



NYABAMU ENTERPRISES UGANDA LIMITED

Research & Development Department

FACTORS INFLUENCING ACCESS TO BASIC WATER, SANITATION AND HYGIENE (WASH) SERVICES IN SCHOOLS OF KYEGEGWA DISTRICT, UGANDA

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ABSTRACT

Access to adequate Water, Sanitation, and Hygiene (WASH) services is vital for fostering student health, well-being and academic success, yet many schools in low-income regions like Kyegegwa District, Uganda, struggle with significant deficiencies in these areas. This study investigated the level of WASH coverage and the factors influencing access to WASH services in schools across Kyegegwa District, where prior data indicated only 30% of schools possessed adequate facilities.

Conducted across 140 schools with a sample of 300 respondents, including teachers, administrators and cleaners, this research employed a cross-sectional design utilizing structured questionnaires. Data analysis incorporated descriptive statistics, chi-square tests, and multinomial logistic regression to provide a comprehensive assessment.

The findings revealed critical inadequacies in WASH infrastructure. Less than half of the schools reported reliable water sources, with only 41.7% of primary and 22% of secondary schools having consistent access. Water quality emerged as a critical issue, with 68.3% of primary and 82% of secondary school respondents rating their drinking water as poor, particularly from shallow wells and rainwater harvesting systems. Sanitation facilities were similarly deficient, with under 50% of schools possessing fully functional, gender-segregated toilets. Hygiene infrastructure was equally limited, with only 37% of primary and 24% of secondary schools equipped with handwashing stations, and even fewer consistently providing soap and water.

Key factors influencing WASH access include physical resource constraints such as inadequate water supply (50.8% in primary, 42.4% in secondary schools) and poor sanitation infrastructure (22.3% and 40.6%, respectively), compounded by a lack of hygiene consumables like soap (25.4% and 16.5%). Despite these challenges, awareness of WASH's importance is notably high, with over 90% of respondents recognizing its role in reducing disease spread.

Participation in WASH training significantly enhanced perceptions of its effectiveness ($p < 0.05$), while reliance on informal information sources, such as parents, correlated with lower awareness ($OR = 0.076$, $p = 0.024$). Staff turnover, particularly among teachers and cleaners with less than three years of experience, further complicates sustained WASH improvements, though seasoned administrators offer potential leadership stability.

The study recommends targeted interventions including infrastructural investments such as borehole drilling and toilet rehabilitation; maintenance and supply chains to ensure consistent provision of hygiene consumables; capacity building through structured training for staff; behavioral and community engagement to reinforce hygiene practices; and monitoring and evaluation frameworks to

track progress. Implementing these measures is essential to bridge the gap between awareness and access, ultimately enhancing student health, reducing absenteeism, and improving educational outcomes in Kyegegwa District's schools.

Keywords: WASH, Water, Sanitation, Hygiene, Schools, Kyegegwa District, Uganda, SDG 6, Public Health, Rural Education

LIST OF ACRONYMS AND ABBREVIATIONS

Acronym	Full Meaning
WASH	Water, Sanitation and Hygiene
UN	United Nations
UNICEF	United Nations Children's Fund
WHO	World Health Organization
SDG	Sustainable Development Goals
KDLG	Kyegegwa District Local Government
SDKP	Sanitation, Drinking Water, Hygiene and Practices
PoU	Point of Use
PoC	Point of Collection
MWE	Ministry of Water and Environment
USEP	Uganda Secondary Education Expansion Project
UBOS	Uganda Bureau of Statistics
STHs	Soil-Transmitted Helminths
UNHCR	United Nations High Commission for Refugees
IOM	International Organization for Migration
CVI	Content Validity Index
ANOVA	Analysis of Variance
PWD	People With Disability
SSA	Sub-Saharan Africa
SPSS	Statistical Package for the Social Sciences
OR	Odds Ratio
DALY	Disability-Adjusted Life Year
M&E	Monitoring and Evaluation

CHAPTER ONE: INTRODUCTION

1.1 Background

Access to safe Water, Sanitation, and Hygiene (WASH) services is widely recognized as a fundamental determinant of public health, particularly in educational settings. Across low- and middle-income countries, millions of school-age children attend institutions that lack even the most basic WASH provisions, a reality that directly undermines their physical health, mental well-being and academic performance (Gude et al., 2019). Research consistently demonstrates that WASH services in schools are not merely a convenience but a critical prerequisite for meaningful learning, gender equity and long-term social development.

A growing body of evidence, including landmark studies by UNICEF (2021) in Kenya and Uganda, has documented the transformative role of WASH infrastructure in improving hygiene practices, reducing waterborne disease burdens and lowering school absenteeism. When children have access to clean water, functional latrines and handwashing facilities, the rates of diarrheal illness, respiratory infections and skin diseases decline sharply, translating directly into improved school attendance and cognitive engagement.

The consequences of WASH deficits are particularly acute for girls. Inadequate sanitation facilities, particularly the absence of private, gender-segregated toilets and menstrual hygiene management resources, contribute significantly to irregular school attendance and increased dropout rates among female students, deepening gender inequalities in education (World Bank, 2020; Kalikola et al., 2024). Children living with disabilities face compounded barriers, as the absence of disability-friendly WASH infrastructure effectively excludes them from equal participation in schooling (Ebenezer et al., 2023).

Uganda has made notable efforts to improve WASH services across the education sector; however, these efforts have been significantly constrained by inadequate infrastructure investment, limited government funding, socio-cultural barriers and insufficient community involvement (Foster et al., 2018; Tumwebaze et al., 2020). The challenge is especially pronounced in rural districts, where geographic remoteness, limited logistical capacity and financial constraints converge to widen the gap between urban and rural WASH standards.

Kyegegwa District, situated in the Western Region of Uganda, exemplifies the WASH challenges facing rural districts across sub-Saharan Africa. With the majority of its population engaged in subsistence agriculture, limited access to infrastructure and a growing strain from refugee settlements, Kyegegwa's schools operate in one of Uganda's most resource-constrained

environments. Recent data from the Kyegegwa District Local Government (KDLG, 2024) indicated that only 30% of the district's 226 primary and secondary schools possessed adequate WASH facilities, a figure that falls far short of both national standards and WHO/UNICEF benchmarks.

This study was undertaken to provide a rigorous, locally grounded assessment of WASH coverage and the factors constraining WASH access in Kyegegwa District schools. It was conducted by NYABAMU Enterprises Uganda Limited as part of the organization's commitment to producing evidence that informs targeted interventions and supports the achievement of Sustainable Development Goal 6 (Clean Water and Sanitation for All).

1.2 Statement of the Problem

According to UNICEF (2019), in Eastern and Southern Africa, more than 78 million school-aged children, representing 42% of the school population, lack access to drinking water at school. Additionally, over 50 million children (27%) do not have sanitation services, and around 117 million (62%) are without handwashing facilities in their educational settings. These alarming figures are not merely statistics; they represent daily realities that jeopardize the health, dignity and educational futures of an entire generation.

The absence of safe drinking water, insufficient sanitation services, and inadequate hygiene systems adversely affect students' health, school attendance and overall educational achievement (UNICEF, 2021). The situation is especially critical for girls, who frequently miss school because of insufficient menstrual hygiene management resources, leading to increased dropout rates (Kalikola et al., 2024).

In Uganda, by 2021, merely 32% of schools were equipped with basic hygiene services, indicating that the majority of educational institutions do not have dependable access to safe drinking water, sufficient handwashing stations or appropriate sanitation facilities (Tumwebaze et al., 2020). In Kyegegwa District specifically, data from the District Local Government (KDLG, 2024) reveals that only 30% of the district's 226 schools have adequate WASH facilities, posing significant health risks and adversely affecting attendance and academic performance.

This pronounced gap in essential WASH services highlights a pressing need to investigate the specific factors affecting access to these services in order to inform targeted interventions and policy reforms that will enhance the overall learning environment and well-being of students in Kyegegwa District.

1.3 Purpose of the Study

This study was designed to contribute to the expanding literature on WASH in educational environments, particularly in Uganda, by providing a localized, evidence-based perspective on the

obstacles and enablers to effective WASH service provision in Kyegegwa District schools. By examining the connection between infrastructure access, stakeholder knowledge and hygiene practices, the study addresses a significant gap in existing research.

The results are intended to provide evidence-based recommendations to assist policymakers, local government officials and educational leaders in creating focused interventions. By identifying specific barriers and key success elements in WASH service delivery, the research guides resource distribution, shapes supportive policies, and facilitates the execution of community-led initiatives. The study also establishes a foundation for future research on WASH in educational institutions across rural Uganda.

1.4 Aim of the Study

The aim of this study was to determine the level of WASH coverage and identify the factors influencing access to WASH services in schools of Kyegegwa District.

1.5 Specific Objectives

1. To determine the level of WASH coverage in schools within Kyegegwa District.
2. To establish the factors influencing access to WASH services in schools of Kyegegwa District.

1.6 Research Questions

1. What is the level of WASH coverage in schools of Kyegegwa District?
2. What factors influence access to WASH services in schools of Kyegegwa District?

CHAPTER TWO: LITERATURE REVIEW

2.0 Introduction

This chapter reviews existing literature on WASH services, with particular attention to their conceptual foundations, global and regional coverage status, health implications, and the factors that influence their implementation in school settings. The review situates the study within both international and national contexts, before focusing specifically on the WASH landscape in Kyegegwa District, and concludes by identifying the knowledge gaps that the study seeks to address.

2.1 The WASH Concept

WASH, an acronym for Water, Sanitation and Hygiene, represents a core development sector concerned with providing communities with the fundamental services necessary to prevent disease and promote human dignity. The sector encompasses a broad spectrum of interventions ranging from the provision of safe drinking water and construction of sanitation facilities to hygiene promotion, menstrual hygiene management and behavior change communication (Reach Global Strategy, 2020).

The importance of WASH is anchored in international development commitments, most notably Sustainable Development Goal 6, which calls for equitable and universal access to safe drinking water (Target 6.1) and adequate sanitation and hygiene for all (Target 6.2) by 2030. Access to WASH is required not only at household level but across a range of non-household settings including schools, workplaces, healthcare facilities and community gathering places (SDKP, 2017).

2.1.1 Water Services

According to WHO and UNICEF (2018), a safe water service is one that is located in an easily accessible area, consistently available when needed, and free from contamination. Water sources are monitored against a ladder of classification, from surface water and unimproved sources at the lowest level, to safely managed piped services at the highest. Improved water sources include tap connections, standpipes, protected boreholes, protected springs, rainwater collection systems and protected dug wells (Ritchie & Roser, 2018).

In school settings, the quality of water at the point of use (PoU) is particularly important, as water collected from improved sources may deteriorate during transportation and storage if proper hygiene practices are not maintained. In sub-Saharan Africa, increasing population pressure and climate-

induced changes in rainfall patterns are exacerbating water scarcity in rural areas, with groundwater demand rising rapidly (Taylor et al., 2019; Wu et al., 2020).

2.1.2 Sanitation Services

Sanitation systems are classified along a ladder from open defecation, the lowest and most hazardous level, through unimproved, limited and basic services, up to safely managed sanitation at the highest level. Improved sanitation facilities include flush toilets connected to sewers or septic systems, ventilated improved pit latrines, pit latrines with slabs and composting toilets (WHO, 2015). Target 6.2 of the SDGs calls for the elimination of open defecation and achievement of equitable access to adequate sanitation for all, with special attention to the needs of women and girls (UN General Assembly, 2017).

Despite progress over recent decades, in 2017 an estimated 4.5 billion people globally still lacked safely managed sanitation services, and 892 million continued to practice open defecation (WHO, 2020). Barriers to universal sanitation access include social norms, institutional constraints, environmental challenges and inadequate financing.

2.1.3 Hygiene

Hygiene encompasses the conditions, principles and practices used to maintain health and prevent the spread of disease. Within the WASH context, handwashing with soap and running water is universally recognized as one of the most cost-effective interventions for disease prevention and is used as a primary indicator for global hygiene monitoring (WHO, 2020). Basic handwashing facilities, consisting of sinks, tippy-taps or portable basins equipped with soap and water, are considered a minimum requirement in schools (UNICEF, 2020). Menstrual hygiene management (MHM) is an increasingly important component of school hygiene programming, as the absence of private, safe facilities and hygiene supplies directly contributes to absenteeism among adolescent girls.

2.2 Global Status of WASH Services in Schools

The global picture of WASH in schools remains deeply troubling. According to UNICEF and WHO (2019), approximately 447 million children worldwide attend schools without access to basic drinking water services, representing nearly 1 in 4 schools globally. In terms of sanitation, 427 million children lack access to single-sex, usable toilet facilities at school; 1 in 5 schools has no basic sanitation service. Most strikingly, 646 million children attend schools without adequate handwashing facilities with soap and running water, 1 in 3 schools globally lacks a basic hygiene service.

Menstrual hygiene services are even more neglected: only 2 in 5 schools provide menstrual health education, and fewer than 1 in 3 schools have bins for menstrual waste in girls' toilets. These deficits are not evenly distributed, they are concentrated in low-income countries, particularly in sub-Saharan Africa and South Asia (Anthony et al., 2021).

2.3 African and East African Context

Sub-Saharan Africa carries the heaviest burden of WASH deprivation globally. Rural communities in this region have significantly less access to health services, infrastructure, transport and markets compared to urban areas, and water sources in low-income rural settings face a substantially higher risk of contamination (Bain et al., 2018; Porter, 2020). East Africa is among the fastest-urbanizing regions on the continent and is simultaneously home to several countries ranked among the most vulnerable to climate change, a convergence that compounds challenges of water access, sanitation provision and hygiene maintenance (WaterAid, 2023).

Rapid and poorly planned urbanization, climate variability, growing refugee populations and inadequate investment in infrastructure collectively undermine the provision of clean, safe and reliable WASH services across East Africa. In many areas, these pressures are threatening fragile environmental systems while leaving large populations, particularly women, children and persons with disabilities, without adequate WASH access (WaterAid, 2022).

2.4 The Status of WASH in Uganda

In Uganda, poor sanitation and hygiene, combined with unequal access to safe drinking water, contribute significantly to the burden of childhood illness and mortality. Diarrheal disease is one of the three leading causes of childhood death in Uganda, accounting for the deaths of an estimated 33 children daily. The disease is largely transmitted through contaminated water and unwashed hands, highlighting the direct link between WASH and child survival (UNICEF, 2022).

According to Uganda's Ministry of Water and Environment's Sector Performance Report (2017), WASH conditions in schools do not meet national standards. By 2021, approximately 32% of Uganda's schools were estimated to have basic hygiene services, soap and running water, leaving the vast majority without adequate provision. The influx of over 1.4 million refugees into Uganda has placed additional strain on already limited water and sanitation resources, particularly in districts hosting large refugee settlements such as Kyegegwa (UNHCR, 2018).

Uganda's population growth rate of approximately 3.2% per annum, among the highest in Africa, further exacerbates pressure on WASH infrastructure, particularly in rural schools where facilities

have not kept pace with enrolment increases (UBOS, 2024). Despite these challenges, government programmes and partner interventions have expanded the number of villages with access to at least one reliable water source to over 56,000, though open defecation and other unsafe sanitation behaviors remain widespread (MWE, 2023).

2.5 The Importance of WASH Services in Schools

WASH services in schools produce a wide range of direct and indirect benefits for student health, gender equity and educational outcomes. When schools provide clean water, adequate sanitation and hygiene facilities, they create an environment in which children can focus on learning rather than managing illness or hygiene challenges. Research conducted in western Kenya found that the provision of safe drinking water, handwashing facilities and hygiene education in primary schools reduced student absenteeism by 35% (O'Reilly et al., 2019).

The relationship between WASH and girls' education is particularly well documented. Globally, millions of girls lack private, safe and appropriately equipped facilities for managing their menstrual health at school, forcing many to stay home for several days each month during menstruation. World Vision International Uganda (2018) reports that poor menstrual hygiene management in schools contributes to a 10% dropout rate among girls, a preventable educational loss with far-reaching social consequences.

Children living with disabilities face compounded WASH-related barriers. Studies indicate that 90% of children with disabilities do not attend school in many low-income settings, a situation that is more pronounced among disabled girls who frequently drop out due to the absence of disability-friendly water and sanitation facilities (Ebenezer et al., 2023). Universal WASH design that includes disability-friendly facilities is therefore a prerequisite for inclusive education.

Beyond individual health outcomes, improved WASH in schools benefits entire communities: children who develop good hygiene habits at school carry these behaviors home, extending the public health benefits to households and communities (Reach Global Strategy, 2020). Investing in school WASH is therefore not merely an education intervention, it is a foundational public health and human rights commitment.

2.6 WASH and Associated Diseases

The WHO (2023) estimates that a significant proportion of global deaths and disability-adjusted life years (DALYs) can be attributed to insufficient WASH services. Key health outcomes linked to WASH deficits include diarrheal diseases, acute respiratory infections, soil-transmitted helminthiasis (STHs)

and malnutrition, the same indicators used to track progress towards SDG 3 (Good Health and Well-Being).

Analysis of global burden data indicates that safe WASH services could have prevented at least 1.4 million deaths and 74 million DALYs annually (WHO, 2020). Diarrheal diseases account for the largest share, over 1 million attributable deaths and 55 million DALYs, with more than 500,000 of these deaths directly linked to unsafe sanitation. Acute respiratory infections represent the second-largest WASH-attributable disease burden, followed by malnutrition and soil-transmitted helminthiasis. The regions most affected are sub-Saharan Africa and South-East Asia, where 66% and 76% of diarrheal disease burden respectively could be prevented through universal access to safe WASH services (UN Action on Climate, 2015).

2.7 Factors Affecting WASH Programmes

Despite international commitments and increasing investment, numerous factors continue to limit the achievement of WASH targets in schools. These barriers span financial, institutional, social and environmental dimensions.

Inadequate and declining financing is among the most significant constraints. Most governments in sub-Saharan Africa have WASH plans but allocate insufficient budgets to implement them. In Uganda, the WASH sector receives only approximately 3% of the national budget despite its critical role in the country's development agenda (Global Water, 2022). This fiscal gap results in schools with broken latrines, non-functional water points and absent hygiene supplies that cannot be repaired or replaced.

Staff turnover and capacity gaps compound the challenges of WASH maintenance. Schools with high staff turnover, particularly among teachers and cleaners, lose institutional memory and continuity in WASH practices. Without dedicated, trained personnel, toilet maintenance, handwashing promotion and safe water management are frequently neglected (Global Water, 2022).

Population growth and refugee influx have placed additional pressure on WASH resources. Uganda's rapidly growing population and the presence of large refugee settlements, including Kyaka II in Kyegegwa District, have stretched existing infrastructure to its limits. The International Organization for Migration (IOM) and Danish Refugee Council have made targeted investments in Kyegegwa, including construction of household latrines and latrine blocks at schools, but these fall far short of the overall need (IOM, 2019).

2.8 Level of WASH Service Coverage in Kyegegwa District

Kyegegwa District presents a challenging WASH landscape. Access to water across the district ranges from 19% in Ruyonza Sub-County to 57% in Hapuuyo Sub-County, with approximately 130 water points abandoned and non-functional for over five years (KDLG, 2024). The district relies primarily on boreholes, rivers, dams and shallow wells, with some households installing submersible pumps for personal water supply.

The Uganda Water and Environmental Sector Performance Report (2020) places access to safe water and sanitation at 39% in urban and just 7% in rural areas of Kyegegwa, with access to handwashing with soap at 61% and 38% respectively. These figures underscore the deep rural-urban disparity in WASH service delivery within the district. The presence of Kyaka II refugee settlement, which hosts tens of thousands of refugees, has significantly strained water resources. IOM constructed a water supply system with 35 tap stands to serve over 28,000 people in Kyaka II, distributing hygiene kits and supporting the construction of latrines as part of emergency WASH assistance (IOM, 2019).

2.9 Knowledge Gaps

Despite the substantial body of literature on the importance of WASH in schools, significant knowledge gaps remain at the local level. Most research on WASH service access and implementation focuses on urban and peri-urban schools, leaving rural schools, where deficits are most pronounced, under documented. This disparity in information creates barriers to effective budget formulation and resource allocation for rural districts like Kyegegwa.

There is limited empirical evidence on the specific coverage levels, implementation practices and awareness dynamics within Kyegegwa's school system. The absence of localized data makes it difficult for district officials, education managers and development partners to design targeted, context-appropriate interventions.

This study bridges this knowledge gap by providing a comprehensive, context-specific assessment of WASH coverage, awareness and practice in schools across both rural and urban areas of Kyegegwa District. The findings are intended to provide the evidence base needed for informed decision-making by all stakeholders involved in WASH service delivery.

CHAPTER THREE: METHODOLOGY

3.1 Study Area

The study was conducted in Kyegegwa District, situated in the Western Region of Uganda. Kyegegwa was selected as the study site due to its representative characteristics as a predominantly rural, resource-constrained district with diverse school types and WASH challenges. The district has a predominantly agricultural economy, limited infrastructural investment and an irregular water supply, all of which significantly influence the quality and availability of WASH services in schools. The presence of Kyaka II refugee settlement within the district adds a further dimension of complexity to WASH resource allocation and access.

The study focused on both rural and urban schools within the district to capture the full spectrum of WASH conditions and to enable meaningful comparisons between different school contexts and geographic settings.

3.2 Study Population

The target population comprised three categories of school stakeholders: teachers responsible for health and hygiene education, school administrators (headteachers and management personnel) responsible for the maintenance and management of WASH facilities, and non-teaching support staff (cleaners) responsible for the day-to-day maintenance of WASH components. The inclusion of these three groups ensured a comprehensive perspective on WASH coverage, awareness and practices from different vantage points within the school system.

3.3 Research Design

This study employed a cross-sectional research design, which is appropriate for assessing the prevalence and distribution of WASH coverage and the factors associated with it at a given point in time. A cross-sectional approach allowed for the simultaneous collection of data from multiple schools and respondent categories, enabling efficient, representative and statistically analyzable findings.

3.4 Sampling Strategy and Sample Size

3.4.1 Sampling Techniques

A multi-stage sampling approach was employed to ensure representative coverage of the district's schools. In the first stage, stratified random sampling was used to select schools. Schools were

stratified by education level (primary and secondary) and geographic location (rural and urban), and random selection was then applied within each stratum to minimize selection bias. In the second stage, purposive sampling was used to select school administrators and teachers, one administrator and one science teacher per school, while simple random sampling was used to select cleaners from among those available at each school.

3.4.2 Sample Size Determination

The number of schools to be studied was determined using Taro Yamane's (1996) formula for finite populations, applied to the 226 primary and secondary schools in Kyegegwa District at a 95% confidence level and 5% margin of error, yielding a sample of 140 schools (22 secondary and 118 primary). The sample size for individual respondents was determined using Cochran's formula, assuming 75% estimated population proportion in the education system, 95% confidence level and 5% margin of error, yielding a sample of approximately 300 respondents.

3.4.3 Sample Distribution

Category of Respondents	Number of Respondents	Percentage (%)
School Teachers	118	39.3
School Administrators	118	39.3
Cleaners (Maintenance)	64	21.3
Total	300	100

Table 1: Distribution of Respondents by Category

3.5 Data Collection Instruments

Three complementary instruments were employed for data collection, each piloted in a non-study school prior to deployment to ensure clarity, relevance and ease of administration:

- Structured questionnaires administered to teachers, administrators and cleaners to assess WASH coverage, awareness and practices. Questionnaires combined closed-ended items (for quantitative analysis) with a small number of open-ended questions to capture qualitative perspectives.

- Semi-structured interviews conducted with school administrators and local education officials (including inspectors of schools and district education officers) to explore challenges, policies and administrative practices affecting WASH service delivery.
- Observation checklists used to objectively assess the physical condition of WASH facilities, water points, toilets and handwashing stations, at each school, recording the presence, absence and functional status of key infrastructure components.

3.6 Validity and Reliability

Content validity was ensured through review of all data collection instruments by subject matter experts in public health, education and WASH, using the Content Validity Index (CVI) to verify that instruments adequately captured all dimensions of WASH services, awareness and practice. Construct validity was achieved by grounding survey items in established WASH theories and previous empirical studies. Reliability was assessed through pilot testing, internal consistency analysis and inter-rater reliability checks for observational checklists.

3.7 Data Analysis

Quantitative data were analyzed using SPSS software. Descriptive statistics, including frequencies, percentages, means and measures of dispersion, were used to characterize WASH coverage, awareness and practice across schools. Inferential statistics, including chi-square tests of independence, t-tests, ANOVA and correlation analysis, were employed to identify significant associations between variables. Multinomial logistic regression was applied to model predictors of WASH awareness levels, generating odds ratios and confidence intervals for key predictor variables. Qualitative data from interviews were analyzed thematically using NVivo software.

3.8 Ethical Considerations

Informed consent was obtained from all participants prior to data collection, ensuring awareness of the study's purpose, procedures and their right to withdraw at any time. Participant anonymity was maintained through the use of unique identifier codes in place of personal names. All data were stored securely and accessed only by the research team. Ethical clearance was obtained from the appropriate primary and secondary school authorities and local education officials.

3.9 Limitations of the Study

The study acknowledges several limitations. Seasonal variability in water availability may mean that conditions observed during the study period do not fully reflect challenges experienced throughout the year. Language and communication barriers in some remote areas may have influenced the

completeness of responses from certain respondents. Additionally, variations in WASH education across schools may have affected the consistency of responses regarding WASH awareness and practices.

CHAPTER FOUR: RESULTS AND FINDINGS

4.0 Introduction

This chapter presents and interprets the findings of the study on determining the level of WASH coverage and factors influencing WASH services in schools of Kyegegwa District. The presentation is organized around the two specific study objectives. Results are presented using descriptive statistics supported by tables and charts, followed by inferential analyses to establish statistical significance at a 0.05 level.

4.1 Demographic Characteristics of Respondents

A total of 300 respondents participated in the study. Table 2 presents the distribution of respondents by key demographic variables.

Variable	Category	Frequency	Percentage (%)
School Type	Primary	183	61
	Secondary	117	39
Gender	Male	134	44.7
	Female	166	55.3
Age Groups	18-25 years	38	12.7
	26-34 years	109	36.3
	35-44 years	122	40.7
	45 years & above	31	10.3
School Staff Role	Administrator	37	12.3
	Teacher	219	73.0
	Cleaner	44	14.7
Years of Experience	Below 1 year	15	5.0
	1-3 years	81	27.0
	4-6 years	139	46.3

	Over 6 years	65	21.7
School Location	Rural	218	72.7
	Urban	82	27.3

Table 2: Demographic Characteristics of Study Respondents (n=300)

Primary schools (61%) had a larger representation than secondary schools (39%), aligning with the broader education landscape where primary institutions are more widespread in rural districts. The gender distribution was fairly balanced, with females (55.3%) slightly outnumbering males (44.7%), consistent with staffing patterns in Uganda's education sector. The majority of respondents were aged between 26 and 44 years, representing a mature and experienced workforce. Teachers dominated the respondent pool (73%), followed by cleaners (14.7%) and administrators (12.3%). Nearly half of respondents (46.3%) had 4-6 years of experience, and the sample was predominantly rural (72.7%), reflecting Kyegegwa's school distribution.

4.2 WASH Coverage in Schools

4.2.1 Water Source Reliability

Table 3 presents the distribution of schools by water source reliability, disaggregated by school level.

Variable	Category	Primary n (%)	Secondary n (%)
Reliability of Water Source	Unreliable Source	58 (31.7)	51 (43.6)
	Reliable Source	125 (68.3)	66 (56.4)
Chi-square Test		X² = 3.867, p-value = 0.0493	

Table 3: Water Source Reliability by School Level

A statistically significant difference ($X^2 = 3.867$, $p = 0.0493$) was found between primary and secondary schools regarding water source reliability. Primary schools were somewhat more likely to report a reliable water supply (68.3%) compared to secondary schools (56.4%). In both cases, a considerable proportion of schools faced unreliable or unsafe supply, meaning many schools frequently ran out of water or depended on untested sources.

4.2.2 Primary Water Sources

	School level investigated	
	Primary N = 183	Secondary N = 117
Primary source of water, Num. (%)		
Borehole	19 (10%)	7 (6.0%)
Rainwater harvesting	3 (1.6%)	4 (3.4%)
River/Stream	22 (12%)	42 (36%)
Shallow well	103 (56%)	52 (44%)
Tap/Piped water	36 (20%)	12 (10%)

Figure 1: Primary Water Sources Used by Schools in Kyegegwa District (Source: Primary Data, 2025)

Most schools rely on shallow wells (56% primary, 44% secondary) and rivers/streams (12% primary, 42% secondary) as primary water sources. Only a minority access tap or piped water (20% primary, 10% secondary) or boreholes (10% primary, 6% secondary). The least common source is rainwater harvesting (1.6% primary, 3.4% secondary). Such heavy reliance on naturally sourced water implies significant vulnerability to seasonal fluctuations, contamination risks and supply disruptions, emphasizing the need for source protection and water treatment programmes.

4.2.3 Water Quality

Table 4 presents respondents' perceptions of drinking water quality at their schools.

Water Quality Rating	Primary n (%)	Secondary n (%)
Excellent	0 (0.0)	1 (0.9)
Good	19 (10.4)	5 (4.3)
Fair	39 (21.3)	15 (12.8)
Poor	125 (68.3)	96 (82.1)

Table 4: Respondents' Perceived Quality of Drinking Water by School Level

Water quality assessments revealed critically poor drinking water conditions. Among primary schools, 68.3% of respondents rated water quality as poor, 21.3% as fair, and only 10.4% as good, with none rating it as excellent. The situation was worse in secondary schools, where 82.1% rated water quality as poor and merely 5.2% as good or excellent. These findings indicate that the majority of students consume water of questionable safety on a daily basis.

When disaggregated by primary water source, the poorest quality was reported from shallow wells (47.7% rated poor) and rainwater-harvested water (21% rated poor). In contrast, piped and borehole sources performed better, though they remain limited in availability. These patterns underscore the urgent need for water treatment, source protection and expansion of higher-quality water access infrastructure.

4.2.4 Sanitation Facilities

	Functionality of the sanitation facilities	
	Non-functional N = 117	Functional N = 183
Toilet/ latrine ratio to students, Num. (%)		
Adequate	1 (0.9%)	49 (27%)
Inadequate	93 (79%)	132 (72%)
Not sure	23 (20%)	2 (1.1%)
Sanitation facility segregation, Num. (%)		
Both(Gender/PWD)	1 (0.9%)	13 (7.1%)
by Gender	64 (55%)	160 (87%)
by PWD	1 (0.9%)	3 (1.6%)
No	51 (44%)	7 (3.8%)

Figure 2: Functionality and Segregation of Sanitation Facilities in Schools (Source: Primary Data, 2025)

Findings on sanitation infrastructure revealed significant deficits. Less than half of the

4.2.5 Hygiene Conditions

Hygiene infrastructure was found to be severely deficient across the surveyed schools. Less than one-third of schools had handwashing stations: 37% of primary and 24% of secondary schools reported having them. Critically, the proportion of schools where these stations were consistently equipped with both soap and water was even lower, 27% of primary and just 13% of secondary schools. Additional hygiene

schools assessed had fully functional, gender-segregated toilet facilities. Direct field observations confirmed that many latrines were in disrepair, with broken doors, missing slabs and deteriorating structures that compromise privacy and hygiene (see Appendix; Photographic Evidence). Only 7.1% of schools with functional toilets had facilities segregated by both gender and disability status, and just 1.6% had PWD-only designated facilities.

These deficiencies are particularly consequential for female students and children with disabilities, who are most affected by the absence of private, functional and appropriate sanitation infrastructure. The findings align closely with national-level reports indicating that fewer than half of Uganda's schools meet recommended student-to-latrine ratios and cleanliness standards.

facilities for girls, such as menstrual hygiene management provisions, were present in only 15% of primary and 9.4% of secondary schools.

These findings indicate that even where basic hygiene infrastructure exists, the absence of consumables such as soap renders handwashing largely ineffective as a disease prevention measure. Hygiene programming must therefore address both the provision of

physical infrastructure and the sustained supply of hygiene consumables.

4.3 Factors Influencing Access to WASH Services

4.3.1 Staff Perspectives on WASH and Disease Prevention

Perspective on WASH & Disease Prevention	Male n (%)	Female n (%)
Strongly Agree	0 (0.0)	1 (0.6)
Agree	58 (43.%)	76 (45.8)
Neutral	0 (0.0)	3 (1.8)
Disagree	9 (6.7)	7 (4.2)
Strongly Disagree	67 (50.0)	79 (47.6)

Table 5: Gender-Disaggregated Perspectives on WASH's Role in Disease Prevention

Over 90% of both male and female respondents agreed or strongly agreed that proper WASH services reduce disease spread in schools, with 50% of males and 47.6% of females expressing strong agreement. This overwhelming consensus demonstrates that knowledge of WASH's health benefits is not the primary barrier to improved practices. Rather, physical resource constraints and inadequate infrastructure are the limiting factors, confirming that material support and systems strengthening must accompany awareness campaigns.

4.3.2 WASH Training and Perceived Effectiveness

Training Participation	Not Effective (%)	Somewhat Effective (%)	Very Effective (%)
No Training Participation	70.33	2.00	1.67
Participated in Training	4.67	7.67	13.67
Chi-square Test	$X^2 = 183.87$, $df = 2$, $p\text{-value} < 0.0001$		

Table 6: Association between WASH Training Participation and Perceived Effectiveness

The chi-square analysis revealed a highly significant association between participation in WASH training and perceived effectiveness ($X^2 = 183.87$, $p < 0.0001$). Of those who participated in WASH training, 13.67% rated it as very effective and only 4.67% as not effective. In stark contrast, among

those who received no training, 70.33% did not believe training would be effective, with fewer than 2% acknowledging potential effectiveness. These findings confirm that direct experience of structured WASH education is a powerful determinant of attitudes toward hygiene practices, and that scaling up quality training programmes has strong potential to drive behavior change.

4.3.3 Satisfaction with Current WASH Provision

Variable	Satisfaction Level	Primary n (%)	Secondary n (%)
Overall Satisfaction	Very Satisfied	3 (1.0)	2 (0.7)
	Satisfied	14 (4.7)	5 (1.7)
	Neutral	28 (9.3)	8 (2.7)
	Dissatisfied	8 (2.7)	4 (1.3)
	Very Dissatisfied	130 (43.3)	98 (32.7)

Table 7: Respondents' Satisfaction with Current WASH Services by School Level

Dissatisfaction with current WASH provisions was pervasive. A combined 43.3% of primary school respondents and 32.7% of secondary school respondents expressed being very dissatisfied with existing WASH conditions. Only 5.7% of primary and 2.4% of secondary school respondents expressed satisfaction. This high level of dissatisfaction directly corroborates the objective infrastructure deficits documented above, unreliable water, broken latrines and absent soap, and signals strong demand for improved WASH investment from practitioners closest to the problem.

4.3.4 Key Challenges to WASH Access

Challenge	Primary n (%)	Secondary n (%)
Inadequate Water Supply	78 (50.6)	60 (42.4)
Poor Sanitation Infrastructure	66 (22.3)	32 (40.6)
Lack of Soap and/or Cleaning Materials	36 (25.4)	25 (16.5)
Lack of Awareness or Education	2 (1.5)	0 (0.0)
Overcrowded Facilities	0 (0.0)	1 (0.6)

Table 8: Challenges Hindering Proper WASH Practices by School Level

Physical resource constraints dominated the list of reported challenges. Inadequate water supply was identified as the leading barrier by 50.6% of primary and 42.4% of secondary school respondents. Poor sanitation infrastructure was cited by 22.3% of primary and 40.6% of secondary school respondents, with the latter reflecting the higher expectations placed on secondary school facilities. The absence of soap and cleaning materials was flagged by 25.4% of primary and 16.5% of secondary school respondents. Notably, lack of awareness and overcrowding were cited by fewer than 2% of respondents across both school levels, further confirming that knowledge deficits are not the primary bottleneck.

4.4 Multivariate Analysis: Predictors of WASH Awareness

A multinomial logistic regression model was developed to identify factors significantly associated with staff WASH awareness levels. The model achieved an overall classification accuracy of 82.7%. Table 9 presents the key predictors.

Outcome	Predictor	Odds Ratio	p-value	Lower CI	Upper CI
Somewhat Informed	Participates in Training	4.01	0.00136	0.539	2.237
Somewhat Informed	Parents as Primary Info Source	0.076	0.024	-4.818	-0.333
Very Well Informed	Aware of WASH Policies	7.47	0.005	0.593	3.417
All Levels	Gender (Male vs. Female)	-	Not Significant	-	-
All Levels	Location (Urban vs. Rural)	-	Not Significant	-	-

Table 9: Multinomial Logistic Regression, Predictors of WASH Awareness (n=300, Accuracy=82.7%)

Three significant predictors of WASH awareness levels were identified:

- Training participation: Staff who attended WASH training were approximately 4 times more likely to report adequate WASH knowledge compared to untrained peers (OR = 4.01, p = 0.00136). This underscores training as a powerful lever for building WASH awareness.
- Reliance on parents/guardians as the primary information source: This was associated with dramatically lower odds of being well-informed about WASH (OR = 0.076, p = 0.024),

indicating that informal information channels are unreliable for WASH education. Respondents relying on parental sources had approximately 92.4% lower odds of adequate awareness than those accessing formal information.

- Awareness of WASH policies: Staff who were aware of formal WASH policies and government guidelines were 7.47 times more likely to be categorized as very well informed ($p = 0.005$), reinforcing the central importance of policy dissemination alongside practical training.

Notably, neither gender nor school location (urban versus rural) showed a statistically significant effect on WASH awareness levels, suggesting that the quality and type of information accessed is a more powerful determinant of WASH knowledge than demographic or geographic variables.

CHAPTER FIVE: DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

5.1 Discussion

5.1.1 Level of WASH Coverage

The study's findings paint a sobering picture of WASH coverage in Kyegegwa District schools. Fewer than half of both primary and secondary schools enjoy reliable water supply, functional sanitation facilities and adequate hygiene infrastructure, confirming and extending the preliminary district-level estimates that motivated this research. The finding that only 41.7% of primary and 22% of secondary schools reported reliable water sources, and that fewer than one-third maintained handwashing stations with soap, represents a significant and consequential shortfall from WHO/UNICEF minimum service standards.

The predominant reliance on shallow wells and rivers/streams, water sources highly susceptible to contamination and seasonal disruption, explains in large part the devastating water quality ratings reported by respondents. With 68.3% of primary and 82.1% of secondary school respondents rating their drinking water as poor, the risk of waterborne disease transmission among students is substantial and ongoing. The finding that piped water and boreholes consistently attracted better quality ratings reinforces the case for prioritizing these source types in future infrastructure investments, even as cost and logistical constraints are acknowledged.

Seasonal variability exacerbates these coverage shortfalls, particularly in rural settings where shallow wells and rainwater systems are prone to failure during dry seasons. This temporal dimension of WASH access, which a cross-sectional study can only partially capture, suggests that the true magnitude of WASH deficits may be even greater than the data presented here indicates.

5.1.2 Factors Influencing WASH Access

The analysis of factors influencing WASH access points clearly to physical resource constraints as the dominant barrier. Inadequate water supply, broken sanitation infrastructure and the absence of hygiene consumables such as soap collectively account for the overwhelming majority of reported challenges. This finding is consistent with broader literature on WASH in sub-Saharan African schools, which consistently identifies under-investment in infrastructure and maintenance as the primary drivers of WASH deficiency (WaterAid, 2022; Godfred Eyoku, 2024).

The "hardware-software gap" that emerges from these findings, where high levels of WASH awareness coexist with deeply inadequate facilities, is particularly noteworthy. Over 90% of respondents understood WASH's role in disease prevention, yet could not translate this awareness into effective hygiene behavior because the physical prerequisites were absent. This confirms that awareness campaigns and behavior change communication, while valuable, cannot substitute for concrete infrastructure investment and sustained supply chains.

The role of structured WASH training in shaping both attitudes and behaviors are a significant positive finding. The strong statistical association between training participation and positive perceptions of WASH effectiveness ($X^2 = 183.87$, $p < 0.0001$), combined with the regression finding that trained staff were 4 times more likely to be well-informed, demonstrates the transformative potential of quality, structured WASH education programmes. Conversely, the finding that reliance on informal information sources, particularly parents, is associated with significantly lower WASH awareness highlights the inadequacy of non-structured community messaging as a primary channel for WASH information.

Staff experience and turnover patterns also emerged as important contextual factors. The high proportion of teachers and cleaners with fewer than three years of experience, compared to the predominantly more experienced administrator cohort, creates a structural vulnerability in WASH Programme sustainability. Frequent turnover disrupts institutional memory and the continuity of hygiene practices, creating a recurring need for orientation and training.

5.2 Conclusions

Based on the findings of this study, the following conclusions can be drawn:

- WASH coverage in Kyegegwa District schools is critically insufficient. Fewer than half of schools meet basic standards for reliable water supply, functional sanitation and adequate hygiene infrastructure. Drinking water quality is predominantly rated poor, particularly from shallow wells and rainwater harvesting systems.
- Physical resource constraints, inadequate water supply, deteriorated sanitation infrastructure and missing hygiene consumables, are the foremost barriers to WASH access, outweighing knowledge and awareness gaps as the primary limiting factor.
- WASH training and policy awareness are powerful enablers of improved WASH knowledge and attitudes. Structured training significantly increases the likelihood of staff being well-informed and supportive of WASH practices, while policy dissemination amplifies this effect.

- Informal information channels, particularly parental/guardian communication, are insufficient and potentially counterproductive as primary means of WASH education, being strongly associated with lower awareness levels.
- High staff turnover among teachers and cleaners undermines Programme sustainability, while experienced administrators represent a stable leadership base for WASH oversight and planning.
- Despite the severe infrastructure deficits, the high level of WASH awareness among school staff, over 90% recognizing WASH's disease prevention role, provides a strong social foundation upon which targeted investments can be built.

5.3 Recommendations

Based on the study's findings and conclusions, the following recommendations are directed to policymakers, district education and health authorities, school management and development partners:

5.3.1 Infrastructural Investment

- **Water:** Prioritize the drilling or rehabilitation of boreholes and the extension of piped water networks to high-need schools in Kyegegwa District. Install or upgrade rainwater harvesting systems with secure, covered tanks and first-flush diverters to improve both availability and quality of harvested water.
- **Sanitation:** Renovate existing toilet facilities to ensure gender segregation, privacy (functional doors, slabs), disability-inclusive design and cleanable surfaces. Construct new facilities where current provision falls below national student-to-toilet ratio standards.
- **Hygiene:** Establish dedicated handwashing stations at all schools, with special attention to proximity to classrooms and toilet blocks. Ensure facilities include provisions for menstrual hygiene management for adolescent girls.

5.3.2 Maintenance and Supply Chains

- Establish school-level WASH committees, comprising administrators, teachers, cleaners and student representatives, to conduct routine facility inspections and coordinate minor repairs, fostering shared ownership and accountability.

- Secure dedicated, ring-fenced budget lines for WASH consumables (soap, disinfectants, chlorine tablets) and establish procurement frameworks to prevent chronic stockouts that undermine the functionality of existing infrastructure.

5.3.3 Capacity Building and Policy Dissemination

- Integrate structured WASH modules into teacher orientation programmes and in-service training to ensure all new and existing staff receive standardized, evidence-based WASH instruction.
- Distribute national WASH-in-Schools guidelines to all headteachers, supported by district-level workshops to clarify roles, responsibilities and monitoring requirements. Ensure that WASH policy awareness is embedded in school management systems.

5.3.4 Behavioral and Community Engagement

- Leverage the high baseline WASH awareness among school staff by establishing school-based WASH clubs and peer education programmes that reinforce and model positive hygiene behaviors among students.
- Engage Parent-Teacher Associations and community radio programmes to reinforce evidence-based WASH messages, explicitly replacing informal information channels that have been shown to produce lower awareness outcomes.

5.3.5 Monitoring, Evaluation and Sustainability

- Implement an annual WASH audit for all schools in Kyegegwa District, using standardized checklists aligned with national WASH-in-Schools indicators. Link audit results directly to district resource allocation decisions, with priority directed to underperforming schools.
- Establish a district-level WASH coordination mechanism that brings together education, health, water and environment departments alongside development partners to align investments, avoid duplication and track collective progress toward WASH coverage targets.

By systematically addressing both the hardware (infrastructure and supplies) and software (training, policy dissemination and maintenance systems) dimensions of WASH service delivery, these recommendations collectively offer a pathway to significantly improved WASH coverage, student health outcomes and educational performance across Kyegegwa District's schools, contributing to Uganda's broader commitments under Sustainable Development Goal 6.

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APPENDIX: PHOTOGRAPHIC EVIDENCE OF WASH FACILITY CONDITIONS IN SCHOOLS OF KYEGEGWA DISTRICT

The photographs below were taken during fieldwork in schools across Kyegegwa District in 2025. They provide visual documentation of the WASH facility conditions described and quantified in the preceding chapters.

Sanitation Facilities

The images below illustrate the deteriorated state of latrine facilities in schools of Kyegegwa District, including broken doors, missing walls, non-segregated cubicles, unsanitary conditions and poor structural integrity.



Photo 1: Latrine block with broken door and deteriorating walls (Source: Field Survey, 2025)



Photo 2: Non-segregated latrine cubicles lacking privacy infrastructure (Source: Field Survey, 2025)



Photo 3: Latrine in poor structural condition with missing components (Source: Field Survey, 2025)

Hygiene Facilities

The images below document the poor state of handwashing facilities within school environments, highlighting structural deterioration and the absence of soap and clean water.



Photo 4: Deteriorated handwashing station without soap or clean water (Source: Field Survey, 2025)



Photo 5: Poorly maintained handwashing point in an unhygienic environment (Source: Field Survey, 2025)