ASSESSMENT OF SANITATION , HYGIENE AND HEALTH STATUS OF AMUFI COMMUNITY RESIDENTS

BY

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DEPARTMENT OF ENVIRONMENTAL MANAGEMENT AND TOXICOLOGY

FACULTY OF LIFE SCIENCES

UNIVERSITY OF BENIN

BENIN CITY

NOVEMBER, 2025.

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AN UNDERGRADUATE PROJECT SUBMITTED TO THE DEPARTMENT OF ENVIRONMENTAL MANAGEMENT AND TOXICOLOGY, FACULTY OF LIFE SCIENCES, UNIVERSITY OF BENIN, BENIN CITY, EDO STATE, NIGERIA; IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR AWARD OF BACHELOR OF SCIENCE (B.Sc) DEGREE IN ENVIRONMENTAL MANAGEMENT AND TOXICOLOGY.

NOVEMBER, 2025.

CERTIFICATION

This is to certify that this research titled "**ASSESSMENT OF SANITATION, HYGIENE AND HEALTH STATUS OF AMUFI COMMUNITY RESIDENTS**" was carried out by "**CLARE MHE'OROGHENE ABEKWARE**" and presented to the Department of Environmental Management and Toxicology, Faculty of Life Sciences, University of Benin, Benin City; in partial fulfillment of the requirements for the award of Bachelor of Science (B.Sc) in Environmental Management and Toxicology. It was conducted under suitable conditions, was carefully supervised and subsequently approved as having met the requirements for the award of Bachelor of Science degree in Environmental Management and Toxicology.

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PROF. E. E. IMARHIAGBE **DATE**

Project Supervisor

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PROF. E. T. AISIEN **DATE**

Head of Department

DECLARATION

I "CLARE MHE'OROGHENE ABEKWARE" declare that "**Assessment of Sanitation, Hygiene And Health Status of Amufi Community Residents**" is my own work and that all sources that I have used or quoted have been acknowledged by means of complete references and that this work has not been submitted before for any other degree at any other University.

_____

Abekware Clare Mhe'oroghene

_____

Date

DEDICATION

This work is dedicated to God almighty whose wisdom enabled me to successfully complete this work and my parents, Mr and Mrs Abekware for their unwavering support, prayers, love and financial assistance throughout my academic journey.

ACKNOWLEDGEMENT

First and foremost, I give thanks to **God**, for without divine grace and strength, this journey would not have been completed. He sustained me through every challenge, provided comfort in moments of doubt, and offered the clarity, perseverance and timely help needed to achieve this milestone.

To my lovely parents, **Mr Augustine and Mrs Esther Abekware, and** siblings, Triumph and Excellence, I owe a debt of gratitude, for without your unwavering love and steadfast support throughout my university journey, I wouldn't be here today. You were my constant source of encouragement, always believing in me even when I doubted myself, and your sacrifices provided the foundation for my success. Thank you, from the bottom of my heart, for everything, your presence and guidance were the greatest gifts, and I will always be grateful for that.

My deepest gratitude goes to **Major Gen Attu, Mr. Sam Attu, the Attu family, late Engr Goru and late Mr. Gift Abekware**. Your incredible financial support made my university journey possible, easing a massive burden and allowing me to focus on my studies. Beyond the monetary help, your wisdom and encouragement provided invaluable moral support and mentorship for which I will always be thankful.I am deeply grateful to my project supervisor, **PROF. E. E. IMARHIAGBE**, for his exceptional guidance and invaluable mentorship. His expertise, rigorous standards, and patience were instrumental to my success. I also extend my heartfelt gratitude to the Head of Department of Environmental Management and Toxicology, **PROF. (MRS) E. T. AISIEN**, my course adviser, **DR. A.F. EGHOMWANRE** and all esteemed lecturers of the department whose dedication, knowledge and encouragement have greatly shaped my academic growth and intellectual development.

To **Miracle**, thank you for being the much-needed source of sanity, laughter, and a much needed anchor and help throughout these intense years. I love and appreciate you. To others, too many to mention, that have touched my life positively, I'm eternally grateful. See you all at the top.

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ABSTRACT

This study assessed the sanitation, hygiene, and health status of residents in Amufi Community, a peri-urban settlement in Ikpoba-Okha Local Government Area of Edo State, Nigeria. The research aimed to evaluate existing sanitation facilities, examine hygiene practices, and identify common health risks linked to poor sanitation and hygiene conditions. A descriptive cross-sectional design was employed, using a structured and pre-tested questionnaire administered to 220 randomly selected residents. Data collected included information on socio-demographic characteristics, sanitation facilities, hygiene behaviors, and self-reported health outcomes, and were analyzed using descriptive statistics such as frequencies and percentages. The findings revealed that 87.7% of households used flush toilets, while 9.5% relied on pit latrines, with 39.5% sharing toilets with other households. Waste disposal practices were poor, as 17.3% of respondents dumped refuse in open spaces and 32.3% resorted to burning. Although 90% had access to soap, only 44.5% had designated handwashing areas, and just 30% consistently used soap and water for handwashing. About half of the respondents (50.3%) reported experiencing waterborne diseases within the past year, with typhoid fever (70.3%) and diarrhea (37.8%) being the most prevalent. Community involvement in Water, Sanitation, and Hygiene (WASH) programs was low, with only 21.8% of respondents participating in any sanitation or hygiene improvement activities. These results indicate that although access to sanitation infrastructure in Amufi is moderately high, inadequate hygiene practices, poor waste management, and limited community engagement continue to sustain preventable health risks. The study concludes that strengthening WASH infrastructure, enhancing hygiene education, and promoting active community participation are essential strategies for improving public health outcomes and reducing disease burden within the Amufi Community.

CHAPTER ONE

1.0 INTRODUCTION

For individual as well as community health, water, sanitation, and hygiene (WASH) practices are essential. Access to clean drinking water, adequate sanitation facilities, and regular hygiene practices are all essential for reducing the transmission of illness, enhancing general health, and bolstering the successful implementation of health policies. These seemingly straightforward actions, such as washing hands frequently and disposing of garbage properly, have a significant impact on people's lives all across the world (Okesanya *et al.*, 2024). Deficiencies in WASH have a major global impact on mortality and avoidable diseases, especially in low- and middle-income nations. The WASH sector in Nigeria is in a dire situation that is sometimes referred to as an emergency (The World Bank, 2021). At the community level, where inadequate WASH services are directly accountable for a significant amount of the disease burden, this national issue has disastrous consequences.

For instance, insufficient WASH provisions account for 73% of the overall burden of enteric infections in Nigeria, resulting in nearly 255,000 unwarranted mortality per year (Smith, 2024).

Sanitation is commonly defined as the provision of facilities and services for the safe disposal of human urine and faeces. Inadequate sanitation is a leading source of disease worldwide, and improving sanitation has been shown to have a large positive influence on health both in families and throughout communities. The term 'sanitation' also refers to the preservation of hygiene standards via services such as garbage collection and wastewater disposal (WHO Africa, 2017).

The direct relationship between contaminated water, poor sanitation, and the transmission of diseases such as cholera, diarrhea, dysentery, hepatitis A, malaria, typhoid, and polio is well recognized (Rawlings *et al.*, 2022). These illnesses not only cause extensive suffering, but

also have substantial economic and societal consequences, such as lost production and school absences.

The importance of sanitation in improving citizens' well-being and promoting sustainable development is reflected in the United Nations' formal recognition of access to safe sanitation as a human right in 2012, as well as the adoption of the Sustainable Development Agenda (SDA) in 2015, where Goal 6.2 called for universal access to adequate and equitable sanitation and hygiene by 2030 (Abubakar, 2017). In Nigeria, low access to improved water and sanitation remains a major contributor to high morbidity and death rates among children under the age of five.The use of contaminated drinking water and poor sanitation increased vulnerability to waterborne diseases such as diarrhea, which kills over 70,000 children under the age of five each year (Rawlings and Seghosime, 2022). Hygiene and hygiene promotion are key components of the WASH framework, acting as the link that connects clean water and adequate sanitation to improved public health outcomes.

While water infrastructure provides resources and sanitation infrastructure controls waste, hygiene promotion is concerned with the behavioral adjustments required to prevent disease and optimize the health benefits of the other two pillars (Izah *et al.*, 2024). According to Reed and Bevan (2017), hygiene promotion is "the planned and systematic attempt to enable people to take action to prevent water and sanitation-related illness, and to maximize the benefits of improved water and sanitation facilities". Hygiene promotion is more than just communicating information; it is a systematic process of encouraging behavioral changes with the ultimate goal of minimizing water- and sanitation-related diseases (Reed and Bevan, 2017). Hygiene promotion is more than just giving soap; it is a multifaceted process of behavior change that includes communication, education, and community-led efforts (CDC, 2025).

Hygiene promotion is "the most cost-effective intervention in the WASH sector" according to

International Medical Corps. This compelling evaluation frames hygiene promotion as a high-leverage investment with big benefits at a cheap cost. A health risk assessment (HRA) is a critical component of the Water, Sanitation, and Hygiene (WASH) framework, acting as a systematic procedure for identifying, analyzing, and managing potential health risks associated with water supply and sanitation systems (Budge *et al.,* 2022). It is a proactive approach that goes beyond basic compliance and prioritizes treatments based on the greatest risk reduction. According to the US Environmental Protection Agency (USEPA), the four basic components of HRA are hazard identification, dose-response assessment, exposure assessment, and risk characterization (USEPA, 2023). The goal is to guarantee that WASH services are not only functional but also safe and sustainable, which directly contribute to public health outcomes.

1.1 AIM AND OBJECTIVES

The aim of this study is to assess the sanitation and health risks of residents of the Amufi community, Benin city. The objectives of this study are to;

1. Evaluate the current sanitation status in Amufi community.
2. Further evaluate the hygiene status of residents of Amufi community.
3. Identify the common health risks and diseases associated with poor sanitation in the community.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 UNDERSTANDING SANITATION AND IMPLICATION OF HEALTH RISKS

According to UNICEF and WHO (2015), sanitation is the utilization of facilities and services for the safe disposal of human urine and feces. It encompasses actions meant to preserve and enhance the fundamental environmental elements that have an impact on human welfare. Access to sanitation benefits health promotion and illness prevention in a number of ways (Donacho *et al.*, 2022). Furthermore, poor sanitation leads to illness, disease, and low productivity, all of which feed the poverty cycle. In places like Amufi and urban slums, the scope of the issue is more apparent. Sustainable development requires access to clean water and sanitation. In 2010, the United Nations General Assembly declared safe and adequate drinking water and sanitation to be human rights that are essential for well health. As a result, access to water and sanitation is regarded as a human right rather than a privilege for all men, women, and children.

Although progress has been achieved in the previous decade to providing safe drinking water and sanitation to people all over the world, billions of people remain without access to these services. WHO and UNICEF (2015) report that only 68% of people worldwide use improved sanitation facilities, with only 30% and 47% of people in Sub-Saharan Africa and Southern Asia, respectively, using improved sanitation. This means that approximately 2.4 billion people lack improved sanitation, and 13% of people live without any kind of sanitation and defecate in the open. According to reports, one of the leading causes of death for children worldwide is inadequate drinking water and sanitation, and those who lack access to these services do not genuinely have more opportunity to reach their full potential in the workplace. (Inah *et al.,* 2020). About 10,000 people perish every day in most nations, especially developing countries,

from illnesses linked to contaminated drinking water and inadequate sanitation, and many more suffer from a variety of crippling ailments. According to Inah *et al*. (2020), public health improves in tandem with improvements in sanitation and water supply. Cholera, diarrhea, dysentery, hepatitis A, malaria, typhoid, and polio are among the diseases that are closely associated with contaminated water and inadequate sanitation. People are exposed to avoidable health risks as a result of inadequately maintained sanitation. An estimated 829,000 individuals, including 297,000 children under the age of five, pass away from diarrhea each year as a result of poor hand hygiene, sanitation, and drinking water (WHO and UNICEF, 2017). However, if these risk factors were addressed, diarrhea is mostly preventable and annual infant deaths may be averted. Over 220 million people needed preventive treatment for schistosomiasis, an acute and chronic illness brought on by parasitic worms that are contracted by contact to contaminated water and inadequate sanitation, according to WHO and UNICEF (2017). Most significantly, Sub-Saharan Africa, including Nigeria, is responsible for a sizable portion of this population. Poor sanitation is evident in many urban informal settlements, such as the Amufi community, where there are no formal sewage facilities and people must rely on open drainage channels and unofficial disposal techniques (WHO, 2022). Numerous illnesses, including as intestinal worm infections, cholera, and typhoid fever, are directly linked to the widespread adoption of these subpar techniques (WHO, 2022).

2.2 RESPONSIBLE SANITATION PRACTICES FOR A HEALTHIER ENVIRONMENT

Inadequate sanitation triggers a significant and systemic cascade of bad health outcomes that extend well beyond a mere rise in disease. The impact of poor sanitation extends its reach into the natural environment, where human waste becomes a cause of substantial ecological devastation. Surface waters, groundwater, and oceans are directly contaminated when untreated wastewater and human waste from sources like open defecation are released into the

environment (Amanabo-Arome and Abbas, 2021). This is a widespread issue; 44% of home wastewater globally is discharged without safe treatment, and an estimated 80% of wastewater worldwide is discharged without any treatment. A variety of dangerous chemicals and bacteria are introduced by the ensuing pollution, endangering aquatic life and poisoning essential drinking water sources (Amanabo-Arome and Abbas 2021).

The process of nutrient overload in water bodies, known as eutrophication, has a significant environmental impact. High concentrations of nutrients like phosphorus and nitrogen are found in untreated wastewater. Although they are necessary for plant growth, an overabundance of them encourages the unchecked growth of algae, which results in toxic algal blooms (Choudhary *et al.*, 2020). Fisheries collapse and biodiversity is lost as a result of these blooms' depletion of the water's dissolved oxygen, which produces "dead zones" where fish and other aquatic life cannot live (Choudhary,*et al.*, 2020). Inadequate waste management techniques, such open defecation, release pollutants and pathogens into the soil in addition to polluting the water. Because infections can spread from polluted soil to crops, this not only lowers agricultural fertility and decreases soil quality but also poses major food safety risks (Schofield, 2022). The fundamental functions that a healthy ecosystem offers, such the provision of safe food and clean air, are compromised by this depletion of natural resources (Münzel *et al*., 2023). Untreated trash continuously enters these systems, indicating a failure to manage the socio-environmental interaction. Contaminated soil and water become direct vectors for human disease, causing ecological devastation and public health crises (Schofield, 2022). Disease transmission is more likely when natural barriers between human and wildlife habitats are eliminated or when shared areas are contaminated by human and animal waste (Münzel *et al*., 2023). A unified and systematic approach to sanitation is therefore not only a matter of public health policy but also a strategic imperative for global security because it prevents the emergence of new infectious threats and increases resilience in all three domains namely;

human, animal, and environmental health. Open sewage pits and dirty latrines are examples of poorly maintained sanitation systems that discharge hazardous gasses like methane and ammonia into the atmosphere. These gases contribute to both air pollution and climate change. According to (USEPA, 2023), improved waste collection and handling sanitation systems can significantly reduce greenhouse gas emissions, aligning sanitation practices with broader environmental sustainability goals.

2.3 THE IMPACTS OF SANITATION PRACTISES ON PUBLIC HEALTH

The social determinants of health, or the non-medical circumstances in the settings where people are born, live, and work, constitute the foundation of rural sanitation and have an impact on a variety of health, functional, and quality-of-life outcomes (Reed and Bevan, 2017). The challenge is enormous in scope. Around the world, 419 million people continue to defecate in open areas, such as behind bushes, in city gutters, or into open bodies of water (WHO, 2022). A significant health crisis is exacerbated by this behavior and insufficient wastewater treatment, since 44% of home wastewater was released in 2020 without proper treatment (WHO, 2022). According to estimates from the World Health Organization (WHO), poor sanitation causes 564,000 fatalities annually, the great majority of which take place in low- and middle-income nations (WHO, 2022). In these areas, solid waste management is particularly difficult, and improper practices such refuse dumping and uncontrolled burning are frequently the result of a lack of knowledge and the right equipment (Abubakar, 2017).

Particularly in low-income and densely populated areas, poor sanitation fosters the growth of dangerous bacteria and starts a vicious cycle of illness transmission (Smith, 2024). The main way that diseases spread is by the fecal-oral pathway, where contaminated water, food, and hands serve as vectors for a variety of diseases after viruses from human waste pollute the environment and are then consumed. (WHO, 2025).

Aumfi's population lives in a rural area where there is no adequate barrier between human waste and the environment, which makes it easy for many diseases to spread. The list of diseases that are linked to poor sanitation is long and includes cholera, typhoid, dysentery, polio, hepatitis, schistosomiasis, and intestinal worm infections. One particularly devastating effect is the high mortality rate from diarrheal diseases, which are a leading cause of death among children under five (CDC, 2025). According to the World Health Organization (WHO) and the Centers for Disease Control and Prevention (CDC), a startling 88% of these deaths are caused by inadequate WASH conditions (CDC, 2025). Recurrent infections impair a child's capacity to absorb nutrients, which can result in malnourishment, stunted growth, and cognitive deficiencies that impede their development and long-term potential, the effects extend beyond mortality.

The most obvious and serious effect of poor sanitation is diarrheal illnesses (WHO, 2025). These include serious gastrointestinal diseases brought on by bacteria, viruses, and parasites, such as cholera, typhoid, and dysentery (WHO 2022). Better water, sanitation, and hygiene might significantly reduce the 395,000 deaths from diarrhea among children under five in 2019 alone, according to the WHO (2025).

Acute infections are merely one of the many negative health effects of inadequate sanitation. Contributions to stunting, malnutrition, and cognitive impairment are among the most serious long-term effects. By impeding nutritional absorption and raising the risk of dehydration, diseases linked to poor sanitation contribute to malnutrition (Amanabo-Arome and Abbas, 2021). Recurrent diarrheal infections in children can result in limited growth and impaired immunity, which increases their susceptibility to various diseases. Long-term exposure to environmental pollutants and dangerous microorganisms can cause developmental delays and impaired cognitive function, which has long-term consequences that limit future academic and

economic possibilities. The implications are not just confined to physical health (Amanabo-Arome and Abbas, 2021).

Mental and social well-being are also severely impacted by the lack of private, secure restrooms. Lack of private restrooms can put women and girls at serious danger for sexual assault and cause them to experience psychological anguish (Okesanya *et al.*, 2024). Furthermore, making children postpone using the restroom can result in physical health problems like infections of the reproductive system and urinary tract. Overall, anxiety and missed opportunities for employment and education are two ways that inadequate sanitation lowers human well-being (Giovanni and Mentore, 2020). Additionally, the ongoing requirement for medicines to treat illnesses brought on by inadequate sanitation fuels the development of antimicrobial resistance (AMR), a hazard to global public health (Amanabo-Arome and Abbas, 2021).

A self-sustaining, intergenerational cycle of poverty can be started by the detrimental consequences of inadequate sanitation on a child's health and education. For instance, recurrent infections impair a child's capacity to absorb nutrients, resulting in stunting and malnourishment. Due to these cognitive and physical impacts, students perform less academically and attend school less frequently, which restricts their future employment options and income potential (Chakrabarti *et al*., 2020). This keeps the family impoverished, which makes it harder to spend money on better sanitation, thereby perpetuating the cycle for the following generation. This causal route shows that cleanliness is not only a health concern but also a key factor in the development of human capital and a fundamental driver of socioeconomic mobility.

In rural areas, improper waste disposal practices including open dumping and burning provide major health hazards (Inah *et al*, 2020). Nigeria and many other developing nations lack the legal structure necessary to impose appropriate waste management procedures. Lack of access

to and availability of safe sanitation facilities and services is the root cause of detrimental effects on health and the environment. In rural communities like Amufi, in

adequate sanitation in homes, schools, marketplaces, medical facilities, and public areas will continue to jeopardize not only human lives but also the environment (both natural and built) (Amanabo-Arome and Abbas, 2021).

2.4 THE SYNERGY BETWEEN WATER, SANITATION AND HEALTH

The United Nations Sustainable Development Goal (SDG) 6 states that universal and equitable access to adequate water and sanitation by 2030 is a key development priority on a worldwide scale (Borja-Vega and Kloeve, 2018). Water and sanitation were specifically acknowledged by the UN General Assembly in 2010 as human rights that are "essential for the full enjoyment of life and all human rights" (UNICEF, 2017). More than half of the sevety percent of water accessed and used by Nigerians are contaminated. This indicates that majority of the water source utilized by most Nigerians are unfit for use (Imarhiagbe *et al.*, 2023). About 60.5% of people in rural areas have access to safely managed drinking water, which is a significant 23% lower than the urban coverage of 83.5%. In terms of sanitation, there is a comparable, but somewhat smaller, disparity: rural areas have 17.3 percentage points less access to safely managed sanitation (48.5%) than urban areas (WHO and UNICEF, 2025).

This persisting disparity suggests that the main obstacle facing global WASH strategy is shifting. Although there have been commensurate improvements in rural sanitation since 2015, frequently as a result of effective efforts to end open defecation, the significant disparity in securely managed services identifies a new systemic constraint. A toilet facility alone is insufficient for a safely maintained status; sanitary treatment and disposal technologies for fecal sludge are also necessary. The crucial step of managing fecal sludge and subsequent treatment is frequently overlooked when rural communities use crude pit latrines or unimproved systems,

which increases the danger of contamination and falls short of the quality threshold needed for complete health protection (Rawlings and Seghosime, 2022).

Politically unstable regions are particularly affected by the extreme disparity. Safely managed drinking water coverage is 33% lower in fragile environments than in non-fragile ones (WHO and UNICEF, 2025). The combination of violence, instability, and subpar service delivery puts SDG 6's universal access targets at risk of failing. Global progress will remain extremely unequal, marked by geographic exclusion and continuous cycles of dependency, unless the funding and governance gaps required to move rural and low-income settings up the service ladder to the Safely Managed by tier are strategically addressed. Also, effective measures to encourage personal hygiene and disinfect the environment are usually necessary to improve public health because germs can survive on our bodies as well as in our surroundings, producing illnesses and diseases (Imarhiagbe *et al.*, 2024).

2.5 THE CRUCIAL ROLE OF WATER, SANITATION AND HYGIENE

Water, sanitation, and hygiene also encourage good hygiene practices. These services are crucial for the well-being of families and communities and aid in the accomplishment of the Sustainable Development Goals of 2030, particularly those related to gender equality, safe drinking water, health, nutrition, and education (Borja-Vega and Kloeve, 2018). Progress on the entire 2030 Agenda is largely dependent on fair hygiene, sanitation services, and safely managed water. By acting as a universal accelerator, these services enable the achievement of other SDGs, especially those pertaining to gender equality (SDG 5), health (SDG 3), education (SDG 4), and poverty eradication (SDG 1) (Borja-Vega and Kloeve, 2018). WASH funding is acknowledged as a very successful and effective intervention. Access to facilities and hygiene education are categorized as extremely cost-effective, life-saving public health interventions. Enhancing WASH services could prevent around 9.1% of illness cases or 6.3% of all deaths globally (Hutton and Chase, 2018).

The World Health Organization claims that improved WASH services, particularly in hospitals, schools, marketplaces, and other public places, can dramatically reduce the prevalence of illnesses like diarrhea and are essential to reducing the global disease burden (Grimes *et al*., 2017). A huge and avoidable global health burden is caused by inadequate WASH services. Diarrhea continues to be the leading cause of death for children under five, with WASH problems directly responsible for almost 88% of these deaths. According to the World Health Organization (WHO), enhancing sanitation, hygiene, and access to water could avert at least 9.1% of the world's disease burden and 6.3% of all fatalities. Inadequate WASH contributes to the spread of chronic diseases, such as cholera and extremely hazardous drug-resistant types of typhoid fever, in addition to endemic children illnesses. Improved sanitation, better hygiene, and a successful immunization campaigns are necessary for the prevention of these diseases (Grimes *et al.,* 2017).

In addition to lowering the prevalence of waterborne infections, having access to clean water and adequate sanitary facilities enhances productivity, especially for women and girls who usually face the task of water collection. Safe WASH in health care facilities (HCFs) is crucial for mother and infant health. The burden on public health systems is much lessened when infectious diseases are prevented and controlled in HCFs and communities through better water, sanitation, and hygiene practices. This also helps to avoid the overuse of antibiotic drugs (UNICEF, 2017).

Certain NTDs, such as intestinal worms and trachoma, can be prevented from spreading by practicing basic hygiene and having access to clean water and proper sanitation. WASH (safe drinking water, sanitation, and hygiene) is essential to raising people's quality of life (Grimes *et al*., 2017). Better physical health, environmental protection, higher educational achievements, convenience time savings, the guarantee of dignified lifestyles, and equitable treatment for men and women are just a few of the enhanced standards made possible by WASH. Vulnerable and

impoverished groups have worse related behaviors and less access to better WASH services. Therefore, improving WASH is essential to lowering poverty, advancing equity, and bolstering socioeconomic growth (Okesanya, *et al,*. 2024).

Strong, climate-resilient WASH infrastructure offers vital protection against the growing threats of extreme weather events, like intensifying floods and protracted droughts. There is an inherent correlation between educational attainment and the availability of WASH facilities. Dropout rates are higher in schools with subpar water, sanitation, and hygiene facilities. Lack of access to clean water and adequate sanitation, which are essential for Menstrual Hygiene Management (MHM), makes matters worse for girls. Lack of these resources exacerbates the gender gap in education by being a major contributor to school absenteeism, especially in rural regions (Mills and Cumming, 2016).

Enabling girls to go to school through WASH infrastructure gives them the opportunity to further their education, find employment, and become financially independent. Entire communities will benefit economically and health-wise from this empowerment, which is essential for ending the cycle of poverty and advancing gender equality. Improving access to WASH services can improve health,further and aid student learning, prolong life expectancy, gender equality, and other issues that are important for international development, clean water for ingestion and food preparation is also very necessary for human health (Imarhiagbe *et al.*, 2023).

The importance of water and sanitation, particularly in rural areas like Amufi, cannot be overstated. Interventions involving water enhance its quantity, quality, or management. Interventions in sanitation keep human touch and excrement apart. These vital services are necessary for sustainable development, human wellness and dignity.

2.6 CHALLENGES IN SANITATION PRACTICE

Devastating public health outcomes, mainly in the form of high rates of child mortality and endemic waterborne illnesses, are directly caused by the structural failure of rural WASH services. One of the key causes of Nigeria's exceptionally high rates of sickness and mortality among children under five is still the lack of access to better water and sanitation. Every year, over 70,000 children under the age of five die as a result of the widespread use of contaminated water for drinking and unsanitary circumstances.

Inadequate restrooms, improper toilet facility emptying procedures, and a lack of approved wastewater disposal locations are problems in many localities. Populations are concentrated by rapid urbanization, but systems are severely strained because growth is frequently not accompanied by corresponding sanitation development. Sewerage is frequently unstable or nonexistent in crowded, impoverished, and unofficial urban settlements, and there is a severe shortage of space for restrooms (Seetharam, 2015). Decentralized wastewater treatment systems, while a feasible alternative, require regular maintenance, adequate administration, and a certain level of technical knowledge and skills, which are frequently not readily available in rural and remote locations. Institutional and financial constraints severely limit the ability to scale and maintain sanitary systems(Seetharam, 2015).

The worldwide budget gap to meet the SDGs for universal access to safe drinking water and sanitation by 2030 is expected to be between $131.4 and $140.8 billion annually. Inadequate funding, corruption, resource mismanagement, and a lack of stakeholder participation in planning and execution are the main reasons why systems fail as a result of poor management and political will. Sanitation often receives little funding, human resources, and technical assistance, making it a low political priority (Okesanya, *et al,*. 2024). Personal preferences for using fields for defecation, cultural conventions, traditional beliefs, and the notion that there is little health risk, especially from children's excrement, are some additional obstacles to good

sanitation practices. Poverty is a significant obstacle since some end users may expect services to be free and may not consider WASH to be their first concern.

Poor people may also face challenges due to a lack of financial literacy and the high interest rates or lengthy processing periods associated with sanitation loans (Abubakar, 2017). Lack of proper services disproportionately affects women and girls. One of the biggest obstacles to their safe and healthy involvement in school is the lack of private WASH areas at home and at school. Moreover, cultural limitations and a dearth of role models frequently hinder women's involvement in WASH leadership positions. A 2023 estimate shows that 1.7 billion people still lack access to even the most basic sanitation facilities, while a 2017 JMP estimate found that 4.5 billion people lacked safely managed sanitation (WHO and UNICEF, 2024). These figures demonstrate that even with the acknowledged significance and continuous advancements, a sizeable section of the world's population is still at risk from the various negative effects of inadequate sanitation.

2.7 HEALTH RISKS LINKED TO INADEQUATE SANITATION

Inadequate sanitation and hygiene practices have been directly related to a number of disease outbreaks and the spread of those illnesses and a significant number of death globally. Numerous illnesses, such as cholera, dysentery, typhoid fever, diarrhea, dehydration, and vomiting, can be brought on by unsanitary surroundings and inadequate hygiene practices (CDC 2025). These illnesses present serious health hazards, especially in settings with poor or insufficient sanitary services.

2.7.1 Cholera

Cholera is an abrupt diarrheal illness that is characterized by severe, watery diarrhea and the possibility of potentially fatal dehydration. Acute watery diarrhea and frequent vomiting that can linger for hours are symptoms associated with the infectious disease cholera, which is brought on by consuming food or water tainted with the *Vibrio* cholera bacteria. It has been

acknowledged that cholera is a widespread affliction that disproportionately affects the most vulnerable and impoverished individuals in low- and middle-income nations such as Nigeria (Olaitan *et al.*, 2022). However, its spread is explained by a number of causes, such as substandard living circumstances and a lack of access to drinkable water, sanitation, and hygiene (WASH) services.

Despite being an endemic diarrheal illness, it has a strong correlation with both civil unrest and natural disasters. Furthermore, residing in periurban regions, delaying seeking medical attention, and having inadequate surveillance are all variables that contribute to greater rates of cholera-related deaths (Olaitan *et al*., 2022). However, living in an urban area and seeking medical attention promptly has been associated with a decreased risk of cholera-related mortality. Outbreaks of cholera, a fecal-oral transmissible infection, have frequently been connected to contamination and a shortage of drinkable water in areas where open defecation is common (Akingbola *et al.,* 2025).

In 69 endemic countries, an estimated 2.9 million cholera illnesses result in 95,000 fatalities annually (WHO Aand UNICEF, 2025). When food or water is contaminated by feces, cholera is spread. Thus, maintaining good cleanliness and access to clean water are essential to stopping its spread. (Chase and Hutton, 2018). In 2024, the epidemiological situation significantly worsened despite the later reactivation of control efforts, such as the establishment of the National Cholera Emergency Operations Center (EOC) to handle the crisis. Compared to the same period in 2023, recent studies show a 174% increase in mortality and a 108% increase in suspected cholera cases by mid-2024. This pattern indicates that the underlying structural problems are not being addressed by the control measures in place (Akingbola *et al.,* 2025).

2.7.2 Dystentry

Dysentery is defined as an acute diarrhea lasting less than 14 days during which the patient passes visibly bloody feces. The majority of stools in dysenteric illness contain mucus, but not

all of them may have visible blood. Fever and systemic toxicity are frequently linked to infectious dysentery.

Although antibiotics may raise the risk of problems in a small percentage of patients, such as those infected with Shiga toxin-producing Escherichia coli (STEC), they are crucial in the treatment of acute dysentery (Pfeiffer *et al.*, 2012). Only fecal pollution of source water is linked to endemic dysentery. Sanitation, cleanliness, and other aspects of the home are not major risk factors, nor are subsequent water contaminations in the home or during transportation.

If confirmed, water and sanitation policies that prioritize the installation of greater quality, lower-risk sources, such standpipes, would reduce the burden of disease. The sixth Sustainable Development Goal, "access to safe drinking water," might nevertheless be accomplished in cases where the current, higher-risk sources cannot be replaced. Appropriate interventions for water quality remediation via treatment at the source or in the home would guarantee this.

2.7.3 Typhoid

Typhoid fever, a worldwide public health concern, an infection brought on by Salmonella enterica serovar Typhi (S. Typhi). The only host and reservoir for Typhi is humans, and the disease is spread by consuming food or drink tainted with feces. Symptoms of typhoid fever vary and include low-grade fever, lethargy, dry cough, diarrhea, constipation, and abdominal pain. If left untreated, symptoms usually last 3 to 4 weeks, but complications like intestinal perforation, gastrointestinal bleeding, and typhoid encephalopathy can occur (Brockett *et al*., 2020). Typhoid fever is thought to affect 11 to 20 million people annually, with 128,000 to 161,000 of those cases occurring in low- and middle-income countries (LMICs) (Kim *et al.,* 2023). Isolating and identifying Typhi from a culture of blood, stool, or bone marrow is the gold standard for diagnosing typhoid; however, healthcare facilities in LMIC frequently lack the capacity to do bacterial culture. As a result, while some typhoid cases go undiagnosed and

receive ineffective treatment, many are identified clinically or through the use of unreliable serologic testing (Grimes *et al.,* 2015). Up to 5% of patients will develop into asymptomatic chronic carriers, possibly excreting the germs for years after infection, and individuals may shed Typhi in their urine or stool for 1–12 months after infection. Despite the fact that there are a number of efficient treatment and preventative methods, WASH is thought to be essential for preventing typhoid fever since S. Typhi is spread via fecal contamination of food or water (Kim *et al.,* 2023). Improving water, sanitation, and hygiene (WASH) and food-handling interventions are essential control measures to stop typhoid transmission because of the fecal–oral channel of transmission and the ongoing shedding by asymptomatic carriers in endemic populations (Brockett *et al.*, 2020).

2.7.4 Diarrhoea

Diarrhoea is defined as the passage of loose or liquid stools three or more times per day (WHO, 2013). Globally, diarrhoeal diseases are caused by infectious agents such as bacteria (e.g. E. coli, salmonella, shigella, campylobacter), viruses (e.g. rotaviruses, noroviruses and adenoviruses), and protozoa (e.g. cryptosporidium, amoeba and giardia), however, the aetiology of diarrhoeal diseases varies from region to region. According to Grimes *et al.* (2015), rotavirus is the primary cause of severe and moderate diarrhea. According to the WHO, non-infectious disorders including intoxication or noninfectious inflammatory diseases account for just a small percentage of diarrhea cases. Children under the age of five account for the majority of diarrheal mortality, and in low-income nations, the very poor are disproportionately affected by diarrhea (Amadu *et al*., 2023). Diarrheal disease is the major cause of death in sub-Saharan Africa and the second most common cause of morbidity and mortality among children under five in both low- and middle-income nations. A child's nutritional status can also be impacted by diarrheal illness, which can have negative health and socioeconomic effects.

According to a multi-country study, five or more episodes of diarrhea may account for 25% of stunting in children under two (Amadu *et al.*, 2023). Environmental enteric dysfunction (EDD) may potentially be partially explained by prolonged exposure to fecal microorganisms. The majority of diarrheal illnesses linked to inadequate WASH are endemic, but others, like cholera and typhoid fever, are epidemic in character. In addition, the continent experiences severe epidemics that lead to elevated rates of illness and mortality. The fecal-oral channel is the typical way that diarrheal illnesses are spread, a person's exposure to fecal pathogens through multiple pathways is increased by poor WASH (Mills and Cumming, 2016).

2.7.5 Dehydration

Food poisoning and severe gastroenteritis, which are frequently the results of this contamination pathway, are frequently accompanied by vomiting. Prolonged vomiting and watery diarrhea can cause dangerously fast dehydration, which can sometimes occur within hours of the onset of symptoms. If treatment is delayed, this rapid fluid loss is what makes the condition so deadly (CDC, 2025).

2.7.6 Vomiting

Vomiting is a serious and hazardous sign of a number of acute infectious diseases that flourish in unsanitary and unhygienic conditions. Gastrointestinal illnesses, which frequently present with vomiting, are caused by pathogens such as bacteria and viruses entering the human digestive system directly and dangerously through poor sanitation measures (Brockett *et al*., 2020). This system explicitly connects personal illness to a breakdown in the community's sanitation infrastructure. One of the leading causes of death worldwide is diarrheal illnesses, many of which are caused by poor water, sanitation, and hygiene (WASH). Food poisoning and severe gastroenteritis, which are frequently the results of this contamination pathway, are frequently accompanied by vomiting.

CHAPTER THREE

RESEARECH METHODS

3.1 Study Area

The study was conducted in Amufi Community, located in Ikpoba-Okha Local Government Area of Edo State, Nigeria. Amufi lies on the outskirts of Benin City and represents a rapidly growing peri-urban settlement influenced by both rural and urban lifestyles. Geographically, it is situated at approximately latitude 6.3170° N and longitude 5.6145° E. The area experiences a humid tropical climate with distinct wet (April–October) and dry (November–March) seasons. Residents are mainly traders, students, artisans, civil servants, and subsistence farmers. The community features a mix of modern concrete buildings and older mud structures, with limited access to clean water, sanitation facilities, and waste disposal systems, these are factors that directly affect hygiene and health outcomes.

3.2 Method of Data Collection

A descriptive cross-sectional study was conducted in Amufi Community, located in Ikpoba-Okha Local Government Area of Edo State, Nigeria. Data were collected using a structured and pre-tested questionnaire administered to 220 randomly selected residents. The questionnaire comprised two sections: one focused on sanitation and hygiene practices, and the other on health status indicators. Respondents were selected through a simple random sampling technique to ensure fair representation across the community.

3.3 Method of Data Analysis

Data obtained from the questionnaires were analyzed using descriptive statistics, specifically frequency and percentage, to summarize and interpret the sanitation, hygiene, and health conditions of the respondents.

Plate 3.1: Open site refuse dumping in Amufi community, Benin city

Plate 3.2: Dumpsite in Amufi community

Plate 3.3: Dumping of refuse in drainage canal in Amufi community

CHAPTER FOUR

4.0 RESULTS

The results obtained from the questionnaire survey of the sanitation and health status of residents of the Amufi community are presented. Data were collected using a structured and pre-tested questionnaire administered to 220 randomly selected residents.

Table 4.1 presents the socio-demographic distribution of the 220 respondents who participated in the study. The results show that the age structure of respondents was largely youthful. More than half (53.6 %) were between 18 and 25 years, followed by 19.1 % within the 26 – 35 years bracket. Respondents aged 36 – 50 years accounted for 15.5 %, while those aged 51 – 60 years made up 7.7 %. Only 4.1 % were aged 61 years and above. In terms of gender, females represented a slight majority (55 %), while males constituted 45 %. The educational profile of respondents shows that the community is relatively well-educated. About 80.5 % had tertiary education, 14.5 % had completed secondary school, and small proportions had vocational (1.8 %) or primary (1.8 %) education. Only 1.4 % reported no formal schooling. Regarding occupation, the largest group were students (50.9 %), reflecting the youthful composition of the sample. Traders (15 %), civil servants (14.1 %), and unemployed individuals (9.5 %) followed, while farmers and self-employed artisans each accounted for less than 5 %. For marital status, most respondents were single (77.7 %), while 19.1 % were married, 2.3 % widowed, and less than 1 % co-habiting. One-third (33.6 %) of respondents earned above ₦150,000 monthly, 27.3 % earned between ₦100,001 and ₦150,000, and 19.1 % between ₦50,001 and ₦100,000. Only 14.5 % earned less than ₦50,000, and 5.5 % fell below ₦10,000. With respect to religion, the majority (89.5 %) identified as Christians, 3.2 % as Muslims, and 1.8 % practiced traditional religion.

Table 4.1: Distribution of Respondents by Socio-Demographic Variables

Variable	Category	Frequency	Percentage (%)
Age (years)	18–25	118	53.6
	26–35	42	19.1
	36–50	34	15.5
	51–60	17	7.7
	≥61	9	4.1
Gender	Female	121	55.0
	Male	99	45.0
Educational Level	No formal education	3	1.4
	Primary	4	1.8
	Secondary	32	14.5
	Vocational	4	1.8
	Tertiary (University)	177	80.5
Occupation	Student	112	50.9
	Trader	33	15.0
	Civil servant	31	14.1
	Unemployed	21	9.5
	Farmer	7	3.2
	Self-employed/Business	8	3.6
	Others (Driver, Nurse, Teacher, etc.)	8	3.6
Marital Status	Single	171	77.7
	Married	42	19.1
	Widowed	5	2.3
	Co-habiting	2	0.9
Household Size	1–3	46	20.9
	4–6	117	53.2
	7–9	46	20.9
	≥10	11	5.0
Monthly Household Income (₦)	Below ₦10,000	12	5.5
	₦10,000 – ₦50,000	32	14.5
	₦50,001 – ₦100,000	42	19.1
	₦100,001 – ₦150,000	60	27.3
	Above ₦150,000	74	33.6
Religion	Christianity	197	89.5
	Islam	7	3.2
	Traditional	4	1.8
	Others		

Table 4.2 presents the key sanitation indicators for residents of the study area. Most respondents (87.7%) use flush toilets, while 9.5% rely on pit latrines and only 0.9% have no toilet facility, showing that most households have access to improved sanitation. However, 39.5% share their toilets with other households, which may increase hygiene risks. In terms of maintenance, 55.9% clean their toilets weekly and 33.2% daily, while a few clean monthly (2.7%) or rarely (2.3%). About 66.4% have a separate bathing area, though 33.6% do not, suggesting some overcrowded or poorly planned homes. For waste disposal, half (50.9%) use formal waste collection services, while 32.3% burn waste and 17.3% dump it in open spaces. Waste collection is irregular, with only 5.5% reporting daily collection and 30.9% saying it happens rarely. Access to public sanitation facilities is nearly balanced, with 48.2% reporting access and 51.8% without. Of those with access, most rated the facilities as fair (38.7%) or poor (21.7%). Only 44.5% of respondents were aware of sanitation campaigns, and just 8.2% found them very effective. Similarly, only 32.7% reported adequate waste facilities and 36.8% had received sanitation training. These findings suggest that while infrastructure exists, community engagement and hygiene education remain limited.

Table 4.3 presents respondents' key hygiene practices within the study area. Findings reveal that only 44.5 % of households have a designated handwashing place, while 55.5 % do not, suggesting that hand hygiene facilities are still inadequate in many homes. Regarding handwashing behavior, 30.0 % of respondents reported always using soap and water, 40.5 % did so most of the time, and 21.4 % sometimes. A smaller group rarely (3.2 %) or never (5.0 %) used soap, indicating that consistent hygiene habits are yet to be fully adopted. The main triggers for handwashing were before eating (90.0 %), after using the toilet (84.5 %), before preparing food (69.1 %), and after handling waste (64.1 %), showing good awareness of critical hygiene moments.

Table 4.2: Key Sanitation Indicators in Amufi Community

Indicator	Response	Frequency	Percentage (%)
Type of Toilet Facility	Flush toilet	193	87.7
	Pit latrine	21	9.5
	VIP latrine	5	2.3
	No facility (Bush/Field)	2	0.9
Toilet Shared with Other Households?	Yes	87	39.5
	No	133	60.5
Frequency of Toilet Cleaning	Daily	73	33.2
	Weekly	123	55.9
	Monthly	6	2.7
	Rarely	5	2.3
	Never	13	5.9
Separate Bathing Place at Home?	Yes	146	66.4
	No	74	33.6
Household Waste Disposal Method	Collected by waste management	112	50.9
	Burned	71	32.3
	Dumped in open space	38	17.3
	Buried	5	2.3
	Other	3	1.4
Waste Collection Frequency	Daily	12	5.5
	Weekly	44	20.0
	Bi-weekly	41	18.6
	Monthly	48	21.8
	Rarely	68	30.9
	No collection	7	3.2
Access to Public Sanitation Facilities?	Yes	106	48.2
	No	114	51.8
Condition of Public Facilities (n=106)	Excellent	14	13.2
	Good	28	26.4
	Fair	41	38.7
	Poor	23	21.7
Sanitation Campaigns in Community?	Yes	98	44.5

	No	122	55.5
Effectiveness of Campaigns (n=98)	Very effective	8	8.2
	Somewhat effective	62	63.3
	Not effective	28	28.6
Adequate Waste Disposal Facilities?	Yes	72	32.7
	No	148	67.3
Received Training on Sanitation?	Yes	81	36.8
	No	139	63.2

In terms of frequency, 35.5 % washed their hands more than five times daily, while 29.1 % did so four to five times and 26.4 % two to three times. Only 9.1 % washed hands only when necessary. Access to hygiene products such as soap was high (90.0 %), but among the 10.0 % without access, the main barriers were high cost (59.1 %) and unavailability (40.9 %). For hand drying, most respondents used towels (44.5 %) or cloth (35.5 %), while 18.6 % preferred air drying and 1.4 % used other methods. Among female respondents (n = 121), 89.3 % practiced menstrual hygiene management, mainly using sanitary pads (90.7 %), while 6.5 % used tampons and 2.8 % used cloths. Access to sanitary products was high (92.6 %), but more than half (55.5 %) lacked proper facilities for menstrual waste disposal. Lastly, only 32.7 % of respondents reported participating in hygiene education, while 67.3 % had not.

Table 4.4 presents respondents' reports on the occurrence of waterborne illnesses within the past year. Out of 147 participants, 74 individuals (50.3%) indicated that they had experienced illness after drinking water, while 73 respondents (49.7%) reported no such experience. This shows that about half of the surveyed population had suffered at least one episode of water-related illness, suggesting potential contamination or unsafe water sources within the community.

Table 4.5 further details the types of waterborne diseases reported among the 74 affected respondents. The most frequently mentioned illness was typhoid fever, accounting for 70.3% of cases (representing 35.4% of the total sample). Diarrhea followed at 37.8% of cases (19.0% of total respondents), while cholera (8.1%), dysentery (6.8%), and other unspecified illnesses (10.8%) were also recorded.

Table 4.3: Key Hygiene Practices of Amufi Community Residents

Indicator	Response	Frequency	Percentage (%)
Designated Handwashing Place at Home?	Yes	98	44.5
	No	122	55.5
Use Soap and Water for Handwashing?	Always	66	30.0
	Most of the time	89	40.5
	Sometimes	47	21.4
	Rarely	7	3.2
	Never	11	5.0
Handwashing Triggers (Multiple Response)	Before eating	198	90.0
	After using toilet	186	84.5
	Before preparing food	152	69.1
	After handling waste	141	64.1
Handwashing Frequency/Day	>5 times	78	35.5
	4–5 times	64	29.1
	2–3 times	58	26.4
	Only when necessary	20	9.1
Access to Hygiene Products (Soap, etc.)?	Yes	198	90.0
	No	22	10.0
Reasons for Lack of Access (n=22)	High cost	13	59.1
	Unavailability	9	40.9
Hand Drying Method	Towel	98	44.5
	Cloth	78	35.5
	Air dry	41	18.6
	Other	3	1.4
Menstrual Hygiene Management (Females, n=121)	Yes	108	89.3
	No	13	10.7
Products Used (n=108)	Sanitary pads	98	90.7
	Tampons	7	6.5

	Cloth	3	2.8
Access to Sanitary Products? (n=121)	Yes	112	92.6
	No	9	7.4
Facilities for Menstrual Waste Disposal?	Yes	98	44.5
	No	122	55.5
Participate in Hygiene Education?	Yes	72	32.7
	No	148	67.3

Table 4.4: Prevalence of Self-Reported Waterborne Illness in the Past Year (N=147)

Response	Frequency (n)	Valid %
Experienced illness after drinking water?		
• Yes	74	50.3%
• No	73	49.7%
Missing	0	—

Table 4.5: Types of Waterborne Diseases Reported (Multiple Response, n=74 who said "Yes")

Disease	Frequency (n)	% of Cases (n=74)	% of Total Sample (N=147)
Typhoid	52	70.3%	35.4%
Diarrhea (loose stools)	28	37.8%	19.0%
Cholera	6	8.1%	4.1%
Dysentery (loose stools with blood)	5	6.8%	3.4%
Other (unspecified)	8	10.8%	5.4%

Table 4.6 shows the level of community participation in Water, Sanitation, and Hygiene (WASH) activities within the study area. Out of 220 respondents, only 48 individuals (21.8%) reported being involved in any form of WASH activity, while a large majority, 172 respondents (78.2%), had no participation. This indicates limited community engagement in sanitation and hygiene improvement initiatives.

Table 4.7 shows the roles among those who participated, the largest proportion served as volunteers (58.3%), often supporting community clean-up exercises or hygiene awareness programs. Health workers accounted for 16.7%, while educators (14.6%) contributed mainly through school or public sensitization campaigns. A smaller fraction (10.4%) fell under other roles such as local mobilizers or facilitators.

Community Involvement in WASH

Table 4.6: Participation in WASH Activities (N=220)

Involvement	Frequency	Percentage (%)
Yes	48	21.8
No	172	78.2

Table 4.7: Roles among participants (n=48):

Role	Frequency	Percentage (%)
Health worker	28	58.3
Volunteer	8	16.7
Educator	7	14.6
Other	5	10.4

CHAPTER FIVE

5.0 DISCUSSION

The study found that 87.7% of respondents use flush toilets, which is considerably higher than national averages and represents a significant achievement for the community. This finding contrasts sharply with national statistics indicating that only 26.5% of Nigerians have access to improved drinking water sources and sanitation facilities, with 22% practicing open defecation (UNICEF Nigeria, 2023). The high prevalence of flush toilet usage in Amufi also surpasses findings from similar community-based studies across Nigeria, where pit latrines and open defecation remain predominant in many areas (Agha *et al*., 2024).

However, the finding that 39.5% of households share their toilet facilities with other households presents a concern. Shared sanitation facilities, while better than no facilities, fall short of meeting the Sustainable Development Goal (SDG) 6.2 target for safely managed sanitation services (Shehu and Nazim, 2022). Shared facilities increase hygiene risks through cross-contamination and may discourage proper maintenance practices, particularly in high-density residential areas. This aligns with observations by Imarhiagbe and Eghomwanre (2023), who noted in their assessment of WASH conditions in selected markets in Benin City that shared facilities often resulted in compromised hygiene standards and increased disease transmission risks.

The waste disposal practices observed in this study reveal mixed results. While 50.9% of households utilize formal waste collection services, a substantial proportion (32.3%) still resort to burning waste, and 17.3% dump waste in open spaces. These practices pose environmental and health hazards, including air pollution from burning and disease vector proliferation at open dump sites. The irregular waste collection frequency, with 30.9% of respondents reporting rare collection and only 5.5% receiving daily service, undermines the effectiveness of formal waste management systems. Similar challenges were documented in a

study of waterborne diseases in South-South Nigeria, where inadequate waste management was identified as a major contributor to disease prevalence (Essiet *et al*., 2024).

The limited access to and poor condition of public sanitation facilities (with 51.8% having no access and 60.4% rating available facilities as fair or poor) highlights infrastructural deficits that require urgent attention. This finding resonates with national data showing that only 57.4% of Nigerian households have access to improved sanitation facilities, with significant regional variations (Nigerian National Bureau of Statistics WASH Report, 2021).

The hygiene practices observed in this study reveal both encouraging and concerning patterns. Only 44.5% of households have designated handwashing facilities, which falls significantly below the requirements for adequate hygiene infrastructure. This finding aligns with recent reports indicating that 150.6 million Nigerians lack soap and/or water to wash their hands at home, representing approximately three-quarters of the population (WASH NORM, 2021; SHF, 2024). According to UNICEF (2024), only 17% of Nigerians practice handwashing at critical times, which is consistent with the hygiene gaps identified in this study.

Regarding handwashing behavior, 30.0% of respondents always use soap and water, while 40.5% do so most of the time. This represents a higher rate than some rural Nigerian communities but remains suboptimal for disease prevention. The critical handwashing moments identified by respondents, before eating (90.0%), after using the toilet (84.5%), before preparing food (69.1%), and after handling waste (64.1%), demonstrate good awareness of hygiene principles. However, the gap between knowledge and consistent practice suggests that awareness alone is insufficient without addressing infrastructural and behavioral barriers (Agha *et al*., 2024).

The high access to hygiene products (90.0%) in Amufi community is noteworthy and exceeds rates reported in many rural Nigerian settings. However, the 59.1% citing high cost as a

barrier among those without access reflects the economic constraints that limit hygiene product affordability, particularly for low-income households.

The study's findings on menstrual hygiene management (MHM) reveal both progress and persistent challenges. While 89.3% of female respondents practice MHM and 92.6% have access to sanitary products, the critical gap lies in disposal facilities, with 55.5% lacking proper facilities for menstrual waste disposal. This finding is consistent with recent research by Onubogu and Umeh (2024), who found that Nigerian adolescent girls face numerous challenges in managing menstruation hygienically, including limited access to private and hygienic disposal facilities.

The predominant use of sanitary pads (90.7%) aligns with national trends, though it contrasts with findings from some rural areas where cloth and other improvised materials remain common due to economic constraints (Nnennaya *et al*., 2021; Uzoechi *et al*., 2023). A systematic review by Uzoechi *et al*. (2023) found that only 37% of women aged 15-49 in Kaduna State had everything needed for proper menstrual hygiene, including clean materials, facilities, and proper disposal options. The relatively better situation in Amufi community likely reflects its urban or peri-urban character and higher educational attainment among residents (80.5% tertiary education).

The lack of proper menstrual waste disposal facilities identified in this study poses environmental and health concerns. Improper disposal methods, such as flushing pads down toilets or discarding them in water bodies, can lead to plumbing blockages, environmental contamination, and potential disease transmission (Igbudu and Ikogho, 2025). Period poverty remains a significant concern in Nigeria, with an estimated 37 million girls (Nigeria Health Watch, 2024).

The prevalence of waterborne illness reported in this study (50.3% experienced illness after drinking water in the past year) is alarming and reflects significant water quality and

sanitation challenges. Typhoid fever emerged as the most reported waterborne disease (70.3% of affected respondents), followed by diarrhea (37.8%), cholera (8.1%), and dysentery (6.8%). These findings are consistent with national patterns where typhoid fever consistently ranks as the most prevalent waterborne disease in Nigerian communities (Adegoke *et al*., 2023; Ahmad & Pyeng, 2024).

A multi-state study on the incidence of typhoid fever in sub-Saharan Africa, including Nigeria, reported high disease burden exceeding 100 per 100,000 person-years of observation in four countries, emphasizing the urgent need for typhoid conjugate vaccine rollout and improved WASH services (Florian *et al.*, 2024).

The 37.8% prevalence of diarrheal disease among affected respondents is particularly concerning given that diarrhea accounts for 16% of deaths among Nigerian children and is highly preventable through improved WASH services (Availability of Drinking Water Source and Prevalence of Diarrhea Study, 2022). Research has shown that improved water sources can reduce diarrheal illnesses by up to 40%, and proper handwashing can reduce respiratory infections by over 20% (Nigerian Ministry of Water Resources, 2024). The waterborne disease burden in Amufi aligns with findings from Ondo State, where inadequate access to improved sanitation (less than 30% in some areas) correlated with over 320% prevalence of waterborne diseases (Adegoke *et al.*, 2023).

The socio-demographic characteristics of Amufi community residents significantly influence their sanitation and hygiene status. The predominantly youthful population (53.6% aged 18-25 years) and high educational attainment (80.5% tertiary education) likely contribute to the relatively better sanitation infrastructure observed compared to rural communities. However, the paradox of high education levels coexisting with significant hygiene gaps (only 44.5% have designated handwashing facilities, 67.3% have not participated in hygiene education) suggests that formal education alone does not guarantee optimal WASH practices.

The income distribution in the community shows that while 33.6% earn above ₦150,000 monthly, 14.5% earn less than ₦50,000, indicating economic stratification that may create disparities in access to hygiene products and sanitation services. Economic constraints have been identified as major barriers to sanitation improvement in Nigerian communities, with many households unable to afford toilet construction or regular purchase of soap and other hygiene products (Abubakar *et al*., 2022).

The gender distribution (55% female, 45% male) and marital status (77.7% single) reflect a young, unmarried population, which may influence household sanitation decision-making patterns. Studies have shown that women and girls disproportionately bear the burden of inadequate WASH services, including time spent collecting water and increased vulnerability to gender-based violence (World Bank Nigeria WASH Report, 2021). The high proportion of female respondents in this study provides valuable insights into gender-specific WASH needs, particularly regarding menstrual hygiene management.

CONCLUSION

This study reveals Amufi's sanitation strengths (87.7% flush toilets) overshadowed by hygiene (55.5% no stations) and health (50.3% illnesses) deficits, driven by low involvement (21.8%). Compared to peers, progress outpaces rural norms but lags urban ideals, urging targeted actions for SDG 6. Future research should explore longitudinal impacts.

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APPENDIX

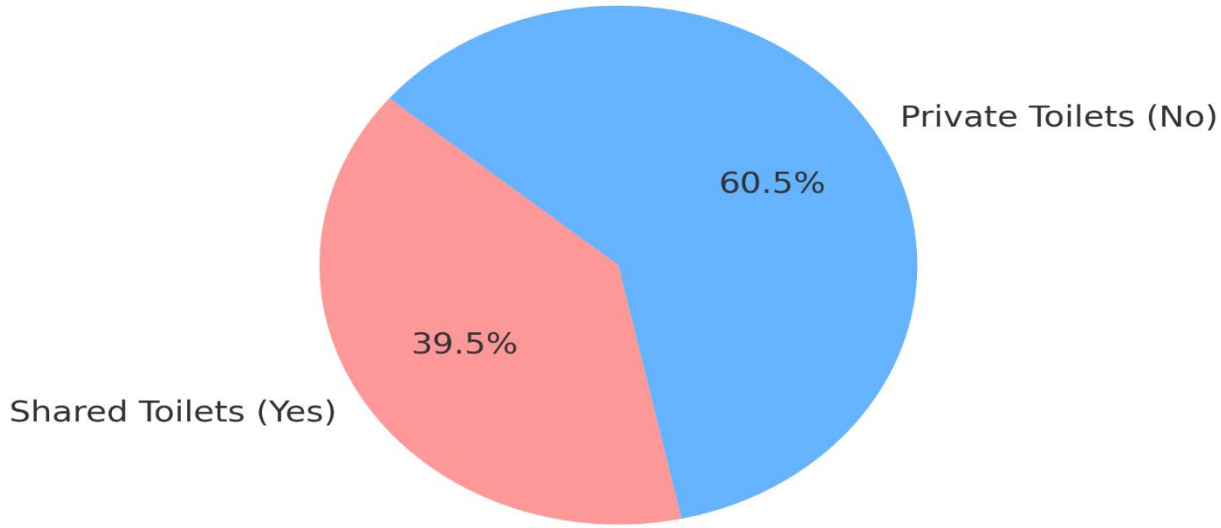

Figure 1: Proportion of households sharing toilets vs private

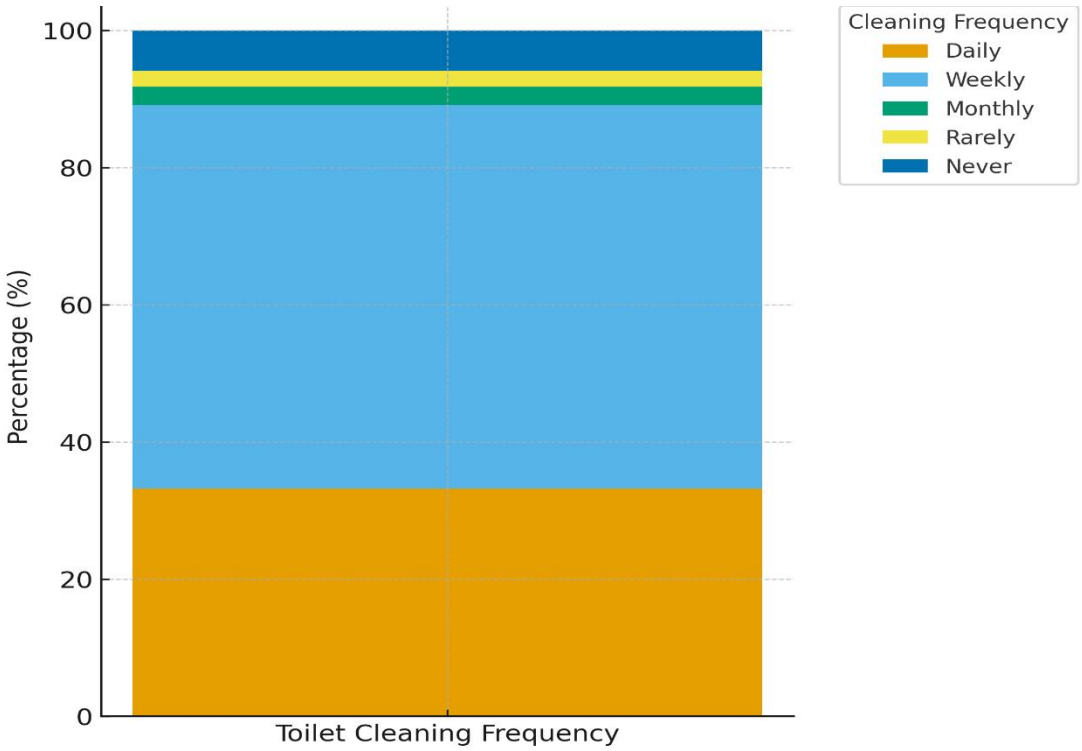

Figure 2: Frequency of toilet cleaning among households

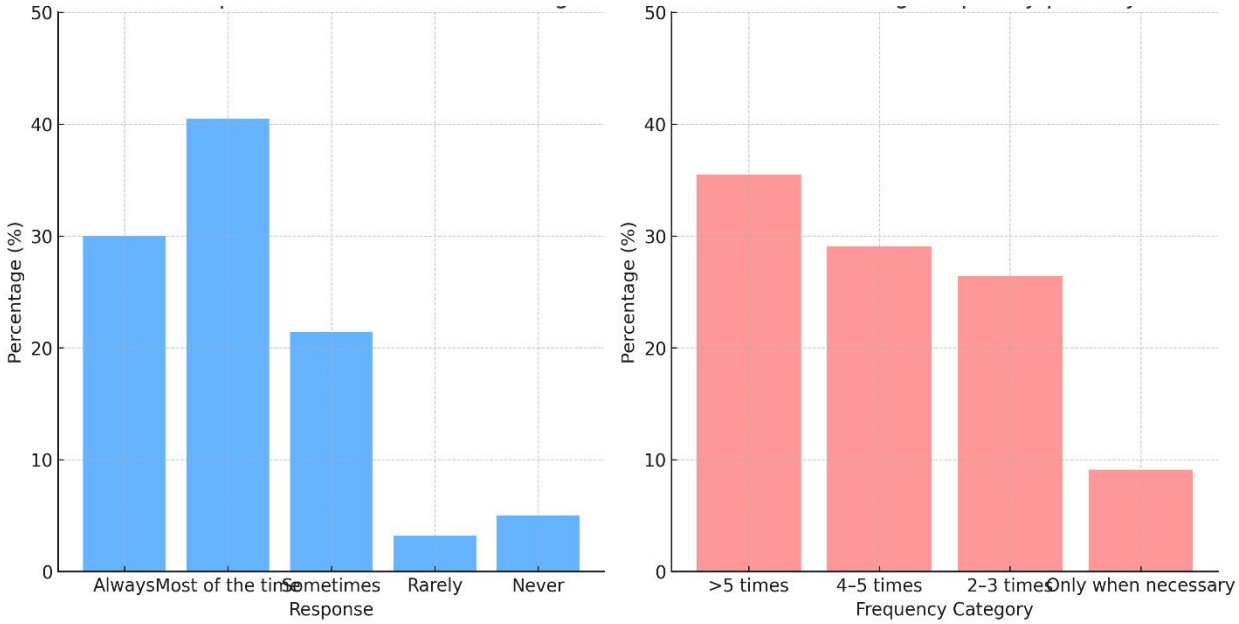

Figure 3: Use of soap and water for washing/ handwashing frequency per day

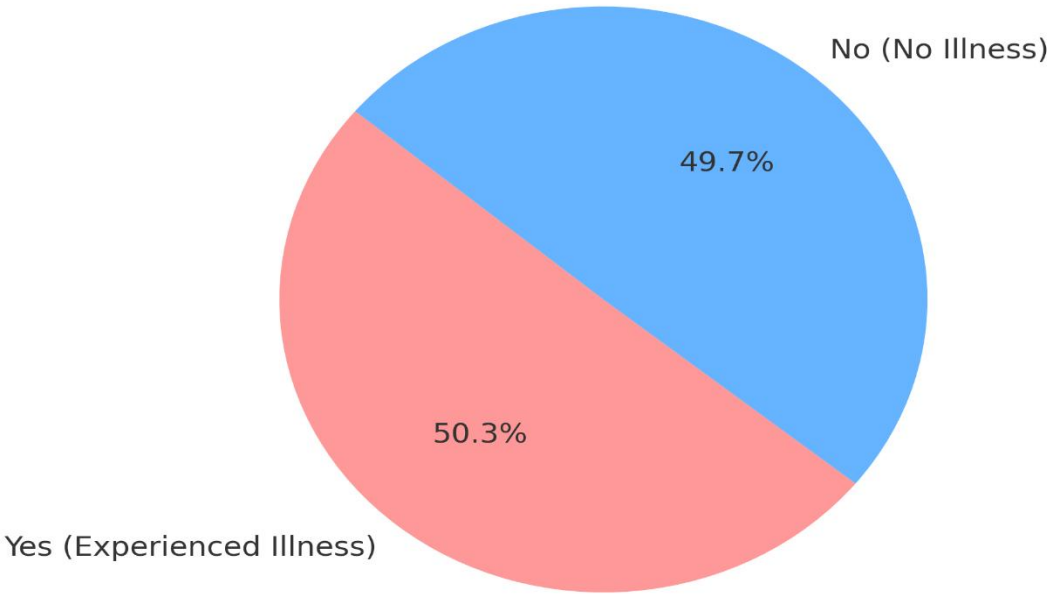

Figure 4: Experience of illness after drinking water

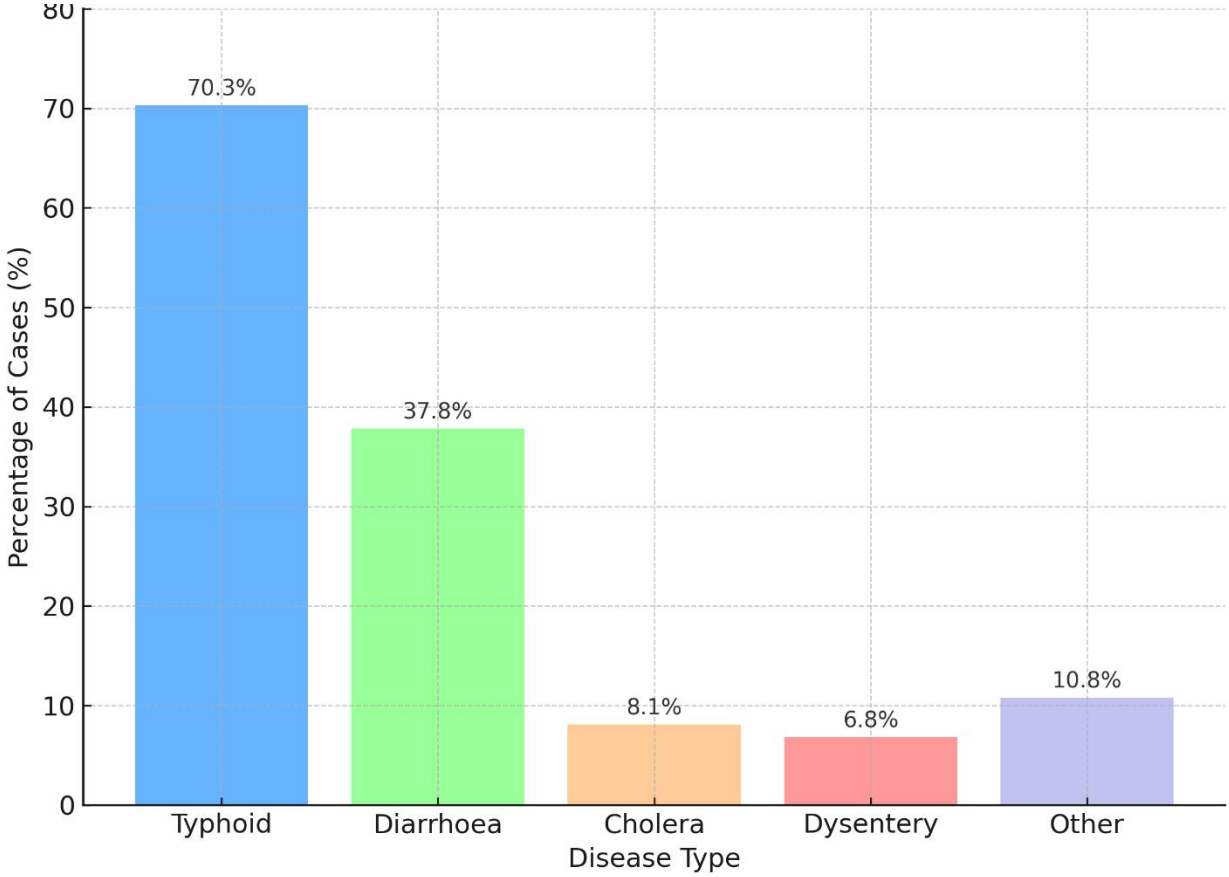

Figure 5: Types of water diseases reported