF, 2018). As a result, actions have been taken to improve the actors' responses to the problem. The Strategic Plan for School Water, Sanitation, and Hygiene encouraged the direct implementation of the school program in schools by calling on different WASH players to provide technical assistance. The SWASH program in the country is implemented within the SDGs in the framework of the Tanzania Development Plan. Despite all efforts, WASH services are reported to be not promising, according to the report by WaterAid, prompting the Ministry of Education to develop five school WASH initiatives as well as guidelines.

#### WASH and Student Life Skills Guidelines

The Ministry of Education has issued guidance on the provision of hygiene education to pre-primary and secondary school pupils. The guidelines share highlights of the themes that can be covered by teachers when teaching hygiene-related subjects in their regular lessons. According to the instructions on the guideline, much emphasis on the delivery of knowledge-based on sanitation and hygiene education should be age-appropriate, interactive, participatory, child-friendly, and disability-sensitive from child to child, peer education, and life skills-based hygiene education approaches (McMichael,

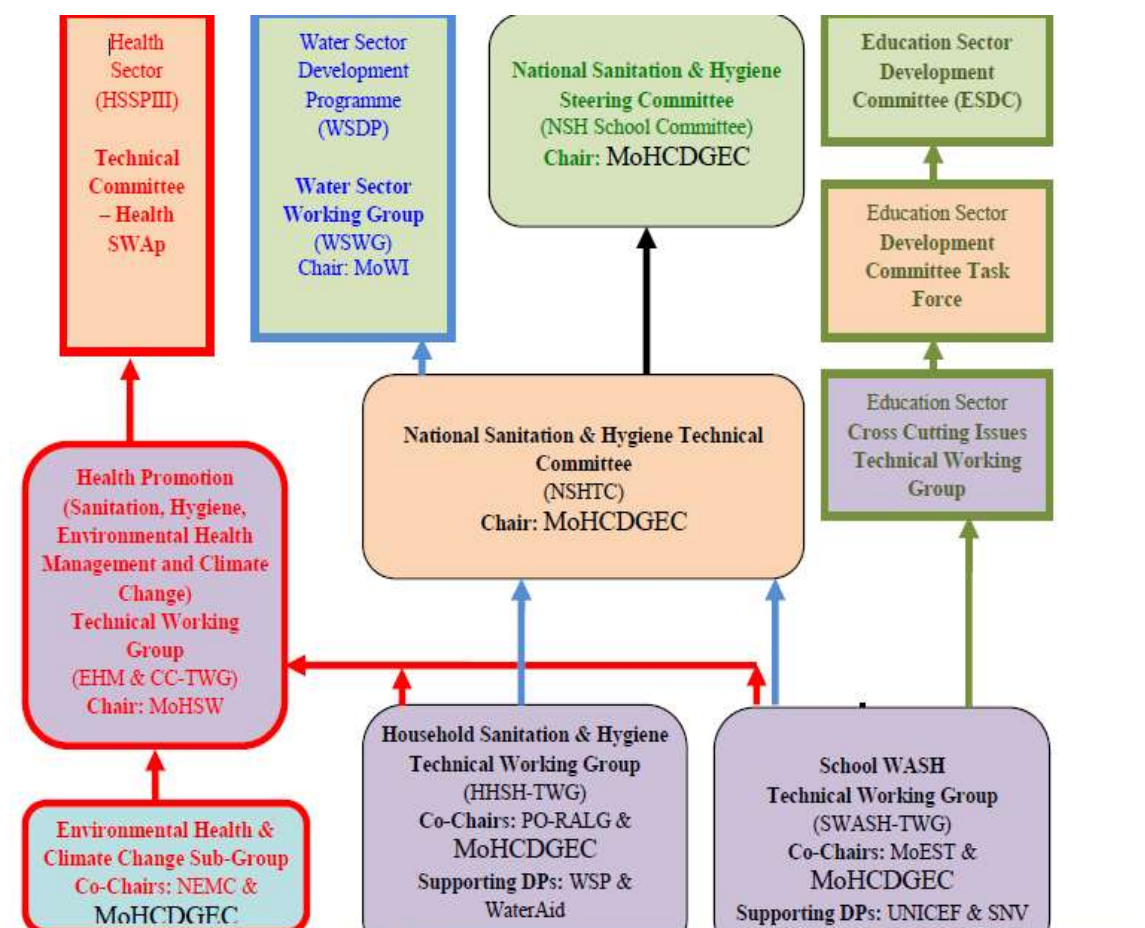
2019). Proper and effective strategies allow students to investigate and acquire hygiene-promoting knowledge, attitudes, and values, as well as practice skills (Barata & Maricoto, 2019; Tamiru et al., 2017). Hutton and Chase (2017) also confirmed that the strategies would help them avoid risky and unhealthy situations and adopt healthier lifestyles. Students with life skills in hygiene education have methods to experiment with, discover, build, and construct their knowledge (Hutton & Chase, 2017). Additionally, students with life skills education have the opportunity to customize information, develop positive attitudes and values, and practice new skills. The school curriculum has room to develop potential skills for school-to-school children in the area of sanitation and hygiene education (Alvarado & Bornstein, 2018). The skills are a combination of knowledge, attitudes, values, and life skills that are assumed to promote better sanitation and hygiene practices in families, schools, and communities. Furthermore, research confirm that a positive impact occurs when the school management provides hygiene facilities including latrines, water supply, hand washing facilities, and solid waste disposal (Kihila et al., 2021; Rarichan et al., 2018). School sanitation and hygiene instruction incorporates clean water and sanitation facilities, as well as hygiene, into the school curriculum. The main goals of most sanitation and hygiene teaching programmes in schools are assisting children in developing knowledge, attitudes, and life skills that is, ability to cope with life that support the adoption of good hygiene behaviors and improved health and reaching out to families and communities to promote safe hygiene and sanitation.

### ***WASH Sector Coordination in Tanzania***

WASH services play a critical role and have a significant impact across multiple sectors. For the WASH programme to be implemented sustainably in these sectors, it must be

well-coordinated. However, a review of the literature indicates significant challenges with coordination in many instances. A comparison of policy development in Tanzania, Kenya, Sri Lanka, and South Africa to that of industrialized countries revealed limited coordination in policy implementation due to inadequate work planning (Ekirapa-Kiracho et al., 2017). Despite having sound policies, studies show that these developing countries still face gaps in work planning, highlighting the need for an effective implementation system. Figure 2.3 illustrates the coordination of the WASH programme, with each sector having clearly defined roles and responsibilities. The flow diagram depicts the reporting and dialogue mechanisms. However, due to funding constraints, effective implementation remains inadequate.

*Figure 2.3 WASH Dialogue of National SWASH Strategic Plan 2012 -2017*



### ***Education Sector Monitoring and Evaluation In Tanzania***

The Ministry of Education established the Monitoring and Evaluation Department to enhance the government's efficacy in monitoring and evaluating education policies and programmes including the SWASH programme. Members of the department was based on a broad understanding of individual officers' profiles and competencies. Their selection emphasizes on the effectiveness and functioning of the organizations involved; the distribution of tasks and coordination between these organizations; the overall policy framework; the management of public sector employees; and the social, economic, and political context in which Monitoring and Evaluation take place. Despite government acknowledging Monitoring and Evaluation as MoEST basic role and involvement of various players, the assessment done by Coswosk et al ( 2019) found some flaws in the Monitoring and Evaluation in the availability of experienced officials in ministries ). Furthermore, there were also some shortfalls in coordination of the Monitoring and Evaluation,. This was true for coordination between the many implementing agencies as well as coordination within the primary ministry, notably MoEST.

There are multiple reasons for the defficiencies found in the M&E team, but the lack of clarity and definition regarding the roles and responsibilities of the various individuals stands out. Because of the following reasons, the efficacy of several departments, particularly in the MoEST Monitoring and Evaluation section, is not satisfactory: a relatively low position in the ministerial hierarchy; an improper internal structure; insufficient Monitoring and Evaluation experience of members; and the lack of a dedicated budget (Huston and Moriarty, 2018; Kessy & Mahali, 2017). Moreover, as mentioned these other authors, the lack of a well designed measurement and evaluation framework

is another barrier that hinders the effectiveness of the department. This is linked to poor coordination, which resulted in a dispersed collection of operations as well as duplication and redundancy. The majority of these activities are routine monitoring, with a focus on collecting statistical data, activity reporting, and field visits, with little investment in data analysis and assessment studies. Monitoring and Evaluation system is disconnected from education policy and goals, and it is unable to adequately assist in policy or practice improvement (Kamara et al., 2017; World Bank, 2018). Inadequate policies, plans, and programmes are results of insufficient evaluation processes. The demand for Monitoring and Evaluation appears to stem mostly from old bureaucratic processes, but it is driven by a desire to assess the organization's effectiveness in accomplishing its policy goals. Where expertise in Monitoring and Evaluation is lacking as mentioned by Coswosk et al. (2019), the evaluation process will not be effective. Coswosk et al. (2019) argued that despite of the presence of competent personnel with many years of experience, there is no correlation between a given post and the profile of its occupant, resulting in a lack of expertise in planning and management, particularly in the sector of monitoring and evaluation.

After the inauguration of the SWASH programme an independent monitoring and evaluation was found necessary. The team involved several members from the responsible ministries and departments, community, NGO and other stakeholders. The purpose of doing the Monitoring and Evaluation of the SWASH programme is to inform the government and people about what has been achieved and also to be able to identify barriers accounted for during the implementation process and evaluate the benefit of the programme to the targeted group if it has been achieved timely.



Evaluation and monitoring helps to identify potential stakeholders who can be engaged in the programme. In addition, the Monitoring and Evaluation give an indication of whether the approaches used are more effective and if they can be applied in other programmes. Through monitoring and evaluation, additional knowledge may be generated and inform the government for future implementation. Thus, participatory monitoring is very crucial for the school's WASH programme. Despite having a Monitoring and Evaluation framework tool, most developing countries are facing several challenges, including economic, social, inadequate funding, management systems, and low knowledge (Kamara et al., 2017). Research conducted in 21 different countries and discovered that the majority of the data reported by this countries is not standard and inconsistent as a result of weakening evaluation and outcome data analysis (Headey and Palloni, 2019). Similarly, the JMP surveys of 2018 indicated that about 67% of the visited countries have no national WASH plans, budgets, or monitoring plans (UNICEF & WHO 2018). Currently, in Tanzania, day-to-day WASH facilities and practices in schools are monitored by school inspectors and Ward Education Coordinators (WEC) using prepared checklists and monitoring tools. The collected data is sent to the District Education Officers (DEOs). At the district level, SWASH reports are compiled using the Educational Management Information System (EMIS). The consolidated data at the LGA level is then submitted to regional and ministerial levels for further action, either as policy or for decision-making at the local level. At all levels, the reports are compiled and saved for reference. These data and reports are used for policy development, planning and budgeting for different interventions, especially for schools at all levels, be they wards, districts, regions or the outermost at the ministry level.

A setback to this is that, the checklist and EMIS used to collect data do not cover much as far as SWASH is concerned. This calls for the checklist and monitoring tools to be harmonized to include basic SWASH data. The JMP report of 2018 suggested that developing countries develop programmes and guidelines that are well-coordinated and holistic approaches that state the roles and responsibilities of each stakeholder at all levels (UNICEF & WHO, 2019). Furthermore, for the effectiveness of the implementation of the programme in school, capacitating teachers and school monitoring committees are crucial activities. The capacity should be based on operation and maintenance, follow-ups and monitoring, and issues related to financial management. It is also necessary to consider the impact of increasing financial efforts to improve the enabling environment within schools, particularly increasing the ratio of latrines per boys and girls, and access for disabled pupils (Headey & Palloni, 2019).

### ***The National and Collaborative SWASH Monitoring Programme***

The national and joint monitoring programmes in the area of institutions describe the strategy's goal of mobilizing resources from WASH actors to implement the programme in a way that is described by the national and joint monitoring programme (JMP) of UNICEF. Through the school's WASH technical working group, the strategy also identifies WASH implementers and specifies each player's role. This strategy is assumed to allow the country to fulfill its WASH commitments at the national, regional, and global levels. The strategy allows advocating to policymakers and development partners as key actors in influencing stakeholders to invest in school WASH. Jena (2018) identify some gaps that needed to be addressed such as inadequacy in several building blocks, insufficient regulation for rural water supply and sanitation, and some key stakeholders,

including the private sector, are not yet well engaged to play their roles. The need for WASH to be mainstreamed into the horizon of the sector development documents with the country's development vision and that of the SDGs framework (UNICEF, 2018) is thus obvious. Similar to the UNICEF advocacy, Durokifa and Ijeoma (2018) recommends that WASH should be mainstreamed in sector development documents, aligning with the country's development vision and SDGs framework for it to perform.

The role of the Ministry of Education is to undertake the responsibility of developing guidelines to be used in SWASH and ensure good coordination. There have been some recent efforts to improve coordination in the sanitation sector. The multi-ministerial Memorandum of Understanding paved the way for a more realistic approach in which the ministry responsible for education is in charge of developing guidelines, monitoring, and evaluating SWASH (Kessy & Mahali, 2017). Currently, the SWASH Programme is implemented in all regions of Tanzania Mainland through the NSC, where some schools have to receive funds for implementing the programme from NSC. Moreover, the Ministry of Education, in collaboration with development partners, has embarked on various school WASH activities, including the incorporation of hygiene education into school curricula, together with the provision of latrines and water facilities in some schools. The purpose of all these is to improve and maintain the standards of WASH facilities in schools. For the purpose of evaluation, the Ministry responsible for education had to propose M&E team and set up their terms of reference. The E&M team is drawn from different government departments, Development Partners, NGOs and community members (Kessy & Mahali, 2017). This deemed necessary because of the multisectorial nature of SWASH components and resources.

## Literature Gap

Literature shows that there is a gap among policymakers that some of the global goals should be merged and implemented simultaneously to achieve the expected outcomes altogether without affecting the other goals. For example, in the case of the provision of quality education, it will be possible if there is a convincing learning environment and suitable infrastructure, with well-trained teachers with broad knowledge. Otherwise the impartation of knowledge to the students would be difficult. Among the factors that contribute to outstanding achievement is the countries' readiness to implement international WASH policies (Coswosk et al., 2019). The translation of international policies into action requires enough knowledge of the WASH arena and sufficient resources. Resource mobilization in the developing countries is not well understood and uttered such that the hinderance to the programme performance is not well established especially in the developing countries.

Framing good policy for the international level, one should comprehend the implementation process, resources and the impact and outcomes through the mapping of potential research findings and stakeholders to feed the policymakers and implementers. Further more, policies formulation should include both public and private sectors; this will facilitate the implantation stage in that particular country. Available literature doesnot show clearly how and to wahat extent should a given stakeholder be involved with what responsibility. Despite the emphasis from the international arena and the importance of WASH and its high priority among the 17 SDGs, national policies has reflect the WASH agenda as an important issue to tackle in their national papers but the efforts done to implement, and reach the targeted objectives is still not well explained.

This could have been one of the major area that needs to envisage. Taking into account that access to WASH services is recognized as a human right, all nations are obliged to have strong policies and influential leaders for decision-making to enable the government to allocate enough budgets for WASH services, especially for developing countries that are most vulnerable to poor WASH facilities. Little facts are available in case of Tanzania that gives concrete reasons for meager budget allocated to SWASH despite of sanitation and other intergrated policies that should have brought a significant impact on the effectiveness of water and sanitation projects in schools and the SWASH programme as a whole. Most of the activities depend on donor funding. Indeed, there is a gap of information on how best the collaboration from different stakeholders should be used to develop sanitation and health work plans for implementing and monitoring the activities according to the national vision instead of being based on the lead by the ministry's partners alone

The programme's implementation is based on developed documents including policies, guidelines and strategies, which seems to lack policymaker support. Despite having a water policy, the implementation it in schools is ineffective possibly due to weak coordination among the ministries responsible for supervising the activities. Literature search doesn't seem to show significant efforts in awareness of the importance of WASH. Moreover, throughout the literature a major share of budget is donors and that it does not flow through the responsible ministry for implementation. For example, the fund for sanitation is under the Ministry of Water while the ministry responsible for sanitation is the Ministry of Health and that responsible for education is the Ministry of Education and higher learning and that of Reginal Administration and Local Government Authority. How

the responsible government entities together with the rest of the SWASH stakeholders should synchronize their responsibilities and be accountable for SWASH performance in such a complex situation is not well documented. Sometimes the implementation may become a challenge due to bureaucracy within the sectors. This is something to be studied to have a clear policy statement for better programme. With this the Ministry responsible for education in the country will be able to develop participatory work plans that are implementable and meet the desired results. From the complex situation, Tanzania's Education Policy does not state how much to invest in sanitation at the school level or how much the community will contribute and engage in improving the school's WASH facilities. Moreover, the policy does not state how much the local government authorities, who are the owners of the school, will pay for school WASH facilities. This is an indication that sanitation is not yet set as national priority, regardless of global and regional commitments that have been made by the country.

Much as there is a strategy to increase enrollment of students in the public schools, there is no literature that shows the approach and expected procedure for increasing the enrolment of primary and secondary schools. This objective of expansion is being to take place and achieved as a result of government political will. No data that could substantiate its future outcome. The expansion of basic education led to the high population of students in classrooms as well as the shortage of drop holes as a result of the overcrowding of pupils and students in the toilets. A recent school assessment, done by UNICEF and NBS in 2018, found that only 28% of schools are meeting the national latrine standard of the pit latrine ratio (UNICEF & NBS, 2020). The poor performance could be because of reliable data to establish clear framework to provide sanitation and hygiene

services at schools. The available policy framework emphasise on the provisional of WASH services in public places. Little has being reported on the local governments by-laws as far as school water supply, sanitation and hygiene is concern. Such documents will enforce the existing implementing sanitation programmes and the use, repair and maintainace for sustainability and behavioural change.

### **Chapter Summary**

Globally, there is a growing emphasis on ensuring water availability, sanitation, and proper hygiene practices in schools. International organizations such as the World Bank and UNICEF are at the forefront of advocating for the importance of School Water, Sanitation, and Hygiene (SWASH) initiatives. When effectively implemented, SWASH has been shown to offer various benefits. The incidence of waterborne diseases such as typhoid, cholera, trachoma, and even the current COVID-19 pandemic is significantly reduced, if not eliminated, within school premises and at students' homes. By providing adequate SWASH services, a conducive learning environment is created, enhancing cognitive learning and ultimately improving school performance. Students have the opportunity to learn and develop skills to manage their health and environment, becoming agents of change in their communities upon leaving school. This individual behavior change not only impacts environmental management but also contributes to maintaining the national economy. Resources that would have been allocated to prevent and treat diseases can be redirected towards other economic purposes. Furthermore, well-equipped students become valuable human resources for national development.

However, existing literature indicates that only a small number of schools have successfully implemented the SWASH program, often with assistance and support from intermediary levels. Schools in rural areas are particularly challenged in achieving the desired goals of having ideal and adequate SWASH facilities on their premises. Despite schools being managed by local government authorities and communities under decentralization policies, the implementation of SWASH programs lacks a clear framework and specified procedures for constructing school WASH facilities. Success in these programs often relies on strong management councils and donor support. To ensure the success of a high-quality SWASH program, the council must coordinate and support SWASH efforts by providing expertise, resources, integrating SWASH into relevant departments, and sharing resources. The focus should be on a combination of actions, including identifying reliable water sources, constructing SWASH facilities, ensuring proper operation and maintenance, promoting behavior change both in schools and at home.

International organizations have developed guidelines, strategies, and expected milestones for countries to incorporate into their national policies and development frameworks. Despite these efforts, many low-income countries have not achieved significant results in their SWASH programs. Key constraints include insufficient funds, lack of stakeholder involvement in planning and monitoring, inadequate planning, low political will, limited awareness creation, and cultural norms and taboos. Proposed solutions include raising awareness from local communities to high-level planners, fostering political will, mobilizing funds rigorously from various stakeholders, and implementing robust monitoring and supervision. Governments are urged to allocate



more budgetary resources to SWASH to enable planned activities to be completed. Regular follow-ups through a supervisory system and periodic school visits are essential for monitoring progress and evaluating achievements against set milestones. Involving teachers in life skills-based hygiene education ensures that students are well-oriented towards positive sanitation and hygiene practices. Collaboration with communities facilitates effective operation and maintenance of infrastructure and promotes the desired changes in sanitation and hygiene practices.

SWASH in schools serves as a gateway to increasing WASH coverage and usage in communities. The program aims to bring about a significant transformation in water, hygiene, and sanitation practices in schools by emphasizing behavior change. Sustainable use of WASH facilities necessitates behavioral changes in schools and surrounding communities. Therefore, any efforts to enhance SWASH should address community WASH concerns and promote behavioral change towards the use and maintenance of facilities. SWASH extends beyond schools themselves and requires multidisciplinary actions to be successful. Sustainable hygiene and sanitation behavior changes in schools and communities are best achieved through awareness and education targeting poor hygiene practices and enhancing sanitation and hygiene education.

The SWASH programme aims to ensure that all school children have increased access to quality water, improved sanitation, and hygiene facilities by 2030, with the expectation that they will adopt changed sanitation and hygiene behaviors, leading to improved learning capacity, school performance, and reduced disease incidents. It is widely recognized that WASH challenges are closely linked to educational outcomes. To

address WASH concerns effectively, the Ministry of Education, as the custodian of education, needs to adopt a sector-wide approach and employ participatory methods to address WASH issues in communities surrounding schools, attracting more funding from diverse sources. By doing so, the expected behavioral changes in SWASH among all students in schools can be notably achieved, thanks to increased access to quality water, sanitation, and hygiene facilities.

A review of related literature reveals several challenges related to the implementation of SWASH programs in low-income countries like Tanzania. School mapping and national SWASH monitoring in Tanzania highlight concerns regarding water supply in schools, followed by inadequate latrines. Without quality water supply, hygiene practices are compromised, leading to subpar sanitation standards. While some schools have SWASH infrastructure in place, operational maintenance is lacking, often due to economic challenges within the community and the country as a whole, as well as issues related to management oversight, failure to adhere to construction standards, and over-enrollment of students. To address the problem of inadequate sanitation and hygiene facilities, rigorous implementation of the SWASH program is essential to enhance hygiene provisions, including safe water supply and waste management systems in schools and communities at large. Major challenges identified in the literature review include water scarcity, limited and uncoordinated funding, poor coordination, insufficient community involvement, gaps in policy frameworks and planning, and inadequate education, knowledge, and skills among students and the community.

### **CHAPTER 3: RESEARCH METHOD**

Based on most recent school WASH assessment conducted in Tanzania in 2018, the provision of WASH services in schools, particularly public schools, is reported to be sub-standard and insufficient. This is despite government initiatives such as the SWASH Programme, which aims to encourage various stakeholders to invest in the WASH sector. While various approaches have been utilized, ranging from local community involvement to interventions by advanced stakeholders, the outcomes of the program have been disappointing. The implementation of the program has shown minimal progress, with challenges in WASH facility construction becoming more evident following the introduction of free education in 2016, leading to a disproportionate enrollment compared to available WASH facilities in schools (UNICEF & NBS, 2020).

The government of Tanzania initiated the SWASH Programme in 2012, calling on WASH actors to invest in the construction, rehabilitation, and provision of WASH facilities in schools. However, assessments have revealed that many schools still lack improved WASH facilities (UNICEF & NBS, 2020). In addition to the inadequate facilities, hygiene education and practices are not adequately promoted in most schools, contrary to policies emphasizing the establishment of sustainable school WASH facilities and the integration of WASH in teachings, clubs, and competitions. The various interventions and methodologies introduced by stakeholders involved in promoting SWASH vary in cost and outcomes, necessitating harmonization. The unsatisfactory outcomes have prompted a re-evaluation of the programme. This study aims to evaluate the implementation of the WASH programme in Tanzanian public schools, using the Pwani Region as a case study.

The goal is to gather sufficient data to establish appropriate methodologies for implementing and evaluating SWASH innovations.

The findings are expected to be utilised by various stakeholders, including programme developers from the ministries responsible for education, health, and WASH partners, to monitor and evaluate WASH activities and practices in public schools. This information is crucial for the equitable allocation of resources to address WASH and bridge gaps in interventions. It will assist WASH actors in designing better methods and approaches for implementation and developing indicators for future monitoring and evaluation of sanitation and hygiene in schools, aligning with the goal of achieving the Sustainable Development Goals by 2030.

The study methods, design, data collection, and analysis were planned to meet the requirements for collecting reliable information. Triangulated methods were necessary due to the vast area and social, economic, and natural differences that could influence program outcomes. Different populations, including planners, supervisors, facilities constructors, and students, were involved, each with distinct responsibilities and concerns regarding the program. Exploratory and descriptive designs were employed to collect both qualitative and quantitative data, considering the diverse influences on program achievement.

This chapter provides a description of the study area, the design approach, and the methodology used for data collection. The characteristics of the research area are outlined to justify the chosen approach and design, considering factors that influenced the selection of the location. Details about the study area, including its location, regional

administrative structure, physical features, demographic data, and background problems, are provided to support the research methodology and data discussion. The sampling techniques, sample size determination, data collection methods, instruments, materials, and instrumentation for research methods are described, along with the operational definitions of variables for each approach. The procedures for data collection and analysis, including the analysis method, data reliability and validity, ethical considerations, and limitations, are also explained. The chapter concludes with a summary in the last paragraph.

### **The overview of the selected study area**

Tanzania comprises 30 administrative areas, including the Pwani Region, covering a total area of 32,407 square kilometers. Positioned between latitude 7° 00' 0.00" S and longitude 39° 00' 0.00" E along Tanzania's coastal belt, the region's administrative hub is in Kibaha. The region typically experiences temperatures ranging from 27 to 32 degrees Celsius; however, these temperatures have been subject to fluctuations due to ongoing environmental changes. As per the 2012 national census data, the region boasted a population of 1,098,668 (URT, 2014), exhibiting a population growth rate of 2.2 percent, ranking it as the fifteenth most populous region in the country. Moreover, it stood as the 21st most densely populated region, hosting an average of 34 individuals per square kilometer. Considering the growth rate, the estimated current population stands at 1,310,365 individuals (Figure 3.1).


Administratively, the Pwani Region is divided into six districts: Bagamoyo, Kibaha, Kisarawe, Mkuranga, Mafia, and Rufiji (Figure 3.1). This study specifically targeted three out of the five districts within the Pwani Region, namely Kisarawe, Kibaha, and

Bagamoyo, situated in Tanzania. The selection of these districts was purposeful, driven by factors such as year-round accessibility, cost-effective transportation, and time efficiency for the researcher. Notably, Kibaha district, despite being the smallest, exhibits a higher level of economic activity compared to the others, which predominantly engage in agricultural activities at a subsistence level. Kibaha district comprises 22 wards, Kisarawe district encompasses 15 wards, and Bagamoyo district includes 26 wards.

Historically, Kibaha, Kisarawe, and Bagamoyo were predominantly inhabited by the Kwere, Ndengereko, and Zaramo ethnic groups, respectively. However, due to urbanization trends, the region has witnessed an influx of individuals from diverse ethnic backgrounds migrating to settle within its boundaries.

*Figure 3.1 Pwani Region and its Administratively Districts and Population*

<b>Pwani Map</b>	<b>District</b>	<b>Population (2012)</b>
	Bagamoyo	311,740
	Kibaha	198,697

	Kisarawe	101,598
	Mafia	46,438
	Mkuranga	222,921
	Rufiji	217,274
	Total	1,098,668

### Education System in Pwani Region

The education system and facilities in the region mirror those found in other Tanzanian regions, encompassing pre-primary, primary, secondary, and post-secondary schools. Pre-primary education admits students from the age of 2 and lasts for a maximum of three years before they transition to primary education at a minimum age of 5. Primary education spans seven years, admitting students as young as 5 and concluding when they reach 12 years of age. Formal secondary education consists of 4 years for ordinary level (Form 1–4) and 2 years for advanced secondary school level (Form 5–6).

The educational facilities in the region are divided into private and public ownership. In total, the region hosts 669 schools, comprising 558 primary schools and 111 secondary schools. Notably, Bagamoyo boasts the highest number of secondary schools, constituting 40% of the total, equivalent to 24.4% of the region's secondary schools, with 24 being public secondary schools. Following Bagamoyo, Kibaha TC houses 31 schools (18.9%), Kibaha DC has 14 schools (8.5%), Rufiji accommodates 21 schools (12.8%), and Kisarawe possesses 20 schools (12.2%). Mafia has the fewest

secondary schools at 6, accounting for 3.7% of the region's total secondary schools. Additionally, while Bagamoyo hosts more public secondary schools (24), Kibaha boasts a higher number of private secondary schools (20) (Unpublished data from the Regional Education Office, Pwani, 2021).

### **Research Approach and Design**

Research is a systematic process aimed at finding solutions to identified problems. Scholars like Rahman (2017) and Timans et al. (2019) have defined the research approach as a structured plan that guides the researcher from broad assumptions to specific methods of data collection, analysis, and interpretation. Creswell and Creswell (2018) have categorized research approaches into two main types: quantitative and qualitative, with a combination of both known as pragmatic approaches or mixed methods. The choice of approach depends on the nature of the information to be gathered, the characteristics of the research subjects, and the expected responses.

Researchers must carefully consider these factors when selecting an appropriate approach or combination of approaches to ensure the collection of valuable and reliable data to address the research problem (Creswell & Plano Clark, 2018; Silva, 2017; Timans et al., 2019). Each approach has its strengths and weaknesses, as highlighted by Creswell and Creswell (2018), who emphasized the importance of considering the research topic and objectives when deciding on the research approach to use.

The research process typically involves various stages, including identifying the research problem, designing the study, collecting and analyzing data, interpreting results, and providing recommendations. These stages are interconnected, and the sequence of implementation may vary. Researchers need to be flexible in their approach to adapt to



the evolving nature of the research process and ensure a comprehensive and effective study. In line with Rahman and Timans et al.'s assertion, selecting the appropriate research approach is crucial for obtaining meaningful and reliable results.

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### **Quantitative Approach (Deductive)**

The quantitative research approach focuses on explaining phenomena by collecting numerical data that is analyzed using mathematical and statistical methods. This approach, as described by Sharma (2020) from the Horizon University perspective, aims to establish general laws or principles and assumes that social reality is objective and external to individual actions. Data collection methods in quantitative research involve gathering structured information that is then analyzed quantitatively. Numeric data is collected directly or non-numeric responses are categorized and coded into numeric form for analysis. This approach allows for comparisons between subjects or groups and enables the measurement of agreement or disagreement among respondents.

Quantitative research is known for its efficiency in terms of time, energy, and resource utilization (Apuke, 2017). The data obtained is easy to analyze, consistent, precise, and reliable. The structured nature of data collection tools allows for the rapid collection of large amounts of data, making it easier to administer and evaluate quickly. Responses can be tabulated swiftly, saving time in the analysis process. By using statistical data for analysis, the need for lengthy result descriptions is reduced, as noted by Apuke (2017) and Creswell & Plano Clark (2018).

When conducted correctly, quantitative research provides high reliability and allows for generalizability of research findings through well-designed sample selection processes. Clear documentation of survey instruments enables other researchers to assess the validity of the findings. The use of statistical software streamlines data analysis, making the process less time-consuming. Standardized approaches in quantitative

research allow for replication of studies in different contexts, ensuring comparable findings over time.

In the study, the quantitative approach was employed specifically when numerical data was required, such as determining the number of students in a school by age and gender

### **Qualitative Approach (Inductive)**

The qualitative research approach is focused on exploring the human element or object of a given topic, delving into how individuals perceive and behave or describing the characteristics of the object under study (Mohajan, 2017). Qualitative data is gathered through various methods such as surveys, participant interviews, questionnaires, documents, texts, and researcher impressions and reactions. This approach employs a variety of data collection and analysis techniques, including purposive sampling, interviews with checklist questions, semi-structured or open-ended questionnaires. In your study, the qualitative approach was chosen to gather insights on individuals' thoughts and feelings related to the research questions.

Despite the known limitations of qualitative research, such as potential biases and unreliable information due to societal taboos and values, your study did not encounter these hindrances explicitly, as noted by Sommer (2019). The grounded theory technique was applied based on the researcher's experience in eliciting information for evaluating the school WASH Programme implementation, focusing on unmeasurable aspects that could be explained or described. This approach was primarily used in interviews and surveys to capture qualitative data that delved into intrinsic values and perspectives.

In the qualitative approach, the collected information needed to undergo a systematic processing. Data organization and cleaning were essential steps to identify recurring themes and patterns. Detailed data analysis and investigation followed after coding and entry into a statistical package. For instance, in qualitative survey data analysis, each participant's responses were reviewed and coded in a spreadsheet to identify common themes. Additionally, field notes and observation recordings were utilized to complement information gathered from open-ended surveys addressed to school administrators and in-depth interviews with key WASH stakeholders, school groups, and committees.

Through these qualitative data collection methods, your study was able to capture rich insights and perspectives that provided a deeper understanding of the school WASH Programme implementation and the stakeholders' experiences and perceptions.

### **Mixed Approach (Pragmatism)**

Similar to other methodologies, a mixed research approach involves the collection, analysis, and integration of quantitative data (such as experiments and surveys) and qualitative data (like focus groups and interviews) (Sharma, 2020). This method includes gathering measurements, numerical data, textual information, and visual content (Mohajan, 2017; Wohlfart, 2020). Mixed methods combine qualitative and quantitative approaches to enhance understanding and strengthen the researcher's perspective from multiple angles (Creswell & Plano Clark, 2018; Dawadi et al., 2021). Moreover, a mixed method offers the advantage of facilitating comparisons between the contradictions found in qualitative and quantitative methodologies (Creswell & Plano Clark, 2018; Dawadi et

al., 2021). Within mixed methods, the voices, experiences, and discoveries of participants play a crucial role. Another benefit of emphasizing mixed-method research is the increased flexibility in study design and the promotion of scholarly interactions (Dawadi et al., 2021).

Researchers can utilize a mixed method to address or overcome the limitations of individual research approaches (Dawadi et al., 2021). In this study, a mixed approach was employed, incorporating a cross-sectional study that involved physical observations, survey interviews, and standard checklist questions to compare the strengths and weaknesses of qualitative and quantitative studies. Johnson and Christensen (2017) recommend using a mixed approach based on the research topic to achieve more appropriate results compared to using a single methodology in isolation. Creswell and Creswell (2018) noted that employing two methods tends to yield more reliable findings. Johnson and Christensen (2017) argue that this approach offers a deeper understanding of the research problem compared to using only one method.

For instance, in cases where a program or project consists of multiple phases, a mixed-method approach is essential for addressing research questions effectively (Ratan et al., 2019). The mixed method encompasses active features that involve collecting and analyzing both quantitative and qualitative data, as was done in this study. This method was selected for the study because neither qualitative nor quantitative sources alone could adequately cover all the necessary data. Some inquiries required numerical data, while others necessitated descriptive information and opinions.

The mixed method was used in the triangulation with other methods to be able to collected data of quantitative and qualitative nature that had allowed the checking of the

validity and reliability of the findings (Creswell & Plano Clark, 2018). The mixed method gave room for the researcher to ask members directly about how they think the programme affects their pupils' attendance and performance at the same time request for attendance, and other quantifiable programme outputs.. The research questions of whether community knowledge, attitudes, and practices on school WASH programmes have an impact on their children had qualitative answers while effect on children's attendance and performance had quantitative answers. Interviews with the school community, with such a groups with mixed feelings, confidence and comparison ability (parents, teachers and students) who fall into different groups of beliefs, cultural norms and wealth on the school water, sanitation and hygiene and attendance of pupils, needed a combination of methods.

The utilization of a mix or combination of methods presents complementary strengths in the absence of overlapping weaknesses. Appiah-Brempong et al. (2018) asserted that quantities linked to specific findings were employed to enhance precision in words, images, and narratives. Utilized in this study, it bolstered the researcher's capacity to address a wider range of questions comprehensively, thereby enhancing strengths and mitigating potential weaknesses inherent in a singular method.

### ***Research Design***

A research design serves as a comprehensive blueprint chosen to integrate various study components logically and coherently, ensuring the successful addressing of research question(s) (Sileyew, 2019). Essentially, it encompasses the arrangement of conditions for data collection and analysis in a manner that harmonizes the relevance of information with the research purpose and economic considerations (Creswell & Plano

Clark, 2018). The research design acts as the roadmap for data collection, measurement, and analysis, with its selection contingent upon the research problem. Depending on the study's nature and data requirements, a design may be classified as qualitative, quantitative, or mixed methods. Some perspectives refer to these designs as approaches (Apuke, 2017; Creswell & Plano Clark, 2018; Dawadi et al., 2021; Johnson & Christensen, 2017; Mohajan, 2017).

Qualitative research aims to address questions of who, what, where, when, and how, with answers expressed through numbers, statistics, graphs, and charts. Conversely, qualitative research seeks to capture viewpoints, answering how and why. Regardless of the approach, other perspectives categorize research designs into five common types: descriptive, exploratory, explanatory, experimental or causal, diagnostic, and correlational. An exploratory design is employed when the researcher aims to uncover facts and details surrounding the subject matter, as seen in the case of the SWASH program. On the other hand, a descriptive design is rooted in the researcher's theory, striving to depict the subject matter without intervention while providing an in-depth understanding of the phenomenon. It seeks to answer questions of what, how, when, and where through observations, case studies, and surveys.

The explanatory design delves broadly into the subject matter to address the why and what, combining elements of both exploratory and descriptive approaches to elucidate and describe the phenomenon qualitatively. The diagnostic design is structured to investigate the root causes of observations. More prevalent in scientific studies are experimental, sometimes referred to as causal designs. While the former explores the relationship between two variables, the latter is designed to ascertain cause-and-effect

relationships, examining how independent and dependent variables interact (Adom et al., 2018).

Given the study's nature, descriptive and/or explanatory designs were employed to unveil the current state of affairs regarding the SWASH program, including who is involved, how tasks are carried out, when it commenced, where it stands, and why it is in its current state. To address these questions, surveys, Focus Group Discussions (FGDs), interviews, and personal observations were utilized as data collection methods. The objective was to gather and consolidate pertinent information aligning with the research purpose and economic considerations (Creswell & Plano Clark, 2018). The problem's nature and the environmental context guided the selection of the appropriate design.

In this case study, focusing on understanding the WASH status in schools where the WASH program is implemented, along with the challenges faced by implementers and the acceptance by the school community, an apt plan or design was necessary for data collection and observation within a specific social unit in its natural setting. The chosen designs emphasized the need to gather both qualitative and quantitative data to depict the WASH situation in schools (Creswell & Plano Clark, 2018).

## **Population, Sampling Frame and Sample of the Research Study**

### ***The Research Population***

A population is defined as a group of people, items, units, or institutions sharing similar characteristics and distinguishable from another group (Elfil & Negida, 2017). In this study, the population consisted of all public schools in the region where the WASH programme had been implemented for a minimum of five years. Specifically, the Pwani



region was chosen as the case study, considering the uniform approach to WASH programme implementation in public schools nationwide. The respondent population included teachers from schools with at least five years of SWASH programme implementation, committee members of these schools, students, NGOs, FBOs, and CBOs involved in SWASH implementation, funders of the programme, and civil servants responsible for programme planning, monitoring, and evaluation. The population was heterogeneous and stratified into four groups: teachers, key informants (NGOs, FBOs, CBOs, and civil servants), students, and school committee members. The school population, based on public schools under the SWASH programme, comprised 569 primary and 119 secondary public schools under government ownership in the Pwani Region (BEST, 2020).

### ***Sampling Frame***

A sampling frame was established, representing the group of units from which the sample would be drawn. This operationalized representation of the target population is crucial for the sampling method. The sampling frame comprised a list of elements belonging to the study area population, specific to the research objectives. In this study, the region had a total of 688 public schools in districts such as Bagamoyo, Kibaha DC, Kisarawe, Mafia, Chalinze, Mkurunga, Kibiti, and Rufiji, with a primary to secondary school ratio of 5:1 (569 primary and 119 secondary schools). Out of these districts, Bagamoyo, Kibaha, and Kisarawe were purposefully selected as the sampling frame due to their accessibility, transport convenience, and time management considerations. Among these districts, only 337 schools had implemented the SWASH program for at least five years, while the remaining districts were not included in the study.

Following the purposeful selection of the three districts as the sampling frame, the study units for surveys and FGDs were drawn from the 337 public schools where the SWASH programme had been implemented for a minimum of five years. The survey population comprised 337 schools from which teacher respondents were randomly selected (Population I). For the Focus Group Discussions, the population included school committees (PIII) and WASH club members (PIV) in these 337 schools. Additionally, the region had 24 key informants, including regional and district water and sanitation teams, stakeholders, and development partners in WASH, making up the population for key interviews (P II), with all 24 units selected for interviews (Elfil & Negida, 2017).

Table 3.1 Key Informants used in the study

S/No	Category	Number
1	DWST (4 x 3 districts)	12
2	RWST (Regional)	4
3	NGO (All in the 3 Districts)	8
Total		24

### ***Sample Unit and sampling***

#### ***Sample unit***

Silleyew (2019) defines a sample unit as a single member (element) or a collection of members subjected to data analysis selected from the entire population. To overcome constraints, the researcher must select a small number of units from the population as representatives, with the findings eventually being generalized to the entire population.

Using a representative sample entity in a population has the advantage of reducing costs and time (Creswell & Plano Clark, 2018; Elfil & Negida, 2017). Additionally, sample studies expedite research analysis (Silleyew, 2019), enabling researchers to work efficiently on data collection, analysis, and interpretation. When appropriately selected, the accuracy of data in sample studies surpasses that of population studies (Elfil & Negida, 2017), enhancing the reliability and validity of results (Astuti et al., 2018). Selecting a sample allows researchers to conduct comprehensive research studies in less time, with fewer resources and costs.

In this study, sampling units were categorized as PI, PII, PIII, and PIV. Population I (PI) comprised head-teachers or their representatives from selected schools under the WASH programme in the three districts, with 60 members drawn from each district. Population II consisted of key informants, while Population III and IV included school committee members and SWASH club members from selected secondary schools, respectively. Sampling was not conducted for the key informant category, as all key informants (P II) were interviewed due to their small number.

### ***Sampling techniques and procedures***

Sampling techniques and procedures involve probability sampling, where every unit in the population has a chance of selection, and non-probability sampling, where some elements have no chance of selection. Non-probability sampling, such as purposeful or judgmental sampling, focuses on researchers' interests and criteria for selection. In this study, non-probability sampling was initially conducted on the sampling frame and schools, with three districts selected out of five and only schools with the SWASH programme for a minimum of five years included.

For survey respondents, the sample size of 180 schools was obtained using an automated calculator with a 5% margin of error and 95% confidence level. Thirty-two public schools that did not qualify for the five-year duration in the WASH program were excluded from the sampling. The 180 respondents from the selected schools provided sufficient data for statistical analysis. The 180 schools were randomly selected from lists obtained from District Education Officers, with 60 schools from each of the three districts. One school committee and one SWASH club were randomly chosen from selected secondary schools for discussions on sanitation and hygiene. The selection of a sample facilitated the collection of necessary information efficiently, reducing costs and time compared to visiting all schools under the SWASH programme.

The probability selection of 60 schools from each district ensured an equal chance of inclusion for any school in the sample from all public schools where SWASH had been conducted for a minimum of five years. Each school was assigned a number, and the selection process was conducted transparently in the presence of the researcher and District Education Officer. The selected schools provided respondents for the survey, ensuring a representative sample for analysis.

The process involved writing the number and name on a piece of paper, folding it multiple times in the same manner, and placing it in separate boxes for primary and secondary schools. Subsequently, a gentle shake and overturning of each box occurred. A district office representative was tasked with selecting 60 pieces of paper from the primary and secondary school boxes at specific ratios: 1:3 for Kibaha, 1:11 for Kisarawe, and 1:10 for Bagamoyo. These ratios aligned with the actual secondary to primary school ratios in each district, resulting in a 1:5 ratio of secondary to primary schools in the sample units.

The 60 paper pieces from each district were then unfolded on the table in the presence of the researcher and the District Education Officer. The names of the 60 selected schools from each district were recorded as the sample schools, from which the headmaster or SWASH teacher was chosen as the survey respondent (see Table 3.2).

Table 3.2 Number of Primary and Secondary Schools Visited per District

District	Selected school			
	Secondary schools	Primary schools	Total	Ratio
Bagamoyo	10	50	60	1:5
Kibaha	15	45	60	1:3
Kisarawe	5	55	60	1:11
Total	30	150	180	1:5

Observations regarding the status and implementation of SWASH were made and recorded by the researcher at these schools. The primary to secondary schools ratio in these districts was nearly comparable to the regional ratio of 1:6, calculated from data obtained from the regional offices (2021), but lower than the national ratio of 1:4 (BEST, 2020). Following this procedure, a total of 180 schools were selected as sample units for the study from the three districts, comprising 150 primary schools and 30 secondary schools (see Table 3.2). From these 180 schools, 180 respondents (headteachers or school WASH coordinators) were chosen for the survey.

### ***Selection for Key Informants for the interview***

Selection of Key Informants for Interviews Key informant interviews are a method of capturing individuals' perceptions of their actions, revealing their understandings or

misunderstandings of topics of interest. According to Fleming et al. (2022), key informant interviews involve speaking with a select group of knowledgeable individuals, allowing for exploration of unanticipated concepts and problems crucial to the study's objectives. Well-designed key informant interviews can reveal local attitudes on program-related issues such as sanitation and hygiene practices, perceptions of menstrual issues in the community, and people's attitudes toward sanitation technology (Fleming et al., 2022). In this study, key informants are essential to provide information on evaluating the effectiveness of implementing interventions in WASH programs. Cossham and Johanson (2019) stated that the researcher should find answers to inquiries based on interviews with a few key informants, such as challenges faced during program implementation.

The number of selected key informants for interviews typically ranges between 10 to 35 people for efficiency. Structured interview questions rely on a list of topics to be discussed (Bernard, 2018). Interviewing key informants allows for a free flow of ideas and information, providing detailed insights that can be expanded upon by research (Cossham & Johanson, 2019). Key informants in this study included regional and district local government staff responsible for WASH, WASH stakeholders within the districts, members of the Pwani Region Water and Sanitation Team (RWST), members of the District Water and Sanitation Team (DWST), and NGOs involved in WASH programs in the three districts, totaling 24 key informants (see Table 3.1).

### ***Selection for Focus Group Discussion members***

**Selection of Focus Group Discussion Members** Two types of focus groups were conducted for each district, one consisting of secondary school students and the other of school committee members from selected schools. From the 60 selected schools in each

district, one school was randomly chosen, and its school committee or SWASH club members were used for the FGDs. Eight members were randomly selected from the school committee or SWASH clubs to form the FGDs. For the three districts, three school committee FGDs and three SWASH club member FGDs were conducted (see Table 3.3).

Table 3.3 FGD members from the Three Districts

Council	Type of respondents	Number of participants
Bagamoyo	School Committee (one school)	8
	WASH Club members (one school)	8
Kibaha	School Committee (one school)	8
	WASH Club members (one school)	8
Kisarawe	School Committee (one school)	8
	WASH Club members (one school)	8
Total		48

Only the school WASH Club members were considered for inclusion in the students focus group discussion as they are part of students expected to have the better insight of the programme.

### ***Research Materials/Instrumentation***

#### ***Data collection tools/Instruments***

Data consist of collected facts such as words, numbers, and measurements, serving as inputs for decision-making in programs or projects. These data are gathered using various tools known as data collection instruments (Shaffer et al., 2018). Instrument selection in research involves choosing specific tools for data collection (Shaffer et al., 2018). Data collection tools function as mechanisms or devices for gathering data. The

selection of data collection methods should consider what data to collect, how to collect and present the data, where data will be collected for analysis, available resources and geographical factors, when to collect data, and who is responsible for data collection (Showkat & Parveen, 2017). Shaffer et al. (2018) argued that data collection instruments must be of high quality, and researchers should be proficient in using them to ensure the collection of valid data.

The appropriate data collection tools are those that enable the careful gathering of necessary information without distortion. These tools empower researchers to produce convincing, credible data that can be analyzed and interpreted to address research questions effectively (Cresswell & Cresswell, 2018). The effectiveness of research instruments directly impacts the authenticity of findings. Due to the significance of data, Showkat and Parveen (2017) emphasized the necessity of systematic planning, patience, determination, hard work, and effective completion in data collection. Various types of data collection tools include paper questionnaires, computer-assisted interviewing systems, checklists, interviews, and observation records (Showkat & Parveen, 2017). The selection of the appropriate data collection tool should align with the research purpose and data type. Showkat and Parveen (2017) noted that data can be qualitative or quantitative, sourced from primary or secondary sources. Primary data, acquired firsthand by the researcher, are considered more reliable, while secondary data are pre-recorded and reported by organizations or individuals. Secondary data, as explained by Wickham (2019), are easier and quicker to obtain and are cost-effective compared to primary data. However, assessing the quality and relevance of secondary data can be challenging, and it may sometimes be outdated.



In this study, both primary and secondary data were collected. The collection of primary data necessitated the use of high-quality data collection technologies and instruments. Questionnaires and checklists, recognized as popular instruments for surveys and interviews, were employed (Cresswell & Cresswell, 2018). Questionnaires were administered to survey respondents, while checklist questions were utilized in interviews and focus group discussions. Materials used predominantly included paper for questionnaires, checklists, and note-taking during focus groups, interviews, and observations. Cameras were used to capture specific photographs during transecting. Public transport facilities were primarily used for movement between locations. Computer and internet facilities were essential for literature search, secondary data collection, data entry, analysis, and report production.

## **Data Collection Procedures and Ethical Assurances**

### ***Data collection procedure***

Data collection involves the gathering of specific information with the aim of substantiating or refuting certain facts (Sileyew, 2019). It is a well-established and systematic process that enables researchers to address research questions, test hypotheses, and evaluate outcomes. The data collection phase is a fundamental aspect of research across various fields of study, including physical and social sciences, humanities, and business. While methodologies may differ among disciplines, the focus on ensuring accurate and ethical data collection remains consistent. The primary objective of data collection is to obtain high-quality evidence that can facilitate robust data analysis and lead to the development of compelling and credible research findings. Regardless of the field of study or the classification of data as quantitative or qualitative,

precise data collection is crucial for upholding research integrity. The selection of suitable data collection instruments and adherence to clear guidelines help minimize errors during the data collection process (Creswell & Guetterman, 2018).

Data collection is a demanding task that necessitates thorough planning, hard work, patience, perseverance, and more to successfully complete the process. This complexity has led to the utilization of multiple methods in the study, considering factors such as cost, validity, and time constraints. Inferences drawn from poorly coordinated data would lack validity and reliability. The use of different data collection methods serves the purpose of cross-checking the validity and reliability of the data.

In this study, both primary and secondary data were collected from various sources using different tools/instruments. Primary data, obtained directly from respondents or observations, were gathered using specific instruments such as questionnaires for surveys, checklist questions for interviews and focus group discussions. Record datasheets were employed to collect primary data from interviews and personal observations, while scoring sheets were utilized for collecting primary data from focus groups. On the other hand, secondary data, which had been previously collected by other researchers and possibly undergone statistical processing, were sourced from various documentation and resource centers and recorded on fact sheets.

Secondary data were acquired through a desk study involving the review of reports in the District Education Officers' records and other reliable sources of information to gather the necessary data for addressing the research questions posed.

## **Interviews**

Interviews are a common method employed in qualitative research that involves direct personal interaction between interviewers and interviewees (Sileyew, 2019). Researchers engage in face-to-face or remote interactions with respondents through various means such as telephone, Skype, or email questionnaires (Creswell, 2018; Sileyew, 2019). This method allows researchers to observe the body language of respondents, draw conclusions, and gather additional information. In this study, interviews were conducted in a verbal interaction format between interviewers (key informants) and the researcher, supported by checklist questions (see Appendix 1) designed to extract information, opinions, and sentiments.

Before conducting interviews and administering survey questionnaires and checklist questions, both open and closed-ended questions were prepared. Pretesting of the questionnaires and checklist questions was carried out to make necessary corrections and enhancements before using the tools in the data collection process. The pre-testing involved selecting six schools outside those chosen for the survey and focus group discussions for questionnaire testing, and three additional members outside the selected interviewees for checklist question pre-testing. Pre-testing, as highlighted by Hashim et al. (2022), is a valuable exercise in research as it helps refine and adjust research tools, address shortcomings, and challenges before the actual study, and facilitate questionnaire completion.

Interviews with key informants, who included all WASH stakeholders involved in the program implementation, aimed to evaluate criteria such as relevance, efficiency, effectiveness, impact, and sustainability. The interviews focused on resource availability, policy issues, performance assessment at project and strategic planning levels,

implementation processes, successes, shortcomings, challenges, best practices, lessons learned, and sustainability issues. Interview questions for all categories are presented in Appendix A.

## **Surveys**

Survey research entails systematically collecting information from a sample of individuals through their responses to questions (Creswell & Hirose, 2019). Surveys are commonly used to investigate social issues and occurrences within a community to identify underlying causes and potential solutions. Surveys involve various tools for data collection, such as structured questionnaires administered through personal interviews or other data collection devices. Survey methods can be exploratory, descriptive, or explanatory, each serving a specific purpose. A combination of survey methods was preferred in this study to ensure comprehensive and reliable data collection. Questionnaires were distributed to headteachers or their representatives who were well-versed in the WASH program to independently complete the prepared and pretested questionnaires (see Appendix I).

Surveys were essential in this study due to the wide coverage of the survey area, involving multiple individuals providing information within a specified timeframe. Surveys allowed for limiting responses to the required information, ensuring data cleanliness and reliability without compromising accuracy. The survey tools were tailored to address research questions identified during the literature review and to fill existing data gaps related to SWASH practices advancement and sustainability challenges. The survey methodology considered the parameters to be evaluated, the characteristics of the population and sample, and the need for both qualitative and quantitative data collection.

However, in some cases, surveys may not provide detailed information on the entire group or population, necessitating the use of multiple methods (Showkat & Parveen, 2017).

### **Focus Group Discussions (FGDs)**

The Focus Group Discussion (FGD) is a qualitative research method and data collection technique where a selected group of individuals engages in an in-depth discussion on a specific topic or issue, facilitated by an external professional moderator (Muijeen et al., 2020). It involves gathering individuals with similar backgrounds or experiences to discuss a particular area of interest. This method constitutes a form of qualitative research where participants are asked about their perceptions, attitudes, beliefs, opinions, or ideas. The FGD heavily relies on a moderator or facilitator and is structured around a predefined set of questions. The primary objective of FGD is to gather information or responses to prepared questions (Zacharia et al., 2021). Participants are encouraged to interact with one another freely. Unlike other research methods employed in the study, FGD promotes discussions among participants and includes a note-taker.

In the case study, FGDs comprised a small group of eight participants who engaged in open discussions on research issues. Two focus group discussions were conducted with members of school clubs and a school committee selected from each district.

The participants were meticulously chosen to closely mirror the broader population under study. Initially, participants, excluding students, were invited in writing, explaining the purpose and methodology of the discussion. For students, SWASH teachers were tasked with informing them accordingly. The FGDs were moderated discussions, with the

researcher acting as the moderator to ensure smooth execution. Participants were selected based on their knowledge of the WASH program implementation and objectives. To attract participants, the time, place, and duration of the discussions were collaboratively scheduled, and members were informed in advance to facilitate planning.

With a structured plan in place, utilizing a checklist of open-ended questions (Appendix 3), the discussions were aligned with the research objectives, complementing each other and addressing the most critical issues first, followed by less significant ones. The use of open-ended questions enhanced the effectiveness of the research in terms of data collection. The researcher's role was to conduct the group discussions confidently, leading members impartially through the questions. The checklist questions for the FGDs focused on the WASH programme implementation in schools to gather opinions on construction/rehabilitation, awareness-raising activities, programme relevance, and satisfaction regarding covered needs.

During the discussions, members were encouraged to express their opinions on program implementation, including satisfaction with activity outcomes, sustainability measures, outreach, community participation, stakeholder cooperation, and encountered or anticipated challenges. The researcher ensured that the research plan and objectives were well understood by group members from the outset, clarifying the group's purpose upon requesting their participation. Discussions were open and participatory, with all members encouraged to share their views. The researcher diligently recorded all opinions and comments expressed within the group, listing and scoring them where necessary to prioritize them.

Opinions and comments from group participants were meticulously recorded, and for certain points, a matrix ranking procedure was employed to weigh and prioritize them, assigning scores accordingly. Points were scored on a scale from one (lowest priority) to five (highest score).

### ***Observations***

Observation as a method of data collection is defined as the act of observing and describing the behavior or characteristics of a phenomenon or subject. It involves collecting data and information through observation, sometimes referred to as participatory study, where the researcher establishes a connection with the respondent or objects. In this method, the investigator or selected individual observes specific events and records all observations using an agreed-upon model, such as tables, drawings, or records. The researcher immerses herself in the setting, such as school premises, to observe and collect information by watching and recording data for later analysis and interpretation. Harvey (2018) highlighted the researcher's reliance on a method called researcher observation, involving recording information on objects, processes, relationships, and events. This method can be categorized into participant, non-participant, and indirect observation. Non-participant or indirect observation relies on observations made by others.

In this study, structured controlled observation methods were utilized to collect data on the general state of WASH infrastructure, patterns of utilization and maintenance, and students' behaviors. The researcher observed SWASH structures in schools and the surrounding environment to assess sanitation and hygiene facilities, capturing evidence of their nature and state through photographs. The specific indicators or variables used

in data collection were derived from WASH guidelines (BEST, 2020). Additionally, unstructured observation methods were employed to gather information in a free and open manner without predetermined objectives, schedules, or variables.

Structured but naturalistic observation was used to study spontaneous student behavior in open or natural settings, recording observations based on prescribed indicators. While naturalistic observation may have limitations in terms of reliability due to uncontrollable variables, the researcher's familiarity with the SWASH program and social and psychological knowledge facilitated the collection, recording, and classification of data. Through a checklist, the research collected data on specific behaviors, knowledge, skills, and practices, enabling direct observation of the environment without altering it. Observation provided the researcher with the opportunity to collect data on a wide range of behaviors, interactions, and verify reported observations from interviews. It allowed for comparisons between reported and observed data, helping to avoid bias during evaluation and interpretation processes. The observation method granted direct access to researched environments and behaviors, ensuring accurate data collection without extensive technical knowledge. It also facilitated hypothesis formulation by observing and understanding subject activities, perceptions, likes, and dislikes.

Desk study and documentary review were conducted to obtain secondary data from various sources, including reports, literature, and official records, to answer research questions. Desk study, a form of secondary research, involved reviewing existing data from sources like public libraries, websites, government agencies, and newspapers. The method was cost-effective and time-saving, providing essential information on the study's scope and objectives.



### ***Ethical considerations***

Ethical considerations play a crucial role in research, particularly in social studies involving human subjects. Researchers are required to adhere to ethical standards throughout the research process, which includes obtaining ethical approval and addressing issues such as anonymity, confidentiality, informed consent, and participant well-being. It is imperative to consider procedural ethics, ethics in practice, and professional ethics codes when addressing ethical challenges in research. These considerations are essential for ensuring the ethical conduct of research and safeguarding the rights and well-being of the participants

### **Ethical Guarantee in the study**

Ethical approval for the research study was obtained from UNICAF REAF on August 11, 2020. The study used a tier-consent process whereby formal departments in education were consulted to provide approval and support for the study. Before data collection, the researcher had explained the nature of the research study and its aims and activities to the Regional, District and Wards Executive Officers and to the head of each of the selected school. and the research requested their permission to conduct research activities at the selected schools . At the school level, informed teacher/matron/patron consent was requested and obtained from all school WASH club members and school committee members. In the case of SWASH club members under the age of 18, the consent was requested and obtained through SWASH teacher or headteacher/master of the school. These were students from whom oral assent to participate in the study was requested and obtained. The letter of request to respondents was submitted two weeks before the start of the study. Language The national language (Kiswahili) was used to

explain to participants how to obtain oral consent from participants. The purpose of the study, procedures, risks, benefits, rights of the participant, and protection of data confidentiality were assured to the respondents.

The researcher ensured that the information could be provided in English or Swahili by the respondent in either source, be it from the interviews, surveys, or focus groups. The questionnaires were developed and written in English language but during execution in some cases Swahili language was used to give some clarification as deemed necessary. All Check list questions were developed using English language. Later on those used in the focus group discussions were translated into Swahili language. Request of consent, Clarification and moderation of the focus group discussions with the School Committee members and the school WASH club members were done in Swahili language. The use of Swahili language in the FGD is because these two groups had some members who are not well conversant with the English language. Meeting point and data storage All records were kept in safe storage, and interview locations were at the convenient and private as agreed by the respondents. Interviews were conducted at a place agreed to have no any environmental risk exposure. Completed questionnaires were/are stored in a locked cabinet accessible only by the researcher.. In very few cases, participants had no time or had some feelings of discomfort in discussing the services received and satisfaction with these services while they were still on the school.. In such a case the interview was shifted to another selected place, assuring the participants of confidentiality of the information provided. No personal identifiers were collected, ensuring confidentiality. No sensitive questions that may have caused the respondents' discomfort were asked in the survey as such questions were pruned or rephrased after

thr pre-testing exercise. Informed consent Informed consent involves potential research participants choosing to participate in a study after receiving detailed information of the reseach and a request to participate. They have the right to refuse the request and to withdraw at any time. In a case a participants withdraw the so far collected data not considered any more in the compilation and is destroyed. The study uses coded information for dissemination, ensuring participant identification in unknown beyond doubts. It was the responsibility of the researcher to make sure that the decisions had to be made free from coercion by a competent person who could have some influence on the dicisions made by the participants. Further more the researcher had to ensure that the information was given to the under 18 year participants by a person who understand well the reseach information given and appreciate the associated risks. Both language of Swahili and Engilish was used depending on the kind of participant to inform them and get the conscent. Confidentiality and anonymity Confidentiality and anonymity are important in research that involves the community. Both confidentiality and privacy during interviews were assured and maintained. The meeting places were chosen so that the respondents could talk freely and uninterrupted. The database was accessible only to the key investigator and was de-linked from personal identifiers to ensure anonymity. By doing all these, the researcher had adhered to research ethics, including the study tools aquisition, obtaining participant consen, and maintaining anonymity, confidentiality, and security of all collected data the researcher had conformed to the UNICAF requirements. The procedure had ensured that the data is kept confidential and the processes are rather private.

During the inception session, the researcher answered questions to the satisfaction of the study participants before obtaining consent and proceeding with the interview. Quality Control and Data Management Data quality is a key priority when planning a study to guarantee appropriate results and conclusions. Detection and remediation of errors in the data collection process, whether they are made intentionally or not, promotes data integrity. Properly gathered data has several advantages for a researcher. Quality data leads to quality information or findings, resulting in saving time and proper utilization of resources (Sadiq & Indulska, 2017). Other advantages include the ability to accurately answer the research questions, other researchers will be in a position to repeat and validate the study. Quality and integrity of information is the keys to leading other researchers to pursue fruitful avenues of investigation. In addition, proper data compromise the integrity of the data in public policymaking and avoids having undoable plans some which may even be harmful to human beings. The researcher is supposed to work on quality control to find the essential remedies for erroneous data gathering procedures and prevent them from happening (Salehi et al., 2018). This means that quality control of data collection processes should be clearly known and stated and the essential steps to prevent recurrence through feedback and education should be taken hitherto (Smit & Onwuegbuzie, 2018). Inadequacy in data collection that may lead to poor quality data and that demand full attention include: individual data item mistakes; systemic errors; protocol violations; issues with specific employees; or site performance fraud or scientific misconduct (Sadiq & Indulska 2017). These authors argue for the researcher to include one or more secondary measures to validate the quality of data to be collected. Otherwise it will be difficult for researchers to be in the position of answering

the research questions of the study appropriately and to be able to test the hypotheses and assessing outcomes of the research. To obtain quality data, the collection procedures were well designed and followed starting from the planning of the research protocols and procedures.

This entailed deploying quality control measures on the development of the data collection tools. As a control measure of the methodology and tools, general and peer-review sessions was conducted with some head teachers and certain officials from the Ministry of Education Science and Technology (MoEST). This was done to ensure that the assignment's undertakings, technique, and general research strategy are all in a manner that could be understood and appreciated by the various stakeholders and that the possible answers would answer the proposed hypotheses. Simple languages were used in the data collection process to have a common understanding and precise answers. Other quality control measures were: pre-testing of the data collection tools before the interviews or survey. Data collection tools were pre-tested at five different schools to guarantee that questions were understood and the data to be collected would be accurately recorded. The schools involved in the pre-testing were not included in the sampled schools for survey.

The findings and experiences from the pre-test were used to edit and refine the questionnaire before the final output was made available for use. Quality of the data was also ensured through cleaning of the field-collected data to remove ambiguous data; and duplicating data entry to for comparison in case of wrong or doubts in the data set already entered in the computer. Cleaning and arrangement of some data from the open-ended questions was inevitable as some answers were so variant. The researcher had to read

the answers and try to put them into categories by coding, which is often subjective and difficult. Utilizing the described research designs (descriptive), sampling methods (probability and non-probability), and data collection procedures and tools (surveys, interviews, and observations with questionnaires, checklist questions, record sheets, and ranking), the data collection process was conducted satisfactorily.

### ***Limitations***

During observations, certain responsible teachers took actions that compromised the accuracy of the observations, such as inaccurately reporting the availability of water and its adequacy. Additionally, in some instances, students altered their behavior abruptly upon realizing they were being observed, which may not reflect their typical actions. For example, when students become aware of someone monitoring their handwashing behavior, they tend to wash their hands at critical times more readily than they normally would. Such actions can compromise the validity of the collected information. The various research designs and data collection tools helped in understanding the actual situation. However, in some instances, the data collection process proved to be time-consuming, especially when respondents had other commitments, leading to delays in completing open-ended questions. Extra efforts were required to ensure that questionnaires were fully completed. Some participants in the Focus Group Discussions (FGDs) faced challenges in expressing their feelings verbally and needed guidance from the researcher (moderator), who utilized her expertise in SWASH, teaching, and community development to assist them. The outbreak of the COVID-19 pandemic resulted in school closures and quarantines, significantly delaying the data collection process.

Unfortunately, the researcher herself was affected by the pandemic, impacting not only the data gathering but also the compilation and creation of reports.

### ***Delimitation***

The study is delimited to a single region selected from a total of 26 regions and three specific districts chosen from a pool of 184 districts. The study was delimited to schools where WASH had been implemented for a minimum of 5 years. This selection criterion was based on the abundance of evidence available in such schools regarding the programme. Key informants within the research area who were actively engaged in WASH programme implementation in the selected districts were chosen for interviews to leverage their experiences in providing essential information. One Focus Group Discussion (FGD) was conducted with the school committee and another with the school club from each district, considering limitations in financial and time resources. These discussions aimed to gather supplementary information that would complement data collected through other methods.

### ***Data Processing and Analysis***

Data processing, as explained by Niraula (2019), is the method of transforming raw data into meaningful statements after the data collection phase. The purpose of data processing is to enable various operations necessary to prepare the data for analysis, which is the subsequent step, as outlined by Watson (2017).

Data analysis encompasses the activities of gathering, modeling, and evaluating data using statistical and logical techniques to support operational and strategic decision-making processes. The technique employed for processing and analyzing data can be either manual or electronic, depending on the availability of resources. This manipulation

includes tasks such as editing, classifying, grouping the responses from open-ended questions, coding, computerization, as well as preparing tables and diagrams for presentation

### ***Visualization and Presentation of Data***

Data visualization involves presenting data in pictorial or graphical formats. It utilizes tables and computer graphics to create visual images that enhance the comprehension of complex and extensive data representations (Li, 2020; Padilla et al., 2018; Watson, 2017). Descriptive statistics and means for various indicators are displayed through statistical tables, charts, figures, graphs, pie charts, histograms, photographs, or a combination of these methods, guided by the UNICAF data presentation format. Histograms, graphs, and charts are preferred for conveying information over absolute numbers in tables as they are more easily understood. Some results are showcased using frequency tables, percentage breakdowns, and scores. These presentations were generated with the aid of SPSS computer software to help identify trends and key insights within the data. By examining relationships and comparing datasets, the researcher was able to determine the underlying causes of patterns or trends and draw meaningful conclusions.

### ***Interpretation of Data***

Data interpretation procedures are used by analysts to help people understand numerical data that has been collected, reviewed, and presented. When data is collected in its raw form, it might be difficult for laypeople to comprehend, which is why analysts must break down the data so that others can comprehend it. After the data analysis was done aided by SPSS software, summarized data in the form of descriptive, means, ,



graphs, and charts were obtained. In some cases tables were also created by the software while in some other cases, tables had to be prepared to summarise the results. By the use of these presentations, the researcher interpreted the findings and prepared the report presented. The researcher's knowledge and observations of data trends, discussions, inferences, and recommendations were used to present the results, their interpretation, and conclusions. The interpretation was supported by the researcher's previously prescribed theories and knowledge.

### **Chapter Summary**

The chapter focused on the research methodology and design employed in this study, explaining mixed-method research as a method for data collection and analysis. Different approaches for sampling and data collection were discussed, with explanations provided for the chosen procedures. From design to data analysis, approaches were selected based on the required information type and expected response nature, ensuring high-quality data collection. The data were collected and processed to eliminate systematic errors. Results from computer analysis and direct responses from participants were presented in simple formats for easy understanding of research questions. Due to meticulous planning, adoption, and adherence to the research design, the obtained data are considered reliable, providing evidenced findings and reliable conclusions. The chapter also emphasized the importance of selecting appropriate data collection tools, particularly those used in the research. Data collection methods included focus group discussions, interviews, surveys, observations, and case studies, tailored to the nature and type of data to be collected. Corresponding data collection tools were score/recording

sheets, checklist questions, questionnaires, and record sheets, with photographs taken during surveys and observations in some instances.

Data analysis techniques for qualitative, quantitative, and combined methods were well-explained in the chapter, with a discussion on the advantages and disadvantages of these approaches. Ethical considerations were elucidated, noting the steps taken during the study to ensure smooth data collection. Ethical approval was obtained from UNICAF REAF, and a tier-consent process was followed, involving consultations with formal education departments and obtaining consent at various levels. Informed consent procedures were meticulously followed, ensuring participants' understanding and voluntary participation. The use of English and Swahili languages was tailored to participants' preferences, with measures taken to maintain confidentiality and anonymity.

Quality control and data management were crucial aspects discussed in the chapter, emphasizing the importance of error detection and prevention during data collection to ensure data integrity. Measures such as pre-testing data collection tools, peer reviews, and refining questionnaires based on pre-test findings were employed to enhance data quality. Data processing involved transforming raw data into meaningful statements for analysis, with data visualization techniques used for enhanced comprehension. Data interpretation involved summarizing numerical data for presentation, drawing conclusions supported by theories and observations.

In conclusion, the chapter underscored the significance of proper data collection tools, ethical considerations, and method selection for high-quality data collection. The use of mixed-method research, diverse data collection techniques, and thorough data

analysis contributed to the study's reliability. Ethical considerations were pivotal in conducting the research responsibly and ensuring smooth data collection processes.

## **CHAPTER 4: RESEARCH FINDINGS AND DISCUSSION**

This chapter presents the study results in alignment with the study objectives and research questions. It commences with an evaluation of the study's trustworthiness measures and the validation, conformability, reliability, transferability, and credibility of the data. Subsequently, it delves into the research findings, starting with an overview of the characteristics of the surveyed schools and the demographic profiles of the pupils in those schools. The third section presents the results pertaining to the research objectives, including the assessment of the quality and quantity of existing school WASH facilities, preferences, and the sustainability of WASH interventions in public schools using various methodologies and approaches for constructing and rehabilitating sanitation and hygiene facilities. Additionally, it discusses community attitudes towards sanitation and hygiene practices in public schools and their perceptions of the SWASH programme. The section also outlines the challenges, opportunities, and proposed solutions for addressing water availability, sanitation, and hygiene practices in public schools. The final subsection provides a report on the modalities and types of government support for WASH facilities in schools.

The findings presented in this chapter are based on the results of research questionnaires, interviews, observations, and document analyses. The data is presented using frequency distribution tables, pie charts, bar charts, and descriptive statistics. Qualitative data gathered through interviews, observations, and document analyses is presented in the form of narratives, excerpts, and direct quotations.

The discussion follows the sequence of research objectives, critically evaluating and interpreting the facts in line with the research questions. The final section of the chapter

covers the discussion of the results, comparing them to findings from similar studies on the SWASH programme. These comparisons form the basis for making recommendations for future improvements and policy decisions.

### *Trustworthiness*

Data trustworthiness encompasses five key components: credibility, transferability, conformability, dependability, and reliability. These components ascertain the credibility of a study by assessing the extent to which other researchers can challenge and trust the data (Korstjens & Moser, 2018). Alongside providing background information and the researcher's qualifications, this ensures trustworthiness by demonstrating that data collection followed recognized methods by an experienced individual. Transferability refers to the accuracy of data transformation across systems without distortion (Creswell & Plano Clark, 2018). Confirmability concerns objectivity, impartiality, and lack of bias, ensuring that other researchers can replicate the data and findings consistently (Astuti et al., 2018). Dependability relates to the stability of findings over time (Korstjens & Moser, 2018). Reliability assesses the consistency of data collection methods and instruments, crucial for controlling random errors (Mohajan, 2017).

To enhance the reliability of the data and research results, the study was conducted by a researcher well-versed in SWASH. Emphasis was placed on credibility, transferability, conformability, dependability, and reliability throughout the study process. Using qualitative methods, the research employed four different data collection techniques such as interviews, surveys, focus group discussions, and observations to ensure trustworthy data. Both Kiswahili and English languages were used for better participant understanding, with a semi-structured questionnaire and checklist questions

employed for data collection. Pretesting ensured clarity and accuracy, while data collection by a single researcher minimized bias and errors. Respondents were carefully selected for relevant information, and data cleaning ensured consistency and conciseness.

Most survey and interview data were qualitative, capturing facility statuses, stakeholder perceptions, and unmeasurable observations. Stratified populations and purposeful selection of respondents ensured first-hand SWASH information. Thematic coding and data familiarization were conducted to ensure reliable results. Transferability was ensured through precise data recording, while dependability was upheld by considering the program's implementation period. Table 4.1 summarizes the findings based on years of WASH programme experience for participants (Meyer & Schuz, 2020).

Table 4.1 Respondents on duration in WASH Programme

S/No	Type of respondents	Mean period (Years)
1	School teachers	5.5± 2.0
2	Stakeholders	7.3±2.2
3	Civil Servants	3.8±2.1
4	Students	3.6±0.7
5	Researcher (as observer)	14

### Background Characteristics of Surveyed Schools

The study, conducted in 180 schools located in the Kibaha, Kisarawe, and Bagamoyo Districts, which are part of the Pwani region, involved interviewing a total of 145 primary school teachers and 35 secondary school teachers, resulting in 180 teacher respondents. The research took place between July and October 2020 and focused on

various factors such as gender, school level, and school setting. Only schools that had implemented a school WASH programme under the National Sanitation Campaign (NSC) since 2012 were considered for selection, as these schools were deemed to possess sufficient knowledge and experience of the programme. Schools were chosen randomly to ensure fair representation in the research process.

The majority of the surveyed schools (97.78%) were day and coeducation schools, each having a school committee for primary schools and school boards for secondary schools, irrespective of their functionality and responsibilities.

### ***Demographic Information of the Study Population***

Demographic information about the study population was crucial for optimizing data collection within a specific timeframe and enhancing the research's overall effectiveness. During the study, the total pupil population across the three districts visited was 117,876, with 60,355 boys (50.9%) and 57,521 girls (49.1%) enrolled in the 180 schools. This distribution mirrored the data available at the district education offices. Teacher respondents were asked to provide details on their involvement in WASH activities, as well as information on the gender breakdown, students with disabilities, and school locations. The aim was to recognize teachers' experience and emphasize equality and inclusion in the WASH programme, acknowledging that different groups may require tailored approaches to address WASH challenges. Understanding the duration of respondents' involvement in the WASH programme was crucial for assessing the reliability of the information provided.

Among the districts, Kibaha had the largest student population (53,527), including Kibaha Town Council and Kibaha District Council, while Kisarawe had the lowest student

population (20,845). The student population ratio, including students with disabilities, was nearly one boy to one girl (Table 4.2).

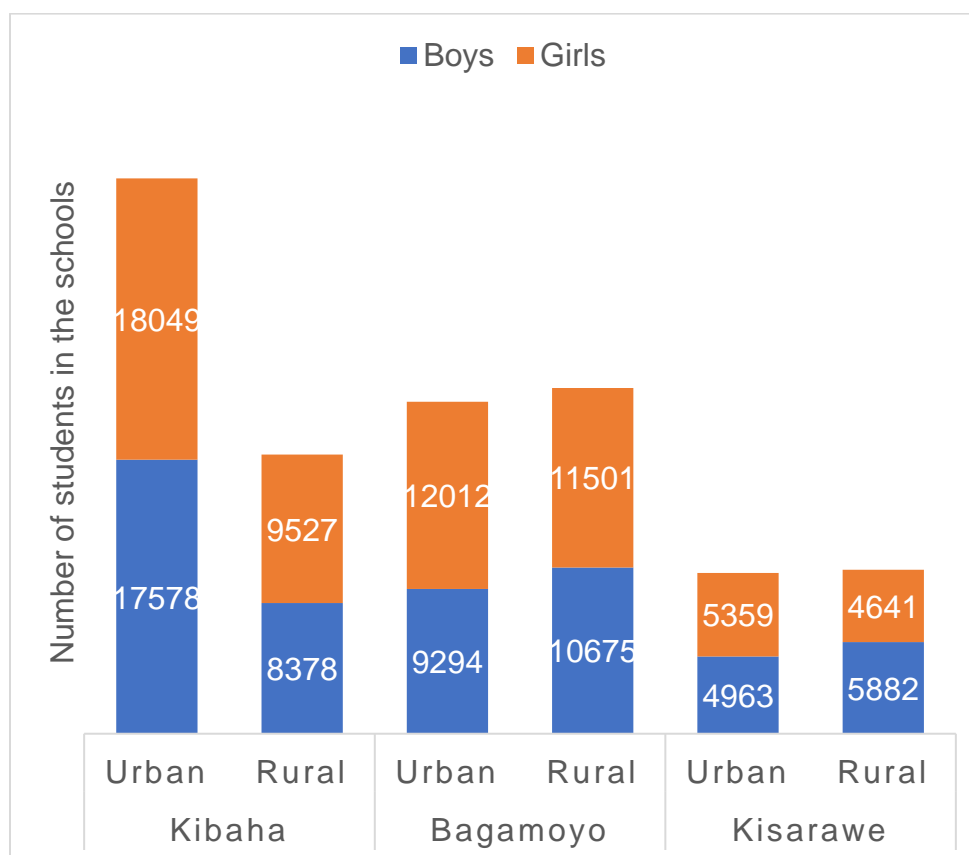
Table 4.2 School Student Population

District	Total	Total	Total Disabled		Total Students
	Boys	Girls			
			Boys	Girls	
Kibaha	27578	25949	45	48	53,527
Bagamoyo	21814	21690	31	34	43,504
Kisarawe	10963	9882	64	50	20,845
Total	60 355	57 521	140	132	117,876

When comparing rural and urban areas, Kibaha, classified as more urban, has a significantly higher urban student population compared to Kisarawe and Bagamoyo. This indicates that the majority of schools are situated in urban areas. Kibaha and Bagamoyo have a slightly larger female population, whereas Kisarawe has a slightly higher male population. The female population is slightly higher in Kibaha and Bagamoyo, while the male population is slightly higher in Kisarawe (see Figure 4.1).

*Figure 4.1 Student Population Based on the Sex and School Setting*

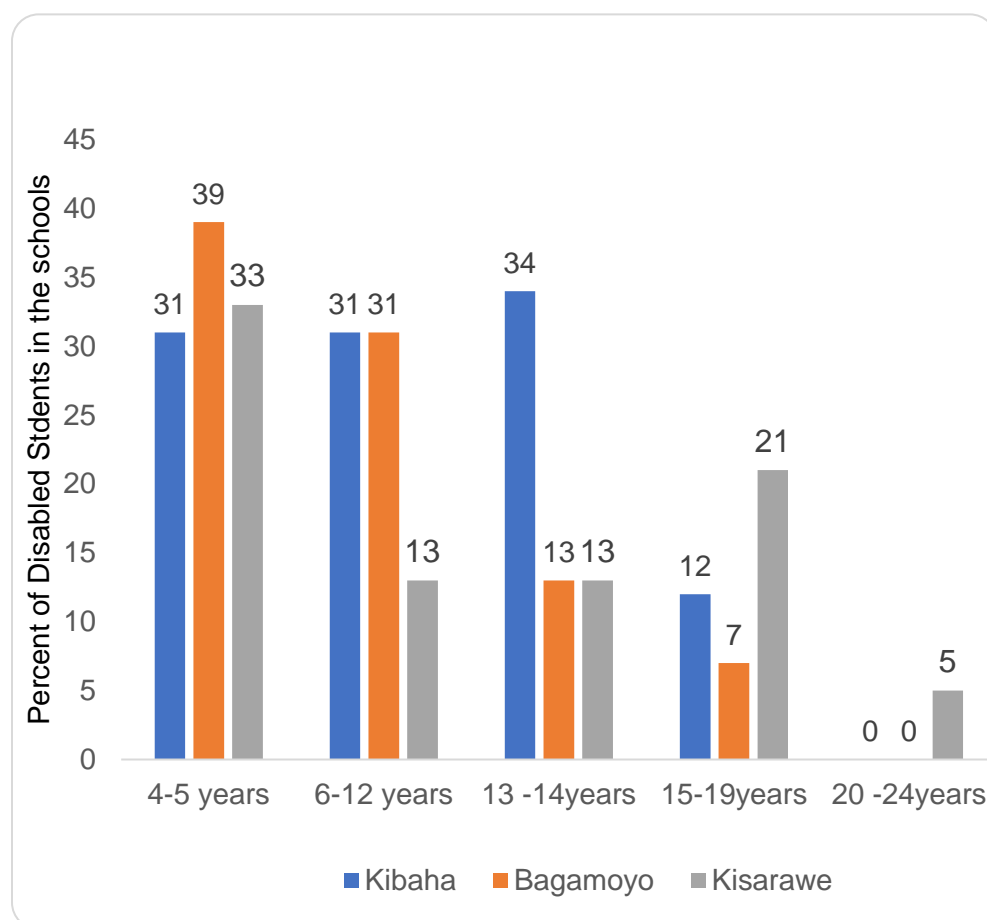




Promoting disability-inclusive WASH practices in both classroom and home environments encourages the enrollment and retention of disabled children in school, particularly girls who may face challenges in using latrines (Poague et al., 2022). Ensuring the presence of inclusive WASH facilities for students with disabilities is essential within school settings. By implementing infrastructure modifications and fostering community engagement, disability inclusion aims to eliminate various barriers, including institutional, physical, environmental, psychological, and attitudinal obstacles (Poague et al., 2022). The study also examines inclusivity by investigating the number of disabled students. The findings revealed that among the student population, there were 145 boys and 138 girls with disabilities across all districts (see Figure 4.2), accounting for 0.24% of the total

student population. It was observed that disabled students aged 20 to 24 years were only present in the Kisarawe District.

*Figure 4.2 Disabled Students in Age (years) Groups*



### **Alignment of current SWASH facilities with national school standards**

One of the study objectives was to assess the alignment of SWASH facilities with national standards for schools. The underlying assumption was that "SWASH facilities, in terms of quality and quantity, do not comply with national school WASH standards." This objective involved evaluating various components, including the status of water supply and facilities.

### ***The Status of Water Supply (Quality and Quantity) in Public Schools***

Water supply and accessibility were key aspects examined within the SWASH program. The study aimed to assess the WASH status in schools concerning water sources, availability, accessibility, and adequacy. The evaluation included examining the main water sources, their functionality, distance from the sources to end-user points, availability, sufficiency, and their utilization for handwashing and toilet purposes.

#### **Main Water Source**

According to Table 4.3, 40% of teacher respondents indicated that schools utilize piped water within the school premises, while 21% fetch water from outside the school premises. Additionally, 20% of schools rely on protected springs and wells within the school premises, and 2.2% of schools obtain water from unprotected springs and wells.

Table 4.3 Main Source of Water in the Schools

Water source	Frequency	Per cent
Piped water within school premises	72	40.0
Piped water outside school premises	38	21.1
Protected spring and well within school premises	36	20.0
Unprotected spring and well	4	2.2
More than one source of water	17	9.4

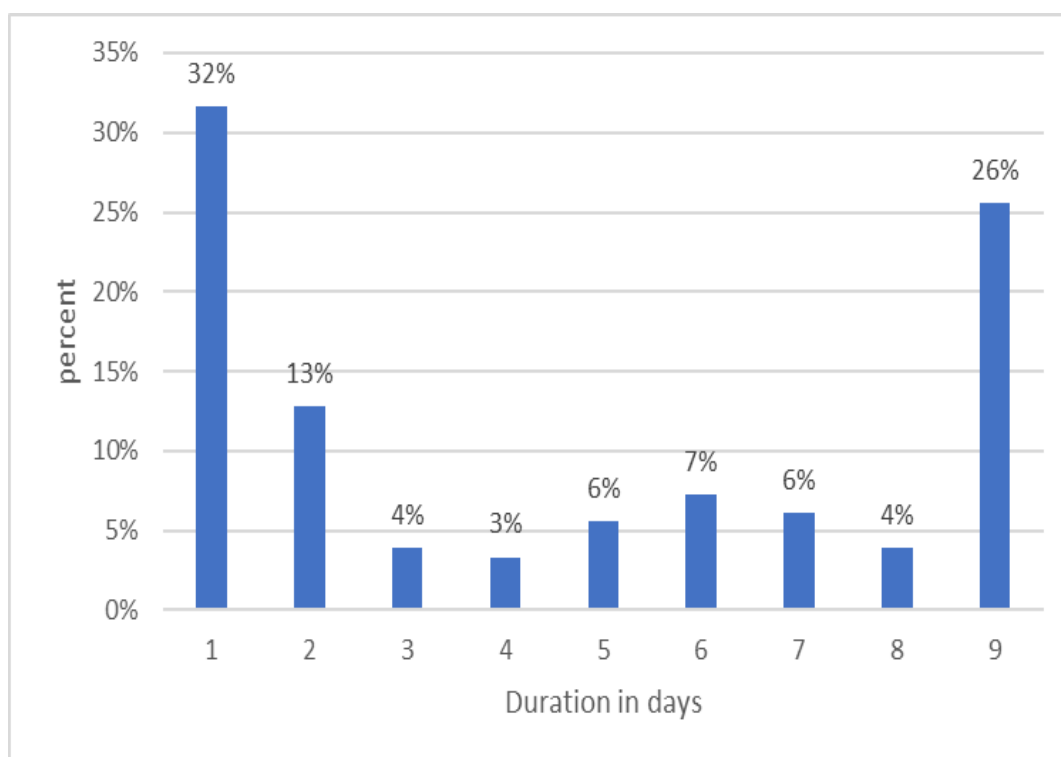
Rain harvesting	2	1.1
Surface water	3	1.7
Other sources	8	4.4
Total	180	100

Furthermore, 9.4% of the schools had multiple water sources, combining piped water with protected or unprotected water. The focus group discussions revealed that the reason for having more than one water source was to address the issue of unreliable water supply from a single source. Despite 61.1% of schools having a piped water system, observations during the visit showed that only 26% of schools had a fully functional piped water system operating at all times. The survey findings also indicated that no single water source provided water consistently throughout the year. The piped water supply, sourced solely from the national water system, was deemed unreliable and often unaffordable. Similarly, water boreholes dried up during extended dry periods. Only 2 out of the 180 schools surveyed (1.1%) were observed to have a rainwater harvesting system installed.

### **Functionality of water source**

Approximately 32% of teacher respondents indicated that the water source remained non-functional for a day, while 26% reported instances where the water source was out of service for more than two weeks (see Figure 4.3). Additionally, some respondents mentioned different durations when water might not be available in the school within a month.

*Figure 4.3 Duration of non-functionality of water source within a month*



### Distance to Water Source

Table 4.4 presents the distances from the schools to the primary water source points in the three districts. The distances were evaluated based on the National WASH Standards, which specify that the maximum distance from the water source to the school premises should not exceed 400 meters. In the surveyed area, schools in Kisarawe District had a mean distance of  $712.12 \pm 11.71$  meters, followed by Bagamoyo District with a mean distance of  $523.54 \pm 34.23$  meters, and Kibaha with an average distance of  $384.56 \pm 12.98$  meters.

Table 4.4 The average distance to a water source

District	Mean Distance (m)
Kibaha	$384.56 \pm 12.98$

Kisarawe	712.12± 11.71
Bagamoyo	523.54± 34.23
Significance (P≤0.05)	0.012

When comparing across the districts, it was observed that Bagamoyo met the acceptable standard, indicating that the differences in distances from the water source to the school premises were significantly different between districts but not within the districts (see Table 4.5).

Table 4.5 ANOVA Table for Distance to Water Source

Source of Variation	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	3235974.444	2	1617987.22	14.09	**
Within Groups	2.03	177	114805.74		
Total	2.36	179			

\*\*Highly significant (P≤ 0.05)

### ***Water Sufficiency in Schools***

The survey results revealed that 116 (64.4%) of teacher respondents believed that schools generally had an adequate water supply, while 64 (35.6%) of teacher respondents reported insufficient water supply (see Table 4.6). Interestingly, despite 56% of the observed schools (101 schools) lacking water on the day of the visit, it is noteworthy that a similar percentage (64.4%) of respondents declared that their schools had sufficient water supply in Table 4.6.

Table 4.6 Water Sufficiency in Schools

Response	Frequency	Per cent	Cumulative Percent
----------	-----------	----------	--------------------

Yes	116	64.4	64.4
No	64	35.6	100.0

During a Focus Group Discussion in Kisarawe, a member of the school committee expressed the following concerns: *"There is a frequent outbreak of typhoid and cholera in the village. The cause is due to inadequate water supply and the use of water from unprotected sources. We need water because everyone requires it for various purposes. The government has been promising to install a water system in our village for years, which could also benefit the school, but no action has been taken yet. Everyone would be delighted to see our schools equipped with sufficient water supply. We are eagerly awaiting the fulfillment of the promises made by water engineers to identify a water source and provide the necessary materials. The villagers are ready to assist the government in constructing the water system. Water is a critical need in our community, including our schools."*

The comments made suggest a lack of adequate water supply in the schools. To assess water sufficiency, teacher respondents were queried about the availability of at least 5 liters of water per day per student. Only half of the teacher respondents (50%) confirmed that students could access a minimum of 5 liters of water daily, while 10.6% were unable to estimate whether the water provided to students could meet the 5-liter threshold per student per day (see Table 4.7).

Table 4.7 Water availability 5 litres per student in the schools

Responses	Frequency	Per cent	Cumulative Percentage
-----------	-----------	----------	-----------------------

Yes	90	50.00	50.00
No	71	39.4	89.40
I don't know	19	10.6	100

The survey results regarding water sufficiency across districts indicated that Bagamoyo schools exhibited a higher proportion of schools with adequate water supply compared to Kisarawe and Kibaha (see Table 4.8). In the district-wise analysis, when teachers were individually asked about the availability of sufficient water for each student daily, the responses varied. For Kibaha, 53.33% of respondents indicated inadequacy, whereas 58.33% in Kisarawe and 81.66% in Bagamoyo reported insufficiency of water in relation to student population and needs (refer to Table 4.8).

Table 4.8 Water Availability and Sufficient in Schools Across Districts

Districts	Kibaha		Kisarawe		Bagamoyo	
	Response	%	Response	%	Response	%
<b>Water sufficient</b>						
Yes	32	53.33	35	58.33	49	81.66
No	28	46.66	25	41.66	11	18.33
<b>Available 5 litres per student per day</b>						
Yes	34	56.66	31	51.66	25	41.66
No	19	31.66	22	36.66	30	50.00
I don't know	7	11.66	7	11.66	5	8.33

Approximately half of the teacher respondents across all three districts confirmed the presence of at least 5 liters of water per day in their schools (Table 4.8). Notably, none of the respondents had conducted physical measurements; their responses were based



solely on mental estimations. In Kibaha, 31.66% of teachers stated the absence of this amount of water, while 11.66% were uncertain about the availability of 5 liters per student per day. Similarly, 36.66% and 50.00% of teachers in Kisarawe and Bagamoyo, respectively, reported the presence of at least 5 liters of water daily per student (Table 4.8). Despite Bagamoyo having more boreholes as water sources, including a significant number of unprotected ones, the water supply was found to be insufficient compared to other districts, indicating that boreholes do not always provide adequate water. Although nearly half of the respondents acknowledged water sufficiency, on-site observations revealed unsanitary conditions in some school toilets in Bagamoyo. However, some toilets were also noted to be adequately clean (see Figure 4.4).

*Figure 4.4 Clean toilet in one of the schools*



### ***Causes of water insufficiency***

Table 4.9 Water Insufficiency Causes in Schools from FGDs

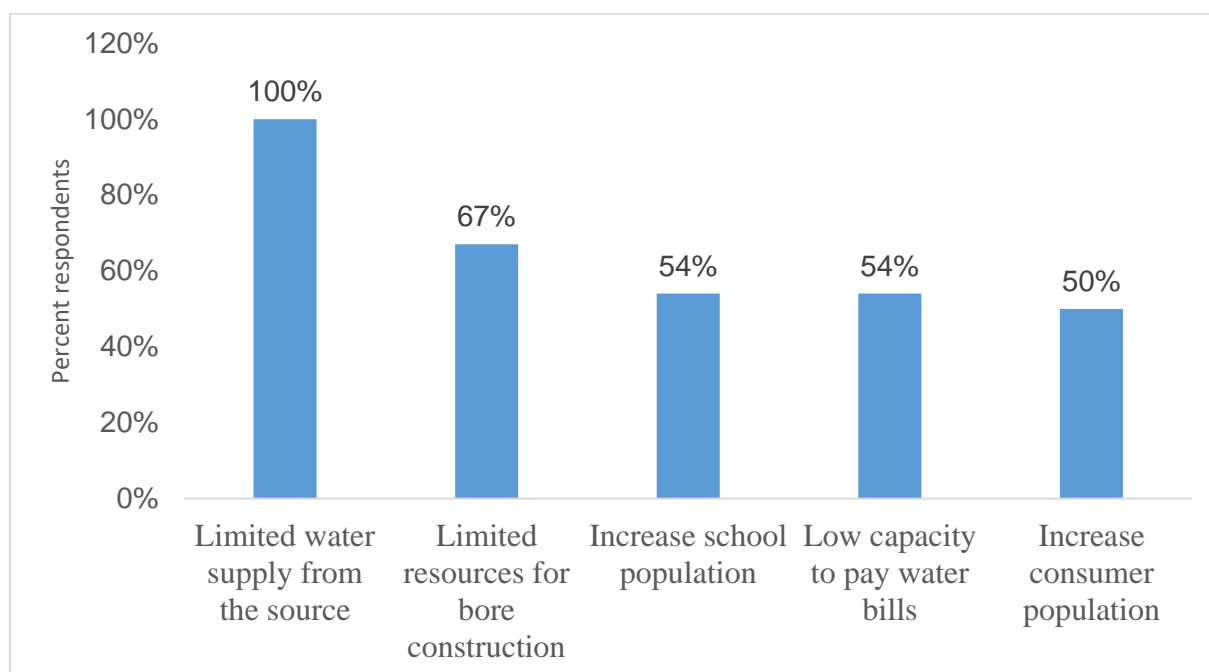
Cause mentioned	Score	Rank
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Little attention paid by the planners and constructor	88	1
Rapid increase in student enrolment	48	2
Little consideration during school's establishment	34	3
Not considering rain water harvest	29	4
Lack of repair and maintenance	29	4
Dry up of sources	7	5
Service interruption	5	6

Water insufficiency was attributed to several reasons, which were listed and coded based on comments from the school committee (refer to Table 4.9 above). The primary causes identified were inadequate attention during the planning and construction phases, followed by a rapid increase in student enrollment. The health and education of schoolchildren are both impacted by the lack of water. These consequences directly influence their academic success and attendance at school.

The study identified five reasons for the water shortage as described by key informants. These reasons include limited resources for borehole construction, insufficient water supply, depletion of water sources, and limited financial resources to cover water bills (Figure 4.5).

*Figure 4.5 Causes of School Water Shortage According to Key Informants*



*Percentages are mutually not exclusive*

### **Water availability in the toilets**

The assessment of water availability in school toilets indicated that nearly all schools examined had water accessible in their toilets, either directly from taps or stored in containers such as plastic barrels, as noted during the investigation. This trend was consistent across both urban and rural schools. Nevertheless, based on feedback obtained from the Focus Group Discussions (FGDs) and observations, it was noted that some schools experienced occasional water shortages in their toilets (refer to Table 4.10). Notably, all boarding schools surveyed were equipped with water facilities in their toilets. Insights from the SWASH FGD highlighted that in cases where water sources were non-operational, immediate measures were taken to ensure the availability of water in the

toilets. Furthermore, the proportion of schools with water supply in their toilet facilities was higher in co-educational institutions compared to day schools (refer to Table 4.10).

Table 4.10 Availability of clean water in toilets

Location /Type/System		Respondents (N)	Per cent of Response*		
			Yes	No	Not always
School location	Urban	55	94.54	0.00	5.45
	Rural	125	94.40	0.00	5.60
Type of school	Full Boarding	5	100.00	0.00	0.00
	Boarding and day	10	100.00	0.00	0.00
	Day	165	77.56	0	22.42
School system	Girls	3	75.00	0	25.00
	Boys	2	50.00	0	50.00
	Co-education	175	82.86	0	17.14
	Overall	180	85.55	0	14.44

During SWASH FGD sessions and observational assessments, it was observed that certain day schools faced water shortages in their toilets when there was a disruption in the water supply. Of particular concern were the girls' toilets, which play a critical role in menstrual health, hygiene, and management. The findings indicated that 91.67% of schools in Kibaha, 53.33% in Kisarawe, and all schools in Bagamoyo had access to clean water in the girls' toilets. Interestingly, these results contradicted the statements made by the school committee and SWASH club members, who highlighted that interruptions in water supply negatively impacted water availability in the toilets. This inconsistency was also evident during on-site observations, where certain schools were found to have insufficient or no water in their toilet facilities. The observational report revealed that 71.44% of schools in Bagamoyo and 53.33% in Kibaha had water in their toilets, sourced either directly from pipes or stored in containers. In Kisarawe, 70% of the toilets had water

supply through pipes or stored containers. When considering the storage containers, it was noted that 53% of the schools had inadequate storage facilities, posing potential risks to water quality and hygiene the standard.

### ***The availability of water for handwashing***

Inadequate or lack of water for hand washing specifically during critical times increase the chance of outbreak of WASH disease such as: cholera, typhoid, skin rushes and COVID-19. The evaluation results in the selected Districts showed that water for handwashing was inadequate. Generally, less than a half (49%) teachers said water for handwashing was adequate, while 24% teacher respondents said water for hand washing was moderate adequate, 14% teacher respondents said water for handwashing was moderately inadequate. A small percent (8%) teacher respondents said water for handwashing was inadequate while 4% of the teachers were not aware if water for handwashing was adequate or not (Figure 4.6).

*Figure 4.6 Availability of water for handwashing*

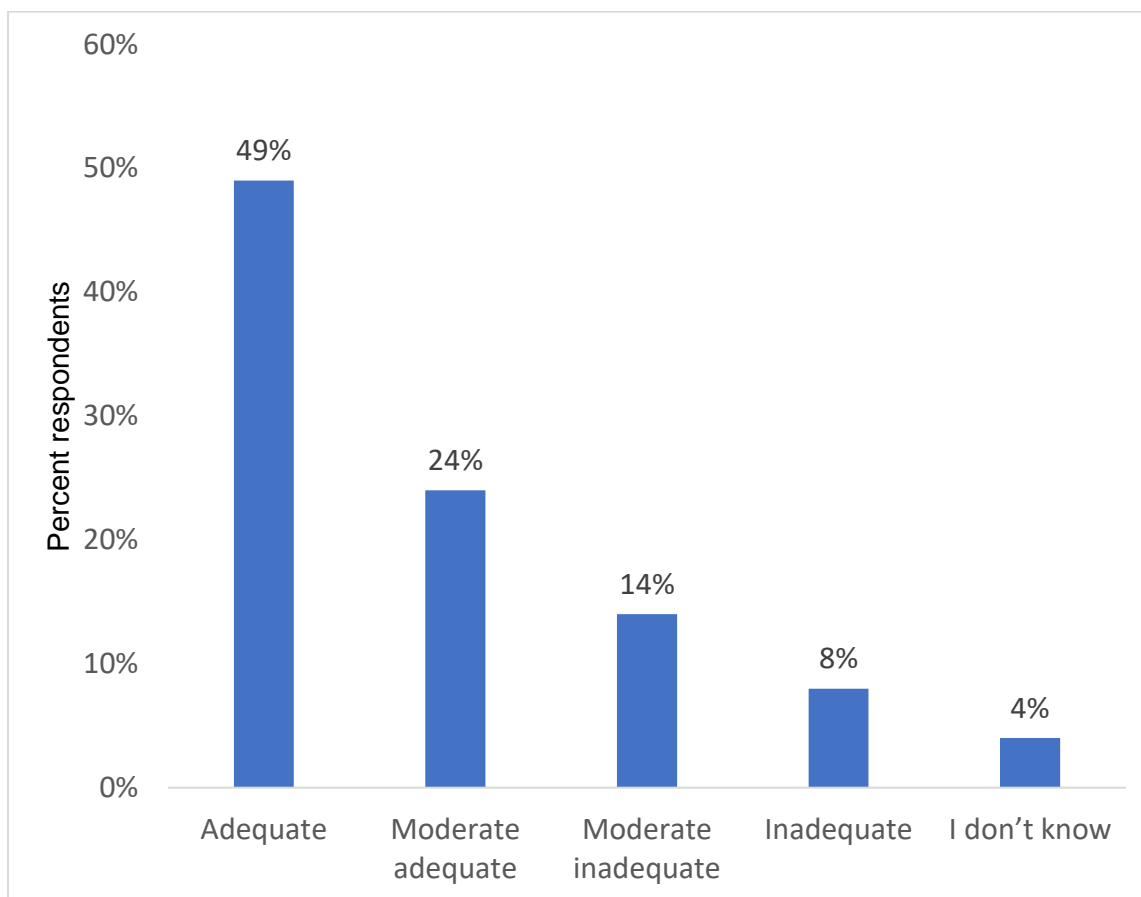
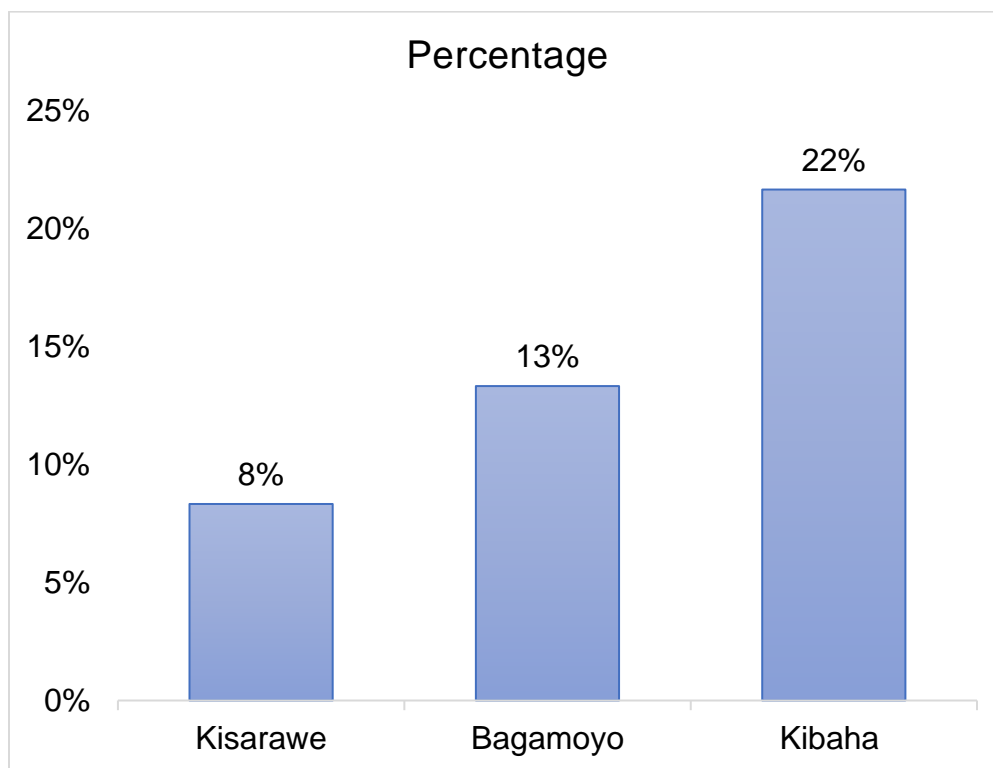


Figure 4.7 illustrates the percentage of schools per district that have a specific area for handwashing points. The data indicates that very few schools had specific areas for handwashing points. For instance, eight out of the schools in Bagamoyo (13.33%), eight out of the schools in Kibaha (13.33%), and 13 out of the schools in Kisarawe (22%) had a point that could be considered a handwashing point. None of the districts had schools with areas specifically designated for permanent handwashing.

*Figure 4.7 Schools' Handwashing Facilities Percentage in Three Districts*



The water points identified by the teacher respondents as hand washing points were actually multipurpose water points used for drinking, washing, and various other purposes as needed. Only three schools were discovered to have implemented local initiatives for hand washing devices known as tippy taps. These handwashing points were primarily utilized during the COVID-19 pandemic; however, they seem to lack durability and repairability, displaying a more disposable nature (refer to Figure 4.8).

*Figure 4.8 Handwashing practice using tippy tap in Bagamoyo*



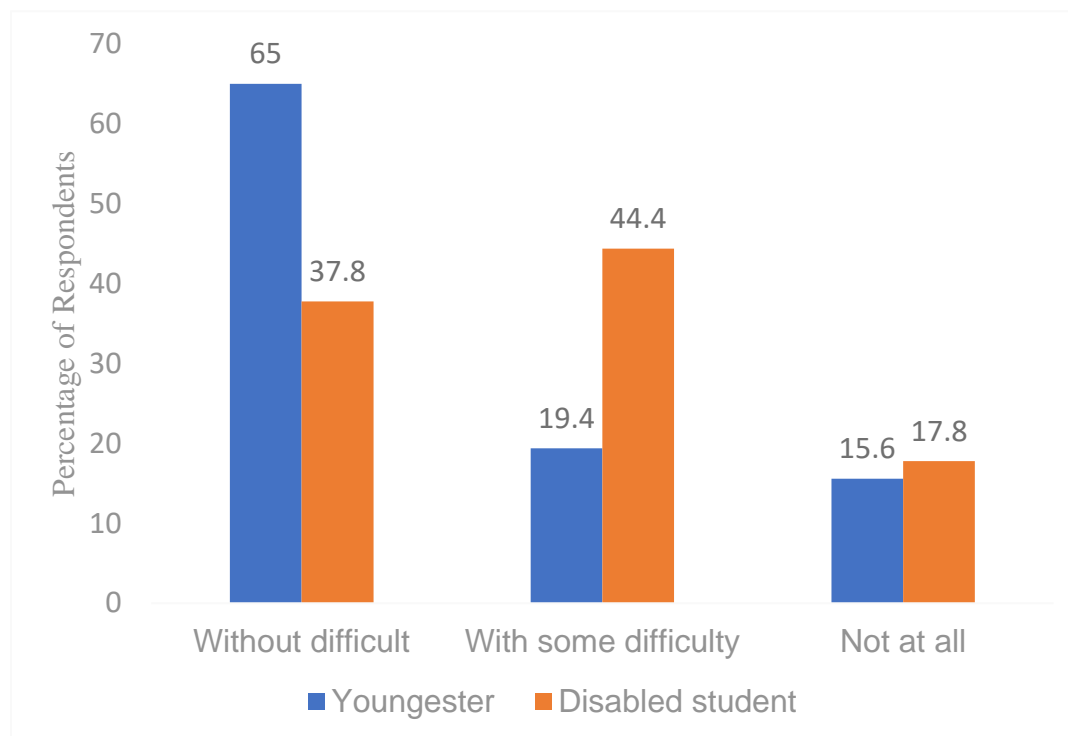
### ***Access to hand washing points by disabled and youngsters***

The teacher respondents reported inadequate water accessibility for young pupils and disabled individuals. Figure 4.9 illustrates the accessibility of handwashing points for disabled and young students, with the results indicating that young students faced more challenges compared to the disabled, possibly due to their larger numbers. A percentage of 15.6% of youngsters and 17.8% of disabled individuals could not access water points.

The accessibility of water points for the disabled in each district is depicted in Figure 4.10. The findings reveal that only 41.67% in Kibaha, 36.67% in Kisarawe, and 35% in Bagamoyo could access handwashing facilities without difficulty. On the other hand, a higher percentage of 30.0% in Kibaha, 50.0% in Kisarawe, and 53.33% in Bagamoyo faced difficulties in accessing water points. Similar observations were made during the study, indicating that some school environments and water points were not conducive for disabled students to access water independently, especially in schools without physically disabled students.

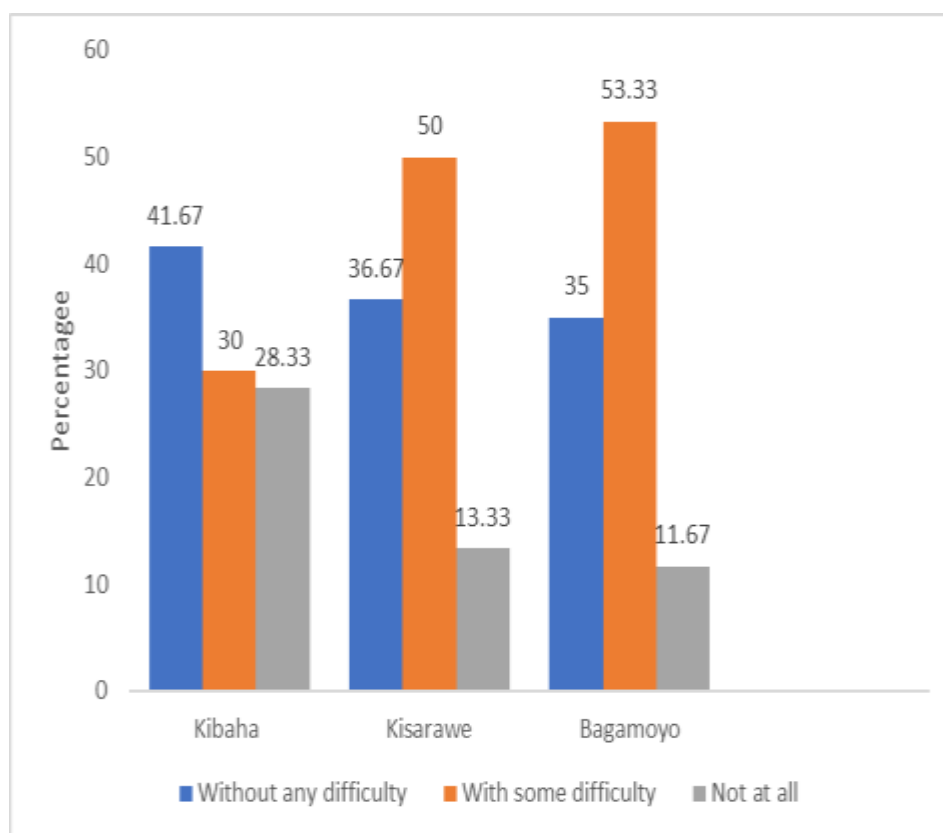


*Figure 4.9: Accessibility of handwashing points for young and disabled students*



This situation may lead to a dislike for schooling among disabled individuals who require assistance from other students. Despite the low numbers of disabilities in most visited schools, this overlooks the importance of providing accessible handwashing points for disabled individuals in schools. Consequently, only a few interviewees mentioned that they could access the handwashing points without difficulty.

*Figure 4.10 Access to handwashing points by the disabled across the district*



### Sanitation Facilities and Hygiene Practices in Surveyed Schools

Sanitation facilities status studied were the toilet type, quality and usability and drop holes sufficiency. Sanitation practices studied include Hand washing practices, water treatment, toilet cleaning, menstrual health and hygiene management, waste disposal WASH club and education.

#### Type of Toilets

The survey findings across the districts indicated that in Kisarawe, 58 schools (96.67%) had pit latrines, while in Kibaha and Bagamoyo, there were 59 (98.33%) and 56 (93.33%) schools with pit latrines, respectively (Table 4.11). Only three schools in total reported having flush systems, with Kibaha having one school and Kisarawe having two

schools with this system. None of the schools visited in Bagamoyo had flush system toilets; instead, four teacher respondents (6.67%) mentioned the presence of compost latrines (Table 4.11). Regarding the toilet locations (inside or outside dormitories/classroom buildings), 88% of teacher respondents, consistent with observations, stated that the schools' latrines were situated outside the classroom buildings but within the school premises. All day schools had their toilets located outside the classroom blocks. Concerning gender, most school latrines were in separate blocks, with approximately 56.67% having toilets in a single block separated by solid walls.

Table 4.11 Percentage of Type of Toilets Across District

Type of toilets	Kibaha	Kisarawe	Bagamoyo
Flush system	2 (3.33%)	1(1.67%)	0 (0.00%)
Compost	0 (0.00%)	0 (0.00%)	4 (6.67%)
Pit latrine	58 (96.67%)	59 (98.33%)	56 (93.33%)

### Quality of the toilets

The quality of sanitation was based on the availability, and accessibility of toilets scored using the National Standard for schools. The scores were assigned from 0 to 5 in ascending sequence. Zero score implied the facility was not existing or was existing in a dilapidated situation, 1 indicating the facility was poorly constructed and maintained and needed rehabilitation. Score of 2 indicated well-constructed but not maintained, despite good building, score of 3 indicate average well-constructed and maintained. A good built toilet with all of requirements (water, urinals and separate buildings for boys and girls) blocks were assigned a score of 4. A score of 5 was assigned to a very good quality

constructed toilet with concrete blocks, well maintained with safety and privacy and the sanitation services are all provided according to the requirement. In a score of 5 toilet, sanitation service was met to surpass even the minimum national standard.

Figure 4.11 presents number of schools according to their toilets condition scores in males and female's toilets separately. All schools visited had latrines separated between male, female and teachers but of different type and status. In all cases girls' toilets scored low because of majority had no menstrual facility of any kind.

*Figure 4.11 The Status of Sanitation Facilities on Gender Basis*

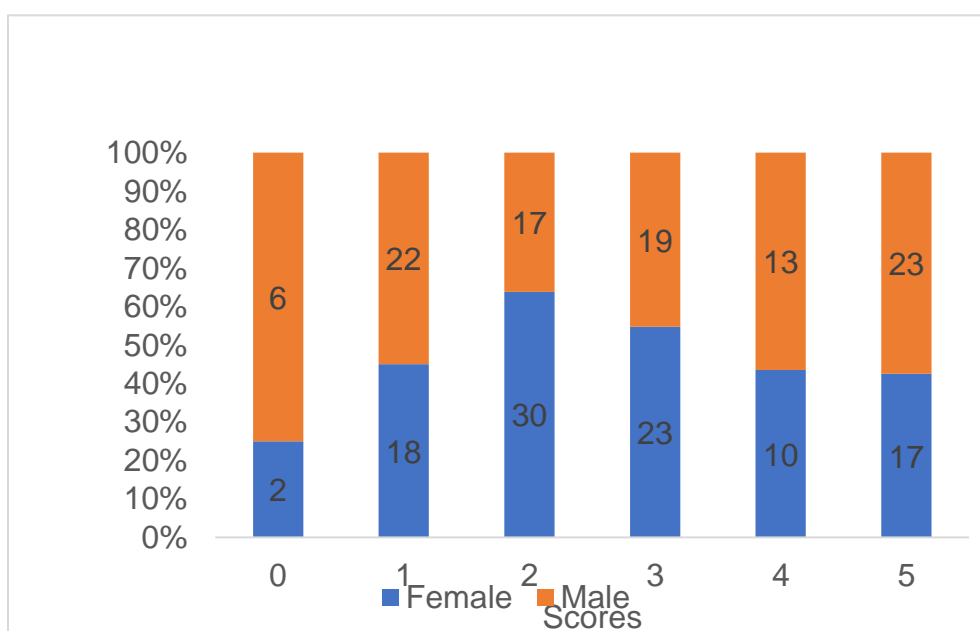


Figure 4.12 shows one of poorly constructed toilet that scored 2 because it lacks the necessary facilities and had no privacy to the user like door shutters and windows were missing.

*Figure 4.12 Poorly constructed and maintained toilets*



The key informant views on the facilities status (Table 4.12) portrays a similar situation where more than half of the respondents had accepted that schools' sanitation facilities are in very poor to poor conditions, unmaintained and lacking necessary amenities.

Table 4.12 Key Informants Views on Status of SWASH Facilities

S/No	Facility status	Frequency	Percent
1	Poor	9	37.5
2	Very poor	6	25.0
3	Fair	6	25.0
4	Good	3	12.5
5	Very Good	0	0.0

Their concern was that, the facilities are poor because of poor construction standards, lack of maintenance, limited number of drop holes, and lack of necessary components such as hand washing points, dustbins, and urinals (Table 4.13).

Table 4.13 Toilet's Facility Availability and Adequacy reported by KII

Nr	Response	Frequency	Percentage
1	Pit drop hole student ratio is too big	24	100.0

2	Lack some necessary amenities	23	95.83
3	Facilities are not sufficient	21	87.5
4	Unstable/unserviceable	17	70.83
5	Not maintained	19	79.17

**Percentages are not mutually exclusive.**

More than three quarter (87.5%) of the key informant's responses on the availability and adequacy of sanitation facilities indicated that they are not sufficient. They agree that majority lack amenities needed by adolescent girls (95.83%). Observations showed that some toilets are rather poorly constructed and maintenance might also be difficult (Figure 4.12). As response to the status of toilets from the key informants, all (100%) indicated that pit latrines do not adhere to the national standards in most of the schools in the area. In addition, 79.17% of the key informants also showed that the facilities are not well maintained while 70.83% showed that largely the sanitation facilities remain unserviceable rendering them unusable.

Responding from the quality of toilets one of the FDGs from Kisarawe said that:

*"In Kisarawe, majority of the rural setting schools have pit latrines. These toilets both in primary and secondary schools cannot provide total privacy to users. Construction of modern flush system is impossible, no water available in the school premises. These are suitable for urban schools and on top flush toilet is expensive to construct and maintain".*

#### **Latrine Drop Hole Status in the Survey Schools**

Table 4:14 shows that the Drop Hole Ratio (DHR) in visited schools was 1:57 for males and 1:49 for girls. The study revealed that the situation was different between the two settings whereby the situation in rural settings was better than in urban. Irrespective of the location, there was no significant difference between boys and girls in terms of Drop Hole Student Ratio (DHSR). Based on the segregation by Districts, the latrine ratio for boys in Kibaha urban was 1:65 and 1:52. In the in the rural area, it was 1: 52 and 1: 45 for boys and girls respectively. The trend of a female having a low ratio to boys was similar to the other districts. While Drop Hole Student Ration (DHSR) for boys in Kisarawe was 1:26 in urban and 1: 41 in rural, it was 1:23 and 1:37 for girls in urban and rural respectively. In the Bagamoyo District which had a high student population compared to the rest, the ratios were 1:85 and 1:64 for boys in urban and rural areas which were higher than 1:78 and 1:56 for girls in the urban and rural areas respectively.

Table 4.14 Latrine Drop Holes Ratio Based on Location in Each District

District	Location	Gender	Student population	Total DH	DH Ratio
General		Male	60355	1061	01:57
		Female	57521	1179	01:49
Kibaha	Urban	Male	15453	236	01:65
		Female	14505	267	01:54
	Rural	Male	6361	122	01:52
		Female	7185	173	01:42

Kisarawe	Urban	Male	1562	60	01:26
		Female	1473	63	01:23
	Rural	Male	9401	225	01:41
		Female	8409	225	01:37
Bagamoyo	Urban	Male	3840	45	01:85
		Female	3190	41	01:78
	Rural	Male	23738	373	01:64
		Female	22759	410	01:56

### Comparison of available toilet drop holes against the recommended standard

The average of the required male drop hole in accordance to the male student population is about 13.41 while only 5.89 were available. On the other hand, the required drop hole for females was 11.6 while only an average of 6.56 drop holes were available (Table 4.15). This ratio is based on the national standard of pit latrine ration which is one drop hole per 20 girls where one drop hole per 25 boys with provision of urinals. Urinals helps in reducing the congestion in the toilets as the majority goes in the toilet for short calls.

Table 4.15 Average of Drop Holes vs Required Drop Holes by Gender

Variable	N	Mean ratio
Required Male Drop Hole	180	13.41
Available Male Drop Hole	180	5.89
Required Female DH	180	16.02
Available Female DH	179	6.56



Valid N (listwise)

179

Chi square analysis was done on the available drop holes against the required. It was found that there were highly significant differences between and within the districts at  $P \leq 0.001$  (Table 4.15 and 4.16).

Table 4.16 ANOVA Table for Available and Required Toilet Drop Holes

Variable	Sum of square	df	Mean Square	F value	Significance.
<b>Boys</b>					
Between District	40.344	2	20.172	8.382	0
Within District	425.967	177	2.407		
Total	466.311	179			
<b>Girls</b>					
Between District	26.8	2	13.4	7.482	0.001
Within District	317	177	1.791		
Total	343.8	179			

### Usability of the toilets

The findings indicate that only 9.4% of teacher's respondents reported that there were no challenges on using the constructed toilets. On the other hand, 48.3% reported existence of multiple challenges in using the toilets. Other factors that make the toilets not user friend is indicated in Table 4.17. These include blockage (6.7%), bad odour (6.1%), water is insufficient due to low water pressure (7.8%). Some of the teachers' respondents (10.6%) also' reported that facilities construction was poor for young students to access. Other teacher respondents (6.1 %) reported water scarcity that makes it hard to clean the toilets.

Table 4.17 Main Hindrance of the Usability of WASH Facilities

<b>Response</b>	<b>Frequency</b>	<b>Percent</b>
Several challenges (broken doors, floors)	87	48.3
Unsafe for youngsters/children	19	10.6
Low water pressure	14	7.8
Blockage	12	6.7
Bad odour	11	6.1
Cleaning is expensive	11	6.1
Pits fill up quickly	9	5
None	17	9.4

### Hand washing practices

Hand washing practices essentially has the impact of reducing water and sanitation-related diseases. Table 4.18 present hygiene practice of hand washing at critical times for pupils/students in primary and secondary schools.

Table 4.18 Handwashing practices as reported by teachers

<b>Attribute</b>	<b>Response</b>	<b>Percent</b>	
		<b>Primary</b>	<b>Secondary</b>
Hand washing after toilet visiting	Yes	87.22	100
	Not known	12.78	0.00
Hand washing before eating	Yes	88.33	100
	No known	11.67	0.00

Of all the primary school teachers' respondents, 88.33% agree that students do wash hands before meals, and 12.78% do not know if they do wash hands before meals or not. Likewise, the majority of 88.33% primary school teachers agrees that school pupils/students practice hand washing after toilet visits. The results indicate that grown up students do practice hand washing at critical accordingly. No student/pupil observed to wash hands at any point during the surveys.

### **Critical time for hand washing**

Table 4.19 depicts the analysis of students understanding the importance of critical time for handwashing. Teacher respondents from all three district who confirmed that their students/pupils do wash their hands before eating was less than 50 %. Kibaha were 37 %, Kisarawe were 32 % and 30%. Regarding washing after eating responses were 41.66% from Kibaha, 32% from Kisarawe and 33% from Bagamoyo respectively. From the discussion groups it was realised that inavailability of water and the location do contribute to less students practicing hand washing.

Table 4.19 Critical Time for Hand Washing Across the Districts

Districts	Kibaha		Kisarawe		Bagamoyo	
Indicator	Frequency	Percent	Frequency	Percent	Frequency	Percent
Before eating	22	36.67	19	31.67	18	30.00
After eating	25	41.66	22	36.67	21	35.00
After defecating	18	30.00	30	50.00	32	53.33
More than one event	17	28.33	8	13.33	7	11.67

### **Water uses**

In the school WASH clubs' focus group discussions (FGDs), hand washing with water was considered the least important out of five key sanitation practices. According to the discussions in the FGDs, the priority for water usage was ranked as follows: toilets, domestic purposes, general cleaning (bathing, washing, and maintaining cleanliness), drinking, and finally, hand washing, with respective priority scores of 1, 2, 3, 4, and 5 (Refer Table 4.20).

Table 4.20 Water Uses Ranked by School WASH Clubs FGD

Attribute	Total Score	Rank
Toilet uses	53	1
Domestic purpose	31	2
General cleaning	26	3
Drinking	15	4
Hand washing	15	4

### Water treatment practice and methods

The study's findings revealed that all respondents understand the importance of treating water, but only half of the teacher respondents claim to treat water before use, while the remaining 50% do not. This indicates that 50% of teacher respondents do not educate students on the significance of using treated water. Even those who claimed to treat water were actually referring to treatment done by the public water provider, as there

was no observed evidence of water treatment at any visited school, despite the fact that the majority, if not all, are aware of various water treatment methods.

Chlorination was carried out centrally by the national water supply system through a service provider. More than half of the teachers in all three councils mentioned treating water with chlorine, which was actually done by the water distributor in the region. Kibaha had 67% of respondents, while Kisarawe had 37% and Bagamoyo had 33% (Table 4.21). Boiling and filtering were the second most mentioned methods for water treatment, especially when water is sourced from boreholes and more advanced methods are not available or accessible. Regarding treatment for drinking water, approximately 20% of schools in Kisarawe use the boiling method, while only 12% in Kibaha and 23% in Bagamoyo employ this method (Table 4.21).

Table 4.21 Various methods used to treat water

<b>Districts</b>	<b>Kibaha</b>	<b>Kisarawe</b>	<b>Bagamoyo</b>
Add bleach/chlorine	67	37	33
Let it stand and settle	15	10	18
Boil the water	12	20	23
Sieve it through cloth	2	13	15
Water filtering device	2	15	1
Other methods	2	5	10
I don't know	10	27	37

## **Toilet Cleaning**

In determining the responsibility for cleaning the toilets based on gender, 99 percent of teachers surveyed indicated that older children from standard three are tasked with this duty (Table 4.22). Cleaning the toilets is not commonly used as a form of school punishment. During the WASH clubs' group discussion in Kibaha, it was emphatically stated that toilets are cleaned based on gender. Specifically, toilets are not cleaned by pupils in pre-primary through standard one to three (Table 4.22). However, inspections revealed that cleanliness is inadequate in some schools and does not meet expectations, primarily due to unstable water supplies, as illustrated in Figure 4.13

Table 4.22 Teacher-Reported Toilet Cleaning Responsibilities

Toilet cleaning responsibility	Kibaha	Kisarawe	Bagamoyo
Girls above 15 years	2	0	0
Boys and girls under 15 years	58	60	60
Respective responsibility			
Girl's clean boy's toilet and boy's clean boy's toilets	58	60	60
Girls clean both girl's and boy's toilets	2	0	0
Cleaning frequency			
Daily	37	53	60
Several times in a week	33	6	0

However, inspections have revealed that cleanliness in some schools is inadequate and below expectations, primarily due to unreliable water supplies, as illustrated in Figure 4.13

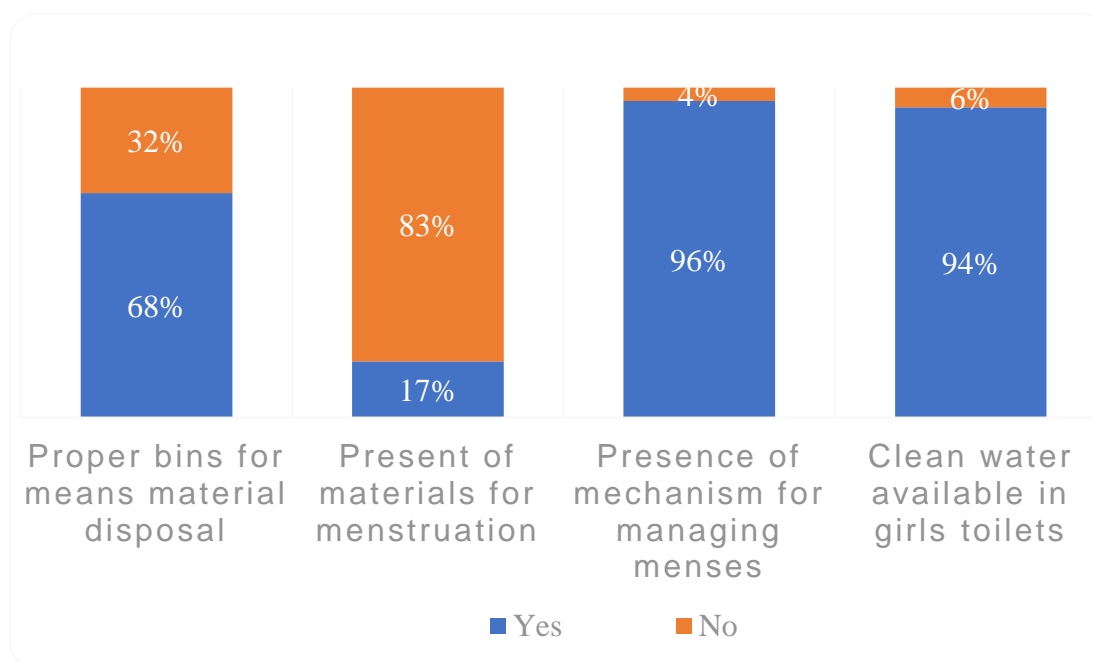
Figure 4.13 Uncleaned Toilet due to lack of water as observe by the researcher



### Menstrual Health and Hygiene Management in School

Menstrual management facilities availability in schools is shown on Figure 4.14. The findings from teachers' respondents showed that 96 % of the schools have several mechanisms for managing menses, while very few schools lack any mechanisms for managing menses. Some 68 % of teacher respondent indicated that schools have waste bins of a kind for menstrual material disposal while 32 % do not have waste bins. This complied with the observed situation but only dust bins were seen placed in the girl's toilets or just near to it and no materials for menses management were at disposal.

*Figure 4.14 Menstrual Health and Hygiene Status in School*



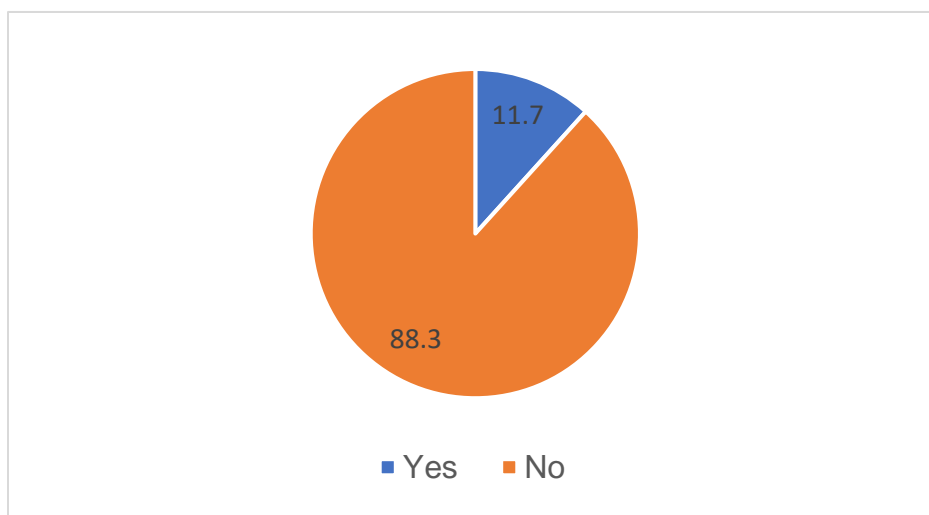
Regarding the provision of amenities for managing menses, that are soap, water and pads, only 17% of schools provide menstrual material occasionally to adolescents while 83% do not have such service. However, no evidence observed to prove the provision of menstrual management material to students. With respect to water in girl's toilets, where it is important for Menstrual Hygiene Management (MHH), the responses showed that 94% of respondent agree that school's has clean water in female toilets. This was contrary to the field observation where substantial number (83%) of schools were found to have no enough water in the female toilets. Teachers were asked if girl students are taught menstrual hygiene education. Their response showed that 88% of schools promote MHH education in their schools. Generally, education involves safe and private menstrual hygiene management practices for girls taught as extracurricular studies..

#### **Availability of changing room for adolescent girls**



Nearly 12% of teacher respondents report that their school latrine had changing room for adolescent girls while 88.33% do not have such a facility (Figure 4.15). Upon observations no school was found to have such provisional.

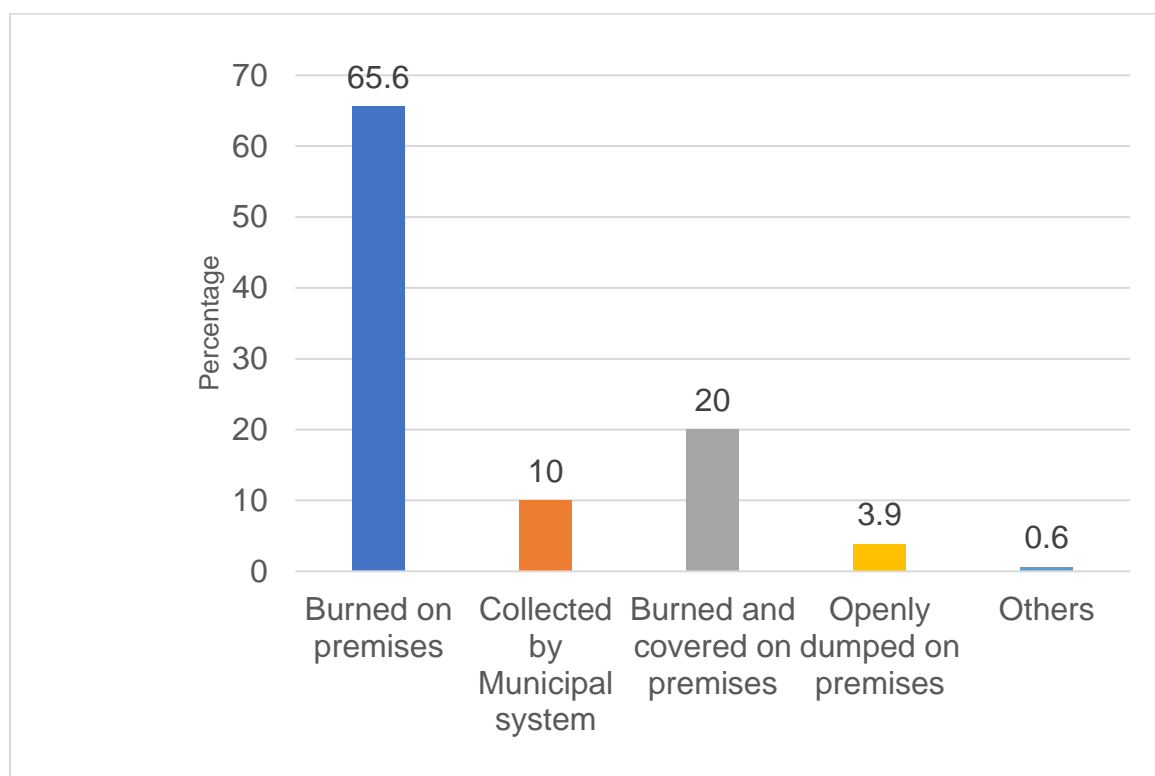
*Figure 4.15 Percentage of Available Menstrual Facilities*



### **Waste Disposal Mechanism**

Waste disposal was another sanitation practice that was envisaged. More than half (65.6%) of teacher respondents reported that solid waste is disposed by burning and burying it within the school premises, while 10% which was schools in the town councils had a system of collecting both solid and liquid waste whereby the service is rendered by the council management or private companies at cost. Solid waste disposal thorough burying and or covered on the premises was practiced by 20% of schools visited. Other mechanisms were through pits (3.9%) and dumping (0.6%) practiced (Figure 4.16).

*Figure 4.16 Solid Waste Disposal Mechanism as Teacher Reported*



Liquid waste disposal in almost all schools except for the 10% under town council was done by draining the waste into sewage pits around the school premises.

### WASH Education

The study sought to examine how the provision of hygiene education based on the school curriculum and its daily application to school children. Table 4:23 shows that 78% of teacher's respondents in all three councils agree that WASH is taught in the school and 57% of respondents confirmed that they have hygiene education materials in the school.

Table 4.23 Hygiene education in Schools

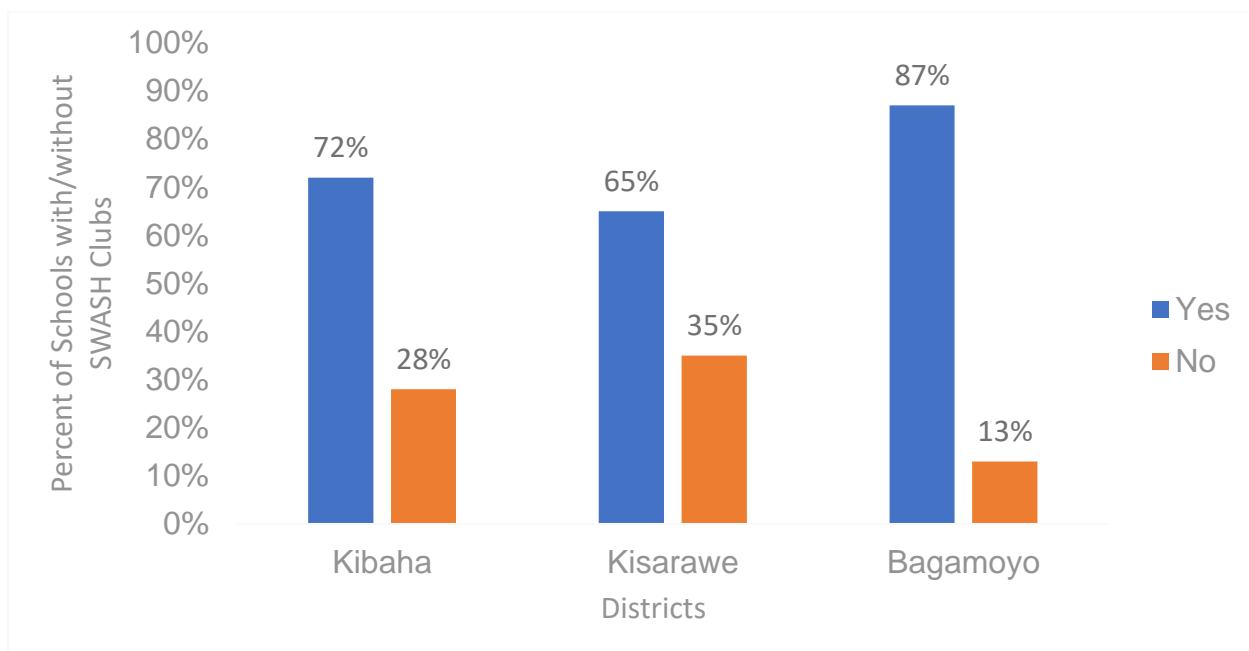
Variable	Response	Kibaha	Kisarawe	Bagamoyo	Total
WASH taught?	Yes	44 (73%)	55 (92%)	42 (70%)	141 (78%)
	No	16 (27%)	05 (8%)	18 (30%)	39 (22%)

Teacher trained in	Yes	52 (87%)	46 (77%)	53 (88%)	151 (84%)
hygiene education?	No	8 (13%)	14 (23%)	7 (12%)	29 (16%)
Hygiene education	Yes	33 (55%)	30 (50%)	40 (67%)	103 (57%)
materials available?	No	27 (45%)	30 (50%)	20 (33%)	77 (43%)

### School WASH Clubs

The respondents declared that schools had established WASH clubs. The interviewed teachers who declared to have SWASH clubs in their schools were 43 (71.67% in Kibaha), 39 (65%) Kisarawe and, 52 (86.67%) in Bagamoyo have (Figure 4.17), although in some schools they have subsided and not existing any more. Nearly, 25 percent of respondents report schools have not established sanitation clubs. Upon observations, approximately fifty percent of the schools visited had live WASH clubs which are patronage by patron or matron. SWASH clubs perform several activities like supervising handwashing facilities, washing hands with soap, environmental cleanliness, and advertising WASH through songs and comedy.

*Figure 4.17 School WASH Clubs status*



Inadequate awareness of WASH education at the school's level is one of the issues facing some schools. Through the evaluation exercise, the researcher observed that some teachers interviewed showed low understanding of the importance of these clubs.

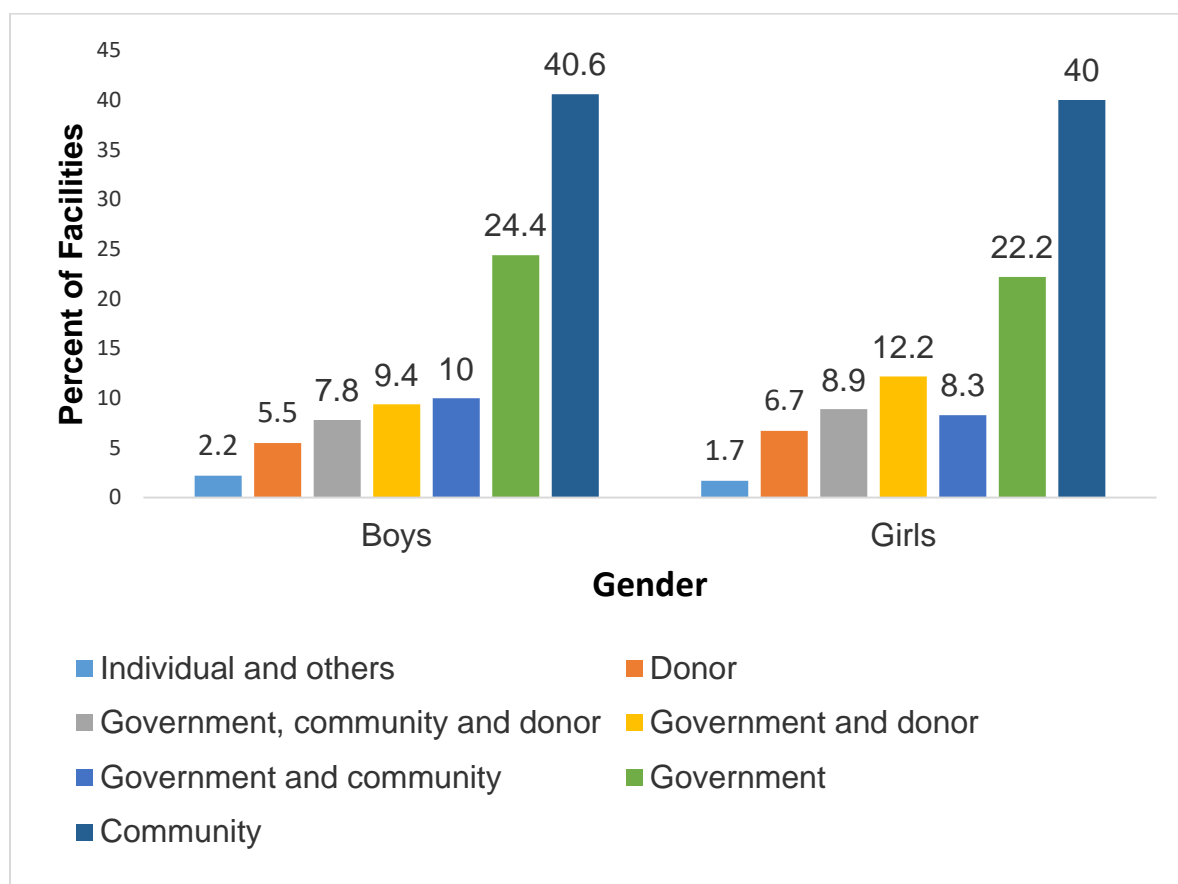
### ***Construction Methodologies, Operation Maintenance and Financing***

The second objective of the study was evaluate the effectiveness of interventions and methodologies used in constructing and maintaining SWASH facilities in terms of quality, operation and maintenance as well as financing. It was hypothesized that school WASH interventions and methodologies used in the construction and to maintain improved WASH facilities in the programme has not shown positive impact. The question being “What are the best bet interventions and construction methodologies and financing among those used in the implementation of the SWASH programme?”. This part of evaluation based on the quantities of facilities, quality of the facilities, and financing the construction, operations and maintenance of these facilities.

### ***Construction Methodologies Used in WASH Programme***

There are different methodologies used in the construction and maintenance of SWASH facilities in Tanzania which are named construction approaches. These approaches include government, donor, community, government and community, Government and donor, Government and Community, Government, Community and donor and individuals approaches. By comparison, the findings showed a difference in the WASH facilities constructed or rehabilitated and maintained by different approaches in terms of quantity, quality and usability. Most WASH facilities were constructed by the community followed by a government approach although the quality differs (Figure 4.18).

*Figure 4.18 Approach for Construction of WASH facilities by Gender*



The facilities were scored and grouped according to approach used to construct them (Table 4.24). The results showed that community approach and community with government approach scored significantly lower than all other approaches. Whereby individual constructed latrines scored higher than any other approach followed by donor funded and supervised approach. Considering the status in individual district, with respect to construction approach Kisarawe district scored highest  $3.48 \pm 1.42$  compared to the other districts which had scored  $2.68 \pm 1.79$  and  $2.40 \pm 1.43$  for Bagamoyo and Kibaha districts respectively.

Table 4.24 Mean scores for quality for the different approaches used

Construction approaches used	Scores	Sig level
------------------------------	--------	-----------

	Mean score	SE	P<0.05
Government approach	2.57	1.28	*
Donor sponsored approach	3.67	1.56	NS
Community approach	1.97	1.23	**
Government and donor approach	4.09	1.19	NS
Government and community approach	3.14	1.36	NS
Government, community and donor approach	4.56	1.09	NS
Individuals and others approach	4.67	3.02	NS

NS: No significance (P<0.05), \* Significant; \*\* highly significant

Considering the status in individual district, with respect to construction approach Kisarawe district scored highest  $3.48 \pm 1.42$  compared to other districts which had scored  $2.68 \pm 1.79$  and  $2.40 \pm 1.43$  for Bagamoyo and Kibaha districts. During the interviews one respondent from one of the districts had commented that:

*"Some partners work directly with communities, while others work via LGAs." their structures are expensive to maintain as a result, demand for repair and maintenance exceeds government/community response, resulting in massive backlogs and unrepaired facilities"*

Another respondent from another district said:

*"The technology is low with poor workmanship and design in some toilets that results in a short life span. In some cases it is difficult to rehabilitate depending on the*

*type of toilet and badly enough neither funds for new construction or rehabilitation are provided from the budget. Eventually, this causes limited accessibility and congestion for students”.*

*Figure 4.19 A typical poor standard pit latrine*



## **Usability**

Report on the observation revealed existence of some toilets with poor workmanship particularly to the old schools and where community along were involved in construction and maintenance. Figure 4.19 present one of the schools' toilets with poor workmanship and construction technology. Despite being old, some of the facilities was not well maintained with cracks and no door shutters. Some toilets were seen to be rather old and unmaintained (Figure 4.19) to the extent that they don't provide total privacy to users. Other facilities were of poor quality irrespective of the type simply because they were built at a substandard level or not maintained. Majority (93%) of teacher's



respondent reported that it is common to have some toilets facilities not in use because repair and maintenance of these facilities is not given due diligence.

### **Operational and Maintenance (O&M) of SWASH facilities**

Operation and maintenance of school properties is important for their sustainability. When asked who is responsible for operation and maintenance, the teacher respondents mentioned several stakeholder that they think are responsible for M&O. These included the local government authority, parents, and school administration, central government and any other well wishers (Table 4.25).

Table 4.25 Operation and Maintenance of WASH Facilities Responsibilities

Entity	Percent Respondents			Total percentage
	Kibaha	Kisarawe	Bagamoyo	
School administration	0.0	23.3	25.0	16.1
Local government	21.7	13.3	21.7	18.9
Parents	11.7	20.0	23.3	18.3
Others	23.3	5.0	8.3	12.2
Central Government	10.0	3.3	5.0	6.1
Any of the above	33.3	35.0	16.7	28.3

### **Financing construction, operation and maintenance**

#### **SWASH budget**

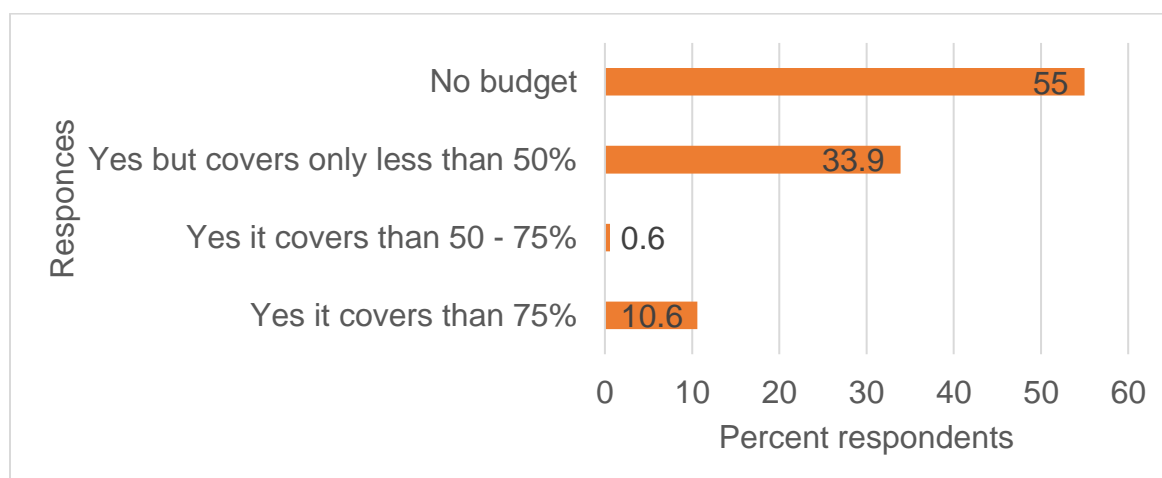
Despite of schools having several sources of funds for WASH construction and maintenance (refer to Table 24 and 25), none of the schools surveyed had a dedicated

budget specifically allocated for this purpose. Instead, funds for WASH maintenance are drawn from the general school budget, primarily provided by the Local Government Authority. However, respondents and key informants unanimously highlighted that these funds were insufficient. As a result, schools often seek additional financial support from various sources such as individuals, parents, and Development Partners (DPs), as illustrated in Figure 4:18. These alternative sources are predominantly utilized for the construction and rehabilitation of WASH infrastructures.

While schools may have multiple funding sources for WASH initiatives, key informants identified Development Partners as the primary contributors, followed by the Local Government Authority. Contributions from parents and the local community were reported to be minimal.

Regarding the budget for the operation and maintenance of WASH facilities, only 10.6% of respondents indicated that the allocated budget covered more than 75% of the requirements. The majority (89.4%) expressed that either no budget was allocated or the allocated budget was insufficient. Specifically, 55% of teacher respondents reported a lack of budget allocation for maintenance and rehabilitation (refer to Figure 4.20), while 33.9% stated that the allocated budget covered less than 50% of the required amount for WASH operation and maintenance. Additionally, 55% mentioned that there was no specified budget for the operation and maintenance of WASH facilities (refer to Figure 4.20).

*Figure 4.20 Budget for Operation and maintenance of WASH facilities*



Responding from the operation and maintenance budget issue it was revealed from the interviews that there is no fund usually allocated specifically for WASH facilities operation and maintenance in the annual school budget.

*“There is no fund for WASH services, and responsible people for resource mobilization have relaxed. One can say that the importance of having improved WASH facilities is neglected due to insufficient budget allocations from year to year”. Response from the Key Informant.*

Another key informant respondent from the interview in one of the surveyed districts had said:

*“The councils have diverse funding sources, including revenue collection from various channels and corporate sponsorships. However, it is evident that SWASH initiatives are not a primary focus of their expenditure. The National SWASH Technical Working Group, which is intended to convene four times a year, has not held any*

*meetings since 2016. This lack of meetings has resulted in unsupervised work and potentially disjointed efforts in the SWASH sector.*

*Additionally, Local Government Authorities (LGAs) have been falling short in conducting district water and sanitation meetings as scheduled for planning WASH activities. This failure is attributed to the absence of a budget allocated for organizing such crucial WASH meetings. The lack of these planning sessions may hinder coordinated efforts and effective implementation of WASH initiatives at the local level”.*

### **Budget allocation for purchase of sanitation amenities**

The survey findings indicated that only 26.67% of schools had a designated budget for WASH amenities. A significant majority, comprising 51.67% of the respondents, reported having no budget allocated for WASH amenities and consequently did not provide these services. The remaining 21.66% stated that their school had a budget that was not specifically earmarked for WASH services (refer to Table 4.26), leading them to face challenges in providing such amenities from their own school resources.

Furthermore, responses revealed that 33.33% of schools had budgets that were deemed insufficient to effectively operate and maintain the WASH facilities. Others mentioned that the budget received by the school included instructions on maintenance, which did not adequately meet the requirements for school rehabilitation.

Table 4.26 Budget for Maintaining the School WASH facilities

<b>Response</b>	<b>Respondents</b>	<b>Percent</b>
Yes	48	26.67

No	93	51.67
Not specific	39	21.67
Total	180	100.00

### **Community and teachers' perception on WASH programme**

The study embarked on a comprehensive exploration of the perceptions held by teachers and the surrounding community concerning Water, Sanitation, and Hygiene (WASH) programs in schools. The overarching aim was to shed light on how these perceptions could influence the establishment, upkeep, and longevity of WASH practices within educational institutions. By delving into various key areas, the research sought to unravel the intricate web of factors that shape the landscape of WASH initiatives in school settings.

One of the pivotal focal points of the study was the State of Drinking Water. This facet entailed a deep dive into how teachers and community members perceive the quality and accessibility of drinking water within schools. Factors such as the sources of water, its cleanliness, and the ease of access were scrutinized to gauge the prevailing sentiments surrounding this fundamental aspect of WASH provision.

Another critical area of investigation revolved around Water Treatment. Here, the research sought to uncover the attitudes and beliefs harbored by teachers and community stakeholders regarding water treatment practices within school premises. This encompassed an exploration of the methods employed for water purification and the hygiene protocols linked to water consumption, offering valuable insights into the prevailing norms and practices in this domain.

The study also delved into the potential ramifications of Limited WASH Services on School Performance. By probing into how the perceived inadequacy of WASH services within schools could impact overall academic outcomes, attendance rates, and health indicators, the research aimed to highlight the interconnectedness between WASH provisions and educational achievements.

Furthermore, the research set out to identify the Limitations to Programme, Success that could impede the effective implementation of WASH initiatives in schools. By investigating the perceived barriers and challenges, such as financial constraints, infrastructural deficiencies, or inadequate stakeholder support, the study aimed to illuminate the hurdles that need to be overcome for sustained program efficacy.

The Effect of Shared Toilets on Gender Segregation emerged as another critical area of inquiry. By examining the attitudes towards shared toilet facilities for both girls and boys within school premises, the research sought to unravel the complexities surrounding privacy, dignity, and the fulfillment of gender-specific needs in WASH infrastructure.

Lastly, the study delved into the realm of Menstrual Hygiene Management Outcomes, exploring how teachers and community members perceive and engage with menstrual hygiene practices in schools. This encompassed an assessment of access to menstrual hygiene products, the adequacy of facilities, and the provision of education on menstrual health, offering a nuanced understanding of this vital aspect of WASH programming.

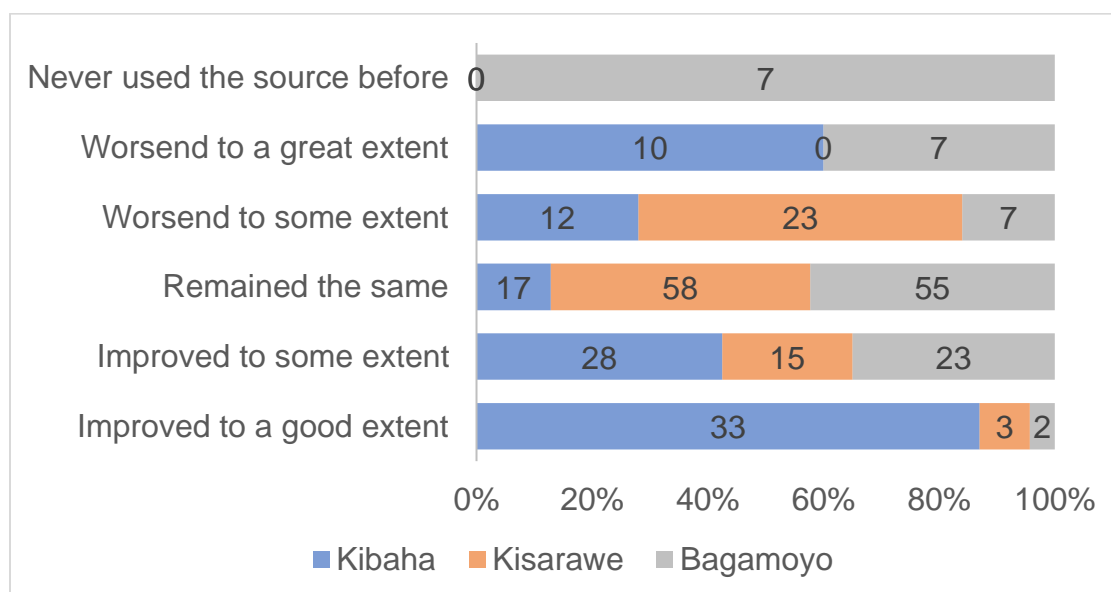
In essence, by scrutinizing these multifaceted dimensions of teachers' and community members' perceptions on WASH programs, the study aimed to unearth

potential challenges, entrenched attitudes, and prevailing beliefs that could either bolster or hinder the sustainability and efficacy of WASH practices in the school environment. This comprehensive investigation serves as a crucial step towards fostering a more informed and responsive approach to WASH programming in educational settings.

### State of drinking water five years ago

In the study conducted in Kibaha, it was observed that 52.9% of teachers surveyed reported that the quality of water had remained consistent over the past five years. Conversely, in Kisarawe, an equal percentage of 52.9% of teachers mentioned that they had been using an alternative water source of poor quality during the same timeframe. Interestingly, a total of 63 teachers, accounting for 35.0% of all respondents from Kibaha, Kisarawe, and Bagamoyo, indicated some improvement in the quality of drinking water. Among these respondents, 20 were from Kibaha, 23 from Kisarawe, and 20 from Bagamoyo, as depicted in Figure 4.21.

*Figure 4.21 State of drinking water five years ago*



## Water treatment

The study revealed a concerning trend regarding water treatment practices in schools. Although all teachers acknowledged the significance of treating drinking water, it was seldom carried out due to it being perceived as an additional cost that schools were unable to bear within their budgets. During the Focus Group Discussion (FGD), a participant from Bagamoyo highlighted this issue, stating, "*Water treatment at the school is an added burden to the parents as schools cannot afford. After all, we have been using this water since time immemorial with no apparent adverse effects.*" This sentiment underscores the financial constraints faced by schools in implementing essential water treatment measures, despite the recognized importance of such practices for ensuring safe and clean drinking water for students and staff.

## Handwashing with soap

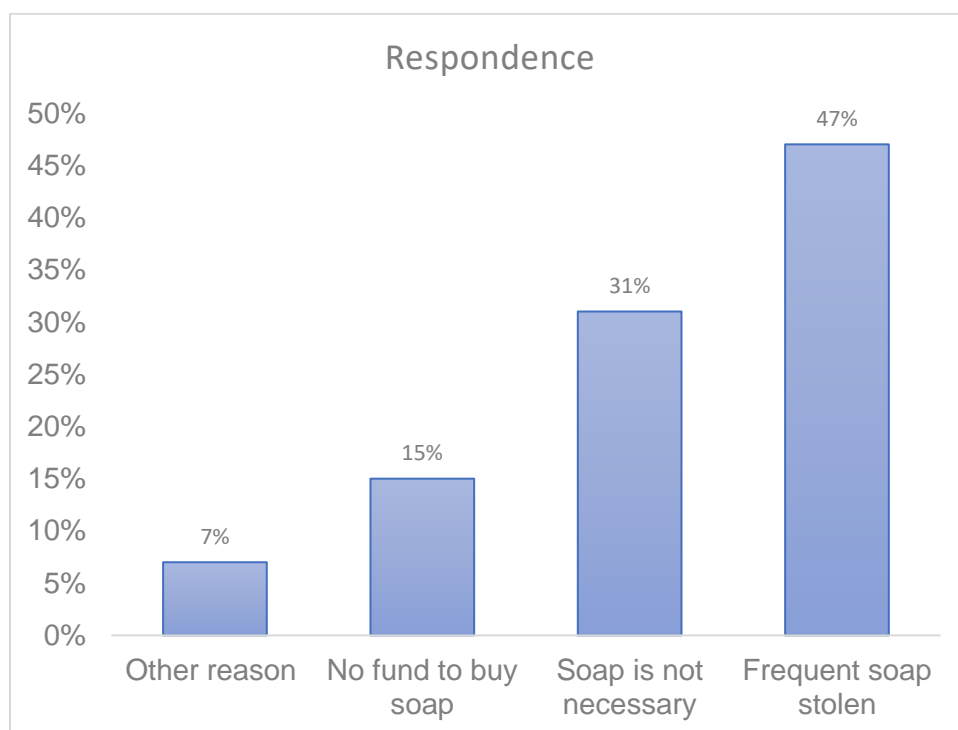
*Handwashing with soap at critical times, such as before and after eating, after using the toilet, and when handling dirty or contaminated materials, is crucial for preventing the transmission of disease-causing pathogens. However, a school survey revealed that approximately 31.1% of teacher respondents reported that students perceive handwashing with soap as unnecessary, citing concerns about the associated costs that could be allocated to other purposes (as shown in Figure 4.22).*

*Contrastingly, during Focus Group Discussions (FGDs) with key informants and members of the School Water, Sanitation, and Hygiene (SWASH) Club, it was consistently emphasized that handwashing with soap is indeed important for maintaining good hygiene practices. The discussions highlighted that the provision of soap for handwashing*



*is often hindered by budget constraints, which limits the school's ability to ensure the availability of soap for students and staff. This discrepancy between the perceived importance of handwashing with soap and the practical challenges related to budgetary constraints underscores the need for sustainable solutions to promote proper hand hygiene practices within school setting.*

**Figure 4.22** Reason for inadequate supply of soap for handwashing



The study uncovered various reasons behind the absence of soap in school latrines, as reported by teachers:

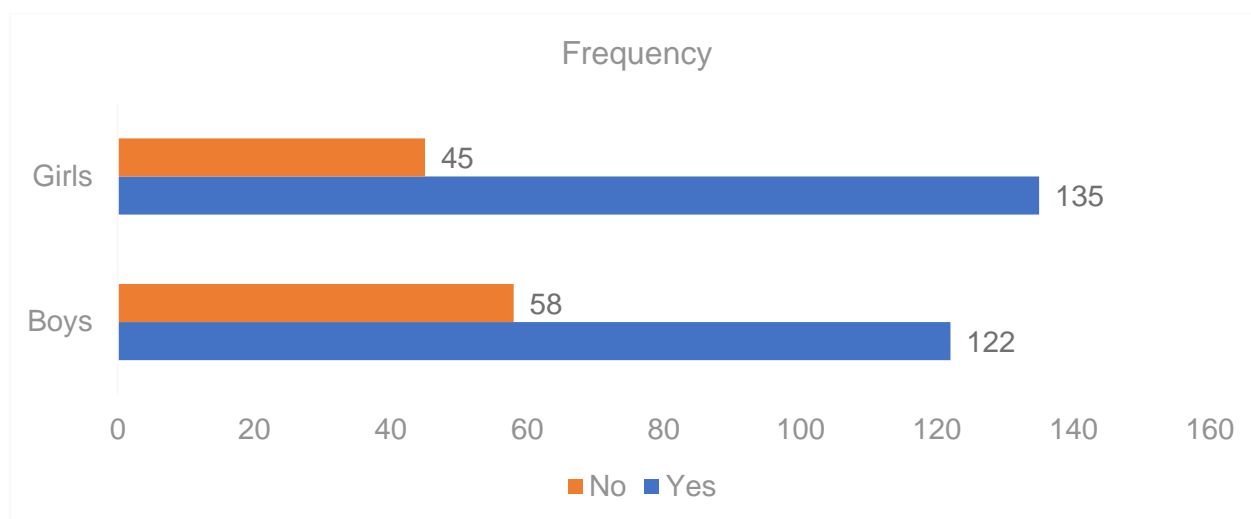
- 47% mentioned that soap theft was a common issue, leading to its unavailability.
- 15% highlighted insufficient funds as a barrier to purchasing soap.
- 31% pointed out that students believed soap was unnecessary for handwashing.
- 7% acknowledged multiple factors contributing to the lack of soap.

These findings emphasize the complex challenges in ensuring soap availability in school latrines, encompassing issues such as theft, financial constraints, and differing perceptions of soap's importance for hand hygiene. Addressing these factors is crucial for promoting effective handwashing practices in school setting.

### **Effect of limited WASH Service on School Performance**

The study revealed that 68% (122) of teachers believe that inadequate Water, Sanitation, and Hygiene (WASH) services impact students' academic performance. Furthermore, 75% (135) of teachers specifically highlighted the negative impact of insufficient toilets on the academic performance of teenage girls (Figure 4.23). These statistics underscore the crucial need for sufficient WASH services and adequate toilet facilities in schools. Addressing these issues is essential to enhance the well-being and academic success of all students, particularly girls, and to promote a healthier learning environment

*Figure 4.23 Effect of limited WASH services on school performance*



### Limitation to Programme success

According to key informants, limitations to Water, Sanitation, and Hygiene (WASH) services in schools include financial constraints, cultural taboos, and negligence, as depicted in Table 4.27. Similarly, teachers' responses indicate that WASH services in schools are constrained by issues such as lack of funding, adherence to cultural norms and taboos, and students' neglect of proper hygiene practices. Addressing these multifaceted challenges is crucial to improving WASH facilities in schools and promoting a healthier and more conducive learning environment for all students.

Table 4.27 Limiting factors to WASH Practices

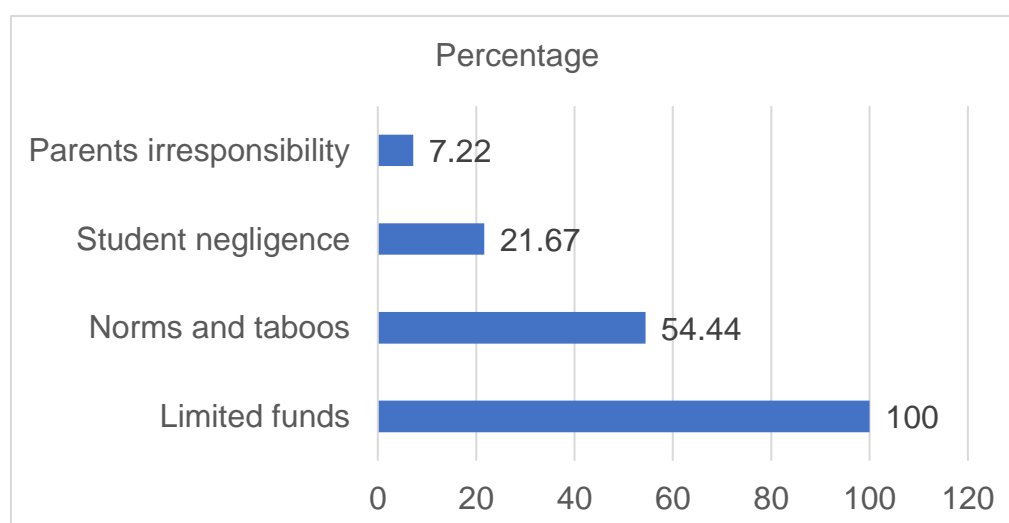
Key Informants response	Frequency	Percent
Finance	24	100
Teachers' negligence	3	12.5
Parents negligence	11	45.83

Students' negligence	12	50.00
Taboos	24	100

Percentages are not mutually exclusive

In alignment with the key informants' perspectives, teacher respondents also identified limited funds, adherence to cultural norms and taboos as the primary constraints on Water, Sanitation, and Hygiene (WASH) services in schools, as illustrated in Figure 4.24. These shared observations underscore the critical importance of addressing financial barriers and cultural factors to improve WASH facilities and practices within school settings. By overcoming these challenges, schools can create a more hygienic and supportive environment for all students.

*Figure 4.24 Teacher perceptions SWASH programme Implimentation*



**Effect of not separating male from female toilets**

According to the responses from teachers, the presence of male toilets that are not separated from female toilets is largely perceived as not affecting girls' school attendance significantly. However, the quality of the toilets is seen as a more significant factor contributing to girls' absenteeism, as indicated in Table 4.28. This distinction highlights the importance of not only providing separate and adequate toilet facilities but also ensuring their cleanliness and maintenance to support girls' regular attendance and well-being in school.

Table 4.28 Impact of Inadequate Gender-Separated Toilet Facilities

	<b>Absenteeism of girls due to no separate toilets</b>		
	Yes	No	I don't know
Urban	32%	68%	0%
Rural	11%	87%	3%
Urban	82%	18%	0%
Rural	25%	73%	3%

All focus groups unanimously agreed that having toilets for both girls and boys in the same block has a discernible impact on girls' performance, particularly among adolescent students. This shared perspective underscores the importance of providing separate and gender-appropriate toilet facilities to support the academic success and

well-being of female students, especially during their adolescent years. Addressing this issue is crucial for creating a conducive and inclusive learning environment for all students

### **MHM Practices at School**

The perception of stakeholders on Menstrual Hygiene Management (MHM) practices garnered significant attention during the school committee Focus Group Discussions (FGDs), with the following statements highlighted for further consideration.

*"According to regional taboos and customs, girls are expected to report to their moms and undergo procedures that involve seclusion for at least a month to learn how to manage menstruation and prevent pregnancy. Girls must understand the consequences of missing school." - Participant in an FGD member.*

*"Students lack sufficient knowledge about menstruation, and teachers should educate boys on girls' menstrual needs to prepare them for future roles as caregivers. This knowledge will benefit them when they become heads of households with daughters." - School committee member from first District.*

*"Toilet facilities lack safety measures for changing menstrual products, with no bins or water available for cleaning sanitary pads. Consequently, many girls avoid changing pads until they return home, impacting their attendance. The school administration should ensure adequate amenities in girls' restrooms." - School committee member from second District.*

*"Parents are supportive of their daughters but face challenges that may lead to school absences. Education on Menstrual Health and Hygiene (MHH) can help mitigate*

*these issues, reducing complications and improving girls' school attendance." - School committee member from third District.*

### Outcome of the SWASH programme

. The outcome of the SWASH programme is perceived by key informants, teachers, and school committee members as leading to positive mindset changes regarding WASH activities in the community and promoting a shift in behavior towards greater adoption of hygiene and sanitation practices, as well as improved personal hygiene (Table 4.29). It is noted that only key informants have linked the program to the SDG goals, while teachers, school committee members, and students have not made this connection. This suggests that they may either lack awareness of this aspect or that it has not been emphasized enough. The future success of the program is seen as dependent on increased funding and the provision of facilities for SWASH in schools. Key informants view raising awareness as a crucial strategy for ensuring the success of the SWASH programme.

Table 4.29 Stakeholders' views on SWASH's future and outcome

Perception on outcome	KII (%)	Response (%)	FGDs (Scores)
Adoption of WASH practices in schools and community	100	100	127
Promote personal hygiene to reduce WASH disease	83.33	67.22	56
More conducive learning and health environment	79.17	78.337	44
Increase school attendance and hence performance	75	39.4	13

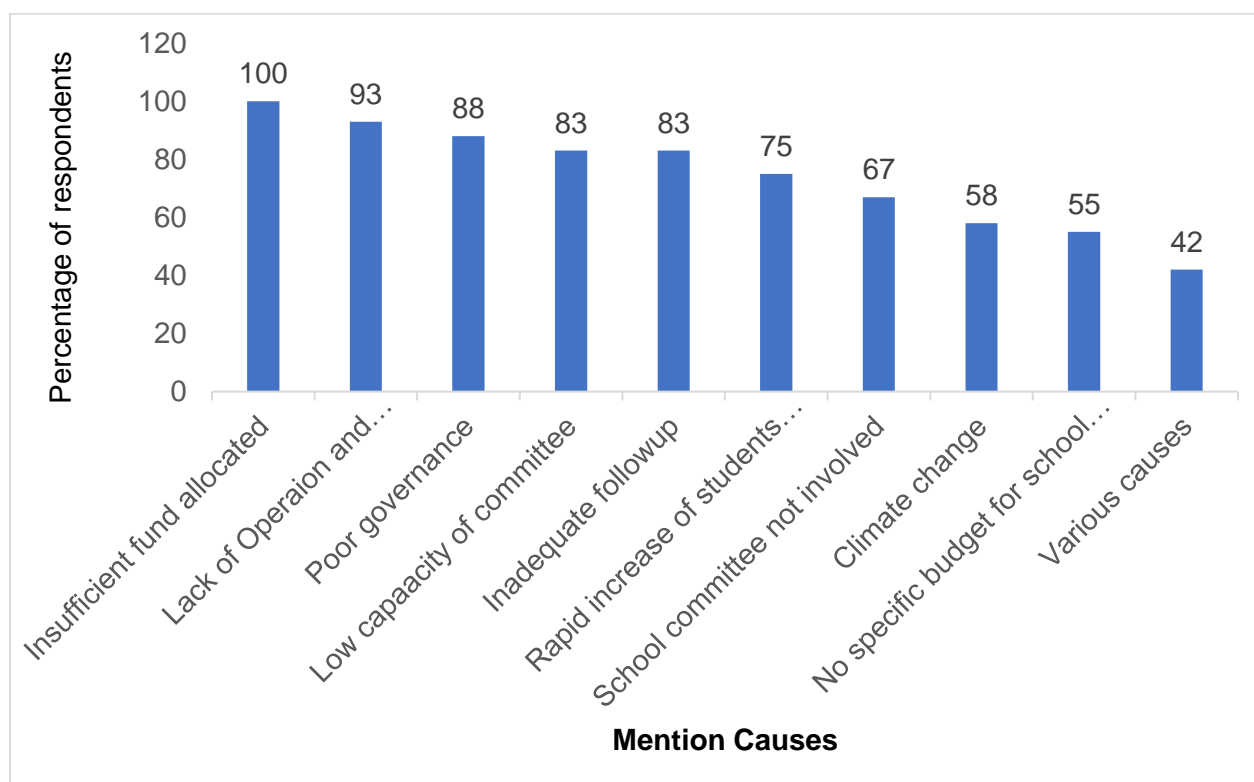
Compliance with the SDG goal Number 4 and 6	50.0	3.9	0.0
<b>Perception on Future</b>			
Increase WASH facilities in school	66.7	78.9	68
Increase awareness for youngster and disabilities	70.8	7.8	19
Increase School WASH budget	75	100.0	101
Promote WASH behavioural change in school community	54.2	5.6	7
Attracts more funders to support WASH facilities	50.0	55.56	31
Improved planning and strengthening monitoring	62.5	38.3	14
<b>Challenges and Opportunities of WASH Programme Implementation</b>			

### ***Challenges of WASH Programme***

The research aimed at revealing challenges that were constraining the implementation and sustainability of the WASH programme. Figure 4.25 shows various challenges mentioned by the respondents during the survey in the 180 schools.

*Figure 4.25 Challenges of Implementing WASH as reported by teacher*





Overwhelmingly, all respondents showed that insufficient funding is a challenge to the programme. Other challenges reported by the majority of the respondents included initial poor planning for operation and maintenance (93%), poor governance (88%), unsatisfactory follow-ups and the low capacity of the school committee (83% each). The rapid increase in enrolment of students (75%), no or low involvement of the school committee (67%), climate change (58%), having no specific budget for WASH (55%) and others which included unforeseen calamities (42%) were also mentioned as challenges to WASH programme. During the interviews, one of the key informants from Kibaha asked about the main challenges that they face during the implementation of the programme had responded as follows:

*Currently, schools are inadequately planned, with some situated far from water sources and distribution systems. The cost of providing water by NGOs is often substantial and sometimes exceeds the school budget, placing a burden on school administrations to fulfill the schools' water needs. In certain cases, schools are positioned in areas where the only water source is sporadically functioning boreholes. Given the geographical constraints, water availability in the village, and even for the community, is severely limited. While a few urban schools are connected to the municipal water supply, schools in rural areas face higher expenses for water provision*

Other respondents lamenting on the budget and priority to WASH, said

*“On the positive side, I believe having a standalone programme focusing on school WASH only will attract more funds as all partners with an interest in school development, WASH and other gender/girls’ interests will contribute to the programme. On the negative side, WASH in school receives low priority because it cut across different ministries including the ministry of water, health and education. Some of these components do attract more partners where resources are distributed in all five main components while Water supply in the community attracts more resources leaving the WASH programme in school starving all the time”.*

Key Informants reported challenges were eight of which insufficient funding was registered as outmost challenge. Table 4.30 others being lack of strategies for fund mobilization, unplanned sporadic increase in pre-primary, primary and secondary students enrolment, low community involvement and insufficient ministerial coordination.

Table 4.30 Challenges SWASH Programme implementation as reported by KIIIs

Challenges	Percent
Insufficient funds allocated for WASH	100
Low community and school committees' participation	75
None mechanism of fund resource mobilization in place	75
Sporadic increase of enrolment of pre-primary, primary and secondary	67
Low moderate ministerial coordination	50
Political influence and interest	38
Low to moderate WASH stakeholder's involvement/accountability	25
Lack of up-to-date facility/instruments costs	13

The ranking of sustainability of the programme in schools by the school committee FGD highlighted that the primary challenge to sustainability is the lack of funds, as shown in Table 4.31.

Table 4. 31 Challenges for sustainability identified and ranked by FGDs.

S/No	Factors hampering sustainability	Scores	Rank
1	Inadequacy in budgeting (not participatory/not sufficient	60	1
2	Poor accountability and governance	59	2
3	Limited knowledge/information to stakeholders	48	3
4	Unclear roles of stakeholders	43	4
5	Planning does not consider source of water and school expansion	30	5
Total Score = 240			

### ***Source of challenges***

Major source of challenges for WASH programme implementation in schools that was mentioned by the teacher respondents are shown in Table 4.32. The major cause mentioned by 42% of the teacher were due to accumulated factors including financing, capacity, unforeseen mishaps, poor planning and no commitment. However, other teacher respondents 32% mentioned that the major source of the challenges was due to poor school infrastructure layout. Other respondents said the major cause of the challenge was due to poor construction (23%) and inadequate infrastructure (3%).

Table 4.32 WASH Challenges According to Teacher Response

<b>Major sources of challenges</b>	<b>Frequency</b>	<b>Per cent</b>
Inadequate Infrastructures (few buildings and or drop holes)	6	3.3
Infrastructures not properly constructed (low quality)	41	22.7
School infrastructure layout improper lay out planning	57	31.7
Others factors include financing, management capacity, unforeseen mishaps, planning and commitment	76	42.2

Concerning the governance, one of the key informants' respondents has said:

*“Speaking of the challenge; Sustainability and scaling up the technology is challenged by some contradicting statements from the political leader and lack of commitment of the community on maintenance of the facilities developed in some of the schools”.* Key informant from Kisarawe.

Physical accessibility is a major element in planning and improving WASH since schools are not physically well-positioned in terms of hardware construction and maintenance. In the planning of the WASH programme, one participant said that:

*"There is poor and inadequate planning of WASH programme that does not consider the school's settings and allocation of water supply sources and water supply systems as a result, the cost of providing water services is high and schools are left without water significant. The government are constructing new schools without planning for WASH facilities. Similarly, there is no water supply in the entire village and the government requires a village to distribute water to the school. The water must then be made available so that members of the community can contribute, but this has yet to be shown. The planning also could consider the physical accessibility as a major element in planning and improving WASH programme implementation because schools are not physically well-positioned in terms of infrastructure and services."* Said one member from NGOs

One member from Kibaha said that their implementation is sometimes difficult because the permission and follow-ups are linked across the different sectors and are not well coordinated. She said:

*"The Education Officer is responsible for educational performance in areas where there is no access to water, the Water engineers are in charge of water distribution, and the health Officer is in charge of hygiene. This makes planning and coordinating the implementing partners exceedingly challenging. There is a lot of bureaucracy in the Regional Secretariat and LGA. This causes delays, and implementation time is squandered on negotiations to secure support. The consultation takes too long and is ineffective."*

Table 4:33 presents the perspectives gathered from the Focus Group Discussions (FGDs) regarding obstacles to sustainability, which were analyzed and ranked. The top hindrances identified were insufficient funding, short lifespan of infrastructure, poor governance, rising water demand, and inadequate planning.

Table 4.33 Challenges for sustainability identified and ranked by FGDs.

<b>Challenges reported</b>	<b>Scores</b>	<b>Rank</b>
Insufficient financing	51	1
Poor governance including monitoring and evaluation	51	1
Short life span of infrastructures	26	2
Increasing demand for water resources	26	2
Poor planning and management	16	3
Presence of inactive water committees	14	4
Low community participation	13	5

Eroded ecosystem	13	5
Institutional restructuring	8	6
Population growth or decline	5	7
Limited capacities of the implementers	5	7
Poor forecast for future development and population increase	5	7
Occurrence of natural disasters or events	4	8
Climate variability/change	3	9

(Total pebbles 240)

### Options for solving the challenge

Options for improving the effects of these challenges as described by the key informants and teachers' respondents are shown in Table 4.34

Table 4.34 Teacher Respondents Options for Solving the Challenges

Response	Frequency	Percent
Provide sufficient funds for construction, operation and maintenance	180	100
Create awareness to parents	98	54
Education to students	137	76
Capacity building to SWASH teachers	111	62
More persuade stakeholders to contribute	87	48

Table 4.35 shows the responses from the key informants based on the stakeholder's sustainability options on finance, advocacy and capacity building. All key informants respond that there is a need for the government to allocate enough budget for school WASH activities. Another area was the capacity building to teachers and school committees in order to enable them to understand the programme and own it. Also, all 24 key informants recommend the advocacy activity to all levels for mobilizing the resources for WASH activities.

Table 4.35 Sustainability options from the key informants

<b>Response</b>	<b>Responses</b>	<b>Percentage</b>
Adequate funding for WASH facility construction/ rehabilitation	24	100
Capacity building on WASH guidelines and strategies to all levels	24	100
Advocacy and policy review of Monitoring and Evaluation	20	83
Provide clear plans for facility maintenance and operation	20	83
Use local available construction materials and train local expert	20	83
Raise awareness among teachers and school committees about WASH	16	67
Facilitate and strengthen enabling environment to support WASH	16	67
Liaising and fostering harmony with WASH implementers	15	63



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Proper planning before implementation giving roles and responsibility	12	50
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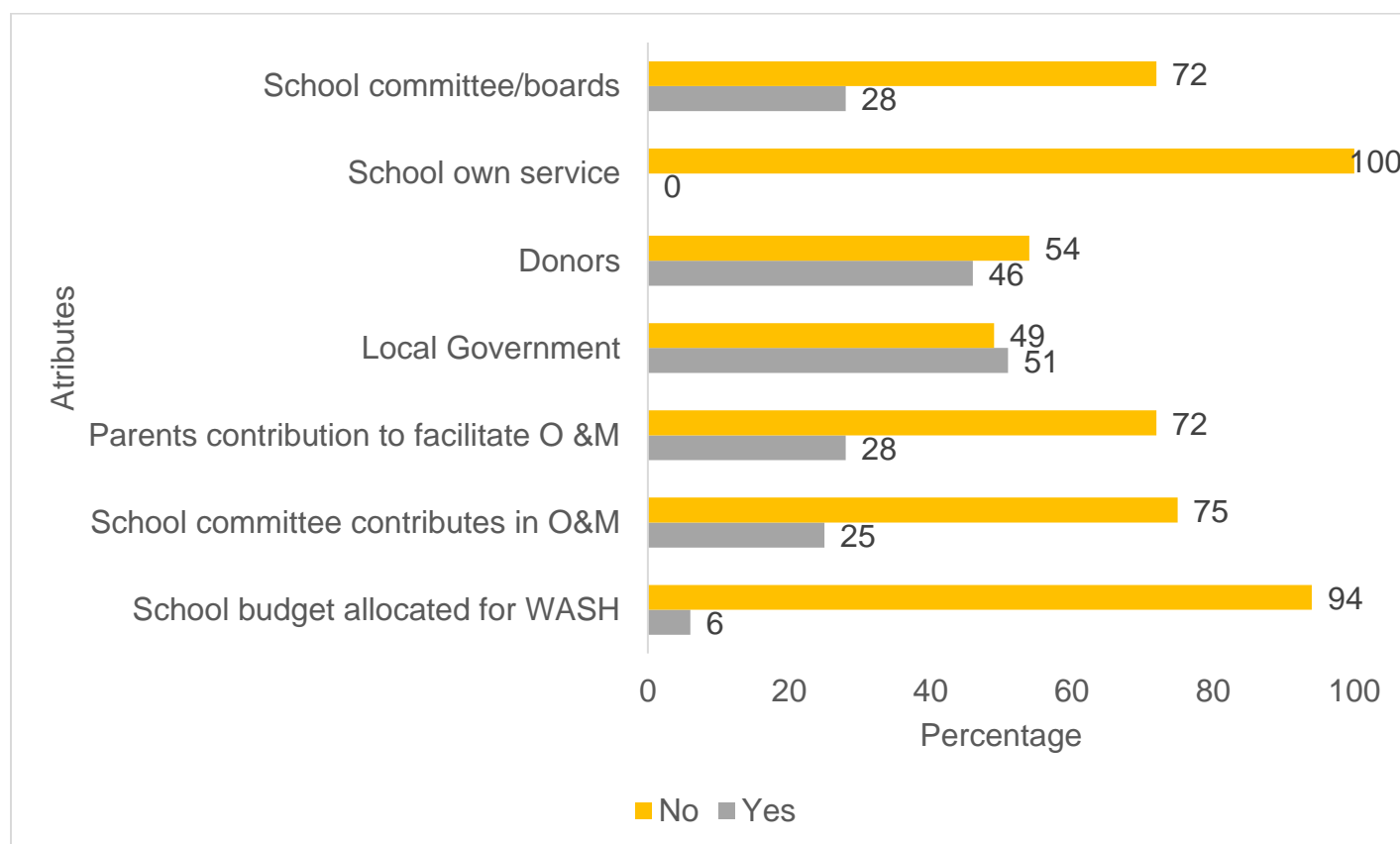
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Percentage not mutually exclusive

### **WASH stakeholders support the Government Policies**

Participation was sought through financial contribution to SWASH projects. It was realised that major contributions are through budget allocated for SWASH from Local Government and donors. Figure 4.26 present school committee and parents contribute little and only in maintenance. Part of the allocated budget comes from the donors eventually making donors to contribute substantially in the projects. In the context of School Water, Sanitation, and Hygiene (SWASH) projects, the participation of various stakeholders through financial contributions plays a crucial role in ensuring the successful implementation and sustainability of these projects. The statement highlights that major contributions to SWASH projects come from the budget allocated by the Local Government and donors. This financial support is essential for addressing the challenges related to inadequate facilities, poor conditions in public schools, and governance complexities that hinder the effective delivery of WASH services.

*Figure 4.26 Source of Fund for WASH Services*



### Community involvement

The community in this study refers as teachers, parents school committees, and school children, whereby the stakeholders represent the individual or group of people with same interest that can influence the policy and implementation of the WASH programme. The study revealed that, all visited schools 100% in all councils had functional school committee in case of primary schools and boarding schools in case of secondary schools. However, in terms of responsibility on WASH implementation, maintenance and operations budget, it is almost left to the councils and stakeholders. During the discussions with school committee, it was realized that everyone in the community knows what to be done in the school. However, they are unable to fulfil their roles and responsibilities because of limited resources especially funds and technical know-how.

Reports from the focus group discussion shows several concerns from the councils that limit their responsibility and commitment. as quoted from one participant.

*" The council officers often do not recognize the significance of community members' involvement in school development, despite our contributions being essential and valuable. The planning processes are often top-down, which diminishes the level of community participation in school programmes".*

It was revealed from the interviewed key informants that little or no community involvement is done in the projects 60%. Only 40% of the key informants considered that the community are fully involved in the planning and execution of the projects at the school level. Comments given by FGDs; each district responses shows that the importance of engaging the community is that;

*"The advantage of engaging the community is also the continuous repair and maintenance of the buildings. The local technicians are reliable and can provide continuous maintenance whenever it is needed" Comment from Kibaha. "The local government is a key unit responsible for continuous supervision and liability for sustainability. Students are belonging to the community, hence each member is responsible for school contributions" Comment from Kisarawe. "The school community have a role for monitor and assess usage for effective utilization." School committee member from Bagamoyo"*

Despite the good expectations when the community is involved committee member in two of the councils had indicated their low economic power to curtail their involvement

*"We like development of our schools, especially we would like to see all school have improved SWASH however money is challenging "comment from school committe Kisarawe while another member said that, "My income totally depends on crops, of which sometimes production is uncertain due to unpredictable weather now days. so, it is improper for the government to expect us farmers to implement most of the assigned activities of the programmes." facilities but our people have no money". Member from Bagamoyo*

### **Provision of SWASH Services in schools**

In the study, participants were asked to elucidate the primary entity responsible for supporting Water, Sanitation, and Hygiene (WASH) services. Results revealed that approximately 70% of teacher respondents identified the school committee as the entity tasked with overseeing and ensuring the proper functioning of WASH services. A smaller proportion, around 15%, indicated that both external entities and the school community share this responsibility. Only 1% of teacher respondents attributed the provision of WASH services to external providers, while approximately 14% reported that parents are responsible for WASH services (see Table 4.36).

Table 4.36 Organization responsible for the provision of WASH services

<b>Response</b>	<b>Frequency</b>	<b>Per cent</b>
External provider	1	0.6
School management	126	70.0
Both External and School	27	15.0

Parents	26	14.4
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Percentages are not mutually exclusive

Conversely, as per the key informants, the primary entity responsible for the provision of Water, Sanitation, and Hygiene (WASH) services in schools is the government, primarily through its operation and maintenance budget. Table 4.37 presents the responses obtained from key informants regarding the responsibility for providing soap in schools.

Table 4.37 Responsibility in providing soap for hand washing in schools

Responsibility entity	Frequency	Percentage
Parents/students	4	16.7
School administration	15	62.5
Local/central government	6	25.0
Parents/school sharing	21	87.5

Percentages are not mutually exclusive

Despite the agreement on the use of soap in washing hands, there were some mixing ideas on who has to provide the soap. Several entities are suggested to provide soaps including school administration, government, parents and cost sharing a between teachers and parents. Majority of key informants (87.5) responses indicate that parent

and schools are supposed to provide soap for hand washing. This is different from teachers who suggested only school budget for the same or parents in a form of cost sharing.

### **Handling complaints to the service providers**

Findings from the districts revealed varied responses regarding the entities responsible for addressing complaints related to Water, Sanitation, and Hygiene (WASH) issues. The majority of teacher respondents in Kibaha indicated that SWASH complaints are typically addressed by the school committee and head teacher. In Kisarawe, respondents identified parents, SWASH teachers, and the vice head teacher as the primary individuals responsible for handling such complaints. Conversely, in Bagamoyo, SWASH teachers, the head teacher, and vice head teachers were perceived as the appropriate parties to address SWASH complaints within the school. Interestingly, respondents in Kibaha also mentioned that such complaints could be addressed by all members of the school community (see Table 4.38).

Table 4.38 Handling complains on WASH programme

Response	Percent respondents		
	Kibaha	Kisarawe	Bagamoyo
School Head teachers	51.7	6.7	41.67
Vice Head teachers	36.7	40.0	23.3
Students	0.0	25.0	75.0
SWASH teachers	0.0	53.3	48.3
School committee	61.7	11.7	28.3
Parents	0.0	100.0	0.0

Other	0.0	56.7	43.3
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\* Percentages not mutually exclusive

### **Monitoring and Evaluation (M&E)**

Monitoring and Evaluation (M&E) of the program is typically designated as the responsibility of the ministries overseeing Water, Sanitation, and Hygiene (WASH) initiatives. Nonetheless, feedback from key informants indicates that they are largely excluded from this process. Only 36.36% of teacher respondents acknowledged that Monitoring and Evaluation activities are conducted on a regular basis. Focus group discussions expressed dissatisfaction with M&E, deeming it ineffective as it has not led to the resolution of their issues.

### **Discussion of the Findings**

The discussion of the findings in this study is centered around the research questions that sought to assess the implementation of the school water, sanitation, and hygiene (WASH) programme in public schools. It delves into various aspects such as the evaluation of WASH status, methodologies and approaches utilized in constructing and maintaining WASH facilities, challenges and opportunities encountered, as well as the perceptions of teachers and the community regarding the program's implementation. Furthermore, the stakeholders' adherence to government support was examined and compared to findings from other researchers, providing a comprehensive analysis of the WASH programme in schools.

### ***Status of WASH facilities ( quality, availability and quantity)***

Providing adequate levels of water supply, sanitation and hygiene in schools is direct relevance to Sustainable Development Goals for achieving quality education, promoting gender equality and sanitation for all (UNICEF & WHO, 2018). These SDGs have included WASH in schools and have specified indicators for global monitoring of SDG 6 targets 6.1 and 6.2: universal access to WASH and SDG 4 target 4.a; inclusive and effective learning environments for all (World Bank, 2018; Ryan, et al., 2017). Adopting the global goals, means that, the government intends to ensure delivery of quality, equitable, accessible and affordable safe and clean water, sanitation and hygiene services to all schools for better health and learning outcome by 2030 (World Bank, 2018). According to UNICEF & WHO, (2018) these targets and indicators for WASH in schools focus on achieving a basic minimum level of service by 2030. The services envisaged include sufficient water supply, adequate sanitation facilities, hand washing, waste disposal and hygiene practices.

### **Water sources**

The results from the water sources indicates that schools had at least one water source but some being not safe or able to supply water throughout the year. It was learnt that some sources had to be abandoned or dry out with time. The study findings show that only 40% had access to pipe water within the school compound and 21% outside the school grounds. This is a source that could be regarded as safe water. Some 9.4% had more than one source including the pipe water source (Table 4.3). The displayed results indicate water shortage in some schools and insufficient to majority of schools. Sources



outside the school are not meant for school but the community at large. Such sources may mean more time spent on water fetching and it takes up some academic time. Another water source was the undefined sources 4.4% and 1.7% with surface running water. These two sources together with the unprotected water used by 2.2% of the schools are not safe especially for drinking. They are easily contaminated with various impurities including pathogens and other health hazardous elements. As such they may be a source of diseases to students (Pruss-Ustun et al., 2019). Global WASH targets consider areas with surface water only to be in the category of limited water services. The results slightly different with those study done in other areas of the country including Kasulu, Sengerema, and Geita. The UNICEF and NBS (2020) shows that 73% of schools used improved water sources, 18% use unimproved water sources and 7% do not have water access. In this study about 81% have improved sources (to include piped water, protected bore holes but not the 9.4 who uses more than one source. Because of the unreliable water source, some schools had to use more than one source.

Some schools had insufficient water supply systems or no water at all. It was learned that some sources had to be abandoned during the dry seasons causing some schools to have insufficient water supply system or no water at all. No single source was observed or reported to supply water throughout the year. In addition, similar to the teacher responses, observation had also depicted that more than 21.1% of the water source was out of school premises (communal water source). This connotes inadequacy in water supply. Although about 61.1% of schools had a piped water system, on the day of survey observation had revealed that only 48.8% of schools had functional water pipe system. Almost all piped water system needed maintenance and the school

administration pay little attention. The pipe water is a reliable water supply compared to springs and wells but questionable if the school's budget can meet the cost of supply. Even the national water system under the Dar es Salaam Water Supply Company (DAWASCO) supply is erratic to the schools, meaning that the schools had inadequate water supply. Inadequate water sources mean insufficient water supply in the school that may cause negative impact to students' academic and health (Hutton & Chase, 2017).

The pipe system is under DAWASCO for both supply, treatment and maintenance with a very little control on the school administration and as such could be regarded as safer and more efficient than the rest of the sources. It is however questionable if the school budgets can meet the DAWASCO bills. Teacher respondents had shown that the bills are such high to be affordable by the schools given that no specific budget is provided and the school population is kept increasing year after year. All these observations indicate that schools have inadequate water availability. Pruss-Ustun et al (2019) proves that there are detrimental effects to pupils when water is not adequately available at the school environment.

Boreholes are owned and controlled by the school administration but they need protection and frequent treatment of the water. The use of unprotected springs and wells may cause health problems for school children when not treated accordingly. Protected water and treatment are paramount for the safety of the schools to control water-related diseases. Stringent measures of treating water are necessary regardless of the water source used. As a result of insufficient water supply and using water from unsafe sources, students and school community at large are at risk of contracting diseases and other calamities associated with limited water supply.

UNICEF and NBS (2020) findings indicated that 68% of the schools in the country have improved source of drinking water. According to JMP ladder for WASH in schools of 2020, more than a half of the schools 55.33% in Tanzania had basic clean drinking water sources (UNICEF & WHO, 2020). The current results indicate a diminishing situation for that matter that could be associated with the rapid increase in student population in schools or the deteriorating environment which causes some of the water sources to dry up. It could be also that the previous studies were done in areas where water sources are readily available. This calls for wider coverage when accessing water availability in schools that consider geographical/environmental factors.

Under normal circumstances at the beginning of the programme or school plan commencement, planners should have looked for sustainable water supply. WASH goals are not achieved at the schools that depend on surface water or the unprotected sources. Previous studies done elsewhere had shown similar results of insufficient water supply that were translated as a situation caused by inadequate accountability of the stakeholders at the school level and lack of sustainability measures that should have been planned right from the start of the schools (Hurton & Chase, 2017; Appiah-Brempong et al., 2018; Sommer et al., 2019). This is an assignment to reconsider the review of the SWASH programme irrespective of the construction modality. Government response to public schools is liable of finding sponsors of promoting a search for water and even installing the system in the already established schools.

### **Water source functionality**

On top of the unreliable sources reported, the functionality of the water sources was questionable. Through observation during the surveys,. Water was not available in some these sources for more than two days. In addition, about 26% of the schools had sources that can remain with no water supply for more than a week (Figure 4.3). This could be interpreted as minimal and insufficient water sources and supply. When the respondents were requested to indicate the frequency of water shortage in the year of the study, the results vary considerably with settings and source. Schools with bore holes showed to have less frequency than those supplied from DAWASCO during long dry periods. DAWASCO supplied schools indicated a frequency water cut off of more than 23 times in a year but those on bore holes indicated 1 - 3 times in a year. Urban area had more cut-off frequency than the rural areas where bore holes are main water source. The water supply should serve throughout the year and with a maximum down time of at least 10 days for operation and maintenance. Otherwise the situation is regarded as insufficient water sources and supply. In such a situation provision of protected deep water bore holes to schools could be favored.

### **Locations and Distance to water Source**

Far sources, even if they are within the premises are not preferred as they curtail the water right particularly to youngsters and disabled ones. There is also time spent to fetch the water that could be used for academic purposes. These far located sources are not preferable for the ideal WASH programme where water availability is a major component. The schools had about 31% young pupils (below 10 years of age) and 0.24% disabled pupils (Figure 4.2) that need water in close vicinity. These categories of students/pupils are severely affected by nature where the sources are wells and springs

and location is far or outside the school premises. Having sources outside the school is a great academic and health obstacle to them (Komarulzaman et al., 2019). Above all when the water source is outside the school compounds, there are other risks of students being harassed by outsiders in some uncouth community or even some students becoming nuisance to the people surrounding them. Also, the water safety is questionable to healthy of the users, the young generation been at high risk of water borne disease attack (Mshinda et al., 2020; Pruss-Ustan et al., 2019). The result is that they will rarely adhere to WASH principles. This is a situation that could have been considered during the planning and commencement of the school construction in all council. Water sources within the school premises and sources sustainability is important to be taken on board outright from the planning of school construction.

Distances that students had to walk to the water sources are significantly at ( $P < 0.05$ ) far than the 400m proposed in WASH guidelines (URT, 2019). The mean distance was between 523 to 712 m. Long distances are intolerable to students especially the young and disabled ones and are known to affect their school performance and attendance (Komarulzaman et al., 2019). The searching for water outside of the school premises is a tragedy to the school pupils/students.

### **Access to water and Hand Washing to disabled and youngsters**

All schools had either some disabled or young students. Similar to observations, more than 50% of respondents agreed that disabled and youngster access hand washing points with some difficulties. Irrespective of the districts, 15.6% and 17.8% of disabled and young students respectively could not access water points for hand washing as

shown in Figure 4.9. Within these two categories, young ones seems to be more affected. Such findings could be influenced by the number of young ones which is higher compared to disabled ones in a school. Off course it doesn't matter on their presence but a school should have disabled and youngster's user friend facilities. Between districts, Kibaha district had a higher percent of respondents who declared to have not user friend hand washing system to disabled and youngster. The other two districts had their points accessible to the disabled although some with difficulty. Only 11.67% to 13.3% of the schools in these two districts had a situation where disabled students could not access water points (Figure 4.10). The schools in which this category of students can not access hand washing points are possibly those schools with no reliable source of water and had to fetch water outside the school compound or at long distance. There is a need to always consider youngster and disables students whenever planning for school or even during WASH facilities rehabilitation. The situation means denying the disabled their right to water according to SDGs (Bolatova et al., 2021). Such situation has effect on their health and academic performance (Komarulzaman et al., 2019). The water insufficiency reasons given in the FGDs (Table 4.9) are all vital to be given due consideration in planning for future SWASH programme starting straight from planning for a new school and in the rehabilitation.

### **Water Sufficiency in Schools**

Observations had shown that about 56% of schools had no water on the day of visit while on contrary, 64.4% teacher responses declared water being sufficient at their schools (Table 4.6). Observation backed by the FGDs indicated that water is not sufficiently supplied to the schools. At times, the amount available at particular time is

inadequate or there is frequent cut off. This calls for water storage facilities at schools as paramount during school construction or in WASH components. Alternatively sources that can supply sufficient water are needed for the already constructed schools. The teacher respondents results showed that only 50% of their school had sufficient water source to supply 5 litre per day per students (Table 4.7). Some could not even tell if the available water could meet the 5 litre for a student per day. This situation could be interpreted that teacher do not know what is the water requirement of their school or do not bother to know what amount is available to them. A minimum national suggested minimum requirement at the school is at least 5 litres of water per pupil/student per day beside the drinking water. This quantity of the water required depends on the type of latrine found in the schools. For example, pit latrine requires less water compared to pour flush latrines. Water requirement is all the time and not some periods. The results emphasis of the need to establish reliable and permanent water supply to the schools.

Across the districts, slightly more than a half of the teacher respondents in Kibaha and Kisarawe declared that available water was sufficient. The results is also reflected in those of availability of 5liters per day per student (Table 4.8). However, there is a contradictory result in case of Bagamoyo teacher respondents where 81.66% reported water available to be sufficient but only 41.66% agreed that students/pupils could obtain 5 litres of water per day. This could mean that water is available but not at that rate or else the teachers are not aware of the amount available to their students. It needs more commitment on the teacher's side to have and keep appropriate requirement records that would help in the planning and budgeting. With insufficient water supply and availability it is impossible for students to practice proper sanitation and hygiene such as hand washing

and through cleaning of facilities (Moretto et al., 2018; Mohamed & Mahmoud, 2021). This limited supply of water could be a major reason of observed unclean toilets such as that shown in Figure 4.13. The situation of water supply observed and described connote that there is a need to reconsider more on water supply source and supply system in school settlements, regardless of the settings urban or rural and school population. Consideration is also for the location of the source/water points. These being among the factor (indication) that contribute to the sustainability of WASH. Otherwise students are deprived of their right to water and their performance performance is curtailed (Andrew et al., 2017; Whale et al., 2017; UNICEF & WHO, 2018).

Focus groups had shown that little attention during planning and the rapid increase in student population is the major cause of water availability and insufficiency problem (Table 4.9). Stakeholders showed limited resources for establishing and constructing water sources and limited supply from available sources as major causes of water insufficient in schools (Figure 4.5). This means that with proper planning and budgeting thereof such challenge would be resolved (Michael, 2019).

### **Availability of clean water in the toilets**

Considerably large number of teacher respondents agreed to have water in the toilets (Table 4.10). Unreliable sources and the limited supply of water have not drastically affected the water availability in the girls' toilets. With a great concern, it was noted that majority of boarding schools and girls' toilets had water always. Such a result is possibly because secondary schools are few and had few students when compared to primary schools some of which are located in very remote areas. In addition adolescent girls who



are found mainly in secondary schools are given priority as far as water availability is concerned and sometimes, they are forced to fetch water for their own use in the toilets. Water in their toilets is rather important compared to boys because of the additional need for MHM. Observation realized that, some of the concrete floor toilets were not cleaned on the day of visit. It can be concluded that the reason of having uncleaned toilet is due to insufficient water supply. The water reserved in the girls' toilets was mainly due to their need for MHH. Altogether, it is not possible to practice proper sanitation and hygiene where water availability is a problem. For this matter practicing sanitation and hygiene in these schools is jeopardised and diseases prevalence and spread is promoted. Teaching hygiene education in the school without practising may not solve the sanitation and hygiene problems in schools.

### **Hand washing and drinking water points**

Water for hand washing was indicated to be sufficient in 49% of the schools while almost 26% schools had declared insufficient supply (Figure 4.6). A small percent of the schools had some stations deliberately designated for hand washing in the schools surveyed (5% in Kisarawe, 8% in Kisarawe and 13% in Kibaha) that was observed during the surveys (Figure 4.7). These were adopted as a measure to curb the COVID-19 epidemic and therefore not a permanent structure (Figure 4.8). Drinking water and hand washing stations are all crucial, but according to the study, few schools put a concern on these. WASH-related diseases are known to come from lack of water to maintain adequate hygiene and sanitation, that include failing to wash hands before and after meals or at any other time when they are dirty or contaminated. This could be a good source of infectious diseases (Ejemot-Nwadiaro et al., 2021; McMichael, 2019). This

observation of having no hand washing points suggests that WASH procedures were not followed as advised. In most of the schools, the observed handwashing points were within the toilet building and or its surroundings. It seemed that water points in the latrines are the one used for hand washing compared to other places. This makes students forced by the circumstances and get used to wash their hands only when coming out of the toilet. Previous studies suggested that hand washing points should be installed in a different location (Chang et al., 2019) for a good outcome.

## **Status of Sanitation and Hygiene Facilities and Practices in the Surveyed Schools**

### **Type and Quality of toilets**

According to JMP 2016, there are two kinds of sanitation facilities, improved and unimproved. Improved sanitation facilities are those designed to separate excreta from human contact. Improved sanitation toilet in this case is the one that enables students as well as other schools' staff to attend daily activities without worrying about contamination. These may include: flush/pour to piped sewer system, septic tanks or pit latrines, ventilated improved pit latrines, composting toilets or pit latrines with slabs. Unimproved facilities include pit latrines without a slab or platform, hanging latrines and bucket latrines. With unproved sanitation, carrying out cleanness is difficulty and even the frequency of toilets cleaning is small.

The study revealed that majority of the schools, 96.67%, 98.33% and 93.33% from Kibaha, Kisarawe and Bagamoyo respectively were using pit latrines located at a distance from the classrooms (Table 4.11). Improved (majority being pit latrines) ones were in 65% of the schools. Only 3% schools had compost and flush (4%) all located within the school

premises. Adhering to the government policy, all schools provided latrine service that were separate according to gender, that is male toilets separated from female students and male teacher toilets separated from female teacher ones. This is per WASH programme guides schools (URT, 2019). In this cases gender equity was therefore at least observed by having male and female toilets in separate blocks (56%). National standard requires female toilets to be in separate blocks and at some distance apart (URT, 2019). All these is to avoid bullying and meet the criteria of gender-specific as per Sustainable Development Goals number 4 (UNICEF & WHO, 2018).

Under normal condition, all schools were supposed to have improved toilets regardless the type. The observed situation indicates an obvious insufficiency in the quality and quantity. It is a right for everyone in the school community to have a toilet which is safe, provides privacy and dignity to both users. Generally, the direct pit latrine is regarded as unimproved sanitation and tends to fill up quickly (UNICEF & WHO 2018). Also, it has been reported to be the source of sanitation-related diseases (Sommer et al., 2019). However, with the water availability problems, they may be the best alternative. Nevertheless, there could be a modification to make more art of state type such as composite which does not require much water for flushing but is more sanitary friendly. The limited water supply is the underlying principle of having only a few schools with flush-type latrines across the region. Studies done by Sommer et al., (2019) criticize the use of pit latrines as they are likely to attract flies that contribute to sanitation diseases. It is important to note that on top of hastening disease transmission, poor toilets facility discourage students/pupils to attend school (Arya & Ambili 2017; Komarulzaman et al., 2019).

The results showed that there is a difference between male and female facilities quality. Some reasons deduced are that more of female toilets were constructed by a consortium of Government, Donors and Community or Donors alone which has proved to construct superior facilities by the teacher respondents. Secondly, by nature, girls do maintain their environment including the WASH facilities and other properties as clean, well dressed and arranged (Kaur & Kaur, 2018). Sometimes without prejudice, the construction and maintenance favours females when it comes to the issue of privacy.

The inadequacies in toilet facilities were not only related to the number of drop holes but also to the design and quality of the toilets themselves. Some toilets were poorly constructed and not user-friendly, as indicated in Tables 4.12 and 4.13. When considering construction quality, the majority fell between very poor and average, as shown in Figure 4.11 and Figure 4.12. In the surveyed area, some toilet structures had poor quality regardless of their type, either due to substandard construction or lack of maintenance, as illustrated in Figure 4.12 and 4.19. The teacher respondents claimed that it is a result of poor planning and poor coordination in the implementation of the SWASH activities. The planned substandard structures, construction materials, low water pressure, and low accountability are drivers that hinder the sustainability of already constructed. Structures planning with the limited fund mind behind would mean to go for simple cheap structures which in most cases will also be of poor quality and high maintenance costs.

Poor quality of sanitation facilities construction was due to various reasons including lack of funds (Table 4.26), inadequate operation and maintenance budget (Figure 4.20), but also could imply irresponsibility, as maintenance was almost lacking. Latrines were seen dilapidated not only because of funding, but simply not maintained

(Figure 4.12 and 4.19). The facilities are below the stipulated standards in the National SWASH guidelines (Antwi-Agyei, 2017). Key informant anonymously (100%) declared the status of the pit latrines to be not in accordance to national standards. Likewise, their response on the facilities available portray a similar situation where more than a half of the respondents had accepted most schools to have poor, unmaintained WASH facilities and which lack some important amenities (Figure 4.10 and Table 4.12). Limited toilets results to congestion and may lead to poor reachability and accessibility of the latrine by students. This may cause some of pupils to opt for open defecation in the rural areas or abscond classes (Alhassan & Anyarayer, 2017). Retrieved from the study, the technology used in several of the toilet's construction is low which end up with toilets of short life span and is difficult to rehabilitate and badly enough schools have no fund allocated for construction neither for rehabilitation. Agreed by the FGD members, schools' sanitation infrastructures are in bad situation and their concern is, government to support by providing fund for maintenance and repair. Such suggestions are also reported elsewhere by Buxton et al. (2019), Huston and Moriarty (2018) and Kanyangara et al. (2021). Depilated toilets were due to poor construction and lack of maintenance making them not user friend (Figure 4.12). Some facilities were of poor quality irrespective of the type simply because they were built at a substandard level or not maintained. These kinds of latrines are mainly those constructed by the community. There is a high possibility of such latrines been destroyed after a short period of construction or by rains and storms because they are weak and cannot withstand harsh environment. Observations confirmed the use of local materials and designs that may not be easy to repair. It should be noted here that, delayed repairs of WASH facilities cause unnecessary high repair costs.

Equally the same, they will affect school attendance and hence performance. Michael (2019) reported that appropriate design for the construction of school toilets and well maintained, tends to motivate pupils to attend and encourage parents with disabled children to send them to school.

There was a concern from the FGD members that the flush system is impossible, as water is not available in the school always. They regard flush toilet as expensive but also suitable for urban schools. This is a wrong perception within the community. Flush system is more ideal as far as sanitation is concern, they are easily cleaned where there is sufficient water and do not allow debris accumulation which turns into an ideal media for microbes/pathogens. The argument concerns for not opting to flush toilets is the insufficient water supply. This type of toilets requires reliable water supply. The work done by Coswosk et al. (2019) in Brazil, showed that having school toilets is not enough where water is a limiting factor. The main hindrance of the use of toilets such as blockage, odour, not safe for special needs could all be minimized by proper planning and adequate construction and maintenance practices.

Schools visited do use the pit latrines for both urination and defecation. Urinals were missing in most of the toilets which concur with of 26.7% UNICEF and NBS (2019) report. Chinyama et al (2017) reported that presence of urinals in the toilet building lowers the cost of toilet construction because few drops hole will be required at a time. Similarly, urinals are important as it is the most used part of the toilet compared to the rest room requirement estimated to be, 88% for urinals and 12% for defecation (Chinyama et al., 2017).

All sources used in collecting information including key informant, interviews and FGDs reflect inadequate repair and unmaintained WASH facilities in schools. About 79% of teacher respondents claimed that the WASH facilities are not well maintained and about 71% of the key informant respondents showed that sanitation facilities remained unserviceable or unusable. This was also confirmed by observations. Construction facilities if not well maintained and operated, its shelf life is reduced. Schools need to put some extra efforts to constructed facilities to have them lasting longer. Knowledge on use and frequent supervision will help to maintain newly constructed toilets. Having water in the toilets is also needed for its proper use.

### **Latrine drop holes (DHR)**

Despite having separated toilets between girls and boys, drop holes were insufficient in almost all the schools in the study area. The calculated drop hole ratio was 1:57 for males and 1:49 for females (Table 4.14). This was a bit better than the previous study of assessment of WASH in school both public and private in Tanzania by National Bureau of Standard of Tanzania (2018) which indicated that the pit latrines with a drop hole in ratio 1:62 in average for girls and boys. Their results also indicated a ratio of toilets / drop hole of 1:68 for public (government) schools compared to 1:21 students for non-government schools (UNICEF & NBS, 2018). All together it is significantly low than the nationally recommended drop hole ratio of 1:25 for males and 1:20 for females (URT, 2019). This ratio calls for immediate measures to improve the situation. A joint effort among stakeholders is needed to intervene the situation. Insufficient drop holes are

associated with school absconding and absenteeism and hence poor performance to mature girls. It encourages adolescent girls abscond from attending school during the menses period (Sommer et al., 2019). Other workers had also associated this with disease outbreaks due to congestion in the toilets (Chard et al., 2019; Coswosk et al., 2019).

### **Toilet usability**

Majority of the constructed/existing latrines in 99.6% of schools were used but with some challenges arising from blockage, low water pressure, odour, untidiness and regular pit filling ups. All these indicate some inadequacy in construction plans or poor maintenance. The situation that could be due to insufficient funding for construction and operation and maintenance. Depicted from the study, funds for repair, operation and maintenance does not meet requirement (Table 4.25 and Figure 4.20). Practically no school was observed to have changed room for adolescent girls during menstruation period and only 11.7% had waste bin in the female toilets for menstrual material disposal (Figure 4.15). The situation that may lead to increased female drop out and poor performance (Kaur & Kaur, 2018). In this there is a need to establish adequate menstrual material management system in the schools. Mobilization of well-wishers could as well improve the situation.

### **Handwashing practices**

In half of the schools visited, handwashing practices were rarely practiced. Some observed handwashing points were temporal for serving the national campaign against COVID 19 spread/prevention (Figure 4.8). This was despite the high percent of teachers



declared their students to wash hands before eating and after visiting toilets. Other workers had also shown some results where about 75% of schools had a poor handwashing practices score (Kessy & Mahali, 2017; Smith et al., 2020). Some workers had also reported a high risk of disease transmission where there are limited facility/water points especially to the young children (Null et al., 2018; Wolf et al., 2019; Younje et al., 2020). Hand washing is also reported to reduce diarrhoeas occurrence by 42 - 47% (Watson et al, 2019; Wolf et al., 2019). Handwashing with soap practices specifically, at critical times, before and after eating, after toilet, handling dirty and contaminated materials is necessary. This assists in preventing contracting pathogens that cause diseases. Findings show that many students practice handwashing after toilet visiting and before eating only (Table 4.18). Secondary schools do this more than the primary schools. For this case more emphasize is to be given to the primary school ones who are also more susceptible to diseases because of their age.

Despite the school curriculum emphasizing the use of soap and clean water for washing hands in critical times, only a few schools had soap and water for washing hands during the day of the visit (Figure 4.22). In-availability of soap in the toilets was accounted to limited/lack of operation budget and staling done by unknown people. In the study conducted by Teumta and colleagues (2019) on handwashing behaviour, their findings showed that handwashing with soap was 10.7% adopted. Likewise, the assessment done in schools in Tanzania and Ghana on knowledge, attitude, and Hygiene practice showed that only 11.7% practiced handwashing with soap (UNICEF & NBS, 2020). The prevalence of diseases related to inadequate water supply, sanitation and hygiene in developing countries like Tanzania has also been reported to be due to poor hand

washing practices at critical times (Wana & Mengesha, 2023). In fact, the priority given by the FGD in water uses that allocated first priority to be in toilets and shown critical times for hand washing (Table 4.19) reflected the importance of water in the toilets for the same purpose of maintaining hygiene and sanitation. However not adhered to because of no hand washing points at the toilet site or the insufficient supply of water.

### **Water treatments**

As an issue of sanitation, the quality water and its treatment is of major concern. As shown in Table 4.21, half of the schools do not treat water before use. The method used to treat water by 45.6% of the schools was the addition of chlorine. About 25% do not treat water at all. In the case of wells/springs, the safety is questionable if water is not treated. It contributes to the risk of water-borne diseases including diarrhoea, cholera, and worm infestations caused by unsafe water (Prüss-Ustün et al., 2019; McMichael, 2019). Views from the Focus Group Discussion (FGDs) equated the cost of treating drinking water with one's life and, some thought water is a gift from God, is safe. A quarter (25%) of teacher respondents indicated water treatment exercise to be too expensive to afford, and about 27% responded that water is always clean and safe. Such information is indicative that schools do not treat their sources. The finding which concurs with other previous study in schools by NBS where only 13% of schools were reported to treat drinking water (UNICEF & NBS, 2020). The no water treatment is pinned to the cost involved that schools cannot afford. The conducted by UNICEF and NBS indicated that 34% of schools treat water for drinking (UNICEF & NBS, 2020). This situation is not

promising for school children. The possibility of contracting water borne diseases to students where water is not safe is high. This is more serious in urban areas because of the high population and the many activities carried out in urban which can easily contaminate water. SWASH programme plans are supposed to devise a means that will make schools to treat water especially where the source is bore holes.

### **Toilets Cleaning and other Hygiene Practices**

Majority of the respondents reported that schools have daily schedules for toilet cleaning and only the grown-ups do clean the toilets with respect to gender (Table 4.22). However, water shortage was a concern of having clean toilets. During the survey, some toilets were observed uncleaned due to no water situation (Figure 4.13). Observation recorded indicated that, where water was a problem, concrete slab or flush system toilets were dirty which means cleanness was not possible. It raises concerns as to how schools are currently cleaning their latrines where water is a problem. Consequences of untidy latrines are disease spread, poor school performance, and even dropouts (Smith et al., 2020). Mainstreaming hygiene education in the school curriculum goes hand in hand with promoting WASH services to school children. It ascertains that teaching hygiene education in the school without practising is not solving hygiene problems in the school. Practicing means having water and other cleaning materials to clean the toilets and appropriate disposal systems.

### **Menstrual Health and Hygiene (MHH) Management Practices in Schools**

The MHH is among the interventions which carry about 25% of the global goals which address the gender equality, education, health care and water and sanitation

(Ssewanyana & Bitanirwe, 2019). Work done by Sommer and others has shown that, lack of clean water in the girls' toilets is associated with poor school attendance and academic performances (Sommer et al., 2019). Provision of clean water and having necessary materials for MHH is compulsory in accordance with Sustainable Development Goals (SDGs) number 4 and 6 for education and sanitation (Ssewanyana & Bitanirwe, 2019). The study reveals that some schools occasionally could not provide clean water in the girl's toilets (Figure 4.15).

The findings revealed that 96.1% reported schools to have several mechanisms for managing the menses, observations proved only having water and dustbins in the girl's toilets. Most of the schools especially in primary school, were observed to use pit latrines which lack necessary amenities for MHH. This is contrary to the reports from the respondents that 68% have waste bins and 17% do provide menstrual materials. Lack of or inadequate waste bins for menstrual material disposal, materials for menstrual management, and poor mechanism for managing menstrual waste materials contribute to low girls' performance (Hennegan et al., 2021) and may also contribute to contagious diseases spread (Chuan et al., 2022)

Regarding the provision of material for managing menses, only 30 schools (16.67%), mainly in Bagamoyo district provide menstrual material other than waste bins, to adolescent girls (Figure 4.15). The FGD member explains that such material was freely provided by external donor at schools only. About 86.67 % of the Bagamoyo District schools reports to provide these materials (soaps and pads). A similar study done in Tanzania finding shows that 51.4% provided sanitary pads for an emergency (UNICEF & NBS, 2020). It should be noted here that, the observed unmaintained waste pit in some

schools is not an ideal way of disposing of such materials. Schools should be encouraged to have incinerators. The situation depicts that councils and schools have not given due attention of the importance of menstrual hygiene management in the school. According to Tanzania SWASH guideline (URT, 2019) the construction of latrine blocks for girls needs to have rooms for menstrual hygiene management for giving privacy to girls reaching puberty. In these surveys, none of the schools was found to have one.

There is low awareness, attitudes and actions related to good health and hygiene during menstruation. Findings in the study by Hennegan et al (2021) in Kenya show that only 66.1% had awareness of MHH skills, 75% had a negative view of health and hygiene during menstruation. Furthermore, Hutton and Chase 2017 found out that 19.3% of students with disabilities could not attend school for a long time due to menstrual challenges. With the observed results from the study, it requires further training on MHH and possibly more intense and well planned and supervised. Often girls feel embarrassed to talk about MHH issues in front of the boys as they worry, they may get teased. The SWASH programme emphasizes that education on menstrual health and hygiene must be given to older girls separately, and gives clear instruction on what this education should involve. It is however important to educate boys on MHH issues as well as this will help normalize the process to them as well as making them good fathers of tomorrow. As one key informant interviewed had put it *"Teachers should teach the boys about girls basic needs related to menstruation as this will help them when they are the father of their family and have daughters of their own"*

Key Informant response on the MHH management facility availability portrays a similar situation where about 98% expressed their concern on the lack of such facilities

meant for MHH management. Changing rooms during menstruation to adolescents gives freedom to feel safe. Records from observation had shown a similar trend of unmaintained latrines without bathing and or changing rooms. In in all-day schools, changing rooms were missing.

With these observations, the intention of enhancing adolescent girls to attend schools and complete their cycle academic without missing classes is questionable. Even though only 20% of respondents regarded the lack of water to affect performance. This is an issue to take on board during planning and maintenance of new and the existing school toilets. School WASH programme should aim to create friendly learning environment which can be accessed by all groups of school students/pupils, both adolescent girls and boys inclusive (Hennegan et al., 2021). Menstrual programmes help to prepare adolescent to have well informed knowledge concerning their sexual and reproductive concerns (Ssewanyana & Bitanihirwe, 2019). Adolescent girls' needs are not considered in the budget even for the needs of buying sanitary products and other amenities. Actually, school budget for maintenance and construction and purchasing of toilet cleaning facilities and sanitation pads is inadequate or lacking all together. Since the school authority/owner has failed to provide these materials, the best way is to educate the community and girls on the importance of having such materials and proper use during the menses period. By engaging, parents will provide the materials during the period instead of depending on the school donor. Educating the girls on MHH will give a better chance to manage the menstruation (Tamuri et al., 2017; Sinha & Paul, 2018). School WASH guidelines directs to have MHH materials in the toilets, having them not in

place leads to the conclusion that there is an ineffective use of existing school SWASH guidelines due to ignorance or the guidelines are not doable.

### **Solid Waste Disposal**

According to Paghasian (2017) solid waste management includes the source separation, collection, storage, transport, processing, treatment, recovery, management, monitoring, and disposal of solid waste materials. In other words, solid waste management refers to the process of reducing the consequences of solid wastes created by human activities on human and animal health, the environment, and aesthetics (Molina & Catan, 2021). As a result of increasing population, solid waste management is becoming an increasingly pressing issue for the entire world and for this case all schools in the country. These issues can be solved by planning and implementing a complete garbage collection, transportation, and disposal programme, as well as waste prevention and recycling efforts. Previous studies on the assessment of waste disposal management in schools showed that there are weaknesses to managing waste safely (Kihila et al., 2021). In this study, Solid disposal was also not well done as the major means of disposal was dumping in a ditch, burning in open air and sometimes burn and burry. Practices that are known to have some detrimental effects to environment and human health.. The different answers from different schools 'respondents on the waste disposal (Figure 4.16) reflects that the waste disposal is not well coordinated. The methods of burning on the premises which is practiced by majority 65.67% or burn and covered practised by 20% has the disadvantage of environmental pollution (Sommer et al., 2021). Some methods including burning on open air and heaping in some places are not preferable because they are rather environmentally unfriendly. A lot of impurities are exposed to the soil or in

the air to be up-taken by living organisms or plants in various ways and forms. They offer a threat to human health. Unburned rubbish is also a major breeding site for pathogens. Students are also subjected to physical injuries from the uncovered or partially covered solid particles (Ampofo, 2020). The result may also be considered that the teachers, instructors as well as the students, and school administrators as a whole like those in other developing nations, have a little awareness/attitude toward environmental cleanliness and garbage disposal in particular.

Poor waste management in schools continues to rise thoughts, attention, and research because of the huge amount of refuse that schools generate (Kaur & Kaur, 2018). Logical hygiene practices including the disposal of solid waste materials produced in the school compound is inevitable. People have a habit of throwing waste materials around carelessly. The findings reveal the mechanism of solid waste is not coordinated well on how to manage solid waste disposal in the school. Work done by Ampofo (2020) on the effects of opening solid wastes shows that open burning releases toxic gases into the air that affect human health. It is a critical concern, and intervention is paramount to address all solid materials disposal in schools.

### **Sanitation and Hygiene Education Programme in Schools**

Hygiene education cover issues of personal hygiene, water hygiene, food hygiene and hygiene during waste handling. It is a way of inculcating knowledge to the school children or family or community on the importance and challenges of not practicing hygiene (Adukia, 2017; Kamwenda, 2019). The results from this study indicate that hygiene education is provided in more than 78% of school. The results indicated that



almost all school teaches hygiene education in a form of mainstreaming it in the school curricular. It is also indicated that 83% of the teachers had received hygiene education (Table 4.23). Obvious it is important school children to learn and understand comprehensively the benefits of hygiene education. However, the hygiene education seems to remain as a theory and not practiced. The method of teaching might not be effective as practices on hygiene and sanitation is observed being minimal. It is important to note that, having all the necessary WASH facilities may not create ideal hygiene and sanitation practices in schools if knowledge is not well imparted in the students mind (George et al., 2018). From the observation, many toilets were not cleaned during the day of visit and hand washing was not really practiced. This is despite the reported exercise of teaching hygiene education. This indicates or confirms that the teachings are not sufficient to create mind set changes to students. It could also be due to limited supply of water and other cleaning materials being not available. Insufficient water and poor constructions may make cleaning the latrines impractical. For this matter, teaching hygiene education in schools may not lead to practicing and will not solve hygiene problems in the schools unless it is also put in practice. More emphasis is needed to put what they learned into practice and which is possible where other components such as water and properly constructed toilets are made available.

### **School WASH clubs**

Students, teachers, and the community need to know why SWASH and appropriate ways and approaches to practice. Work done elsewhere (Pereno & Eriksson,

2020) show that SWASH club is one way to promote this. The respondents declare that schools had established WASH clubs (72% in Kibaha, Kisarawe is 65% and 87% in Bagamoyo Districts) making more than 63% of all visited schools to have SWASH clubs. This is to say, more than a half (63%) of the schools have functional WASH clubs. With patron or matrons. The observations and in FGDs it was found that only 20% of schools had active SWASH clubs. SWASH clubs perform several activities like supervising hand washing practices, environmental cleanness and advertising SWASH through songs and comedy. However, as per the key informants, this fact seems not to be given due weight by the heads. However, deduced from the focus group discussions, WASH clubs are not given due consideration by school administrations and was not part of school curriculum. It could be due to a lack of sufficient knowledge on the positive effects of such clubs. Usually, the underlying principle of lack of interest is lack of knowledge. Inadequate provision of WASH education at schools' level is one of the reasons to why the 37% schools has not yet established sanitation clubs. Through evaluation exercise the researchers observed that other head teachers interviewed showed low understanding of the intention of clubs. This was not expected because, majority of the teachers had being trained/oriented and teachers have been on the programme for a long period of more than five years in majority of schools. This is a good potential of having these clubs in existence. Nonetheless, provision of incentives on WASH clubs' formation and activeness could strengthen them and hence promote hygiene in schools. Other motivation could include increased budget for operation and maintenance, install hand washing facilities/point, ensure sufficient safe toilets with sufficient number of drop holes and reliable source of water.

### ***Efficiency of Methodologies used and WASH interventions***

Figure 4.18 present six different approaches used in the construction, maintenance, and repair of WASH facilities in schools. It shows that the approach which involves community alone results in low incomplete and poor/substandard toilets. Supported from the other sources of information in the study, the approach scores were significantly different ( $P \leq 0.05$ ). The community-based approach scored least. The government approach had constructed the majority of schools but is not the most efficient approach. The best method is the consortium with the inclusion of more than one approach. One of the participants commenting on the approached had said *“Where the technology is low itt ends up to facilities of short life span. But also, with advanced technologies it is difficult to rehabilitate and badly enough no funds for construction neither or rehabilitation”*. It was remarked that the approach which involves community alone results into incomplete or takes long time to complete and end up with poor/substandard toilets. Essentially this causes limited accessibility and congestion for students. On the other hand, donor-funded projects are fast in accomplishing the construction although involves high costs, results into high standard toilets but then are difficult to maintain. The approach is regarded to create little ownership perception to the beneficiaries. Reported by Kessy and Mahali (2017) and Tseklevs et al. (2022), the two combined with government support are likely to achieve better results. The issue here is to have roundtable discussions and plan together for a school project.

In other areas, donor-funded projects possess conditions that intimidate government involvement. Sometimes are not readily affordable by the community for continuous maintenance (Novotny et al., 2018). As such a regulatory mechanism could

accommodate the interests of all stakeholders. Despite the fact that Donor's and the community approach have ranked first, experience entails that this approach may also contribute to dependency. In such an approach government lacks control and becomes expensive constructions and unserviceable at times. Novotny et al (2018) emphasize of involving the community in latrines construction because the community members take ownership of the structures. As claimed by one of the school committee, *"The advantage of engaging the community is also the continuous repair and maintenance of the buildings. The local technicians are reliable and can provide continuous maintenance whenever it is needed. The local government is a key unit for continuous supervision and liability for sustainability. They monitor and assess usage for effective utilization"*. The comments reflect donor funded projects to erect not easy to maintain kind of structures. In a proper governance where guidelines are provided and M&E is effectively adhered, such cases are avoided. With appropriate regulatory mechanisms it is possible to accommodate the interests of all stakeholders. Guidelines for SWASH are in place to facilitate construction, maintenance and operations but still the approaches created significant differences in quality ( $P \leq 0.05$ ). This would imply poor supervision during execution or governance or the limited understanding of the guidelines. Orientation to the guidelines is needed.

### ***Perceptions of stakeholders on WASH Programme***

Poor sanitation and hygiene are known to cause poor performance to students. Different authors confirm the effects concerning the poor provision of WASH services and school performance (Chang et al., 2019; McMichael, 2019; Kaur & Kaur, 2018). The study findings show that there are about 20% of teachers that could not see the effect.

### **Perception on water availability, quality and safety**

As perceived by 74% key informants, and FGDs the water shortage could be rooted to little attention paid by the planners and constructors of school infrastructure according to the school demand. Some schools are located in areas where there is no water source such as piped water or bore holes. The bore hole that are mostly used are adversely affected by environmental and human activities (Novotny et al., 2018). There are cases where the sources had dried out as a result of climate changes. This situation needs a copying mechanism to be in places such as deep wells and rainwater harvest which are currently not installed.

Local community beliefs on the water as natural good and assuming it has been safe by open eye observations. Some effect of the negligence of treating water, even the drinking water in schools has been reported elsewhere (Ampofo, 2020). Water treatment is inevitable given the fact that majority of schools uses bore holes either protected or not. Water quality had remained the same to majority of the schools (Figure 4.21). Only Bagamoyo District has appreciated the water safety increased substantially within the past five years. This were schools that uses national water network which is treated nationally. Majority of teachers in Kisarawe and Bagamoyo Districts had the perception that the quality has not improved substantially. Using WASH clubs that have already shown interest could increase awareness on the importance of water treatment that would in turn reduce diseases incidences. Drinking untreated water has always resulted in various health hazards like diarrhoea, worms, acute respiratory, trachoma, and dysentery (Chinyama et al., 2019). The practice of treating water must therefore be emphasised in the schools in acceptable and affordable means. The cheapest and controlled treatment

could be the use of chlorine at accepted concentration. DAWASCO as government institution could be assigned this task to ensure that all bore holes at all schools are well treated.

### **Hand washing practices**

Both students and teachers perceive and agreed hand washing being important at critical times of before and after eating and after using the toilet. Some 31% of teacher respondents indicated that using soaps to wash hands is not very necessary and funds for purchasing soaps could be used for other purposes (Figure 4.22). Negligence for hand washing with soap was attributed by lack of funds to purchase soaps, insufficiency of water and stealing. Stealing of the soap bars put in the toilets is done by students and this has discouraged most of the schools' efforts. Almost a half (47%) of the teacher respondents had reported this (Figure 4.22). Use of liquid soaps ready diluted to use could release such a challenge. Provision of soap with some awareness will create mid set change and hence readily adopting hand washing with soap.

### **Limitation to WASH services provision and adoption in schools**

Majority of respondents agreed with the fact that limited WASH services interfere the health and academic performance of students, boys and girls all together (Figure 4.23). Key informants regard the limitations to provision and adoption of WASH practices to be due to limited financial resources and also to parents and teachers' negligence (Table 4.26). The stand is that if all necessities are provided and both parents and teachers are strict enough, students will be forced to adopt and eventually customize the practices. Likewise, teacher respondents have the perception that the limited resources

and services due to poor financing, is the major limitation. Norms and taboos within the community as well as students' reluctance and negligence are other major contributors to poor WASH practices according to the teacher respondents (Figure 4.24). All these limitations could be eliminated through proper planning and rigorous awareness creation.

### **Poor or separate toilet blocks for males and females**

There is a general guideline that toilets blocks should be separated boys from girls at for social humanity purposes. However, teachers do not see having separate toilet blocks as a reason for girls being absent from school. To them at least a concrete wall separation is sufficient. The teachers regards poor and non-maintained toilets to cause absenteeism of adolescent girls. This is more prominent in the urban settings (Table 4.27). This is more when considering the taboo of the natives of the area. As stipulated in the FGDs; *“Toilets rooms are not safe for changing their paints, no bins, no water to wash their sanitary pads and therefore most of them don not change their pads, until they go home and thus, they better stay at home. School administration has to ensure that these amenities are made available adequately in the girl’s toilets’ toilets”*. The results concur with those reported by Sommer (2019). From group discussions menstrual period is an individual experience and occurs in different fashion. Its management differs from person to person but there are commonages. Within the coastal community taboos, it is managed from their mothers' details. This perception is in line with their rituals that at puberty, girls are supposed to report to their mothers and they will be kept in house for at least one month where they are taught how to handle menstruation periods and dispose the sanitation materials, as well as how to avoid pregnancy.

Report from FGD members "*Girls are supposed to report to their mothers one at menstruation onset. Also, they are supposed to follow coastal rituals for putting their girls for at least one month inside. They are taught how to handle and dispose of but also how they can avoid getting pregnancies*". Such comment means adolescent girls should stay at home and little importance is paid to school attendance. In this case they will have several days absent from school/classes that has an impact on their performance. Awareness is needed not to the girls only but also to their parents.

Almost all (96.8%) of the interviewed teachers had the perception that limited number of toilets causes poor performance to adolescence girls. The results from the study indicated that teachers do not appreciate that a limited number of toilets is associated with absenteeism but more with poor performance in the rural areas where more than a half (51.67%) had indicated no or no idea of the relation with absenteeism but to poor performance (58.89%). This seems to contradicting as absenteeism will definitely cause poor performance. Nevertheless, as viewed in the group discussion, the menstruation period is habitually a secret to individuals and it is difficult to establish its effects to girls' performance. From this point of view, both teachers and students had to be more oriented on the effects of WASH services and the poor performance relationship. Due to little knowledge of the effects of menstrual cycle, majority has not related it to their performance. However, most of girls during 8 days before and during menstruation there is some psychological pattern change which normally do affect school performance.

### **Perception on financing the programme**



The result shows that the budget allocated for SWASH is insufficient. Majority of schools do not have such a specific budget for neither construction nor maintenance and operation. Very few schools had a budget allocated for SWASH while others did not have. Findings from the FGDs suggest that lack or inadequate dedicated budget for WASH is due to the poor coordination of WASH components that was ranked among the factors that may hamper sustainability. The community response is that it is the local government's responsibility to construct, operate and maintain them. WASH component is a cross-cutting programme that involves education, health, and the water sector. Accordingly, coordination is inevitable for good results. Accountability and good governance are factors for achieving the programme objectives. In all forms of data collection in this study, financing, governance and planning has featured out as challenges that hinder progress and sustainability of the programme. Clear roles and responsibilities of each stakeholder involved in the programme will assist in maintaining efficiency and sustainability programmed. Table 4.26 showed inadequate funds as a major factor hindering progress and sustainability. In this regard, a better planned financed procedure is needed. Such procedure has to consider reliable source of fund, planning and accountability

### **Views on SWASH Programme future and outcome**

Stakeholder views on the outcome of the SWASH programme (Table 4.28) could be summarized as positive impact where the learning environment will be more favourable; adoption of WASH practices within the community; increased school attendance and performance; improved hygiene and reduced disease incidences. All of these means that school children will be more innovated to practice sanitation and

hygiene. In other words, sanitation and hygiene knowledge, attitude and practice to the pupils will be enhanced, creating a positive impact to the students and be able to maintain a good health. And by being within the family, it will make other members of the family to copy these good behaviours. They will also be a change agent in their respective community in a positive way and there shall be some improvement in equitable social economic growth. As for the future, all sources of information viewed an increase in SWASH facilities as obligatory. This means increased budget and attracting more funders. This will make the sanitation and hygiene practices in schools possible and enhanced. Others are promoting WASH behavioural change through rigorous awareness campaigns, and strengthening governance and seriousness in accountability. All these are regarded as issues to enable SWASH programme implementation effective. Nevertheless, given the observed situation and reported governance procedures, there is still a lot to do to achieve what is viewed by the stakeholders. Continue engaging people to participate in the nation sanitation campaign will promote hygiene as well as reducing the WASH related diseases. Strategic WASH interventions is required in all districts to have effective WASH implementation. Consequently, this will increase the sustainability of WASH facilities and more conducive learning environment.

Comments given during the FGDs such as insufficient budget for WASH facilities and responsible people for resource mobilization have relaxed are some facts to take into consideration. The fact is that, that SWASH is not directly targeted in the national budget, there is no fund set directly to SWASH services. Insufficient budget could be translated to having SWASH facilities improvement is undermined. Having all responses showing

inadequate funding reflect the big task the various stakeholder at the school level and Government Authority (LGA) has to do to raise campaigns for SWASH.

There is a need to put some efforts to create a common understanding and more knowledge to stakeholders including the community and students not only on the need and intention of the programme but also on the implementation procedure and guidelines of operation and maintenance. Such endeavours have been reported to bring about some positive results elsewhere. As a result of more awareness and participatory implementation respondents' views more comprehensive planning and budget improvements. The two will eventually create more conducive working environment and hence positive achievement to WASH programme. All these are also reported elsewhere in developing countries where SWASH programmes have been taking place (Pradhan et al., 2020). The two-research work has observed an improved personal hygiene and eventual community hygiene in Kenya, and Nigeria.

Sustained improvements in school WASH will be possible only if there is institutional arrangements in place to ensure that, once provided, WASH facilities continue to deliver good quality services. The WASH plan should therefore be according to the institution terms of reference and identifying the institutional arrangements required for effective facilities management. The existing institutional arrangements seems not guarantee long-term viability of SWASH facilities, the plan should include realistic proposals to strengthen existing pillars and, where appropriate, introduce more focused institutional arrangements. When assessing institutional terms and needs, the following specific points should be considered.

- (i) Management needs of the WASH technologies proposed for the school,

- (ii) Any requirement for cooperation and liaison between the school and service providers,
- (iii) Institutional needs for hygiene education
- (iv) Operational costs of WASH facilities and services, and
- (v) Support systems are required to ensure that school-level systems can function effectively

### ***Challenges and Opportunities of WASH Programme***

#### **Financing**

The insufficient budget for the programme and lack of mechanism for fund mobilization are mentioned by all sources of information as inadequate and regarded as a cause of most other challenges. Furthermore, lack of specific funds for the SWASH programme has also featured as a major challenge. The findings from the study have shown that all of the schools do not receive enough budget for WASH programme implementation (Figure 4.25 and Table 4.29). This suggests funding as a major constraint to the implementation of the School WASH programme implementation according to the findings from the field. This is despite the fact that success of the programme depends on how the nation could invest in WASH to the required standard. This challenge is chronic in most low-income countries including Tanzania (Tsinda & Abbott, 2018; WHO, 2019). WASH programme in these countries requires a boost in the budget that will enable may successful implementation. The findings depict that more than fifty per cent of the schools (55%) do not have a budget for WASH programme implementation. As described by one member in the FGD *"Schools are currently poorly planned. Some schools are located at long distant from water sources and water distribution systems,*

*and the expense of providing water by NGOs is significant and at times unaffordable by the school budget. This is a burden on the school administration to meet the requirement of schools. In fact, some schools are located in places where the source of water is merely bore holes with irregular supply of water. Due to the nature of the area, there is very little or no water supply source/system in the village, even for the community. Few schools in urban areas are linked to the water supply network, but in rural locations, the expenses are higher".* With this comment it means water sufficiency is curtailed. Another comment regarding the budget was *"No sufficient budget for WASH facilities operation and maintenance set by the responsible ministry. Responsible people for resource mobilization are not taking up their responsibility, possibly the importance of SWASH is neglected by the local authority"*. This situation could culminate from the fact that the sector is controlled by more than one ministry that does and have the budget separately. No specific budget for WASH implementation and the sector should take it seriously. From the FGD and teachers' respondents it was reported repeatedly by majority that there are no funds for operation and maintenance.

Overall, the budget for WASH services allocated at school level is very low. Only few 5.6% teacher respondents reported that their schools' had budget allocated for WASH. Majority of schools 94.44% have no budget allocated for school WASH service. Budget for WASH services is reported to be obtain from local government 49% and 54% from donors. None of the school had mentioned to have own source. Moreover, only 28% agreed the school committee does mobilise fund for WASH service from various organizations and companies for school WASH.

As already indicated, majority of SWASH funding in Tanzania is from "donor funds" from international organizations, both external and internal NGOs. Improper planning and supervision may lead to misuse. Misappropriation at school and district level have a grave impact on disbursements and the pace/timing of implementation of such projects. At the district level or funds may be misappropriated or routed to another sector and disbursements are sometimes delayed, which may result in donor withdrawal. Donors of any kind would like to have and see measurable impacts for further disbursement or donation.

Insufficient funding/budget and poor governance and accountability are ranked first and second by the FGD as causes of poor programme performance (Table 4.30). Together with the comments given by FGD members in Kisarawe suggest that initial planning and supervision had all to do with the insufficient or no budget. These comments indicate that the pace we are making concerning Sustainable Development Goals (UNICEF & WHO, 2018; Tsinda & Abbott, 2018) is rather small. It is important here to note that campaign of retain adolescent girls in school will be achieved if there will be equitable and equity of SWASH services delivery. Such equitable and equity environment service delivery is far to be reached if no deliberate funding of SWASH is done.

### **School Committee and Parents Involvement**

The study findings show that fully participation of parents and school committees is a challenge. The education policy stipulates that it is the role and the responsibility of the school committees to maintain and operate school WASH facilities once constructed. However About 56% of the respondent agrees that school committee are responsible for

operation and maintenance of WASH facilities while 44 % of the respondent regards school committee as not responsible for the same. School committees are not regarded to contribute in the maintenance and repair of school WASH service and only 49% regards parents as contributors (Table 4.38). This is indicating that school committee and parents are not adequately carrying out their responsibilities and roles. Such findings would mean the committees are incapable of undertaking their responsibility. Another reason could be that they don't know their roles and responsibility.

As a means to sufficient budget to cater for construction, maintenance and operation it need stakeholder's involvement starting from the initial planning where responsibilities are assigned. Another way is to have specified government department to deal with SWASH. This will initiate the budget for construction repair and maintenance and supervise the implementation. Fund mobilization and accountability is another area for improving SWASH programme implementation.

### **Operation and Maintenance**

Operations and maintenance (O&M) of WASH facilities requires repairs, which is a challenge to the schools and communities. The process involves financing, materials and human resources for latrine, water points, waste collection and disposal and hand washing facilities repair or operate. To affect these, it needs clear and well-set budget which has been observed in this study as a lacking pillar for programme execution. Because this is lacking, the findings had indicated poor performance in O&M in all schools. Additionally, there is a wrong perception that operation and maintenance are the responsibility of the government and school administration while on the other hand, the

district is intended to play a supervisory role, which is rarely implemented. As result, there is a significant gap in government financing for SWASH activities. This has also been linked to the serious lack of technicians and spare parts. As a result, the LGA is meant to focus on Operation and Maintenance, yet there is a significant gap in government financing for SWASH activities budget

### **Planning and governance**

Besides financing, inadequacy in planning and governance are other challenges mentioned and which are indirectly associated with limited funding. This is another area of concern. Participatory planning that involves all stakeholders is needed. Off course poor governance could be meagerly associated with financing because where there is no funds, effective M&E is not possible, Planning should consider funding, appropriate school location and layouts, operation and maintenance as well as software improvement (knowledge and mindset change). Challenges like increased enrollment and accountability are issues that could be dealt with right from the initial planning. It is through proper planning where accountability, roles and responsibilities, Participation, involvement and fund mobilizations could be dealt with. All these are considered by the key informants as a challenge from all sources of this study information.

Poor planning of construction, operation and maintenance of WASH facilities was observed and reported at all levels of the implementation irrespective of the approach used. The research findings show that 93% of the respondents complain that there is poor planning for the operation and maintenance of WASH at all levels. Comments given by one of the key informants on the planning and water sources indicate haphazard planning with little or no focus on the community engagement power. indicated about 67%



of visited countries had no proper plans, budget, Monitoring and Evaluation plans (UNICEF & WHO, 2018). Data collected in Tanzania by EMIS are in fact insufficient to show up this arena (BEST, 2020). They as well need to be revised to give room for better SWASH status data in the schools. This calls again for using coordinated technocrats in the planning and implementation of the programme. In essence, there should be prior feasibility studies and forecasts for future development including an increase in the school population. Incidences like an increase in school population should have been included in the planning of school establishment (Kamara et al., 2017). Maintenance on the facilities has become difficult because always the school and local government lack plans and budget for repair and maintained of water and other facilities. The outcome is obvious in the schools that was found to have more than half of the water facilities not functional and unattended. In deed it is sometimes difficult to make some repair of water facilities because it is difficult to obtain suitable spare party and experts for maintenances, they are expensive. As reported by FGD in Bagamoyo, the technology options are somehow new, that requires experts to choose the appropriate technology option. Prioritizing the identified barriers to address the challenges will help to be more focused and know where to put more efforts to be able to excel

Uncoordinated planning has a negative impact on receiving donor investment and support for the WASH programme (Coswosk et al., 2019; Sinharoy, et al.,2019). The WASH programme must define each WASH actor's responsibilities and guarantee that well-coordinated, functional planning is in place. The fact that there are so many WASH stakeholders in the country, each with their own goals and planning horizons, makes developing a sector-wide programme extremely challenging (Kamara et al., 2017; Tsinda

& Abbott, 2018) but that must be done. Furthermore, at the local level, there is no prioritization of the SWASH programme, with other sectors having precedence in planning and budget allocation. The government's plan relies more on village-level participation to influence intervention targeting at the district level. District-level decision-making meetings are underrepresented and under-attended, even though they are platforms where opportunities can be discovered and barriers addressed (Antwi-Agyei, et al., 2017; Kamwenda, 2019).

Governance involves coordination and M&E. Desk studies done revealed that some SWASH coordination at the district level but they do not have decision-making authority on the WASH activities budget. The state of WASH facilities in public schools visited was bad, with descriptions such as non-functional, dirty, dilapidated, or unavailable. Although reported elsewhere, (Antwi-Agyei, et al., 2017; Bolatova et al., 2021) it is not a situation to embrace. As observed by Pruss-Ustun et al, (2019) where there is no coordination mechanism for WASH stakeholders, there is a duplication of effort and unclear communication among the implementer. From the desk study, major contributors to the programme are donors either through the government budget or direct to the local authority.

WASH component is a cross-cutting programme that involves education, health and water sector. A good planning, coordination and accountability are key factors for achieving the programme objectives. In addition, clear roles and responsibilities of each stakeholder involved in the programme will assist in maintaining efficiency and sustainability programmes hence reaching the national and global objectives. Findings from the study shows that 88% of respondents reported that there was poor governance

translated by infrequent follow-ups and monitoring of school WASH programmes. In other words, the governance system is weak and non-accountable. This is a result of a lack of coordination at the national level, which is reflected at the regional and district levels in all WASH indicators (water availability, facilities, health, and education). This concurs with the reports from Kamara et al., 2017; Fuente & Bartram, 2018; Sinharoy, et al., 2019). Measure to reduce this bureaucracy is needed for the WASH programme to come into effect, one being the involvement of all government and non-government stakeholders. Let them come together for planning and responsibility assignments as proposed by Curtis (2019). The poor governance, follow up and more to insufficient funding that could as well be associated to the inadequacy of national planning is a trend in most low-income countries (Bolatova et al, 2021). Possibly the national policymakers have not assigned due importance to WASH. It could also be due to a limited national budget that is a problem for poor/low-income nations (UNICEF, 2019).

The contribution from local Government own source is unreliable. Well-wisher donors, and community at the ground contribution is yet to be tapped. It is in fact minimal. Coordination is needed to bring all on board. Hutton and Chase (2017) explicitly show support from school committee and government, in improving WASH services that was directly related to wellbeing of school students' health and performance.

### **Community and school committee participation and capacity**

A among the reported challenges that contributed to poor performance on the implementation of SWASH programme was ineffective school committee participation in the various activities including supervision. About 67% of the school teacher respondents

in the schools surveyed confirm that the community is not actively participating in WASH activities. The responsibility of school committees has remained meagrely on fund mobilization only. Only (10%) of the respondents reported that the school committee is responsible for WASH programme implementation (Figure 4.25). The school committees view their roles and responsibilities as not valued by LGA. Nevertheless, study done by Tsinda and Abbott (2018) shows that the involvement of the school committee and public-private partnership in maintaining the WASH services is important for the sustainability of the programme. More emphasized the involvement of the school committee in the early stage of the plan so that identification of the needs and priorities to set in collaborative (Tsinda, & Abbott, 2018). Of course, effective and efficient involvement of the community, committee and stakeholders depends on the political commitment of the country (Tsekleves et al., 2022).

There is also an element of limited capacity (finance and knowledge) of these community representatives. The committees being among the main stakeholder and representatives of the community at large, this is a big challenge. The school committee that is reported to have limited capacity to administer the programme is the organ at the grass-root level with the responsibility of monitoring the implementation of the project at school (Koop & van Leeuwen, 2017). If this committee is entrenched with low capacity, inevitably there would be various negative outcome associated. With such a committee, it will be a problem even to plan for mitigation of the climate/environmental challenges which are normally unforeseen to be included in the plans (Koop & van Leeuwen, 2017). This calls for training for knowledge creation to the school committee or nominating candidates that are well conversant with the nature of such a programme. Low or not

involving the school committee could be translated to not involving the community. In this case, community ownership will be missing. On the other hand, although not reported, the committee and the community at large may be shaded off unknowingly due to the need to contribute financially. The majority of committee members as well as the community at the school level have poor income or lack proper knowledge of WASH or even have antagonistic traditions. All of these had been reported elsewhere to cause poor involvement in the community (Bauza et al, 2021). They are more pronounced where community has not been well informed at the begin before they are involved in the planning Informing them beforehand make them to conceptualize ownership.

Some school of thought consider the importance of the community in the intervention as a way of creating enabling environment for them to participate and for resource mobilization and ownership of the programme (Tsekleves et al., 2022). Further to this, it is also thought that community engagement and participation should start from the initial stage of planning of the programme (Nelson, et al., 2021). To emphasize on this, a study done in Sierra Leon indicates some shortfall of the school committee not adhere to their responsibility which resulted in poor construction (Pruss-Ustun et al., 2019).

A study in Kinondoni Municipal Council (Tanzania) indicated that the role of the community and stakeholders were not clearly stated in the school WASH guideline concluding that as a weakness (Mafuru et al., 2018) that could make the committee irresponsible. Commenting from the FGDs, *"The contribution of the community is important and valuable but the council officers usually do not value the role of community members in the development of the school Furthermore, the plans are sometimes top*

*down. This sometimes lower the community's participation in school programmes"* This become an issue of planning and governance to make sure that appropriate personnel is elected into the committees and are equally involved.

The success of many programmed is through the engagement of stakeholders of different approaches and networking (Ekirapa-Kiracho et al., 2017). Knowledge to various stakeholders is a powerful tool that enable networking to facilitate the implementation of WASH activities sustainably and mutual sharing of the knowledge gained and progress between one nation and another (Sandison, 2018). The results showed little engagement and involvement. For this matter the improvement of WASH services in the schools to meet the SDGs also depends on the involvement of WASH stakeholders. The involvement of communities and other WASH actors (various kinds/types of donors) on the technical options of WASH services promote ownership of the programme and sustainability of the programme. There is a big possibility that the inadequate of WASH services funding in school is due to poor engagement of WASH stakeholders. Indeed, this way of active involvement of community and other stakeholders at early stage had been observed to be a challenge in the developing countries (Sandison, 2018; Mafuru et al., 2018).

A success story from one of the key informants had shown that there is a need to have set goals for contribution in the programme projects. Quoted from him

*"we have experienced working with various communities and forged away sustainability enabled constructions of WASH facilities and libraries. Our approaching has been ganging local resources in terms of human and materials. We agreed with local*

*resources in terms of human and materials. We agreed with LGA to contribute 20% community members 20% and our organisation 60%. We opt to use local technicians to accommodate local technical expertise and achieve affordability; our main investment becomes one water engineer who supervises the local technicians. Community members contribute in terms of local available resources such as building sands, stones, timber depending on the what is available. Further, community also provides labour during constructions such as digging foundations, support building technicians and mobilizes resources. It has been working since community members take ownership of the structures, they even volunteer to pay the guide. This advantage of engaging in the community is also seen in continuous repair and, maintenance whenever it is needed. Furthermore, the local government is a key unit for continuous supervision and liability usage of the building. They monitor and assess usage for effective utilization”.*

This is an encouraging scenario that need to be taped. It involved not only the local community but the local authorities at all levels which are eventually supposed to be the overseer of the project. Financial contribution from the community is an equally important indicator to gauge the community’s commitment to sustaining the programme. In this study, financial contribution from the community and in particular the school committees seem to be minimal or to existing at all. There are different ways in which the communities can contribute including cash, and in-kind in the form of non-technical labour (digging trench or wells, and arranging a roster to bring water to the school for personal cleaning and cooking), transportation and other materials for the improvement of the hardware and software of the programme. Also, in-kind contribution involves technical labour which can include mason, construction supervision, Furthermore, the community

through mobilization of different people can use available opportunities, technical knowledge or expertise, and construction materials such as cement and burnt bricks.

Brown and colleagues emphasize the involvement community in latrines construction because the community members take ownership of the structures (Novotny et al., 2018). As said by one of the key informants that “*The advantage of engaging the community is the continuous repair and maintenance of the buildings. The local technicians are reliable. Furthermore, the government is responsible for supervision and liability for sustainability. They monitor and assess usage for effective utilization. Unfortunately, this is not the case*” Reported by school committee member from Bagamoyo).

### **Accountability challenge**

Another factor reported by teacher respondents (Figure 4.25), comments from the interviews (Table 4.29), and FGD (Table 4.30) is lack of accountability. This could be reflected as negligence at the different level because guidelines and schedules are already in place but not followed for the lack of fund blames. The discussion in the groups and with key informants reflected that teacher do not take their role and responsibilities of promoting hygiene. The school committee and school community have a role in the implementation of the WASH programme but does very little. Knowledge building among these stakeholders at the ground level is needed for them to get involved. The M & E are not done accordingly and neither is feedback given to implementors.

Source of Challenges and Options for Resolving



Teachers' respondents regard financing, planning and commitment as a major source of the existing challenges (Table 4.31) while for the school committees, the major source of challenges is insufficient funding and poorly constructed infrastructures (Table 4.32). Key informants had commented of poor governance and inadequate planning as a major source of challenges. The research finding from the survey depicted that 83% of the key informants think that there is a problem with making up follow-up on water and sanitation activities. There is also no capacity building for the school committee that focuses on the role and responsibilities that are supposed to be attained. The exercise is done in ad hoc. The reviews from previous studies such as those of Ginja et al., (2021) find that many programmes in public school activities failed due to inactive follow up as well as a lack of awareness about the programme. Having WASH programme guidelines in place is not enough if the community is not well informed about the roles and accountability in implementing the programmes (Kamara et al., 2017). Comprehensive routine monitoring of school WASH programme by joint supervision is very important. It is from Monitoring and Evaluation that administration could draw some remarks to WASH implementers to improve the methodologies and approach for implementation. The government should assess the WASH facilities regularly using the global recommended core questions for WASH. This will assist in measuring the progress.

In some schools, water insufficient is created by the gradual or sudden increase in the number of students in the school. The research findings showed that about three-quarters of the participants claim that school enrolment did not focus on the availability of the WASH facilities in the school. The increase in school enrolment was accelerated with the rapid increase in students as a result of the introduction of free education programmes

in 2016. Knowing the fact that the provision of WASH services has a positive impact on economic and social well-being (Kamara et al., 2017). There should have been a parallel budget for SWASH with this intentional enrolment.

The WASH programme also is affected by climate change as reported by respondents (58%). SDG 6 aspires to provide universal access to water and sanitation and sustainable management of these resources. However, climate change sometimes causes floods to wreak havoc on these fundamental rights by generating various types of water pollution and destroying sanitary infrastructure. all of which negatively influence the health of the people impacted (Kamara et al., 2017; Kabir et al., 2021). Flooding disrupts school facilities, causing disruptions and affecting clean water and sanitation services. Increased rainfall intensity and associated floods are anticipated to increase the danger of airborne and vector-borne diseases, while excessive temperatures can lead to death from heat stress (Koop & van Leeuwen, 2017; McMichael, 2019). In the view of the WASH conceptual framework (Figure 2.1) environment in Tanzania is relatively better than the two other pillars. Looking to the reported facts, the budget is this sustaining pillar is the weakest link. It would therefore be paramount that school WASH intervention should focus on it and pay due respect attention to it. The prioritization of identified barriers to addressing the challenge will help to be more focused and know where to put efforts to be able to excel. Challenges in the implementation of school WASH programme in the public schools mainly is due to budget, access to water and sanitation services, repair and maintenance are key barriers for WASH programme implantation and sustainability. In view of all WASH conceptual framework (Figure 2.1) environment in Tanzania is relatively better than the two other pillars. Looking to the reported facts, the "Sustaining"

pillar is the weakest link. It would therefore be paramount that School WASH interventions focus on this, and pay due attention to this area. The prioritization of identified barriers to addressing the challenges will help to be more focused and know where to put efforts to be able to excel.

All source of challenges including insufficient funding, improper construction, few facilities (toilets buildings and drop holes), school layout und unforeseen calamities reported by the teacher respondents (Table 4.31) and FGDs (Table 4.32) could be ceased by proper planning and adequate budgeting that are also regarded as source of challenge in the FGDs. As viewed by key informants, and teachers, (Table 4.33 and 4.34) as well as all comments from the FGDs, plausible options for resolving the challenges include good planning, sufficient funding and responsible governance. Other options being awareness and knowledge building to teachers, parents, and persuasion/advocacy to stakeholders.

### **Government and Stakeholders Involvement WASH programme**

The government is responsible for supporting the implementation of the WASH programme in public schools, encompassing both software and hardware aspects. The reviewed sources from the desk study indicate that the government has undertaken various actions to enhance the WASH situation in schools. It has placed significant emphasis on engaging people, organizations, stakeholders, and government departments. The government has developed SWASH guidelines along with toolkits, which are utilized in program implementation. WASH themes have been integrated into extracurricular activities related to WASH and to some extent into the school curriculum

to raise awareness and promote a change in mindset (URT, 2019). The establishment of Memoranda of Understanding (MOUs) between key ministries has facilitated the involvement of ministries responsible for water, health, and education, as outlined in the URT report of 2019.

Stakeholders have highlighted the need for the government to provide strong motivation to encourage participation from individuals, firms, and organizations in the program, fostering a common understanding of its objectives. Additionally, creating a robust network among implementers is deemed essential. Currently, there are only eight donors supporting SWASH initiatives in various capacities within the study area (refer to Table 3.2). However, there is potential for engaging more stakeholders through deliberate and targeted efforts.

Primarily, the Local Government Authority is tasked with ensuring an adequate budget for WASH, as indicated by the majority of respondents. Interestingly, the findings reveal that a significant portion of the funding, approximately 46% for schools, comes from donors, with none of the surveyed schools having a budget from their own sources (see figure 4.26). This reliance on donors portrays SWASH as being donor-driven and dependent, necessitating thorough and strategic planning and execution. Instances of project failures have been observed due to donor withdrawal for various reasons (Prüss-Ustün et al., 2019; Kessy & Mahali, 2017). Challenges in maintaining facilities constructed by donors have been noted, as end-users often lack the capacity to sustain them. Although schools contribute minimally to operational and maintenance costs (as depicted in Figure 4.26), these contributions are insufficient. Notably, donors are typically reluctant to fund maintenance and repair activities. Therefore, it is crucial for the government and

school communities to establish comprehensive plans for maintenance and repair to ensure the sustainability of WASH facilities.

### **Community involvement**

School community including parents, teachers and committees are insignificant contributing to construction of facilities. On the other hand stakeholders represent the individual or group of people with same interest that can influence the policy and implementation of the WASH programme. Effective and efficient involvement participation of other stakeholders (community and donors) depends on the political commitment activists of the nation. Political commitment tends to assure individual as well as community as a group the advantages, security and sustainability of their planned programmes. This increases participation. The FGD revealed their role is not valued by the government and plans are top down and this lowers their morale to participate. Majority of the key informants reported on poor inadequate involvement and governance as the responsible council do not consider the importance of SWASH in their plans and budgets.

Common participation of government and WASH actors in the programme implementation has been proved to trigger fund resource mobilization and quick results (Tsinda & Abort, 2018). This makes the cooperation stronger whether in the form of Public Private Partnership (PPP) or collaborative association. The role of the government is to coordinate the various stakeholders including the programme enforcers. Good

coordination is needed for engagement of stakeholders that will give in sustainable results. This is the role of the government who is essential the owner of the schools for her future community. As pointed out in the FGD, the advantage of engaging the community is the possibility of having continuous repair and maintenance of the buildings by local technicians. They are reliable and can provide continuous maintenance whenever it is needed. They know that local government is a key unit responsible for continuous supervision and liability for sustainability but as parents to students they responsible for contributions in school development and performance. However, their low economic power is their concern where they are supposed to contribute. In addition, they have the role of monitoring and assessing the value for money.

There is an opportunity for donors to engage in the programme so long as they are there in the study area through cooperate responsibility. The shy away nature from SWASH to other projects for some existing companies could be due to the unfavourable environment such as reluctance of community to cooperate and undoable guidelines. Under proper management and administration, a conducive environment can be envisaged to enable more participation by these companies within the area.

### **Provision of SWASH Services and Handling Complains**

Provision of SWASH services and handling of complains as far as SWASH services is concern is placed on schools and parents by majority of teachers (Table 4.35 and 4.37). This means that adequate supervision and proper information relay is necessary from facility users to school community (parent, students and teachers). Where there is little supervision and information break down, it will cause improper use and delay

in maintenance and pave way to unrepairable damages. Key informants on the other hand see the provision of adequate services to be a responsibility of the government by providing sufficient budget for required amenities including soap in the toilets and at hand washing points. For instance, they had suggested provision of soaps to be from either school administration, government, parents and cost sharing a between teachers and parents (Table 4.36). This would then be possible and practical only where parents are well informed and there is strict supervision at the school level.

### **Responsibility for operation and maintenance**

Like the service provision, teachers pointed out that operation and maintenance of the already constructed facilities is a responsibility of local government authority, parents, and school administration (Table 4.38). Contrary to the guidelines which had left the operation and maintenance issues to the community and local government, (URT, 2019). The education policy stipulates the role and the responsibility of the school committee (URT, 2019). In most incidences this has been found not applicable and facilities are not operational in some periods within a year. Only 7% of teacher respondents had reported having operational facilities throughout the year. The activity becomes rather challenging because the users regard it to be maintained and operated by somebody else. This has thus remained a big challenge to the schools who do not have such funds for the required and maintenance resources. Government budget is insufficient, community contribution is low and school own source is almost not there. This is the cause of the observed situation of unrepared or ill-maintained facilities. In this case an alternative has to be thought and made very clear in the planning for the sustainability of the programme. Only

by having parents responsible could ensure increased level of amenities provision in the schools.

### **Monitoring and Evaluation Responsibility**

Monitoring and Evaluation organization is another government responsibility. Where properly planned and done, it ensures success of any programme. This is because it gives room for analysis and assessment of the programme stage by stage to make good base for the subsequent stages. The study revealed a poor M & E of the programme. Less than a half (36.4) of teachers indicated M&E is not well done. The global GLAAS and JPM had made tools specific for Monitoring and Evaluation of WASH (UNICEF & WHO, 2018). Nationally, an independent body of this nature is suggested to create area specific monitoring framework and tool. Currently the framework involves staff from the various sector that might not be attached to the programme. In this regard, the various institutions that are managing parts or any component of SWASH such as Water Supply Authorities for the piped water and either school administration or local community for the bore holes, health and education institutions and community development are needed to team up with SWASH specialists. At the school level SWASH activities management is reported being under school committees. Water sources are reported to be managed by DAWASCO and some by local water committee and Water Consumer Association, within 'mtaa' or village. Bringing them on board in the planning, monitoring and implementation is important as a means of making them to participate effectively and evaluate the value for their efforts.



## CHAPTER 5: IMPLICATIONS, RECOMMENDATIONS, AND CONCLUSIONS

### Summary of the Results

In this chapter, the implications, recommendations, and conclusions drawn from the study on School Water, Sanitation, and Hygiene (SWASH) programmes in Tanzania are discussed. The chapter begins with a summary of the results, highlighting key findings and conclusive remarks for each research question. It delves into the assessment of the status of school WASH facilities, methodologies for construction and maintenance of SWASH facilities, and the impact of teachers' and community perceptions on school WASH sustainability.

**Assessment of the Status of School WASH Facilities** The stakeholders, including the school community and key informants, acknowledge the current shortcomings in achieving sustainable WASH practices in schools. While the WASH programme is seen as a solution to existing challenges, issues such as inadequate planning, insufficient budgeting, lack of accountability, and the need for proper planning have been identified.

**Challenges and Opportunities for WASH Services in Public Schools** Stakeholder adherence to government WASH policies and guidelines, as well as the involvement of stakeholders in resource utilization, are crucial aspects discussed in this section. Efforts to strengthen school committee management, address capacity constraints, and enhance members' capacity are highlighted as essential for effective WASH service delivery.

The chapter concludes by emphasizing the current inadequacies in SWASH programmes in Tanzania, citing factors such as inadequate facilities, poor conditions in public schools, governance complexities, and funding shortages. Recommendations are provided to address these challenges, including the development of a national operational

framework, strengthening institutional roles, and increasing investment in SWASH programmes for sustainable improvements.

**Recommendations for Improving SWASH Programme Implementation.** The study underscores the need for enhanced facilities and conditions in public schools, along with collaborative efforts, increased stakeholder involvement, and greater investment in SWASH programmes to overcome challenges and achieve sustainable improvements.

Increase advocacy and awareness campaigns to shift community mindsets towards the benefits of SWASH and foster engagement and commitment. Develop a SWASH Strategic Plan to promote better health outcomes for students and communities. Suggestions for future research to enhance SWASH programme implementation in schools are provided based on the study's findings.

## **Recommendations based on research questions**

### **Assessment of the status of school WASH facilities**

The findings from the research on water availability, sufficiency, and safety showed that these components were generally poor in almost all schools. Only 56% of schools had a functional water source that was reliable. The source of water was not guaranteed to be safe because other sources were secured from unprotected boreholes. Some 3.9% used unprotected or unsurfaced water, and 4.4% could not describe their water source. Such a situation is regarded as very unsafe. The mean distance from the water source was observed to be 384 – 712.12 meters, while the recommended national average is 400 m. Kisarawe and Bagamoyo had longer distances than the average, meaning that they were not able to meet the requirements. This is despite having a number of disabled students and young ones who would not be able to walk long distances for water. The

reliability and sufficiency were also low. About 26% of the schools experienced water shortages, and in some schools, there was no water at all for more than 2 weeks. Water cutoff frequencies were about once a year, whereas in urban areas, the cutoff frequencies are more frequent, although they mostly use the national water supply network. Complaints of water insufficiency are also reflected by various comments from the FGDs and teachers respondents who indicate that water charges from DAWASCO are exorbitant. Furthermore, the availability of at least five liters per day per student was precarious. Some schools could not even ascertain if the available water could reach that level. It is sufficient to conclude that water availability is insufficient. With the reported rapid unplanned increase in enrollment, these findings reflect an increasing insufficiency situation that will hamper proper hygiene and sanitation practices given that water is a major component in SWASH. Based on these findings, the SWASH status is rather poor.

In practice, schools have no designated handwashing points, and only about half of the schools agreed to have moderate to sufficient water for handwashing (24.44% and 48.44%, respectively). Approximately 15% of day schools have been documented as lacking access to clean water within their toilet facilities. These are presumably those with water cutoffs and those using boreholes. At least all girls' toilets in visited schools were maintained with water, which is rather important for the adolescent ones. The quality of the water is also questionable because the majority obtain water from boreholes, which are regarded as an unsafe source. Treatment is done mainly by DAWASCO in the piped system only. Although approximately 35% to 47% of schools across the districts provide water access for the disabled and young students, nearly half of all schools in these

districts still face challenges in ensuring water accessibility for these groups. The situation goes against the children's right to water.

From the findings, the functionality and usability of SWASH facilities were not at the required standard. Extra attention is therefore needed to curb this situation by increasing the existing school water facilities and requirements for standard sanitation and hygiene. Among the measures that could be taken up are looking for more sources of water for the already existing schools and providing a waiver/subsidy to the DAWASCO bill. In the case of new school constructions, there should be due consideration for sufficient water sources that could supply water to the projected number of school children. Furthermore, a realistic budget for installing drinking and handwashing points, water in the toilets, and treatment of the water sources needs to be taken on board.

Looking at the sanitation facilities (toilets in this regard), the result showed that all toilet blocks or chambers were separated by gender. Regrettably, about 14% of the schools had no structure that could be regarded as toilets or had dilapidated toilet blocks. Furthermore, almost half had very poor to poor toilets. These are toilets that have several deficiencies and are not maintained, have no doors, are rather small rooms, have no water, and have cracked floors/drop holes. Most schools use pit latrines (96%), which are difficult to clean and do not have running water or urinals, a situation that is contributed to by insufficient water supply. The situation was actually similar in all districts. The available drop hole number was were too far to reach the recommended ones. Generally, given the school population, dropholes requirement for boys would have been about 14 drop holes, and for girls it would have been 12 drop holes (this is per the national requirement of one drop hole per 20 girls and one drop hole per 25 girls). However the

sudy findings showed that there were only about 6 for boys and 7 for girls. Despite the few drop holes observed, schools had dilapidated toilets, which are not safe and almost have no privacy for the user. This means swift actions are needed to improve the situation.

### **Methodologies/ Approaches for Construction and Maintain SWASH Facilities**

In some schools, the construction design was found to be inadequate. The government, working independently, constructed a higher percentage of toilets (38.9%) compared to other approaches involving coalitions with the government, community, and donors. The remaining approaches accounted for 23.6% of the toilet blocks in schools. However, this particular approach received the lowest rating, averaging 1.97. In contrast, the government/donor approach and contributions from anonymous individuals/donors scored the highest (4.7) in terms of quality and standards. This disparity underscores the importance of establishing consensus on material quality, measurements, design, and specifications to achieve top-notch toilets.

Budget constraints and lack of responsibility are major factors contributing to the presence of unrepaired, dilapidated toilets in schools. This situation may stem from the high costs associated with repairing and maintaining either substandard constructions or high-end structures. Poor initial construction quality leads to early and frequent repair needs. Additionally, improper construction design was noted in some schools, with the government-alone approach constructing a higher percentage of toilets (38.9%) compared to other approaches involving coalitions with the government, community, and donors. However, this approach received the lowest score, averaging 1.97, while the government/donor approach and contributions from anonymous individuals/donors

scored the highest (4.7) in terms of quality and standards. This disparity underscores the need for alignment on material quality, measurements, design, and inclusions to ensure state-of-the-art toilets.

The construction of WASH facilities requires funding that communities often find challenging to afford independently. This could explain why structures solely constructed by the community tend to score poorly. Moreover, the operation and maintenance of these facilities, primarily overseen by school committees and community members, also face financial constraints. Conversely, construction approaches that lack strategic community involvement have been deemed impractical. Therefore, convening a roundtable meeting is crucial to foster consensus and accountability among community members. Proper planning is essential to identify required assets, facility types, and funding sources. It is vital not to overlook repair and maintenance costs during this process.

The lack of dedicated budget allocation for the operation and maintenance of School WASH programmes poses a significant challenge to their sustainability. Teachers participating in the program highlighted this as a critical factor hindering its success. As a result, schools struggle with operation and maintenance, often resorting to pressuring parents or relying on limited internal funds due to the absence of reliable external funding sources.

In Tanzania, the majority of SWASH funding originates from donor funds and external assistance from NGOs. This reliance on external sources impacts the disbursement process, planning, and the pace of implementation. At the district level, delays in disbursements and instances of misappropriation or redirection of funds to other sectors have been observed. It is crucial to ensure that allocated funds are channeled to

the designated schools for their intended purpose, including operation and maintenance of facilities. Inadequate budgeting, lack of accountability, and improper planning have been identified as key factors hindering the financing of SWASH projects. Failure to incorporate operation and maintenance costs into the budgeting process may lead to incomplete projects and temporary functionality, exacerbating the existing challenge

### **Teachers' and Community Perceptions on School WASH Sustainability**

The stakeholders, including the school community and key informants, agree that the objective of achieving sustainable WASH practices in schools has not been met. The school community sees the WASH programme as a solution to existing challenges but notes inadequate planning. Key informants highlight factors such as insufficient budgeting, lack of accountability, and the need for proper planning and capacity building among stakeholders and students as crucial for programme sustainability. Teachers also emphasize the absence of a dedicated SWASH budget as a key obstacle to sustainability. These perceptions align with previous reports on the programme's objectives and challenges (Gonzalez-Rodrigo et al., 2022; Jimenez et al., 2018).

Concerns about water quality improvement and treatment arise due to budget constraints and the burden it may place on parents. Handwashing with soap is neglected due to funding shortages, despite its importance in the context of water quality. Teachers note that inadequate SWASH services, both hardware and software components, affect school attendance and academic performance, particularly impacting adolescent girls who rely on these facilities for menstrual management.

Stakeholders identify financial limitations, parental negligence, and social and cultural factors as barriers to sustainability. They suggest adopting theory of change principles to shift mindsets in planning and evaluating program progress. This approach aims to raise community awareness about the importance of the WASH program through education and involvement. Key informants envision a future with increased WASH awareness, an enhanced learning environment, improved hygiene practices, additional facilities, and better SWASH planning, contingent on implementing the recommended measures.

### ***Challenges and opportunities for WASH services in public schools***

In the context of School Water, Sanitation, and Hygiene (SWASH) programmes, challenges and potential solutions were explored. Financing emerged as a critical issue, with insufficient budgeting identified by teachers as a primary obstacle. Adequate investment in WASH infrastructure is crucial for meeting standards, requiring a robust budget aligned with program needs. Policy makers and planners play a key role in addressing these challenges by establishing appropriate budgets to support effective implementation.

Effective planning for construction, repair, and maintenance of WASH initiatives is essential. Concerns were raised by teachers about inadequate planning impacting donor investments and support. Clear delineation of roles and responsibilities among WASH actors, along with sector-wide collaboration, is vital for successful implementation. However, challenges persist due to the complexity of coordinating various stakeholders with distinct goals.



Governance and service delivery structures face practical challenges such as inefficiencies, communication gaps, and unclear roles. Weak governance practices in schools, lack of accountability, and coordination gaps at different levels hinder effective implementation. Collaboration among implementing partners and a sector-wide approach are recommended to enhance WASH governance and ensure sustainable execution. Community and school committee participation are crucial for successful WASH programs. Ineffective community involvement and inadequate school committee capacity were noted as barriers. Creating an enabling environment for community participation, clarifying stakeholder roles, and offering training to school committees are essential for program success. Guidelines should outline stakeholder involvement levels to prevent implementation gaps.

Rapid school population growth poses challenges to WASH facilities, impacting maintenance and hygiene practices. Climate change exacerbates WASH issues, causing floods, water pollution, and water shortages that affect programme sustainability and community health. Addressing these challenges requires proactive measures, community engagement, and sustainable planning to ensure the effectiveness of WASH programmes amidst evolving environmental conditions.

### ***Stakeholder adherence to government WASH policies and guidelines***

Government policies and stakeholder involvement in Water, Sanitation, and Hygiene (WASH) programmes encompass various activities such as planning, financing, supervision, and facility utilization. While the government has developed SWASH guidelines and strategies for programme implementation, low utilization suggests a need

for increased awareness and support from policymakers. Regular awareness campaigns and document revisions may improve stakeholder engagement and programme effectiveness.

A SWASH policy can guide programme implementers in executing initiatives effectively, supporting institutional implementation, emphasizing school behavior and community action, and integrating sanitation and hygiene into education systems. A multi-sectoral approach involving education, health, and water departments is essential for efficient implementation. Recognizing stakeholders' contributions and maintaining strong partnerships among various entities are crucial and fall under the responsibility of the lead ministry.

In terms of funding, schools primarily rely on funds from the local government and donors, with criticisms of insufficient funding prompting the need for sustainable financing models. Differentiating between capital and operating costs is vital for sustainability, with stakeholders encouraged to propose stand-alone budgets for better monitoring and evaluation. In-kind contributions and local support can supplement funding, emphasizing the importance of planning and accountability in resource utilization.

Efforts to strengthen school committee management, address capacity constraints, and build members' capacity are essential for effective WASH service delivery. Local governments, parents, and school administrations play key roles in WASH services, operation, maintenance, provision of sanitary materials, and menstrual health hygiene management. Collaboration among stakeholders, aligned with proposed solutions, is crucial for successful program implementation. Each stakeholder should contribute within their capacities to ensure effective programme delivery.

## **Conclusion**

The current state of School Water, Sanitation, and Hygiene (SWASH) programmes in Tanzania falls short of expectations, with inadequate facilities and poor conditions in public schools. Despite a robust policy framework, the National School Health Programme lacks effective execution, while SWASH faces governance complexities and funding shortages. Challenges include insufficient allocated funds, poor planning, and inadequate monitoring, hindering successful implementation.

Key hindrances include inadequate adherence to guidelines, lack of cooperation among stakeholders, and poor administrative capacity. These factors impede proper facility operation and maintenance, affecting students' hygiene practices and community health outcomes. To address these issues, collaborative efforts involving stakeholders and community participation are crucial. Developing a national operational framework, strengthening institutional roles, and increasing investment in SWASH programmes are recommended for sustainable improvements.

In conclusion, concerted efforts from the government and WASH actors are essential to address WASH challenges and achieve national goals. Encouraging stakeholder involvement, implementing health education, and promoting community engagement through national campaigns are vital steps towards successful SWASH programme implementation.

## ***Recommendations for Improving SWASH Programme Implementation***

The study highlights the challenges faced by School Water, Sanitation, and Hygiene (SWASH) programmes in Tanzania, emphasizing the need for improved facilities

and conditions in public schools. Key issues include funding shortages, poor planning, and inadequate monitoring, which hinder successful implementation. To address these challenges, collaborative efforts, enhanced stakeholder involvement, and increased investment in SWASH programmes are essential for sustainable improvements.

## **Recommendations**

### **1. Increased Investment and Budget Allocation:**

The government should allocate sufficient funds for SWASH activities, prioritizing both software (hygiene promotion, mindset change) and hardware (toilets, handwashing facilities).

### **2. Awareness and Stakeholder Engagement**

Raise awareness among SWASH stakeholders, emphasizing the importance of the program and mobilizing resources for implementation.

### **3. Policy and Guideline Revision**

Revise SWASH policy documents to be comprehensive and explicit, specifying contributions from all stakeholders for construction, operation, and maintenance of SWASH facilities.

### **4. Strategic Planning and Institutional Strengthening**

Develop a national operational framework with clear roles and responsibilities for each stakeholder to enhance collaboration and coordination.

### **5. Capacity Building and Training**

Provide comprehensive training on SWASH programmes to WASH teachers and school committees to ensure effective program ownership and participation.

### **6. Policy Implications**

Ensure districts and school committees understand SWASH guidelines and frameworks to comply with national and international standards

## **7. Monitoring and Evaluation**

In the context of water sanitation and hygiene in public schools, monitoring and evaluation play a crucial role in assessing efficiency, effectiveness, and impact. Efficiency ensures that resources align with outcomes, while effectiveness measures goal achievement. Impact evaluates the actual influence on targeted issues. It is recommended to conduct joint monitoring and evaluation involving local administrators, teachers, and school committees to track progress effectively (Mgoba & Kabote, 2020).

## **8. Community Perception Enhancement**

Increase advocacy and awareness campaigns to shift community mindsets towards the benefits of SWASH and foster engagement and commitment.

### ***Strategic Initiatives for SWASH Programme Enhancement***

#### **Develop a SWASH Strategic Plan**

Creating a comprehensive SWASH strategic plan, organizations and stakeholders can enhance the effectiveness of their interventions, improve water, sanitation, and hygiene practices, and ultimately contribute to the well-being and development of communities. Through strategic planning, effective resource allocation, and stakeholder engagement, SWASH initiatives can achieve sustainable impacts and create lasting positive change in the lives of individuals and communities.

#### **Establish Autonomy and Stakeholder Platform**

Establish autonomy and create a stakeholder platform for Safe Water, Sanitation, and Hygiene (SWASH) actors, it is essential to develop a mechanism that enhances

commitment and streamlines operations. This mechanism will promote collaboration, coordination, and shared responsibility among stakeholders to ensure the success and sustainability of SWASH initiatives.

### **Raise Awareness and Educate Stakeholders**

Initiate awareness campaigns and capacity-building efforts to promote SWASH practices . By implementing these strategies and engaging stakeholders through targeted awareness campaigns and capacity-building efforts, organizations can foster a culture of SWASH practices, empower communities to take ownership of their health and well-being, and drive sustainable behavior change for improved water, sanitation, and hygiene outcomes.

### **Secure Funding and Resources**

Collaborate to increase fund mobilization efforts and ensure transparency in fund utilization. This can be done by establish partnerships with various entities, apply for grants, run crowdfunding campaigns, seek corporate sponsorships, host fundraising events, maintain transparency, conduct impact assessments, and foster collaboration to enhance fund mobilization and ensure project success.**Policy and Guidelines Review**

Review existing guidelines, integrate SWASH subjects into school curricula, and provide training on updated guidelines, a structured approach is. This approach ensures alignment with national standards, educates students on hygiene practices, and equips school staff with the necessary skills for implementing SWASH initiatives. By following these steps, research efforts can be impactful and contribute to improving water sanitation and hygiene practices in schools.

### **Monitoring and Evaluation**

Conduct joint monitoring, engage local stakeholders, and organize SWASH competitions to ensure programme effectiveness. To conduct effective future research, a multifaceted approach is key. This includes collaborating on joint monitoring with stakeholders for diverse insights, involving local stakeholders for ownership and sustainability, and organizing SWASH competitions to drive awareness and behavior change. By combining these strategies, research efforts can be more comprehensive and impactful in advancing water sanitation and hygiene initiatives in public schools

### **Enhancing Community Perception**

Increase advocacy and awareness campaigns to shift community mindsets towards SWASH benefits and foster engagement. By implementing these recommendations and strategic initiatives, the effectiveness and sustainability of SWASH programmes in Tanzanian schools can be significantly enhanced, leading to improved water and sanitation practices and better health outcomes for students and communities.

### ***Recommendations for future research***

Based on the information provided, here are some recommendations for future research to enhance the SWASH programme implementation in schools.

#### **1. Geographical blocks analysis**

Conduct research to assess the status of SWASH programme implementation in different geographical blocks within Tanzania. Explore how factors such as water sources, cultural taboos, social and economic status impact the effectiveness and sustainability of the programme in each zone. This research can help tailor guidelines and interventions to specific needs of each zone, improving overall implementation and sustainability.

## **2. Private Schools Comparison**

Extend research efforts to include privately owned schools in the study of SWASH practices. By comparing the success stories and challenges faced by private schools with those of public schools, valuable insights can be gained. This comparison can help identify differences in implementation strategies, highlight successful practices, and provide a basis for improving guidelines and interventions. Additionally, understanding the investment patterns and initiatives in private schools can offer valuable lessons for the public sector.

## **3. Longitudinal Studies**

Conduct longitudinal studies to track the impact of SWASH programmes over time in schools. By monitoring the progress and outcomes of these programmes over an extended period, researchers can assess the long-term sustainability, effectiveness, and benefits of SWASH interventions. This data can inform future policy decisions and programme adjustments to ensure continued success.

## **4. Evaluation of SWASH Guidelines**

Assess the sufficiency and effectiveness of existing SWASH guidelines and policies in Tanzanian schools. Investigate discrepancies between written guidelines and on-the-ground implementation, particularly regarding water sources and sanitation facilities. By assessing the practicality and adaptability of these guidelines in both public and private schools, researchers can identify areas for improvement and suggest modifications to enhance programme implementation across all school types.

## **5. Analysis of Programme Funding**



Conduct research to examine the adequacy and coordination of funding mechanisms for the SWASH programme. Investigate stakeholders' commitment and contributions to identify gaps in funding and coordination. Explore ways to enhance stakeholder involvement and ensure effective allocation of resources for sustainable programme implementation.

## **6. Infrastructure building approaches**

Investigate the most efficient approaches for constructing SWASH infrastructures in schools. Evaluate the roles and responsibilities of stakeholders during construction, maintenance, and repair processes. Clarify funding mechanisms and improve coordination among stakeholders to enhance the quality, quantity, and accessibility of facilities.

## **7. Human resource management**

Assess the qualifications and effectiveness of school committees and WASH actors in managing SWASH activities. Investigate challenges related to supervision and administration of sanitation and hygiene facilities. Develop criteria for selecting qualified committee members and teachers to ensure accountability and promote effective SWASH practices in schools.

## **8. Enhancing SWASH Practices**

Identify barriers to implementing essential SWASH practices in schools, such as water treatment, waste disposal, and menstrual hygiene management. Investigate reasons for reluctance in following these practices, even when requiring minimal funding. Enhance knowledge and awareness among students, teachers, and administrators

through training, WASH clubs, and routine education programmes to promote sustainable SWASH practices.

By addressing these research areas and strategic interventions, stakeholders can gather valuable data and insights to enhance the scalability, effectiveness, and sustainability of SWASH programmes in schools, ultimately improving the health and well-being of students and communities.

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## Appendix A: Questionnaires

SECTION 1: SCHOOL IDENTIFICATION Do you want to participate in the assessment? (Please tick the appropriate answer)

YES ..... 1                      NO..... 2

What is your role at this school?.....

Headteacher .....1 Vice headteacher ..... 2 School wash teacher ... 3

None of the above available.....4

### SECTION 2: SCHOOL INFORMATION

<p>1.</p> <p>Today's Date:</p>	<p>2. School Name:</p>	
<p>3.School ID:</p>	<p>4. District Name:</p>	<p>1. Kibaha</p> <p>2. Kisarawe</p> <p>3. Bagamoyo</p>
<p>5.Village Name:</p>	<p>6. Region:</p>	<p>Is this school located in an urban or rural area? Check one.</p> <p>1. Urban</p> <p>2. Rural</p>
<p>1. What level is this school? (Please tick the appropriate answer)</p>		<p>1. Primary</p> <p>2. Secondary</p> <p>3. Both Secondary and Primary</p>

2. What type of management does this school follow?	1. Boys only 2. Girl only 3. Co-education
3. What type of school is this?	1. Day School 2. Boarding School 3. Day and Boarding
4. What is the age of your youngest student?	.....
5. What is the age of your oldest student?	.....
6. During what months is the school in session?	1. January 2. February 3. March 4. April 5. May 6. June 7. July 8. August 9. September 10. October 11. November 12. December

7. What is the total student population at this school?	Number of students
8. How many boys are enrolled in this school?	Number of boys
9. How many girls are enrolled in this school?	Number of girls
10. How many students at this school have physical disabilities?	Number of students
11. How many of the students with physical disabilities are male?	Number of male students
12. How many of the students with physical disabilities are female?	Number of female students
13. Does this school have a school committee?	1. YES 2. NO
14. If yes, do the schools' water, hygiene, and sanitation facilities', and sanitation facilities in the schools?	1. YES 2. NO
15. Does the school committee help fund water, hygiene, and sanitation facilities in schools	1. YES 2. NO

16. If yes, how much does the school committee financially contribute to water, hygiene, and sanitation facilities in schools?	1. Per month 2. Per year 3. Other (Specify)
17. Does the school receive funding for water, hygiene, and sanitation purposes from any other community-led organizations, other than the parents' committee?	1. YES 2. NO
18. Is there a dedicated budget at the school for the purchase of toilet cleaning supplies?	1. YES 2. NO

## SECTION II: WATER SUPPLY

### Availability and Access

What is the main source of drinking water provided by the school? (Check those most frequently used)	1. 1.Piped water supply 2. Protected well/spring 3. Rainwater 4. Unprotected well/spring 5. Packaged bottled water 6. Tanker-truck or cart
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	<p>7. Surface water (lake, river, stream)</p> <p>8. No water sources</p> <p>9. Other (specify)</p>
Is drinking water from the main source currently available at the school?	<p>1.YES</p> <p>2.NO</p>
Does the school use any of the following ng sources for handwashing?	<p>1.Piped into the compound</p> <p>2.Piped to neighbour/ Public tap/standpipe</p> <p>3.Protected Tube well, borehole</p> <p>4.Unprotected well</p> <p>5.Water from protected spring</p> <p>6.Unprotected spring</p> <p>7.Rainwater collection</p> <p>8.Tanker-truck</p> <p>9.Cart with Mall tank/drum</p> <p>10.Surface water (river, stream, dam, lake, pond, canal, irrigation)</p> <p>11.Channel</p> <p>12.Bottled water</p> <p>13.Other (specify)</p>
a. How often does the school usually clean the Drinking water storage container?	<p>Select one.</p> <p>1. Daily</p>



	<ol style="list-style-type: none"> <li>2. Several times per week</li> <li>3. Once a week</li> <li>4. Once a month</li> <li>5. Once every three months</li> <li>6. Once every six months.</li> <li>7. Less often than half-yearly</li> <li>8. Other</li> </ol>
b. How often does the school usually clean the Main Handwashing source	<p>Select one.</p> <ol style="list-style-type: none"> <li>1. Daily</li> <li>2. Several times per week</li> <li>3. Once a week</li> <li>4. Once a month</li> <li>5. Once every three months</li> <li>6. Once every six months</li> <li>7. Less often than half-yearly</li> <li>8. Other</li> </ol>
c. What is the approximate distance from the main drinking water/handwashing source to the main school entrance in meters?	<p>.....Meters</p>

d. When the main water source is functional, does it provide enough water for the needs of the school?	<ol style="list-style-type: none"> <li>1. Yes</li> <li>2. No</li> </ol>
e. Does the main water source provide 5 litres per person per day for all students and staff in the school? (Select one).	<ol style="list-style-type: none"> <li>1. Yes</li> <li>2. No</li> <li>3. Don't know</li> </ol>
f. How frequently was water from the main source available during the last week? (Select one).	<ol style="list-style-type: none"> <li>1. Daily at certain hours</li> <li>2. Daily for 24 hours a day</li> <li>3. One or two days a week</li> <li>4. Three to five days a week</li> <li>5. Less than once a week</li> </ol>
g. During the periods when you typically cannot use the main water supply, why is this water source not (sufficiently) available? (Select all that apply)	<ol style="list-style-type: none"> <li>1. Service disruption</li> <li>2. Water unavailable from source</li> <li>3. Pump or pipe broke</li> <li>4. Too expensive / couldn't pay</li> <li>5. Scarcity</li> <li>6. Don't know</li> </ol>
h. Does the school do anything to make water safer? (Select all that apply)	<ol style="list-style-type: none"> <li>1. Boil the water</li> <li>2. Add bleach/chlorine</li> <li>3. Sieve it through cloth</li> <li>4. Water filtering device</li> <li>5. Another filter</li> </ol>

	6. Let it stand and settle 7. Other (specify) 8. Don't know
i. Is the main water source for handwashing the same as the main water source for drinking?	1. YES 2. NO
4. In the previous two weeks, was drinking water from the main source available at the school throughout each school day?	1. YES 2. NO
5. If No, (that the drinking water source was not functional). How long has it been non/partially functional?	1. Within 1-2 weeks 2. Weeks 3. Within 2-4 weeks 4. Weeks 5. More than a month: record number of months..... 6. Other (specify) 7. Don't know
6. If the drinking water supply system is not functional or partially functional at this time, what are the main reasons? (Select all that apply)	1. Unclear responsibility for the operation and/or Maintenance 2. Poor operation and/or maintenance practices 3. lack of spare Parts

	<p>4. Lack of operation consumables (fuel, electricity, etc.)</p> <p>5. Poor initial design of the system</p> <p>6. Age of the system</p> <p>7. Other (specify)</p> <p>8. Don't know</p>
<p>7. In the last 2018-2019 academic year, have there been any major interruptions or breakdowns in the drinking water supply from the main source, meaning that water was unavailable for 7 days or more? (Select one).</p>	<p>1. Yes</p> <p>2. No</p>
<p>a. How many times were there major interruptions or breakdowns?</p>	<p>Number of times ...</p>
<p>b. During these interruptions or breakdowns, how many days was drinking water not available? (Add up all irregular interruptions in the last 2018-2019 academic year)</p>	<p>Number of days: .....</p>

<p>c. What was the main reason for the interruption or breakdown of the main drinking water supply? (Select all that apply)</p>	<ol style="list-style-type: none"> <li>1. Service disruption</li> <li>2. Water unavailable from source</li> <li>3. pump or pipe has broken</li> <li>4. Too expensive / couldn't pay</li> <li>5. Scarcity</li> <li>6. Don't know</li> <li>7. Other (specify)</li> </ol>
<p>d. Compared to 5 years ago, have major interruptions or breakdowns in the water supply become more common, less common or remained the same? (Select one.)</p>	<ol style="list-style-type: none"> <li>1. More common</li> <li>2. About the same</li> <li>3. Less common</li> <li>4. Didn't use this source before</li> <li>5. Don't know</li> </ol>
<p>8. Can students with disabilities or other special needs access drinking water facilities without assistance? Select one).</p> <p>(To be considered accessible, water can be accessed (directly from the source or from a storage container) via a clear path without stairs or steps that is free of obstructions and has age-appropriate handrails, the tap can be reached from a seated position, and the</p>	<ol style="list-style-type: none"> <li>1. Without any difficulty</li> <li>2. With some difficulty</li> <li>3. With a lot of difficulty</li> <li>4. Not at all</li> </ol>

<p>water source/dispenser can be opened/closed with minimal effort with one closed fist or feet.</p>	
<p>9. Do students with disabilities or other special needs face any of the following barriers to getting drinking water without assistance? (Select all that apply)</p>	<ol style="list-style-type: none"> <li>1. Distance to source</li> <li>2. Difficult terrain</li> <li>3. Lack of access features like ramps</li> <li>4. Pump handles are hard to use</li> <li>5. Difficulty carrying container</li> <li>6. Other (specify).....</li> </ol>
<p>10. 10. Can the youngest students access the drinking water facilities without assistance? (skip the question if it is a secondary school) (Select one.)</p>	<ol style="list-style-type: none"> <li>1. Secondary school</li> <li>2. Without any difficulty</li> <li>3. With some difficulty</li> <li>4. With a lot of difficulties.</li> <li>5. Not at all</li> </ol>
<p>11. Do the youngest students at the school face any of the following barriers to getting drinking water without assistance? Select all that apply)</p> <p>12 Skip the question, if it is a secondary school]</p>	<ol style="list-style-type: none"> <li>1. Distance to source</li> <li>2. Difficult terrain</li> <li>3. Lack of access features such as ramps</li> <li>4. Pump handles are hard to use</li> <li>5. Difficulty carrying container</li> </ol>

**QUALITY AND SAFETY**

<p>1. How would you rate the quality of your drinking water from the main source? (select one)</p>	<p>1. Good 2. Moderately good 3. Moderately bad 4. Bad</p>
<p>2. Compared to 5 years ago, have there been any Sunes in the quality of your drinking water from the SAME source? Select one.</p>	<p>1. Improved to a great extent 2. improved to some extent 3. Stayed the same 4. Worsened to some extent 5. Worsened to a great extent  6. Didn't use this source before</p>
<p>3. Do you treat the drinking water before use?</p>	<p>1. YES 2. NO</p>
<p>a. If yes, what does the school do to make water safer to drink?</p>	<p>Select All That Apply</p> <p>1. Boil The Water 2. Add Bleach/Chlorine. 3. Sieve it through cloth  4. Water filtering device 5. Other filter (ceramic, sand, composite</p>

	6. Let it stand and settle.  7. Don't know
b. When was the last time the school treated the water using this method?  Select one.	1. Today  2. Yesterday  3. Less than one week ago  4. Less than one month ago  5. More than one month ago  6. Don't know
c. If no, why not?	Select all that apply.  1. Water is safe to drink  2. Water is unsafe, but i don't think it necessary to treat  3. Too expensive.  4. No knowledge of treatment options  5. Not enough time  6. Unavailability of treatment technologies  7. No young children



<p>4. Do students bring their drinking water from home? Select one.</p>	<ol style="list-style-type: none"> <li>1. Most students bring water from home</li> <li>2. Roughly half the students bring water from home</li> <li>3. Some students bring water from home</li> <li>4. No students bring water from home</li> </ol>
<p>5. Does the school have a water meter installed? (Select one)</p>	<ol style="list-style-type: none"> <li>1. No piped water</li> <li>2. Yes</li> <li>3. No</li> </ol>
<p>6. Would you like to have a water meter installed those measures how much water the school consumes?</p>	<ol style="list-style-type: none"> <li>1. Yes</li> <li>2. No</li> </ol>
<p>a. If yes, why? (Rank top 3 in order of importance)</p>	<ol style="list-style-type: none"> <li>1. Saving money</li> <li>2. Monitor consumption</li> <li>3. The tariff rate is overstated</li> </ol>
<p>b. If no, why (rank top 3 in order of importance)</p>	<ol style="list-style-type: none"> <li>1. Nobody proposed to install</li> <li>2. Meter too expensive</li> <li>3. Meter breaks easily</li> <li>4. Water pressure will fall</li> </ol>

<p>7. When there is a problem with the drinking water supply, who does the school communicate with?</p>	<p>SELECT ALL THAT APPLY</p> <ol style="list-style-type: none"> <li>1. Village/street leader</li> <li>2. Local water board official</li> <li>3. Water service provider (DAWASCO)</li> <li>4. Water consumer association</li> <li>5. Schools' committee</li> <li>6. Don't know</li> </ol>
<p>8. In your view, what entity has the primary responsibility for the maintenance of the school's water system? Choose which body has the primary responsibility, whether or not it is successfully maintaining the system. Select one.</p>	<p>SELECT ONE.</p> <ol style="list-style-type: none"> <li>1. Village/street leader</li> <li>2. Local water board official</li> <li>3. Water service provider (DAWASCO)</li> <li>4. Water consumer association</li> <li>5. School' committee</li> <li>6. Ministry of water</li> <li>7. Ministry of health</li> <li>8. Ministry of education</li> <li>9. Ministry of finance</li> <li>10. Ministry of local government authority</li> <li>11. Parents</li> <li>12. School itself</li> </ol>

<p>9. In your view, what entity has the primary responsibility for the repair of the school's water system? Choose which body has the primary responsibility, whether or not it is successfully maintaining the system. Select one.</p>	<ol style="list-style-type: none"> <li>1. Village/Street Leader</li> <li>2. Local Water Board Official</li> <li>3. Water Service Provider (DAWASCO)</li> <li>4. Water Consumer Association</li> <li>5. School Committee</li> <li>6. Ministry of Water</li> <li>7. Ministry of Health</li> <li>8. Ministry of education</li> <li>9. Ministry of finance</li> <li>10. Ministry of local government authority</li> <li>11. Parents</li> <li>12. School itself</li> </ol>
<p>10. In your view, are the school water facilities successfully maintained when required? Select one. SELECT ONE.</p>	<ol style="list-style-type: none"> <li>1. Yes</li> <li>2. No</li> <li>3. Partially</li> </ol>
<p>11. In your view, are the school water facilities successfully repaired when required? Select one.</p>	<p>SELECT ONE.</p> <ol style="list-style-type: none"> <li>1. Yes...</li> <li>2. No</li> <li>3. Partially</li> </ol>
<p>12. Do you know how to interact with the service provider?</p>	<p><b>select one</b></p> <ol style="list-style-type: none"> <li>1. yes</li> </ol>

	2. somewhat 3. no 4. no provider
13. Who in the school usually interacts with the service provider?	1. headteacher 2. academic teacher 3. swash teacher 4. other (specify)
14. Do you know how to file a complaint to your service provider? Select One.	1. Yes 2. Somewhat 3. No 4. No Provider
15. Who in the school usually files the complaints to the service provider?	1. Head of school 2. Academic teacher 3. School wash teacher 4. Did not complain
16. During the last year of the school year, how often did this person contact your service provider?	No. of times .....
17. During the last year of the school year, how often did this person contact your service provider to complain?	No. of times. .....

## SECTION III: SANITATION AND HYGIENE

### Toilet Facilities

1. Does the school have any toilet facilities?	1. YES 2. NO
2. If yes, Are there separate toilets for students and teachers?	1. YES 2. NO
3. What kind of toilet facilities do students in the school have access to?	1. Flush / pour flush /to piped sewer system/ to septic tank//pit/ 2. Flush to somewhere else/ unknown place / not sure 3. Pit latrine 4. Ventilated improved latrine 5. Pit latrine with slab/without slab / open pit 6. Composting toilet 7. Bucket 8. Hanging toilet/latrine 9. No facility / bush / field
a. Where is this toilet located?	1. In school building 2. Outside school building, but on-premises

	3. Elsewhere (specify)
b. Can the youngest students access the toilet facility without assistance	1. Without any difficulty 2. With some difficulty 3. With a lot of difficulty 4. Not at all
c. Are there special toilets for students with disabilities?	1. Yes 2. No
d. Have you made any adaptations to the toilet facility for students with disabilities or other special needs? (Select all that apply)	1. Widened entrance 2. Widened space of toilet Facility 3. Adapted door handles or closing mechanism 4. Built a ramp or sloping pat 5. Installed handrails or grab bars 6. Sunned latrine design 7. Use or adapted toilet seat 8. Sunned flooring material 9. No adaptations were made
e. Are their special toilets for the youngest students?  [Skip question if it is a secondary school]	1. YES 2. NO



7. Does the school also have urinals?	1. YES 2. NO
8. What kind of urinals exist? Select one.	1. Individual Urinal Units 2. Continuous Urinal Walls/Gutter
9. What problems do you face with the way the school's toilet facility is functioning? (select all that apply)	1. No problems 2. Blockages 3. Low water pressure 4. Odour 5. Pits fill up too quickly 6. Cleaning is expensive 7. Not safe for children
10. What do you think is the source of the problem? SELECT ALL THAT APPLY	1. Utility infrastructure 2. Local infrastructure 3. School infrastructure
11. How satisfied are you with the school's toilet facility?	1. To a great extent 2. Somewhat satisfied 3. somewhat dissatisfied 4. Dissatisfied
12. Within the school, who is responsible for cleaning the toilet facilities?	1. Staff 2. Parents 3. Girls under 15 4. girls above 15



	<ol style="list-style-type: none"> <li>5. Boys under 15</li> <li>6. Boys above 15</li> <li>7. Don't know</li> </ol>
13. If students have some cleaning responsibilities, what are the respective responsibilities of girls and boys?	<ol style="list-style-type: none"> <li>1. Girls usually clean girls' toilets</li> <li>2. Girl usually clean boys' toilets</li> <li>3. Girls usually clean teachers' toilets</li> <li>4. Boys usually clean girls' toilets</li> <li>5. Boys usually clean girls' toilets</li> <li>6. Boys usually clean teachers' toilets</li> </ol>
14. Are toilet cleaning duties assigned to students as punishment for misbehaviour or poor school performance?	<ol style="list-style-type: none"> <li>1. YES</li> <li>2. NO</li> </ol>
15. How often are the toilets for students cleaned in this school?	<ol style="list-style-type: none"> <li>1. Daily</li> <li>2. Several times per week</li> <li>3. Once a week</li> <li>4. Once every two weeks</li> <li>5. Once a month</li> <li>6. Once every three months</li> <li>7. Once every six months</li> <li>8. Less often than half-yearly</li> </ol>

16. When was the last time the school latrines for students were emptied?	<ol style="list-style-type: none"> <li>1. Built new latrines when the pit is full</li> <li>2. I don't know</li> <li>3. Never</li> </ol>
17. How much would it normally cost to empty the latrine?	Tanzania Shillings.....
18. Is sewage from school latrines always emptied and removed before they fill up?	<ol style="list-style-type: none"> <li>1. YES</li> <li>2. NO</li> <li>3. New latrines are built</li> </ol>
19. If yes, when there is a problem with the sewage system, who does the school complain to?	<ol style="list-style-type: none"> <li>1. School headmaster</li> <li>2. Vice Headteacher</li> <li>3. Student</li> <li>4. School WASH Teacher</li> <li>5. School Management/Committee</li> <li>6. Parents</li> <li>7. Did not encounter a problem</li> <li>8. Did not complain</li> </ol>
20. If the school is not connected to a piped sewage system: why?	<ol style="list-style-type: none"> <li>1. Pipe network unavailable in area</li> <li>2. Not enough funds in community</li> </ol>

	3. Not enough funds in school  4. Don't know
21. Is the school connected to a functional piped sewage system?	1. YES  2. NO
22. How is solid waste (garbage) from school disposed of? Select one.	1. Collected by municipal waste system  2. Burned on-premise  3. Buried and covered on premises  4. Openly dumped on-premises  5. Other (specify)
23. If there is a problem with the sanitation facilities, whom does the school complain to?	1. School head master  2. Vice headteacher  3. Student  4. School wash teacher  5. School management/committee  6. Parent  7. Did not encounter a problem  8. Did not complain  9. Others (specify)

	10. Don't know
24. In your view, what entity has the primary responsibility for the maintenance of the school's sanitation facilities? Choose which body has the primary responsibility, and whether or not it is successfully maintaining the system.	<ol style="list-style-type: none"> <li>1. School Headmaster</li> <li>2. School WASH Teacher</li> <li>3. Parents</li> <li>4. School management</li> <li>5. Ministry of Education</li> <li>6. Ministry of Finance</li> <li>7. Local Government Authority</li> <li>8. Donor</li> <li>9. Others (Specify)</li> </ol>
25. Is there a budget for the operation and maintenance of WASH services at the school?	<ol style="list-style-type: none"> <li>1. Yes, the budget covers more than 75% of the needs</li> <li>2. Yes, the budget covers between 50% and 75% of the needs</li> <li>3. Yes, but the budget covers less than</li> <li>4. 50% of the needs</li> <li>5. No</li> </ol>
26. Who is responsible for providing the budget for the operation and	<ol style="list-style-type: none"> <li>1. School administration</li> <li>2. Local public administrations</li> <li>3. Parents of the pupils</li> </ol>

<p>maintenance of WASH services at the school</p>	<p>4. Other (please specify): _____</p>
<p>27. Who is responsible for the provision of WASH services on the school premises?</p>	<p>1. External provider 2. School management 3. Both external provider and school management 4. Other (please specify) _____</p>
<p>28. Who is responsible for the operation and maintenance of the WASH facilities on the school premises?</p>	<p>1. External provider 2. School caretaker(s) 3. Both external provider and school 4. Caretaker(s) 5. Other (please specify) _____</p>
<p>29. Who is responsible for solid waste management?</p>	<p>1. External provider 2. School caretaker(s) 3. Both external providers and school caretaker(s) 4. Other (please specify) _____</p>

30. If your view, are the school sanitation facilities successfully maintained when required?	1. YES 2. NO 2. PARTIALLY
31. If your view, are the school sanitation facilities successfully repaired when required?	1. YES 2. NO 3. PARTIALLY

## B: HYGIENE PRACTICES

1. Does the school have soap for handwashing?	1. Bar Soap 2. Detergent (Powder, Liquid, Paste) 3. Liquid Soap 4. Ash/Mud/Sand 5. No Soap
a. If no soap, why not?	1. No funds 2. fear of theft 3. Not necessary

<p>b. If yes, where are handwashing facilities with water and soap located at the school?</p>	<ol style="list-style-type: none"> <li>1. Toilets</li> <li>2. Food preparation area</li> <li>3. Food consumption area</li> <li>4. Classrooms</li> <li>5. Schoolyard</li> </ol>
<p>2. Who is responsible for providing the soap?</p>	<ol style="list-style-type: none"> <li>1. Teachers</li> <li>2. School administration</li> <li>3. Students/families</li> <li>4. Parent-teacher association</li> <li>5. Local government</li> </ol>
<p>3. Is there sufficient soap available?</p>	<ol style="list-style-type: none"> <li>1. Always</li> <li>2. Sometimes</li> <li>3. Never</li> </ol>
<p>4. Do you consider the quality of water in schools adequate for students to wash their hands?</p>	<ol style="list-style-type: none"> <li>1. Adequate</li> <li>2. Moderately adequate</li> <li>3. Moderately inadequate</li> <li>4. Inadequate</li> <li>5. Do not know</li> </ol>
<p>5. Do you consider the quality of soap in schools adequate for students to wash their hands?</p>	<ol style="list-style-type: none"> <li>1. Adequate</li> <li>2. Moderately adequate</li> <li>3. Moderately inadequate</li> </ol>

	<ol style="list-style-type: none"> <li>4. Inadequate</li> <li>5. Do not know</li> </ol>
6. When do you think it is important for students to wash their hands or have /her hands washed?	<ol style="list-style-type: none"> <li>1. Before eating</li> <li>2. After eating</li> <li>3. After defecating</li> <li>4. Before going out</li> </ol>
7. Is there a designated period allotted for students to wash their hands before eating?	<ol style="list-style-type: none"> <li>1. YES</li> <li>2. NO</li> </ol>
8. Do students always wash their hands after using the toilet?	<ol style="list-style-type: none"> <li>1. YES</li> <li>2. NO</li> </ol>
9. If students don't always wash their hands after using the toilet, why not? (Select all that apply.)	<ol style="list-style-type: none"> <li>1. The facility is not near enough</li> <li>2. There is not always enough water</li> <li>3. There is not always soap</li> <li>4. It's sometimes too crowded</li> <li>5. Don't know</li> </ol>
10. Can students with disabilities or other special needs access the	<ol style="list-style-type: none"> <li>1. Without any difficulty</li> <li>2. With some difficulty</li> <li>3. With a lot of difficulty</li> </ol>



handwashing facilities without assistance?	4. Not at all
11. Can the youngest students access the handwashing facilities without assistance? (Select one.)	1. Without any difficulty  2. With some difficulty  3. With a lot of difficulty  4. Not at all
12. How many seconds does it take to walk from the toilet facility to the handwashing facility?	.....

### C: HYGIENE EDUCATION

1. Is hygiene education taught in the school?	1. YES  2. NO
2. How is hygiene taught in the school? (Select all that apply.)	1. As a component of the core curriculum (e.g. in science Class)  2. As an integral part of a special module on healthy living/life Skills

	<p>3. As a stand-alone special module on hygiene exclusively</p> <p>4. Through school-sponsored extracurricular programmes (e.g. sanitation Clubs)</p> <p>5. Only sporadically/ informally/ occasionally</p> <p>6. Donor-funded activities</p>
3. Is the importance of the use of soap (or ash) when handwashing stressed in the hygiene education material?	<p>YES 1</p> <p>NO 2</p>
4. Is the importance of handwashing with soap (or ash) at critical times (immediately after defecation and before eating) stressed in the hygiene education material?	<p>YES 1</p> <p>NO 2</p>
5. Are students encouraged to transmit hygiene knowledge to their families and communities? Select all that apply (Select all that apply).	<p>1. Yes, through the hygiene lessons and/or education material that encourages students to talk about or</p>

	<p>demonstrate good hygiene practices at home</p> <p>2. Yes, through regular school-sponsored outreach events (e.g. plays/songs on hygiene by students for parents visiting the school, community sanitation surveys conducted by students, etc.)</p> <p>3. Yes, but only sporadically/ informally/ occasionally</p> <p>4. No</p>
--	---

#### D: MENSTRUAL HYGIENE

<p>1. What facilities and programmes are there in the school for promoting safe and private menstrual hygiene for girls? (Select all that apply)</p>	<p>1. Menstrual hygiene education sessions for girls</p> <p>2. Private bathing/Suning areas</p> <p>3. Private areas for washing and drying reusable materials</p>
--	---

	<p>4. Private disposal/incineration facilities for disposable napkins</p> <p>5. Any kind of napkin distribution programme</p> <p>6. None</p>
<p>2. In some areas, it is common for girls to miss school days because there are no separate toilet facilities for girls and boys. In this school, have there been any times when girls were not able to attend school because of the unavailability of separate toilet facilities</p>	<p>1. YES</p> <p>2. NO</p> <p>3. DON'T KNOW</p>
<p>a. If yes, how many days in a school year, on average, does a female student miss school because of the unavailability of separate toilet facilities?</p>	<p>No of days.....</p>
<p>3. In some areas, it is common for girls to miss school days because the conditions of the toilet are poor. In this school, have there been any times</p>	<p>1. YES</p> <p>2. NO</p> <p>3. DON'T KNOW</p>

when girls were not able to attend school because of the poor condition of toilet facilities?	
a. If yes, how many days in a school year, on average, does a female student miss school because of poor sanitation	No. of days.....
4. Is there water available in the girls' toilet cubicles for menstrual hygiene management?	YES 1 NO 2
5. Are there covered bins for the disposal of menstrual hygiene materials in the girl's toilets?	YES 1 NO 2
6. Are there mechanisms for managing menstrual hygiene waste at the school?	YES 1 NO 2
7. Do you think the number of toilets at the school affects the school performance of girls?	YES 1 NO 2
8. Do you think the quality of toilets at the school affects the school performance of girls?	YES 1 NO 2

9. Do you think the number of toilets at the school affects the school performance of boys?	YES 1 NO 2
10. Do you think the quality of toilets at the school affects the school performance of boys?	YES 1 NO 2

THANK YOU FOR SPARING SOME TIME TO FILL OUT THE QUESTIONNAIRE

**OBSERVATIONS CHECKLIST**

(OBSERVE AND RECORD, TAKE A PICTURES)

1. Can you show me the drinking water source?	YES 1 NO 2
a. What is the Quality of the structure (Slab Roof, Doors, walls, water reticulation, water for cleansing)	Good quality 1 Fair 2 Poor quality 3
b. What is the general condition of the facility	Dilapidated 1 Poor 2 Fair 3 Good 4 Very good 5
c. Is there water available for drinking?	Yes, Some water, but not enough 1 No water at all 2
d. If the drinking water comes from a bucket, barrel or jug, does it have a cover?	YES 1 NO 2
e. If there are children with physical disabilities in the school, are they able to use the toilet	Yes 1 No 2 Don't know 3

f. If there are children with physical disabilities in the school, are they able to use the handwashing station?	Yes 1 No 2 Don't know 3
g. If there are children with physical disabilities in the school, are they able to use the handwashing station?	Yes 1 No 2 Don't know 3
h. If the school have soap for handwashing?	Yes 1 No 2 Don't know 3
i. During the periods when you typically cannot use the main water supply, why is this water source not (sufficiently) available?	Yes 1 No 2 Don't know 3
j. Can the youngest students and students with disabilities or other special needs, access water facilities without assistance? (Appropriate installations for	YES 1 NO 2



accessibility to all groups (Age group/disabled)	
2. Is the general school environment clean	Yes 1 No 2 Don't know 3
a. Are there any hygiene /Presence of hygiene message poster	Yes 1 No 2 Don't know 3
b. How often are the toilets for students cleaned in this school?	Yes 1 No 2 Don't know 3
c. Within the school, who is responsible for cleaning the toilet facilities? (Include up to three in order of significance)	Yes 1 No 2 Don't know 3
d. Are toilet cleaning duties assigned to students as punishment for misbehaviour or poor school performance?	Yes 1 No 2 Don't know 3

e. When do you think it is important for students to wash their hands or have his/her hands washed?	.....
f. Do students always wash their hands After using the toilet? (if not why)	Yes      1 No        2 Don't Know 3
g. Is sewage from school latrines always emptied and removed before they fill up	Yes      1 No        2 Don't Know 3
h. How is solid waste (garbage) from school disposed of?	Yes      1 No        2 Don't Know 3
3. What is the approximate distance from the main water source to the main school entrance in meters?	.....
a. Is the drinking water source protected?	YES      1 NO        2
b. Is there a tap?	YES      1 NO        2

c. If there is a tap, does water flow out of the tap	YES	1
	NO	2
d. If there is a tap, does the tap leak?	YES	1
	NO	2
e. Can you show me the water storage container?	YES	1
	NO	2
f. Is the cup/dipper/ladle kept clean, off the floor and out of reach of students?	YES	1
	NO	2
g. Is the drinking water storage container covered?	YES	1
	NO	2
h. Does the drinking water storage container have a narrow neck?	YES	1
	NO	2
i. Are any of the following treatment equipment or supplies observed?	YES	1
	NO	2
j. Are any of the following treatment equipment or supplies observed?	YES	1
	NO	2

<p>k. If there are students with a disability or special needs, do they face any of the following barriers to getting drinking water without assistance? (Select all that apply)</p>	<p>Distance to source 1</p> <p>Difficult terrain 2</p> <p>Lack of accessibility features such as ramps 3</p> <p>Pump handles are hard to use 4</p> <p>Difficulties carrying or transporting Container 5</p> <p>Not student with a disability 6</p> <p>Other (specify) 7</p>
<p>4. Do the youngest students face any of the following barriers to getting drinking water without assistance?</p>	<p>Distance to source 1</p> <p>difficult terrain 2</p> <p>lack of accessibility features such as ramps 3</p> <p>pump handles are hard to use 4</p> <p>difficulties carrying or transporting container 5</p>
<p>5. Can you show me how the school disposes of used water?</p>	<p>Yes 1</p> <p>No 2</p> <p>Don't Know 3</p>
<p>a. What are the points of discharge of school's</p>	<p>Piped to sewer 1</p> <p>Piped soak-away/septic system 2</p> <p>Sanitation facility 3</p> <p>Open channel 4</p>

<p>b. Wastewater? (Observe and record: Take a picture) - select all that apply.</p> <p>c. Other observations about points of discharge of used water (select all that apply)</p>	<table border="0"> <tr> <td>Street surface</td> <td>5</td> </tr> <tr> <td>Arik / street ditch or gutter</td> <td>6</td> </tr> <tr> <td>Space outside premises</td> <td>7</td> </tr> <tr> <td>Water body (lake, river, etc.)</td> <td>8</td> </tr> <tr> <td>Premises' yard or garden</td> <td>9</td> </tr> </table>	Street surface	5	Arik / street ditch or gutter	6	Space outside premises	7	Water body (lake, river, etc.)	8	Premises' yard or garden	9								
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Premises' yard or garden	9																		
<p>d. Other observations about points of discharge of used water (select all that apply)</p>	<table border="0"> <tr> <td>stagnant water pool</td> <td>1</td> </tr> <tr> <td>Swampy area</td> <td>2</td> </tr> <tr> <td>Lots of insects</td> <td>3</td> </tr> <tr> <td>Bad smell</td> <td>4</td> </tr> <tr> <td>Signs of residues (soap, green slime)</td> <td>5</td> </tr> <tr> <td>None</td> <td>6</td> </tr> </table>	stagnant water pool	1	Swampy area	2	Lots of insects	3	Bad smell	4	Signs of residues (soap, green slime)	5	None	6						
stagnant water pool	1																		
Swampy area	2																		
Lots of insects	3																		
Bad smell	4																		
Signs of residues (soap, green slime)	5																		
None	6																		
<p>6. Can you please show me the school toilets?</p>	<table border="0"> <tr> <td>YES</td> <td>1</td> </tr> <tr> <td>NO</td> <td>2</td> </tr> </table>	YES	1	NO	2														
YES	1																		
NO	2																		
<p>7. What type of facilities exist? Select all that apply and a record number of each type of facility.</p>	<table border="0"> <tr> <td>Flush / pour flush to piped sewer system</td> <td>1</td> </tr> <tr> <td>Flush to septic tank</td> <td>2</td> </tr> <tr> <td>flush to a. pit latrine</td> <td>3</td> </tr> <tr> <td>Flush to somewhere else</td> <td>4</td> </tr> <tr> <td>Flush to unknown place</td> <td>5</td> </tr> <tr> <td>Pit latrine ventilated improved latrine</td> <td>6</td> </tr> <tr> <td>Pit latrine with slab</td> <td>7</td> </tr> <tr> <td>Pit latrine without slab / open pit</td> <td>8</td> </tr> <tr> <td>Composting toilet</td> <td>9</td> </tr> </table>	Flush / pour flush to piped sewer system	1	Flush to septic tank	2	flush to a. pit latrine	3	Flush to somewhere else	4	Flush to unknown place	5	Pit latrine ventilated improved latrine	6	Pit latrine with slab	7	Pit latrine without slab / open pit	8	Composting toilet	9
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Pit latrine without slab / open pit	8																		
Composting toilet	9																		

	Bucket	10
	Hanging toilet/latrine	11
	No facility / bush / field	12
8. What are the conditions of these facilities? Select one.	Fully functioning	1
	Partially functioning	2
	Not functioning	3
9. Do the student toilets/latrines provide privacy?	Yes	1
	No	2
10. Do you observe any of the following? (Select all that apply).	Closable doors that lock from inside	1
	Holes or Cracks	2
	Windows Or Low Walls	3
11. Do you observe any of the following adaptations for students with disabilities/special needs?	Widened entrance	1
	Widened Space of Toilet Facility	2
	Adapted door handles or closing	3
	Built a ramp Or Sloping Path	4
	Installed handrails or grab bar	5
	Suned latrine design	6
	Use moveable or adapted toilet seat	7
	Suned flooring material	8
12. Do you observe any of the following adaptations for the youngest students?	Smaller toilet hole	1
	Lower seat	2
	Lower door handle	3

a. Visible faeces in and around the drop whole or the basin.	YES	1
	NO	2
b. Visible faecal residues on the floor, wall or door	Yes	1
	No	2
c. Visible used anal cleansing material (e.g. toilet paper)	Yes	1
	No	2
d. Surface flow of sewage	Yes	1
	No	2
e. The toilet smells bad	Yes	1
	No	2
f. Functional lighting	Yes	1
	No	2
g. Does the latrine look like it is being used	Yes	1
	No	2
h. What is the main material of the walls of the latrine?  Natural Walls	Natural Walls Mud and Palm/Trunk	1
	Straw, Thatch Mats	2
	Rudimentary Walls	3
	Mud Bricks	4
	Plywood, Re-Used Wood	5
	Cardboard, Plastic	6
	Finished Walls	7

	Cement Or Stone Blocks	8
	Bricks	9
	Wood Planks/Shingles	10
i. What type of flooring is there in the latrine?	Earth / Sand / Mud	1
	Wood Planks	2
	Brick	3
	Ceramic tiles	4
	Concrete	5
j. What type of roof does the latrine have?	Thatch	1
	Mats	2
	Wood Planks	3
	Tarpaulin, Plastic	4
	Cloth	5
	Zinc, Metal, Tin	6
	Wood	7
	Ceramic Tiles	8
	Concrete, cement	9
	Asbestos Sheets, shingles	10
	Stone	11
	No Roof	12
k. What is the latrine door made of?	Metal Sheet	1
	Mats	2



	Cloth curtain	3
	Wood	4
	No Door	5
l. Does the latrine have a lid/cover?	YES	1
	NO	2
m. Is the latrine pan broken, choked, blocked due to debris, stone, leaves, mud, paper	YES	1
	NO	2
n. Does the latrine have a functioning light?	YES	1
	NO	2
o. Does the latrine have a ventilation pipe to take out the odor from the pits?	YES	1
	NO	2
p. Is the outer tip of the ventilation pipe covered with a wire net or any material that has perforation/small holes that will prevent flies from entering/leaving the pits	Yes	1
	No	2
	Don't Know	3

q. Is there a water storage container or tank in the latrine for anal cleaning or flushing?	YES 1 NO 2
r. Is the pit or septic tank covered?	Not covered 1 Properly covered 2 Cover doesn't fit well 3 Direct pit latrine, doesn't need cover 4 Don't know 5 Does not have pit or septic tank 6
s. Is there a place to wash hands	YES 1 NO 2
t. Is the water at the place of hand washing?	YES 1 NO 2
u. Is there soap, detergent or other cleaning material?	YES 1 NO 2
v. Is there water available in the girls' toilet rooms for menstrual hygiene management?	YES 1 NO 2

<p>13. Can you please show me where students most often wash their hands?</p>	<p>Observed 1</p> <p>Not Observed 2</p> <p>Not in dwelling/Plot/ Yard 3</p> <p>No permission to see 4</p>
<p>14. Is sewage disposed of safely? (If sewage is dumped in an open garbage pit, in a vacant lot, in a stream</p>	<p>YES 1</p> <p>NO 2</p>

### **Checklist questions for a Focus Group with WASH clubs' members.**

#### **Water Supply and Sanitation facilities**

- 1) What is the role of school WASH Clubs in ensuring adequate water sanitation and hygiene sustainability?
- 2) How often are the toilets for students cleaned in this school and who is responsible for cleaning the toilet facilities
- 3) What do they know about the WASH programme and any other related WASH programme that has been implemented in your school
- 4) Is the programme helpful to the school community
- 5) Do they think that the other programme/projects are more important than the WASH programme? and that they should have been implemented instead of this one?
- 6) What are the main problems faced regarding sanitation facilities including water supply?
- 7) To what extent do they believe that this programme solves these problems and why?
- 8) Regarding water and sanitation facilities, do they think there are still some needs that haven't been met by the programme. What are they?
- 9) Do they currently think that things have improved and toilets are freely and properly used.
- 10) Discuss about soap and cleansing materials, whether they are always available at toilets and who supplies them

Always 1 Sometimes 2

Never 3

- 11) Discuss any negative issues that have arisen from the programme implementation and how they can be reduced
- 12) Enquire opinion, from group members on what could be done to keep water and sanitation facilities usable and in a good condition sustainably
- 13) What is the role of school children in ensuring sustainability?

### Awareness and education

1. Enquire if school/teacher give you lesson/education/awareness on hygiene, health and sanitation?	1. Yes 2. Sometimes 3. No 4. No answer
2. If yes indicate the number of hygiene education lessons you have attended this year	.....
3. What means are used to increase awareness?	1. Activities 2. Classes 3. School morning assembling 4. School WASH competition

4. What subjects are covered in the education process about hygiene, health and sanitation?	1. Biology 2. Science 3. Life skills
5. Hygiene education can improve your academic performance.	1. Strongly agree 2. Disagree 3. Strongly disagree
6. Are they aware of the global hand washing day that took place each year nationally? Does the school participate?	1. Yes 2. No 3. Do not know

### **C: Menstrual Hygiene Management**

1. What support could be provided to girls at school to help them during menstruation. (What information or advice do they need / from who, what facilities do they need, materials, other support).
2. What do girls think about the water, sanitation and hygiene facilities at school, particularly in relation to the needs of girls, including during menstruation?

**THANK YOU ALL FOR YOUR ACTIVE PARTICIPATION IN THE DISCUSSION**

Date of interview: Day: \_\_\_\_\_ Month: \_\_\_\_\_ Year: \_\_\_\_\_

### Stakeholder's in-depth interviews questions

Interviewer name: .....

Interviewee name: .....

Organization: .....

Interviewee's professional title (if applicable):

\_\_\_\_\_

- 1) How long has the interviewee been working/ involved in the WASH sector?
- 2) Date of interview: Day:    Month:    Year:
- 3) In general, how do you see/evaluate your WASH in school strategy compared to that of National school WASH Programme
- 4) In your opinion, what are the main positive and negative aspects of National school WASH Programme?
- 5) Do you consider the WASH in School Programme as a priority? Why?
- 6) Do you think WASH in School has aligned with National WASH guidelines? And is it in line with the Ministry's plan for the sustainability of water and sanitation networks? How?
- 7) In light of our organizations past experience in the WASH in schools' sector, how do you view the performance of this specific project/programme to date?
- 8) What are its main strengths/successes? What are its main shortcomings? What are the main challenges that you face during the implementation?
- 9) How would you evaluate the level of coordination between WASH Implementers, MOE, LGAs, and PORALG? Could it be improved? If yes, how?

- 10) Can you give more details about the meetings held on-site between the district level, MOE personnel, and community/village leadership? How frequent are they? How important are they?
- 11) Has the WASH stakeholder in the School WASH project lived up to its key objective of maintaining effective governance in targeted schools to ensure the sustainability of water and sanitation systems? If yes, how?
- 12) What more should be done to ensure the sustainability of the upgraded WASH facilities?
- 13) What is your vision for the impact of WASH in schools after 5 years? 10 years?

Date of interview: Day: \_\_\_\_\_ Month: \_\_\_\_\_ Year: \_\_\_\_\_  
\_\_\_\_\_



**Checklist questions for school committee focus group discussion**

- 1) What specific role(s) do you play that are different from the Central government in ensuring adequate school WASH services?
- 2) Have you received any training on school water and sanitation management?
- 3) Is WASH important in schools
- 4) How can the school best maintain water and toilet facilities?
- 5) What factors account for (causes) toilet and water facilities to be vandalized in the school if any?
- 6) What kind of support do you receive from the government and CSOs if any to strengthen water and sanitation sector in your school?
- 7) Is the SWASH programme planned and implemented in a participatory approach
- 8) In your view, has the primary responsibility for maintenance of the school's sanitation facilities?
- 9) Are the school committee norms and standards been considered and set on the programme?
- 10) Have governance of School WASH service providers (e.g., water committees in terms of functions, constructors, policymakers) well instituted, if not what is missing/deficiencies
- 11) What methodology and mechanisms have the project put in place to ensure adequate maintenance of project hardware? Community or school level?

- 12)What aspects of construction and repair of hardware is a challenge within the community and why?
- 13)In your opinion, which of this methodology (approach) mechanisms have been successful
- 14)Which of these mechanisms hasn't been successful? How have you ensured local knowledge to repair and replace hardware?
- 15)In your view, is SWASH facilities well maintained when required? Who is currently doing the maintenance if maintenance is well done?
- 16)What are the greatest challenges to sustainability of the programme?
- 17)What do you think is the source of the challenges (list)
- 18)How are these threats documented and addressed in the programme on an on-going basis?
- 19)Are there any recognizable behavioural Sune concerning water sanitation and hygiene
- 20)What is the observable intended and unintended outcomes as a result of the interventions (positive and negative)?

Date of interview: Day: \_\_\_\_\_ Month: \_\_\_\_\_ Year: \_\_\_\_\_  
\_\_\_\_\_

## Appendix B: Informed Consent



UU\_IC - Version 2.0

### Informed Consent Form

#### Part 2: Certificate of Consent

**This section is mandatory and should to be signed by the participant(s)**

**Student's Name:** Theresia Paul Kuiwite

**Student's E-mail Address:** tkuiwite2000@yahoo.com

**Student ID #:** R170102205547

**Supervisor's Name:** Dr. Vikram Niranjan

**University Campus:** Unicaf University Malawi (UUM)

**Program of Study:** PhD in Education

**Research Project Title:** Evaluation of School Water, Sanitation and Hygiene Programmes  
Implemented in Public Schools in Tanzania

I have read the foregoing information about this study, or it has been read to me. I have had the opportunity to ask questions and discuss about it. I have received satisfactory answers to all my questions and I have received enough information about this study. I understand that I am free to withdraw from this study at any time without giving a reason for withdrawing and without negative consequences. I consent to the use of multimedia (e.g. audio recordings, video recordings) for the purposes of my participation to this study. I understand that my data will remain anonymous and confidential, unless stated otherwise. I consent voluntarily to be a participant in this study.

**Participant's Print name:**

**Participant's Signature:**

\_\_\_\_\_

**Date:**

**If the Participant is illiterate:**

I have witnessed the accurate reading of the consent form to the potential participant, and the individual has had an opportunity to ask questions. I confirm that the aforementioned individual has given consent freely.

**Witness's Print name:**

**Witness's Signature:**

\_\_\_\_\_

**Date:**

**Appendix C: Gate Keeper Letter**



### Gatekeeper letter

**Address:** P.O.BOX, 30263, KIBAHA PWANI TANZANIA

**Date:** 05-Apr-2020

**Subject:** REQUEST FOR ENTRY IN YOUR UNIVERSITY

Dear Sir/Madam,

I am a doctoral student at UNICAF University of Malawi. As part of my degree I am carrying out a study Evaluation of School Water, Sanitation and Hygiene Programmes Implemented in Public Schools in the Pwani Region of Tanzania. I am writing to inquire whether you would be interested in/willing to participate in this research.

The Supervisor of my research is Dr. Vikram Niranjana.

Subject to approval by UNICAF Research Ethics Committee (UREC), the data collection methods to be used including are surveys, focus group discussions, triangulation/observations, and documents perusal.

The applicable tools for data collections will be:

- (i) Structured Questionnaire for a formal survey
- (ii) Checklist questions for focus group discussions and face to face contacts

School WASH Programmes intend to improve WASH facilities in schools been one of the factors which significantly contribute to school attendance and hence promote education performance to school children. Providing adequate levels of water supply, sanitation and hygiene in schools is of direct relevance to the United Nations (UN) Millennium and Sustainable Development Goals of achieving Universal Education, promoting gender equality and reducing child mortality. Adopting this, the Government intends to ensure the delivery of quality, equitable, accessible, and affordable safe and clean water, sanitation and hygiene services to all schools for better health and learning outcomes.

The research aims to evaluate School WASH Programmes implementation in Public schools in Tanzania. The findings from this study are expected to develop effective and sustainable School WA programs. The participants of this study will involve teachers, school committees, and members of school WASH.

Thank you in advance for your time and your consideration of this project.

Yours Sincerely,

Theresia Kuiwite

**Student's Name:** Theresia Kuiwite

**Student's E-mail:** Principal Education Officer

**Student's Address and Telephone:** P.O.BOX 30263, KIBAHA

**Supervisor's Title and Name:** Dr. Vikram Niranjana

**Supervisor's Position:** Public Health Specialist

**Supervisor's E-mail:** Email: v.niranjana@unicaf.org

## Appendix D: UREC Decision (Not Approved)



### UREC's Decision

Name of Participant:

Theresia Paul Kuiwite

Title of the Research project:

Evaluation of School Water, Sanitation and Hygiene Programmes  
Implemented in Public Schools in Pwani Region of Tanzania.

Date:

29.03.2019

#### Comments

☐

**Approved** without revision or  
comments.

☐

**Approved** with comments for  
minor revision.

☒

**Not approved** with guidance  
comments for moderate revision and  
resubmission.

☐

**Not approved** with guidance  
comments for major revision and  
resubmission.

**The student needs to proceed with the below  
amendments from the REAF form:**

1. Point 3b, co-investigator is the supervisor, print name accordingly.
2. Pont 9, please specify who will participate in the questionnaire as it is not clear.
3. Point 11a: it is mentioned that students will be interviewed. This information is not included in point 9. If students are to be interviewed this should be included. Written consent form also should be retained from all participants and if under aged students are involved then parental consent should also be obtained.
4. Point 14 iii, select YES.
5. Point 21, complete the checklist accordingly
6. The student needs to clarify points 9 & 11.

**Overall comments:**

1. Delete all references (from all documents) to potential risks as no risks deriving from the proposed research.
2. The student needs to refer to the correct Partner University which is University Malawi, in all forms required.
3. Correct programme of study needs to be completed in the required fields. E.g. PhD in Education.
4. In the informed consent form please delete irrelevant comments: "there is small chance that any of these respondents may be identified later."

**The students' research project is Not Approved,  
guidance is provided for moderate revision and  
resubmission.**

## Appendix E: URECS Decision (Approved)



### UREC's Decision

**Student's Name:** Theresia Kuiwite

**Student's ID #:** R1701D2205547

**Supervisor's Name:** Dr Vikram Niranjani

**Program of Study:** UUM: PhD Doctorate of Philosophy - Education

**Offer ID /Group ID:** O17035G16367

**Dissertation Stage:** 3

**Research Project Title:** Evaluation of School Water, Sanitation and Hygiene Programmes Implemented in Public Schools in Pwani Region - Tanzania

**Comments:**

**Decision:** A. Approved without revision or comments

**Date:** 11-Aug-2020