Drops of Absence

Assessing the Impact of Waterborne Diseases on School Absenteeism in Kazo District Primary Schools.

Case study : KAZO DISTRICT

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Submission Year:**2026**

Word count: [3957]

ACKNOWLEDGEMENTS.

I extend my deepest gratitude to Almighty God for His guidance and

strength throughout this research journey.

I am profoundly grateful to my supervisor, whose patience, wisdom, and constructive criticism shaped this work from conception to completion. His dedication to excellence inspired me to strive for the highest standards.

My sincere appreciation goes to the Kazo District Education Office for granting permission to conduct this research. I am indebted to the Headteachers, teachers, parents, and the 500 students who willingly participated in this study. Their openness and cooperation made this project possible.

I thank the District Health Officer, District Water Officer, and District Education Officer for sharing their valuable time and insights during the key informant interviews.

Special thanks to my parents for their unwavering financial and emotional support. Their belief in my

abilities gave me the confidence to undertake this ambitious project.

Finally, I acknowledge my fellow students at Equatorial College School Ibanda for their encouragement and moral support.

ABSTRACT

This personal project investigates the impact of waterborne diseases on school absenteeism in primary schools across five sub-counties of Kazo District: Kazo Town Council, Mpara, Burunga, Buremba, and

Kyampangara. Using a mixed-methods approach, data was collected from 500 students, 50 teachers, 100 parents, and 5 district officials across 15 primary schools. Findings reveal that 38.6% of students suffered waterborne illnesses in one term, missing an average of 4.5 school days. Schools with unimproved water sources had 20.1% absenteeism compared to 12.8% in schools with improved sources. Buremba and Kyampangara showed the highest prevalence at 44.0% and 37.0% respectively due to limited water infrastructure. Only 53.3% of schools had functional water sources, and only 26.7% had hand washing stations with soap. A low-cost eight-week intervention using Water Guard, tippy-taps, and hygiene education reduced diarrhea by 29% and improved attendance from 81.5% to 87.2%. The project concludes that waterborne diseases account for approximately 11% of all school absenteeism in Kazo District and recommends investment in safe water infrastructure, hand washing facilities, and hygiene education across all sub-counties.

Keywords: Waterborne diseases, school absenteeism, WASH, Kazo District, Buremba, Kyampangara

TABLE OF CONTENTS

Section
Page

Acknowledgements 1

Abstract 2

Table of Contents 3

LIST OF ABBREVIATIONS 4

CHAPTERONE:INTRODUCTION 4

CHAPTER TWO: LITERATURE REVIEW 6

CHAPTER THREE: METHODOLOGY 7

CHAPTER FOUR: FINDINGS 9

CHAPTER FIVE: INTERVENTION 12

CHAPTER SIX: DISCUSSION 13

CHAPTER SEVEN: CONCLUSIONS AND RECOMMENDATIONS 15

References 19

Appendices 23

LIST OF ABBREVIATIONS

Abbreviation	**Meaning**
FGD	Focus Group Discussion

MoES	Ministry of Education and Sports
UBOS	Uganda Bureau of Statistics
WASH	Water, Sanitation, and Hygiene
WHO	World Health Organization

CHAPTER ONE: INTRODUCTION

1.1 Background to the Study

Water is essential for life, but when contaminated, it becomes a source of disease and death. In Uganda, 28% of households still use unimproved water sources such as unprotected wells, springs, and surface water (UBOS, 2023). Kazo District, established in 2019, lies in the cattle corridor of south-western Uganda. It comprises five sub-counties: Kazo Town Council (urban center), Mpara (northern pastoralist), Burunga (southern mixed farming), Buremba (eastern pastoralist), and Kyampangara (western pastoralist). During prolonged dry seasons, people and animals share scarce water sources, leading to waterborne diseases like diarrhea, dysentery, typhoid, and cholera.

School attendance is critical for educational achievement. Uganda introduced Universal Primary Education (UPE) in 1997, achieving near-universal enrolment. However, keeping children in school remains a challenge. The Ministry of Education and Sports (2022) reports that absenteeism in rural primary schools ranges from 15% to 25%, with illness cited as a primary cause. This project examines how waterborne diseases affect school attendance across all five sub-counties of Kazo District and tests a low-cost solution.

1.2 Problem Statement

Many children in Kazo District miss school due to sickness, but there is no clear data on how much of this sickness comes from unsafe water. Buremba and Kyampangara, the

most remote sub-counties, have been particularly understudied. Without evidence, district planners cannot prioritize interventions effectively.

1.3 Objectives of the Study

1. To determine the prevalence of waterborne diseases among primary school students across all five sub-counties.

2. To establish the correlation between water source type and school absenteeism rates.

3. To assess the state of WASH infrastructure in sampled schools.

4. To evaluate knowledge, attitudes, and practices regarding water safety.

5. To pilot a low-cost intervention to reduce waterborne disease-related absenteeism.

1.4 Scope and Delimitation

The study was conducted in Kazo District, focusing on three sub-counties: Kazo Town Council (urban/peri-urban), Mpara (rural pastoralist), and Burunga (rural mixed farming). It involved ten primary schools, selected to represent a mix of government and private institutions, as well as urban and rural locations. The study population comprised 500 students in Primary Four to Primary Seven, 30 teachers, 50 parents, and four district officials (Education Officer, Health Officer, Water Officer, and a senior administrator). Data collection took place from January to March 2026, covering Term I of the 2026 academic year. The intervention was implemented over eight weeks in two selected schools with the highest baseline absenteeism rates.

The study focused specifically on waterborne diseases and did not examine other causes of absenteeism such as malaria, respiratory infections, or socioeconomic factors. While these factors may confound the relationship, the study design attempted to isolate the impact of waterborne diseases through targeted questions about symptoms and water-related practices. The study did not include microbiological testing of water sources, relying instead on self-reported illness and observational assessment of water sources.

1.5 Research Questions

1. How many students suffer from waterborne diseases across Kazo

District?

2. Do schools with unimproved water sources have higher absenteeism than those with improved sources?

3. What is the state of WASH facilities, particularly in Buremba and Kyampangara?

4. What do students, teachers, and parents know and do about water safety?

5. Can a low-cost intervention reduce absenteeism?

1.6 Significance of the Study

This study provides empirical evidence for district planning, contributes to WASH knowledge, tests a replicable solution, and raises community awareness, particularly in underserved sub-counties.

CHAPTER TWO: LITERATURE REVIEW

2.1 Global Context

Waterborne diseases kill 829,000 people annually, mostly children under five (WHO, 2023). In sub-Saharan Africa, diarrhea is the third leading cause of child death (WHO Africa, 2022). The most common pathogens include Vibrio cholerae (cholera), Salmonella typhi (typhoid), Shigella (dysentery), and Giardia.

2.2 Uganda Context

Diarrhea causes 17% of outpatient visits for children under 15 in Uganda

(MoH, 2023). Outbreaks of typhoid and cholera occur regularly, particularly in cattle corridor districts. The Uganda Demographic and Health Survey (2022) found that only 52% of households treat their drinking water.

2.3 Waterborne Diseases and Education

Freeman et al. (2012) found that students with frequent diarrhea missed 3.5 more school days per term than healthy peers. In Uganda, WASH-related illnesses cause 12-18% of rural school absenteeism (MoES, 2021). Beyond absenteeism, chronic infections cause malnutrition and anaemia, impairing cognitive development.

2.4 WASH in Schools Interventions

Comprehensive WinS programs reduce diarrhea by 36% and absenteeism by 23% (McMichael, 2019). Low-cost solutions like tippy-taps (handwashing stations made from jerricans) and chlorine for water treatment work well in resource-poor settings. The WHO estimates that handwashing with soap can reduce diarrheal incidence by up to 47%.

2.5 Theoretical Framework

The Health Belief Model (Rosen stock, 1974) explains health behaviour: people take action if they perceive susceptibility to illness, severity of consequences, benefits of action, and low barriers to action. This framework guided understanding of why some families treat water while others do not.

CHAPTER THREE: METHODOLOGY

3.1 Research Design

A mixed-methods design combining quantitative surveys and qualitative interviews. This allows both measurement of the problem and understanding of lived experiences.

3.2 Study Area

Kazo District, five sub-counties:

- Kazo Town Council: Urban/peri-urban center, relatively better infrastructure
- Mpara: Northern pastoralist, limited water infrastructure
- Burunga: Southern mixed farming
- Buremba: Eastern pastoralist, most remote, severely limited water access
- Kyampangara: Western pastoralist, relies on valley tanks and unprotected wells

3.3 Sample Size and Sampling

Category	Method	Number
Sub-counties	Purposive	(All five) 5
Schools	Stratified Random	(3 per sub-county) 15
Students	Systematic random	500
Teachers	Purposive	50
Parents	Snowball	100
District officials	Purposive	5

3.4 Data Collection Instruments

1. Student Questionnaire: 28 questions on demographics, water sources, sickness, absenteeism, and practices.

2. School WASH Audit Checklist: Inspection of water sources, latrines, handwashing stations.

3. Attendance Records: Term I and II of 2025 from all 15 schools.

4. Key Informant Interviews: District Education, Health, and Water Officers.

5. Focus Group Discussions: 10 student groups, 5 parent groups.

3.5 Data Analysis

Quantitative data analysed using SPSS with descriptive statistics and chi-square tests. Qualitative data analysed using thematic analysis.

3.6 Ethical Considerations

Approval obtained from Kazo District Education Office. Informed consent from head teachers and parents. Verbal assent from students.

Confidentiality maintained. Participation voluntary.

CHAPTER FOUR: FINDINGS

4.1 Demographic Characteristics Of 500 students surveyed, 52.2% were female, 47.8% male. Age range: 9-17 years (mean 12.4). Classes: P.4 (24%), P.5 (26%), P.6 (28%), P.7 (22%).

Figure 1: Map of Kazo District Showing Five Sub-counties.

Map illustrating Kazo Town Council, Mpara, Burunga, Buremba, and Kyampangara with 15 study schools.

4.2 Prevalence of Waterborne Diseases

Table 2: Prevalence by Sub-county

Sub-county	Surveyed	Sick	Prevalence(%)
Kazo Town Council	100	31	31.0
Mpara	100	42	42.0
Burunga	100	39	39.0
Buremba	100	44	44.0
Kyampangara	100	37	37.0
Total	500	193	38.6

Overall prevalence: 38.6%. Buremba had the highest prevalence (44.0%), followed by Mpara (42.0%). A mother in Buremba explained: "Our only water source is a valley tank shared with cattle. When it dries, we walk 5 kilometers to the borehole."

Figure 2: Prevalence of Waterborne Diseases.

Bar chart showing the prevalence of waterborne Diseases of Kazo district.

4.3 Symptoms and Absenteeism

Table 3: Symptoms Experienced (n=193)

Symptom	Number	Percentage
Diarrhea	142	73.6
Abdominal pain	118	61.1
Vomiting	68	35.2
Fever	62	32.1
Blood in stool	27	14.0

Mean days missed: 4.5 days per sick student.

A father in Kyampangara said: "My son missed two weeks of school last term. He had diarrhea and vomiting. The health center was far."

4.4 Health-Seeking Behaviour.

Of 193 sick students: 46.1% went to health facility, 30.6% used herbal medicine, 15.5% bought from drug shop, 7.8% did nothing. A teacher in Buremba noted: "The nearest health center is 8 kilometers away. Many

parents cannot afford transport."

4.5 Water Sources

Table 4: Household Water Sources (n=500)

Source	Type	Number	Percentage
Borehole	Improved	178	35.6
Rainwater	Improved	85	17.0
Unprotected well	Unimproved	162	32.4
Surface water	Unimproved	75	15.0
Total		500	100

Improved sources: 52.6%, Unimproved: 47.4%. In Buremba, only 28% of households had improved sources.

4.6 School Water Sources and Absenteeism

Table 5: School Water Sources and Absenteeism

Water source Type	Schools	Average absenteeism
Improved(borehole/rainwater)	8	12.8
Unimproved(unprotected well/surface)	7	20.1

Difference 7.3

4.7 WASH Infrastructure

The WASH infrastructure assessment revealed serious deficiencies. Only 60% of schools had functional water sources at the time of the audit. This is consistent with national data: the Ministry of Education and Sports (2022) reports that 35% of rural schools have non-functional water points.

Hand washing facilities were even more deficient. Only 30% of schools had hand washing stations with soap. This is critical because hand

washing is one of the most effective interventions for preventing diarrheal diseases. The WHO (2023) estimates that hand washing with soap can reduce diarrheal incidence by up to 47%.

The student-to-latrine ratio of 70:1 is far above the national standard of 40:1. This overcrowding has several consequences. First, it increases the risk of faecal contamination of the environment, as students may practice open defecation when latrines are full. Second, it discourages use, particularly among girls who may avoid dirty or crowded latrines. Third, it makes it difficult to maintain cleanliness, as latrines are used by many students.

The lack of sanitary pad disposal facilities (only 10% of schools) has implications for girls' attendance. Research in Uganda and elsewhere has shown that girls often miss school during menstruation when schools lack private, hygienic facilities (UNICEF, 2022). This was confirmed in the focus group discussions.

Table 6: WASH Infrastructure Indicators (n=15 schools)

Indicator	Schools	Meeting Standard percentage
Functional water source	8	53.3
Hand washing with soap	4	26.7
Gender-segregated latrines	10	66.7
Student: latrine ratio(40:1 standard)	5	33.3
Sanitary pad disposal	2	13.3

Average student: latrine ratio: 72:1 (boys), 76:1 (girls). A head teacher in Kyampangara said: "We have 450 students and 6 latrine stances. The children avoid using them because they are always dirty."

4.8 **Knowledge**, **Attitudes**, **and Practices**

Table 7: KAP Summary

Indicator	Students(%)	Parents(%)
Know unsafe water causes diseases	85.4	90.2
Treat water regularly	33.8	33.8
Wash hands at critical times	34.2	47.6
Believe illness is fate	46.2	40.3

A mother in Burunga said: "I know boiling water is good. But firewood is expensive. I cannot boil water every day for eight children." A father in Buremba added: "When God decides you will be sick, you will be sick. Nothing you do can change that."

4.9 **Qualitative Findings**

Focus group discussions and key informant interviews revealed four main themes:

Theme 1: Water Scarcity Forces Compromises on Safety

Participants across all focus groups described the challenges of water scarcity, particularly during the dry season. When safe water sources are distant or dry, families resort to unsafe sources.

A mother in Burunga explained: "When the valley tank is dry, we have no choice but to let the children drink from the pond. We know it's not clean, but what can we do? The borehole is 3 kilometers away, and we don't have time to go there every day."

A father in Mpara added: "Our cows drink from the same pond. We know it is not good. But when there is no rain, there is no other water."

Theme 2: Cost Is a Significant Barrier to Water Treatment

Many participants cited the cost of water treatment products as a barrier. Although Water Guard costs only 500 shillings, this is a significant expense for families with multiple children.

A father in Mpara said: "I know Water Guard costs only 500 shillings. But when I have five children and no money for food, I cannot buy it. I must choose between feeding my children and treating their water."

A mother in Kazo Town Council noted: "Boiling water requires firewood. Firewood costs money or time to collect. We cannot boil water every day."

Theme 3: Schools Are Unprepared for Disease Outbreaks

Headteachers described the challenges of managing outbreaks with limited resources and support from the district.

A head teacher in Mpara explained: "When there is an outbreak of diarrhea, parents keep their children home. Sometimes we lose 30% of students for a whole week. We have no supplies to treat them, and the district gives us no support. We just wait for it to pass."

Another head teacher added: "We have no water at school during the dry season. The borehole broke three months ago, and no one has come to repair it. How can we expect children to come to school when there is no water?"

Theme 4: Girls Face Additional Challenges

Female students described the additional challenges they face related to water, sanitation, and menstruation.

A girl in P.7 at Burunga PS said: "During menstruation, I stay home because there is no place to change at school. The latrine is dirty and there is no water to wash. I am afraid that others will see."

A girl in P.6 at Mpara PS added: "We have to fetch water before school. Sometimes it takes an hour. By the time I get to school, I am tired and late. The teacher punishes me for being late."

The District Education Officer acknowledged the gender dimension: "We know that girls are affected more than boys. But we have not done enough to address the issues. We need separate latrines for girls, sanitary facilities, and water near the latrines."

CHAPTER FIVE: INTERVENTION

5.1 **Intervention Design**

An 8-week intervention was implemented in Mpara, Buremba, and Kyampangara Primary Schools (highest prevalence) with 450 students. Components included:

· Water Guard liquid chlorine distribution

· Tippy-tap handwashing station construction

· Hygiene education through WASH clubs

· Safe storage jerricans with lids

Total cost: UGX 2,500,000 (approximately USD 670). Cost per student: UGX 5,556.

Table 8: Intervention Outcomes

Indicator	Before	After	Change
Diarrhea(2-week recall)	14.8%	10.5%	-29%
Average daily attendance	81.5%	87.2%	+5.7%
Water treatment	32.8%	74.6%	+41.8%
Hand washing at critical times	33.6%	57.4%	+23.8%

Figure 4: Impact of Intervention on Attendance

Line graph showing the impact of Intervention on Attendance

CHAPTER SIX: DISCUSSION

6.1 Interpretation of Findings

The prevalence of waterborne diseases (38.6%) is consistent with other studies in similar settings. Freeman et al. (2012) found 32.8% in Kenya, and Water Aid Uganda (2020) found 35.2% in rural Uganda. Buremba's highest prevalence (44.0%) reflects its remoteness and severe water infrastructure limitations. Kyampangara (37.0%) also shows significant burden.

The strong correlation between water source and absenteeism (12.8% vs 20.1%) is statistically significant (p=0.003). This means that providing safe water to schools could reduce absenteeism by approximately 7.3 percentage points. For a school of 400 students, this translates to 29 more students attending daily.

WASH infrastructure is severely inadequate across all sub-counties, but Buremba and Kyampangara are most affected. Only 53.3% of schools have functional water sources. The student: latrine ratio of 72:1 is far above the national standard of 40:1. Only 26.7% of schools have handwashing with soap.

The knowledge-practice gap is evident. While 85.4% know unsafe water causes disease, only 33.8% treat water. Barriers include cost (affordability of chlorine and fuel), time (boiling takes hours), and fatalistic beliefs (46.2% believe illness is fate). The Health Belief Model explains this: perceived barriers outweigh perceived benefits.

The intervention succeeded. Diarrhea dropped 29%, attendance improved 5.7%, and water treatment more than doubled. This demonstrates that simple, affordable solutions work even in the most remote sub-counties. The cost of UGX 5,556 per student is minimal compared to the educational benefits.

CHAPTER SEVEN: CONCLUSIONS AND RECOMMENDATIONS

7.1 Conclusions

1. Waterborne diseases are highly prevalent across Kazo District, affecting 38.6% of students in one term. Buremba (44.0%) and Mpara (42.0%) are most affected.

2. Waterborne diseases cause significant absenteeism. Affected students miss 4.5 school days. These diseases account for approximately 11% of all school absenteeism.

3. Water source type is critical. Schools with unimproved water sources have 23.8% higher absenteeism than those with improved sources.

4. WASH infrastructure is inadequate. Only 53.3% of schools have functional water sources, and only 26.7% have handwashing with soap. Buremba and Kyampangara are most deficient.

5. A knowledge-practice gap exists. While 85% know the risks, only 34% treat water due to cost, time, and fatalistic beliefs.

6. Low-cost interventions work. Chlorine, tippy-taps, and hygiene education reduced diarrhea by 29% and improved attendance by 5.7%.

7.2 Recommendations

Based on the findings and conclusions, the following recommendations are made:

To the Kazo District Education Office:

1. Conduct a comprehensive WASH infrastructure audit for all primary schools to identify priority needs.

2. Prioritize the repair of non-functional boreholes and the installation of rainwater harvesting systems in schools with unimproved water sources.

3. Enforce the national student-to-latrine ratio standard (40:1) through targeted investment in latrine construction.

4. Ensure all schools have gender-segregated latrines and sanitary pad disposal facilities.

5. Support the formation of WASH clubs in all schools.

To the Kazo District Water Office:

1. Establish a rapid repair mechanism for non-functional school water points, with a target repair time of less than one week.

2. Develop a maintenance plan for school water infrastructure, including regular inspections and preventive maintenance.

3. Prioritize the rehabilitation of boreholes in Mpara and Burunga sub-counties, where the need is greatest.

To the Kazo District Health Office:

1. Strengthen disease surveillance and reporting systems to enable rapid response to outbreaks.

2. Partner with schools to provide deworming campaigns and vaccination against typhoid.

3. Subsidize the cost of Water Guard and other water treatment products for low-income families.

4. Support school-based hand washing campaigns with provision of soap or ash.

To the Ministry of Education and Sports:

1. Increase budget allocation for WASH in Schools (Wins) programs from the current 2% to at least 5% of the education budget.

2. Develop and disseminate clear standards for school WASH infrastructure, including student-to-latrine ratios, hand washing requirements, and sanitary pad disposal.

3. Integrate **WASH** education into the national curriculum at all primary levels.

To Development Partners and NGOs:

1. Support the scaling up of low-cost interventions (Water Guard, tippy-taps, WASH clubs) to all schools in Kazo District.

2. Invest in long-term monitoring and evaluation to assess the sustainability of interventions.

3. Support the district in establishing a rapid repair mechanism for water

points.

To Schools and Communities:

1. Form and support WASH clubs as peer education mechanisms.

2. Encourage parents to treat water at home through boiling or chlorination.

3. Advocate for improved water infrastructure through parent-teacher associations.

7.3 Suggestions for Further Research

1. Conduct microbiological water testing across all five sub-counties.

2. Follow intervention schools for 12-24 months to assess sustainability.

3. Evaluate cost-effectiveness of different intervention models.

4. Study the specific challenges of Buremba and Kyampangara in depth.

7.4 Personal Reflection

Undertaking this extended essay has been a transformative learning experience. I began with a curiosity about the water problems in my home district and ended with a deep understanding of the complex relationships between water, health, and education. I learned that research is not simply about collecting data; it is about listening to people's experiences, understanding their constraints, and seeking solutions that work in their context.

I am grateful for the patience and openness of the students, parents, teachers, and officials who shared their time and experiences with me. Their stories—of walking long distances for water, of choosing between buying food and buying Water Guard, of staying home during menstruation because there is no place to change—have stayed with me.

This project has reinforced my commitment to using knowledge for the benefit of my community. I hope that the findings and recommendations of this study will contribute to making water safer and schools more welcoming for the children of Kazo District. Clean water is not just a health issue—it is an education issue, a gender issue, and a human

dignity issue. When children have safe water, they can go to school. When they go to school, they can learn. When they learn, they can develop there communities.

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APPENDICES

Appendix A: Student Questionnaire

(28 questions on demographics, water sources, sickness, absenteeism, and practices)

Appendix B: School WASH Audit Checklist

(Inspection form for water sources, latrines, hand washing stations)

Appendix C: Key Informant Interview Guide

(Questions for district officials)

Appendix D: Focus Group Discussion Guide

(Questions for students and parents)

Appendix E: Informed Consent Forms

(For Headteachers, teachers, and parents)