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## **The Operation and Maintenance of School Toilet Facilities and their contribution to meeting sanitation needs: A case study of Accra Metropolitan Assembly (AMA)**

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## **Summary**

Ghana faces significant challenges in providing adequate sanitation services, particularly in urban areas. Despite the UN declaration of access to safe water and sanitation as a fundamental human right, Ghana struggles to achieve universal coverage. In the Greater Accra region, only 68.6% of households have access to improved toilet facilities, with many resorting to public toilets or open defecation. This alarming situation contributes to numerous health problems and hinders educational progress, especially for girls.

While some studies have examined school toilet management in Ghana, few have explicitly linked institutional arrangements to operational and maintenance characteristics. Often, failures are non-technical and originate from insufficient planning, cost recovery, or outreach by responsible agencies. The successful operation and maintenance of facilities are critical elements of sustainability, yet are usually overlooked.

Against this backdrop, this study sets out to investigate the institutional arrangements that influence the O&M of school toilet facilities in AMA and identify gaps in current practices by examining the institutional arrangements, decision-making processes, resource allocation, and maintenance practices. It also aims to recommend best practices that enhance the collaboration and accountability of stakeholders. A case study methodology was employed in the AMA to gather qualitative data and identify patterns affecting the O&M of school toilets.

Findings revealed numerous challenges stemming from fragmented institutional arrangements, and undefined roles and responsibilities among government agencies and schools involved. Inadequate financial resources, limited community engagements, the absence of financial arrangements, and the lack of mechanisms for monitoring and evaluation further exacerbate the situation. Principal stakeholders pointed out the need for greater collaborative efforts, cost recovery strategies, and capacity building to ensure the sustainability of school sanitation facilities.

Given this, this research aligns with UN SDG 6, which aims to achieve universal and equal access to safe and affordable sanitation by 2030. By understanding the hindering factors for effective O&M of school toilet facilities in AMA, this study serves as a value-addition to the broader goal of improving sanitation conditions, which will ultimately improve overall health outcomes in Ghana.

## **Keywords**

AMA, Operation and Maintenance, Sanitation, School Toilet Facilities, Sub-metros

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## Foreword

This research topic is an important and oft-neglected aspect of sanitation: how school toilet facilities are managed and maintained. In many developing country contexts, provisioning physical infrastructure for water and sanitation tends to dominate, instead of emphasizing long-term management and maintenance.

This case study of the Accra Metropolitan Assembly shows how institutional arrangements and stakeholder collaboration are essential in ensuring that school toilets operate sustainably. Too often, gaps in responsibility and accountability lead to the rapid deterioration of newly constructed sanitation facilities, undermining efforts to improve access and hygiene.

## Abbreviations

Abbreviation	Full form
HIS	Institute for Housing and Urban Development Studies
AMA	Accra Metropolitan Assembly
CONIWAS	Coalition of NGOs in Water and Sanitation
ESP	Environmental Sanitation Policy
GAMA-SWP	Greater Accra Metropolitan Area-Sanitation and Water Project
GES	Ghana Education Service
JMP	Joint Monitoring Programme
MSWR	Ministry of Sanitation and Water Resources
NESSAP	National Environmental Sanitation Strategy and Action Plan
O&M	Operation and Maintenance
PHC	Population and Housing Census
PPP	Public-Private Partnership
PTA	Parent Teacher Association
SHEP	School Health Education Programme
SDGs	Sustainable Development Goals
WASH	Water Sanitation and Hygiene
WHO	World Health Organization
WSP	Water and Sanitation Program
WSUP	Water and Sanitation for the Urban Poor

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# CHAPTER ONE

## INTRODUCTION

### 1.1 Background

The Environmental Sanitation Policy (2010) of Ghana classified sanitation as a public good. As per the UN Human Rights Council (2002), everyone is entitled to safe drinking water and improved sanitation facilities. However, the challenge of sanitation access extends to urban areas in Ghana including Accra. Sanitation coverage in the Greater Accra region as highlighted by the Ghana Statistical Service (PHC 2021) data revealed that only 68.6% of the 1,176,499 households have access to improved toilets. While a small portion (0.7%) relies on unimproved toilets, a significant number (24.5%) use public facilities. Worryingly, a substantial 6.2% lack access to toilets and hence practice open defecation.

The Sustainable Development Agenda of the UN tackles many issues, including access to water, sanitation, and education. One key goal, Goal 6, specifically targets water and sanitation, aiming for universal access to safe drinking water and proper sanitation facilities by 2030. Education is another crucial focus, with Goal 4 promoting high-quality, inclusive learning opportunities throughout people's lives. This goal emphasizes building safe and effective educational facilities that cater to everyone, including children, those with disabilities, and people of all genders (JMP, 2022). Consistent with Peaslee (1969), who stated that education is increasingly important as economies become more industrialized, and cities grow, countries need their citizens' higher skills and knowledge to function effectively in this changing environment. In addition to these global trends, the situation in Ghana remains challenging. From 2015 onwards, there has been annual progress of 0.7% in global sanitation provision in schools. Nevertheless, to achieve SGD6 by 2030, a substantial increase is necessary at an even greater rate in the current development (Rajapakse et al. 2023; JMP 2020; Singh et al. 2022).

The Joint Monitoring Programme (JMP, 2020) report revealed a substantial disparity in the availability of basic sanitation in schools worldwide. Approximately 700 million children were without this crucial service. This figure encompasses schools that have made improvements but still have facilities that are either non-functional or unsuitable for single-sex use (331 million) and schools without sanitation (367 million). School sanitation services are categorized as basic (improved, usable, and separated by sex), limited (improved but not ideal, such as shared or non-functional facilities), or no service (lacking improved facilities or no facilities at all) (JMP, 2022). However, these categories may be less applicable to the unique challenges of urban sanitation management (Beard et al. 2022). Rapid urbanization has made it difficult to operate and maintain these facilities provided for school-going children because developing countries create difficulties in providing sanitation due to crowded living spaces, unplanned settlements, and limited resources for planning, building, and maintaining safe sanitation systems (Dodman et al. 2017; Isunju et al. 2011; Tremolet et al. 2010; UN-HABITAT, 2012).

According to the World Health Organization (WHO, 2018), the lack of proper sanitation facilities can lead to a variety of health problems, including infections, diseases, stunting, and even the development of antibiotic-resistant bacteria. A significant concern in Ghana is that

around 23% of school-aged children suffer from stunting (Ntow, 2019). While there have been positive developments with deaths from diarrhoea in children under 5 years decreasing from 25% (Binka et al. 2011) to six percent, this rate remains unacceptably high in Ghana (Football for Water Ghana, 2019). Furthermore, inadequate sanitation facilities in schools can have a detrimental effect on education, especially for female students. This is because these facilities are frequently insufficient or non-existent, resulting in worries about privacy and difficulties in maintaining hygiene. These issues can deter people from attending (UNICEF, 2015). Studies on urban sanitation consistently highlight the critical role of toilet maintenance and the surrounding infrastructure. Furthermore, it is crucial to clearly define who is responsible for this maintenance under what circumstances (as noted by Black et al. 2008). Beyond their physical aspects, toilets also hold symbolic significance within the urban environment (McFarlane, 2023).

Operation and maintenance are essential components of sustainability and have often been responsible for water supply and sanitation infrastructure failure. Several failures are non-technical. They can arise due to insufficient planning, inadequate cost recovery, or insufficient outreach efforts of centralized agencies (DFID 1998). Water, Sanitation, and Hygiene (WASH) in schools have received minimal attention from management and key actors regarding their operation and maintenance, optimal functioning, and conduciveness for school-going children. According to the WSP (2012), poor sanitation causes economic losses for Ghana. It was reported that economic loss from poor environmental sanitation is estimated to have cost Ghana \$290 million, or 1.6% of GDP annually. Operation and maintenance comprises all the necessary operations for functioning a water supply and sanitation system, excluding creating new infrastructure. The primary objective of operation and maintenance is to guarantee the optimal functioning, efficacy, and long-term viability of water supply and sanitation infrastructure (Castro et al. 2009).

## **1.2 Problem statement**

Like other African nations, Ghana encounters significant limitations in delivering sufficient and enhanced sanitation services to its rural and urban residents. Its economic growth has led to swift urbanization, which has placed considerable pressure on WASH facilities (Mariwah 2018). Despite progress in sanitation coverage, the country still faces challenges, with nine percent of open defecation occurring in urban areas (PHC, 2021). In the Accra Metropolitan Assembly (AMA), difficulties in maintaining school toilet facilities due to inadequate operation and maintenance might be a contributing factor. This research investigates the gaps in current institutional arrangements for operating and maintaining these facilities in AMA. By identifying these gaps, the study recommends best practices for improved collaboration and accountability among actors, ultimately leading to more sustainable sanitation solutions.

Literature has shown that some research has been done on school toilet facilities in Ghana. The focus, however, has been on issues such as “Poor facility management in the public schools of Ghana: Recent empirical discoveries” (Wuni et al. 2017) and Atogenzoya et al. (2020) researched “Facility management in Ghanaian Public Second Cycle institutions and implications for effective school facility management. A study of the Upper West region” etc.

Moreover, there is limited literature on how institutional arrangements affect the O&M of school toilet facilities in the Ghanaian context. This study seeks to investigate institutional arrangements and their influence in operating and maintaining school toilet facilities.

This study therefore seeks to answer the following research question;

1. How do the roles of various institutions affect the O&M of school toilet facilities in AMA?

The following sub-questions seek to answer the main research question.

- What has been the role of the various actors in the O&M of school toilet facilities in AMA?
- To what extent have institutional relationships between the key actors and the communities affected the O&M of school toilet facilities in AMA?
- What measures address the gap in institutional arrangement for effective O&M of school toilet facilities constructed in AMA?

### **1.3 Significance of the study**

The benefits of effectively operating and maintaining WASH in school programs are well-documented. According to JMP (2022), and UNICEF (2015), inadequate sanitation facilities in schools can significantly impair education, particularly for female pupils. This is due to the frequent inadequacy or absence of these facilities, leading to concerns about privacy and challenges in maintaining them. These problems can discourage school-going children from participating fully in their education. Given this, this research seeks to help understand the potential role and limitations of school toilet facilities in meeting urban sanitation challenges and enhance scholarly discussions on WASH in schools by examining the roles of institutions. Previous research has primarily focused on the facilities themselves, while institutional arrangements governing their operation and maintenance have less been explored. Also, the GES (2014) guide indicates that to ensure the effectiveness of school WASH facilities, a collaborative approach involving various actors is crucial. This includes representatives from all levels; national, regional, district, community, and the school itself.

### **1.4 Study scope and limitations**

This study was conducted in the AMA which at the time of study, consisted of three Sub-metros (Ablekuma South, Ashiedu Keteke, and Okaikoi South). The study focuses on institutional arrangements and their effect on the O&M of school toilet facilities in AMA. To understand the dynamics and how institutional arrangements, particularly the role of actors, affect the O&M of school sanitation facilities, the study selected one school from each Sub-metro within the AMA. The criteria for school selection had limitations due to language barriers and accessibility. The researcher's existing knowledge served as a benchmark for comparing the facilities between the three schools.

However, the focus of this research on institutional arrangements was one aspect of the factors that might affect O&M. Other controlling factors likely exist. Additionally, limited time and resources during the study influenced the selection of the study population. Future studies should delve into the unique dynamics of coastal schools, comparing WASH infrastructure usage and maintenance practices while considering other factors that impact the O&M of school toilet facilities by engaging a broader population.

## **CHAPTER TWO**

### **LITERATURE REVIEW AND HYPOTHESIS**

#### **2.1 Overview**

This section includes state-of-the-art theories, as well as literature-informed research, and explores the challenges in O&M of school toilet facilities in Ghana, with a focus on AMA. The review highlights best practices and recommendations for improving O&M in Ghana.

#### **2.2 Policy framework for toilet provision in schools in Ghana**

The recommended number of toilet facilities per school depends on student enrolment (Adjibolosoo et al. 2019). According to the Ministry of Local Government and Rural Development's Toilet Provision Policy Guidelines (2010), a maximum of 40 students should share a toilet cubicle or squat hole daily. However, to ensure privacy, the guidelines recommend separate toilet facilities for boys and girls (MLGRD, 2010; GES, 2014). Additionally, they suggest including changing rooms for adolescent girls' restrooms. These guidelines emphasize the need for toilet sizes appropriate for children to promote comfort and safety during use (MLGRD, 2010; GES, 2014).

#### **2.3 WASH in Schools – Institutional Roles and Responsibilities**

##### **2.3.1 WASH in Schools**

The implementation of WASH practices in schools in Ghana has been established for some time as indicated in the GES (2014) guide. The international community has allocated substantial resources and effort toward attaining the essential objectives of providing universal access to clean, affordable, satisfactory, and readily available safe drinking water and sanitation by 2030 (UNCG & CSO). WASH in schools tackles issues such as behavioural change and infrastructural development to improve the school environment and enhance best hygiene practices (Chouhan et al. 2022). The community sees it as a worry as most schools lack basic WASH facilities (Moelyanigrum et al. 2023). The prioritization of specific SDGs targeted by the United Nations was necessitated by these concerns. The SDGs set aside specific goals to be achieved by 2030, and the issue of basic sanitation access and hygiene promotion in schools is key. Goal 4 seeks to promote equal access to education and a healthy environment for learning with WASH access at the centre (UNDP, 2022). The GIZ (2017) manual for WASH in schools set WASH access as a fundamental need for schools arguing that it has an impact on both academic performance and health. The presence of basic sanitation facilities in schools according to studies by (Chatterley et al. 2013; Spears et al. 2013; Dreibelbis et al. 2014; ESP, 2010) tends to improve school attendance and enrolment. This according to the authors, paves the way for healthier individuals.

Global sanitation in schools' data from 123 countries across all eight Sustainable Development Goal (SDG) regions according to (JMP, 2022), gives insights regarding sanitation access for school-aged children, representing nearly 60% of the world population in this age group. Fortunately, 72% of schools indicated that they own operational and secluded sanitation amenities (upgraded and segregated by gender). Nevertheless, a total of 16% of schools already possess enhanced sanitation facilities that either serve both genders or are not entirely

functional. In addition, a total of 13% of schools do not have access to unimproved sanitary facilities at all. The report indicates a large disparity between income levels. Schools in low-income countries have just 47% rate of basic sanitation facilities, while high-income countries boast a near-perfect 100% coverage. In sub-Saharan Africa and Oceania, access to basic sanitation services in schools falls below 50%. Data for pre-primary schools is limited, but available information suggests that sanitation coverage is higher in primary (68%) and secondary schools (75%). One-third of children lacking basic sanitation at school reside in Least Developed Countries (LDCs), while over half are in fragile contexts. To achieve universal access (over 99.5%) by 2030, a substantial acceleration is needed. This translates to a threefold increase in the current progress rate globally, and a much steeper (over 100 times) in LDCs and 50 times in fragile contexts (JMP, 2022). Poor sanitation amidst ineffective enforcement of facility management is reflected in the lifespan of sanitation facilities in schools and the high increment in sanitation-related diseases and poor hygiene infections. Ghana faces a significant challenge in ensuring proper sanitation for its citizens. The PHC (2021) data reveals that only 42.6% of the population can access improved sanitation facilities. This means a large portion relies on shared latrines (55%), unimproved latrines (2.4%), and open defecation practices (18%). The severity is further highlighted by the fact that five regions have an open defecation rate exceeding a staggering (50%) indicating the dire consequence of inadequate sanitation.

Despite governments allocating significant financial resources towards constructing school toilet facilities to promote effective environmental sanitation and ensure a sustainable environment (Modernghana.com, 2023), inadequate operation and maintenance tend to reduce the lifespan of WASH compliance within schools (Chouhan et al. 2022). Basic sanitation is essential for human dignity, a healthy environment, and hygiene. However, Ghana faces major challenges in both resource availability and the actual provision of sanitation services by local authorities. To meet the specific target outlined in the global Sustainable Development Goal 6, Ghana must construct a minimum of 944,000 additional sanitation facilities in both households and educational institutions within the next seven years (Ghanaweb.com, 2022). Also, in unplanned and densely populated low-income urban areas, shared sanitation facilities are unavoidable and serve as the only alternative to open defecation, as highlighted by research by Evans et al. (2017); and Mariwah et al. (2017). Evans et al. (2017) further categorized these shared facilities as; (a) Shared household toilets: Toilets within one household used by other households as well (b) Compound toilets: Toilets accessible only to residents within a specific compound. (c) Community toilets: Toilets not associated with a single household but used by a designated group of households. (d) Public toilets: Toilets open for use by anyone. This review confirms that several factors hinder the construction and use of toilet facilities in low-income communities, as indicated by numerous studies in this area.

## **2.4 The Institutional Analysis and Development (IAD) Framework**

To better understand the complex institutional landscape surrounding WASH in schools, we turn to the Institutional Analysis and Development (IAD) framework developed by Ostrom (2011). This framework provides a structured approach to analyzing how institutions interact to influence outcomes in various contexts. A visual representation of this framework is represented in Figure 1:

The IAD framework consists of three main components:

1. The action situation: The social space where individuals interact, make decisions, and engage in activities related to the issue at hand (in this case, WASH in schools).
2. External variables: Factors that influence the action situation, including:
  - Biophysical conditions
  - Community attributes
  - Rules-in-use
3. Patterns of interaction and outcomes: The results of decisions and actions taken within the action situation.

**Figure 1: Elements of the Institutional Analysis Development Framework**

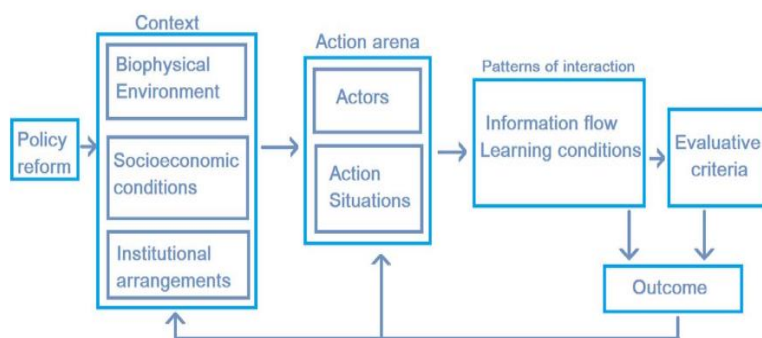


Fig. 1. The IAD framework.  
Source: Ostrom et al. (1994).

Source: Nigussie et al. (2018)

By applying this framework to the context of WASH in schools, we can systematically examine the institutional arrangements that affect the operation and maintenance of school toilet facilities. This approach allows us to identify key actors, understand the rules governing their interactions, and analyze how these factors collectively influence WASH outcomes in schools.

#### 2.4.1 Institutional Roles and Responsibilities

Viewing WASH in schools through the lens of the IAD framework reveals a complex network of actors and institutions whose interactions shape the success or failure of sanitation initiatives. As IRC (2018) stresses, key components of this institutional landscape include; fostering a supportive environment for advocacy, policy and planning, financing mechanisms, WASH infrastructure, capacity building and behaviour change promotion, partnerships, and monitoring and evaluation.

IRC (2018) defined following institutional landscape as;

- ✚ Advocacy, policy, and planning: Multiple actors, often with misaligned motives, must collaborate despite bureaucratic challenges. This aligns with the "rules-in-use" component of the IAD framework, highlighting the need for clear policies and coordination mechanisms.
- ✚ Financing mechanisms: Limited financial resources necessitate innovative approaches, such as public-private partnerships and novel tax solutions. This reflects the

"community attributes" in the IAD framework, particularly the economic constraints and opportunities within the system.

- ✚ WASH infrastructure: The provision and maintenance of physical facilities represent the "biophysical conditions" in the IAD framework. These tangible assets form the foundation upon which other institutional arrangements operate.
- ✚ Behavior change promotion and capacity building: These efforts address the "community attributes" by seeking to alter social norms and individual behaviours related to sanitation.
- ✚ Collaborative efforts: The emphasis on teamwork between different actors (governing bodies, schools, NGOs, etc.) illustrates the complex "patterns of interaction" within the action situation.
- ✚ Monitoring and evaluation: These processes provide feedback loops that influence future decision-making, a key aspect of how outcomes in the IAD framework can reshape the action situation over time.

By examining these institutional components through the IAD framework, we gain a more nuanced understanding of how various factors affect WASH outcomes in schools. This approach reveals that successful WASH implementation requires physical infrastructure and carefully coordinated institutional arrangements that foster collaboration, sustainable financing, and community engagement.

#### **2.4.2 Institutional Models for Sanitation Service Delivery**

Building on our understanding of the IAD framework for WASH in schools, we now examine broader institutional models for sanitation service delivery. Through the lens of the IAD, we can identify common themes and challenges across various approaches. Studies increasingly emphasize the need for holistic integrated strategies that address multiple sanitation components, including marketing, governance, and technology (Apanga et al. 2020; Mallory et al. 2022). This aligns with the IAD framework's focus on understanding the interplay between different elements of the action situation.

Also, public-private partnerships (PPPs), widely recognized as a potential solution to institutional and financial challenges, represent a specific set of "rules-in-use" within the IAD framework. This can provide alternative funding sources and enhance service efficiency as cited in (WSUP, 2017; Johannessen et al. 2014). Additionally, community-led initiatives, such as Community-Led Total Sanitation (CLTS), emphasize the "community attributes" component of the framework. These models leverage local knowledge and social dynamics to promote sustainable sanitation practices (Kar & Chambers, 2008).

Furthermore, the success of sanitation initiatives often hinges on a standardized regulatory framework with clear institutional responsibilities and strong accountability mechanisms (International Water Association, 2022). This highlights the importance of well-defined "rules-in-use" within the IAD framework. As revealed by Beard et al. (2022), many African cities face a complex web of overlapping institutional responsibilities, inadequate regulations, and limited funding for enforcement especially in the urban contexts. This situation illustrates how poorly defined "rules-in-use" and conflicting "patterns of interaction" can hinder progress.

Synthesizing these findings through the IAD framework reveals that effective sanitation service delivery requires a delicate balance of formal and informal institutional arrangements. Successful models tend to:

- Integrate multiple stakeholders and components of the sanitation value chain
- Leverage both public and private resources
- Engage communities in decision-making and implementation
- Establish clear regulatory frameworks and accountability mechanisms
- Adapt to local contexts and constraints

However, challenges persist, particularly in urban areas where institutional responsibilities are often fragmented and resources are limited. The framework suggests that addressing these issues requires not only technical solutions but also careful attention to the underlying rules, community dynamics, and patterns of interaction that shape sanitation outcomes.

By applying this institutional lens to the specific context of school sanitation in Ghana, we can better understand the factors that influence the operation and maintenance of toilet facilities. This approach provides a foundation for developing more effective strategies that address both the physical infrastructure needs and the complex institutional landscape surrounding WASH in schools.

## **2.5 Operation & Maintenance Challenges in the Ghanaian Context**

Sanitation facilities O&M in Ghanaian schools have been a persistent problem for years that calls for urgent attention. Research studies have linked the lack of sanitation facilities for households to the poor O&M of school WASH facilities and calls for national strategy/regulations that compel every Ghanaian household to own a private toilet facility (Akpakli et al. 2018). Appiah-Brempong et al. (2018) asserted these challenges and proposed better infrastructure and O&M activities to improve the conditions of these toilet facilities. Adeenze-Kangah (2022) highlighted the challenges in maintaining not only school sanitation facilities but also rural water facilities citing Builsa North District, Ghana as an example. He indicated that at the site of these water facilities, poor environmental sanitation practices occur. According to this author, there is a need for awareness creation, sensitization, and enforcement of sanitation laws that seek to address both behavioural and infrastructural issues to prolong the sustainability of these facilities. Akanzum & Pienaa (2023) stressed that poor WASH facilities in schools adversely impact girl's education. Snyder et al. (2020) cited that some of the detrimental factors or causes and challenges to sanitation facilities in schools are negligence and underfunding. They identify functionality monitoring to ensure service delivery of quality. Similarly, Duijster et al. (2022) advocated for the bundling of O&M interventions to increase usability and cleanliness within public schools.

## **2.6. Sustainability of Sanitation Interventions**

A vital component of guaranteeing sanitation intervention's long-term efficacy and impact is their sustainability. Medium- to long-term WASH intervention sustainability was the focus of

a thorough evaluation carried out in Central America. This study focused on the sustainability of WASH systems – technical appropriateness, functional parameters, social acceptability, economic viability, and environmental protection (Sabogal et al. 2014). This review focused on the need for continuing follow-up programs within hygiene promotion and sustainability programs, underlining the role of water committees and community capacity in water system maintenance. An assessment of impact evaluations believed to have been carried out showed a reduction in diarrhoea diseases from the WASH interventions studied. The importance of environmentally friendly methods of sanitation resonated with (Waddington & Snilstveit, 2009). Their research also brings out lessons learned, emphasizing the need for community empowerment to keep these sanitation facilities running to avert open defecation, achieve long-term functionality, and positive health outcomes. Antwi-Agyei et al. (2020) suggested that coerced, educative, persuasive treatments and incentivization would help improve user-toilet ratios and speed up processes for maintenance problems in developing countries. Some of the interventions explored in enhancing the usability and cleanliness of restrooms, in turn improving the overall hygiene of a school, are packaged operation and maintenance, whereby a school is offered necessary supplies, direction, and instruments for such maintenance and even budget for planning (Duijster et al. 2022). Koseoglu et al. (2021) study showed that life-cycle cost analysis for stimulating demand and building community capacity can all impact the sustainability of sanitation facilities. Tiwari et al. (2022) proposed that for sanitation facilities to be sustainable, it requires a comprehensive intervention that will enhance micro-environments, increase access to sanitation infrastructure, and hygienic behaviours of communities. It has been shown through research that shared and well-managed toilets with an emphasis on maintenance and accessibility are major factors in ensuring the cleanliness and usability of such facilities (Vu et al. 2022). Yan et al. (2021) found that liveable and accessible urban environments protect the health of school children and communities at large. This would be through sustainable sanitation interventions. For this to be so, efficient plans for its operation and maintenance are essential as highlighted by (Wada et al. 2020).

## **2.7 The Role of Technology and Innovation**

Technology and innovation in the maintenance and management of school toilets are very important in ensuring the health, welfare, and academic achievements of students. In relation, Jasper et al. (2012) assert that various studies recognize the need for adequate school sanitation facilities while others associate sanitation with education. It is observed that intervention measures focusing on improving toilet usability and cleanliness through organized maintenance programs improve the overall infrastructure and hygiene standards of school restrooms (Duijster et al. 2022; Buxton et al. 2019). Novel technologies, such as bioremediation, have been explored in the resolution of issues such as odors in school toilets, underscoring the maintenance of good ambiance to the nearby residential areas, school-going children, and workers (Evans et al. 2020). A growing body of research emphasizes the notion that light is not shed on the human right to WASH for school-going children by merely providing toilets in schools. Their facilities need to be of high quality, clean, and easy to use (Coswosk et al. 2019). Building on this requirement for adequate facilities, other research shows that effective management comes with collaboration between the various actors, which at times extends to

external organizations (Buitrago-Garcia et al. 2022). Moreover, sanitation is not just all about toilets. As pointed out by Jahan et al. (2020) who called for schools to have friendly and culturally appropriate systems for menstrual hygiene products. Asnodkar (2020) provides some discussion on the potential that smart toilets hold in making positive changes in sanitation practices. Good restroom operation and maintenance shall help create a healthy and supportive learning environment. Some drastic improvements in terms of quality, usability, and cleanliness of facilities are thus quite within reach, provided creative solutions are found together with an ensemble of actors and technology—including smart toilets. These improvements will translate into gains in the scholastic performance of school children, sanitation coverage of the community, and improvement in overall well-being.

## **2.8 Gender Dimensions of Sanitation in Schools and Communities**

There are important gender dimensions to consider in sanitation access and practices in schools and communities. In particular, inadequate sanitation facilities adversely affect more women and girls, particularly in developing countries (Caruso et al. 2017; NESSAP, 2010). In schools, the inadequacy of sanitation facilities is a major concern that impinges on girls' education. Among the major factors involved, Menstrual Hygiene Management is reported to have caused absenteeism by many girls during menstruation due to inadequate facilities (Sommer et al. 2016). In Kenya, one such study proved that the provision of menstrual cups along with education reduced sexually transmitted infections and school dropout rates (Phillips-Howard et al. 2016). Similarly, Mprah et al. (2022) stated that school absenteeism during menstruation in Ghana is caused by inadequate sanitation. Some gendered dimensions also exist in community sanitation. To a great extent, women collect the water and manage household sanitation, which can be time-consuming and physically burdensome (Caruso et al. 2015). The lack of private sanitation facilities exposes them further to an increased risk of sexual violence when they go out for open defecation (Jadhav et al. 2016). Gender-responsive sanitation interventions hold much promise. Research done in India demonstrated that in cases where women were involved in design and implementation, such sanitation programs had better outcomes and were more sustainable (O'Reilly et al. 2017). Shrestha et al. (2021) and Jahan et al. (2020) emphasized the need for gender-specific washrooms that guarantee privacy with proper waste disposal facilities.

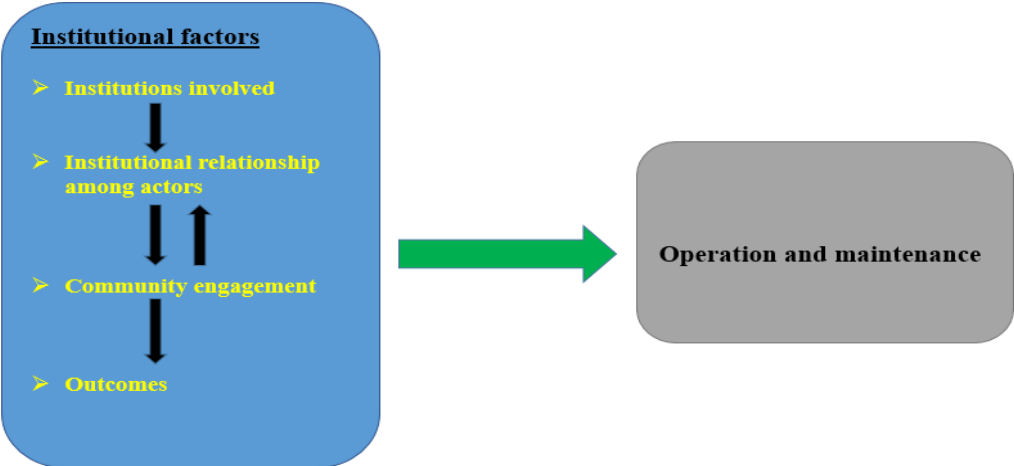
## **2.9 Conceptual Framework**

Drawing on the work of Leshem & Trafford (2007), a conceptual framework acts as a bridge between the theoretical foundations of a research project and the practical aspects under investigation. This framework condenses theoretical perspectives on the research question into a streamlined model to ensure the research focus is maintained with clarity.

To start with, institutions as adapted from North (1990) act as the underlying frameworks that govern human interaction within a society. These frameworks, established by humans themselves, define the “rules of the game” that shape incentives for various forms of exchange, be it political, social, or economic. In contrast to institutions, institutional arrangements encompass a specific set of formal or informal rules, processes, and structures. These arrangements guide how organizations interact and collaborate, particularly in governing and

managing public goods, common-pool resources, and other complex situations (Ostrom, 2011). This research will explore ‘institutional arrangements’ as a set of factors influencing the O&M of school toilet facilities. These arrangements involve actors such as Ministries, school administrators, NGOs, community members, etc. It also considers the rules governing their roles and responsibilities, the interrelationship, and established communication that facilitates interactions. A visual representation of this framework is represented in Figure 2:

**Figure 2: Conceptual Framework**



Source: Author’s Construct, (2024)

## CHAPTER THREE

### RESEARCH DESIGN AND METHODS

#### 3.1 Overview

This section presents the methodological approaches and design used in this study, the operationalization of key study variables and indicators, and highlights the research techniques adopted.

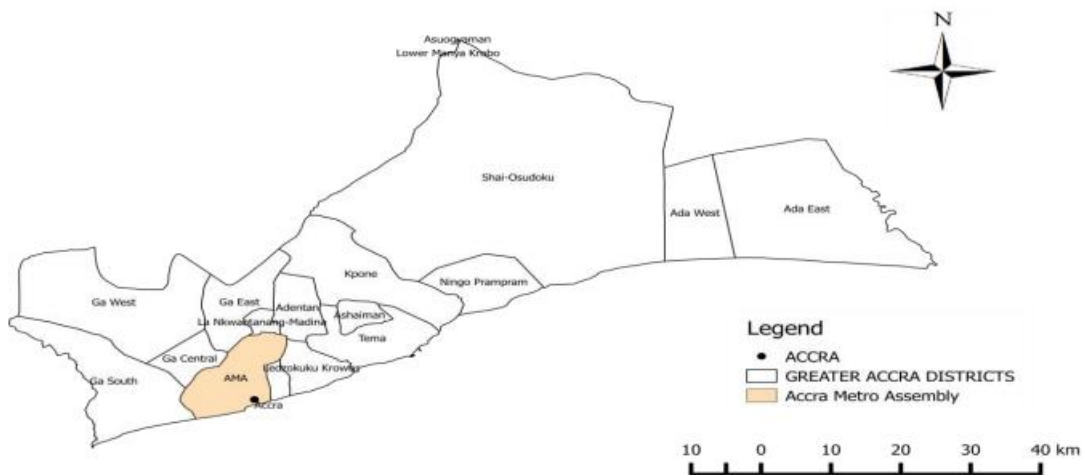
The research methodology covers these topics;

2. Study area
3. Operationalization
4. Research Strategy
5. Study participants, Sample Size and Sampling Methods
6. Data collection procedure and research instruments
7. Ethical requirements
8. Validity and reliability
9. Data Management and Analysis Methods

#### 3.2 Study area

AMA is a local government authority in Ghana. It is located in the central business district of Accra and among the 29 MMDAs within the Greater Accra region. The AMA comprises three sub-metros; Ablekuma South, Ashiedu Keteke, and Okaikoi South and it is shown in Figure 3.

**Figure 3: Map of the Case Study Area in Regional Context**



Source: ama.gov.gh (2020)

#### 3.3 Operationalization of Key Concepts

According to Thiel (2014), bridging the gap between theoretical ideas and real-world data collection is an imperative step in research. This process, called operationalization, involves defining abstract concepts to allow the researcher to measure them directly. In doing this as

stated by the author, it is mandatory to illustrate concepts and variables that can be expressed in empirical terms, and that the outputs of these variables can be assessed.

Within this research, the focus is on institutional factors as the independent variable. These factors encompass the various actors involved in the WASH in Schools program within the Accra Metropolitan Assembly. This includes both actors responsible for undertaking O&M interventions and the framework that governs their interactions. Ostrom's Institutional Analysis and Development Framework (2011) provides the foundation for analyzing these factors. This research delves deeper into the operationalization of these sub-variables in the following: the institutions involved, the level of interaction among institutions, roles and responsibilities, coordination channels, power dynamics, and decision-making processes.

Per this research, the actor's presence refers to the number of governmental and private organizations dedicated to WASH in school programs. This refers to the presence of these organizations within AMA and their proactive involvement in carrying out the program.

To assess the operationalization of WASH in schools, the research considered an "action situation" proposed by Ostrom (2011). This was operationalized by three indicators: the system of rules, the actors involved, and the biophysical conditions. The system of rules refers to the legal framework that emerges from a constitutional, legislative, or administrative background that underpins the activities of each actor/stakeholder. The actors involved refer to stakeholder composition or participants dedicated to O&M activities, as evidenced by the number of activities in the organization's budget. Biophysical factors refer to the physical environment and its characteristics that influence how actors interact with a resource system. The involvement of a greater number of public and public-private organizations in WASH in school program implementation can indicate a strong commitment to achieving the long-term lifespan of school toilet operation and maintenance.

This research employed an operationalization framework to analyze how institutional factors affect the O&M of school sanitation facilities. The IAD framework served as the core concept with institutional factors (independent variable) and O&M effectiveness (dependent variable). This framework outlines sub-variables, indicators, measurement methods, and data sources relevant to this study. The sub-variables include - institutional presence, institutional relationship, community engagement, and support. For example, to assess institutional presence, the number of actors involved, and their mandate for WASH in school activities. Data collection methods were qualitative through interviews or document review. In addition, the financing mechanism was added as a controlling variable, as it has the potential to influence O&M activities through different streams such as budgetary allocations and Public-Private Partnerships.

### **3.4 Research Strategy**

The adoption of a Case study approach best fits this topic. Thiel (2014) indicated that this strategy involves an in-depth investigation of a single or numerous real-world examples. Researchers collect extensive qualitative data to get a full picture of the subject. This approach

is precious because it allows the study to integrate the insights of various actors, providing a richer picture of the challenges and potential solutions (Creswell et al. 2007). The research employed this approach to understand how multiple institutions' roles affect the O&M of school toilet facilities in AMA.

### 3.5 Sampling Techniques and Sample Size

This study employed a purposive sampling strategy to target key actors involved in AMA's O&M of school toilets. As suggested by Prior et al. (2020), this approach was required to ensure the sample population accurately reflects the research focus. These involved actors represent diverse stakeholder groups such as:

- **Public sector:** Ministry of Sanitation and Water Resources (MSWR) -1 Deputy Director, School Health Education Programme (SHEP) -1 National Coordinator, AMA Metro Public Health Department -1 Director, Headteachers (3, one from each selected school), Assembly members (3, one from each sub-metro), and Parent Teachers Associations (3, one from each school). Student representatives (6) were also included.
- **Quasi-government: Greater Accra Metropolitan Area Sanitation and Water Project (GAMA-SWP)** -1 Sanitary Engineer.
- **NGO: Coalition of NGOs in Water and Sanitation (CONIWAS)** -1 Executive Secretary.

The selection of participants included one school per Sub-metro (Korle Gonno Roman Catholic Boys Basic School – Ablekuma South, Jamestown Methodist Basic School – Ashiedu Keteke, and Kaneshie Methodist Basic 2 – Okaikoi South) to ensure representation across AMA. This approach aligns with Thiel's (2014) recommendation for purposive sampling in studies seeking diverse perspectives. By including a range of actors (20 in total), the research aims to enhance the trustworthiness of the results by ensuring they apply to a broader population and contribute to a more comprehensive understanding through triangulation.

### 3.6 Data Collection Methods and Instruments

This research employed a qualitative research method with the social constructivist perspective. It drew on both primary and secondary data sources. Thiel (2014) suggests qualitative research focuses on understanding the context and experiences of participants, typically involving smaller sample sizes. This study collected primary data through in-depth interviews with key informants and other relevant actors responsible for WASH in schools intervention in AMA. This provided comprehensive information on the actors involved, the system of rule, and the biophysical environment. The following qualitative data collection methods below were used; interview guide and observation checklist. Thiel (2014) stated that accessing diverse data collection sources is essential in a case study. Adding that such an approach enhances information wealth on the case under study. To make the findings richer, this study gathered secondary data from project reports, annual action plans, policies, strategies, guidelines, publications, and other related scientific articles.

### **3.6.1 Guided Interview**

In-depth interviews were conducted with key informants, following an established qualitative research guide. During this exchange as stated by Bryman et al. (2007), the interviewer asks targeted questions to gather information and perspective from the interviewee. This study employed an interview guide to converse with actors like; MSWR, GES/SHEP/, AMA, etc. Alvesson (2003); Silverman (2013); & Bryman (2016) asserted this by disclosing that interviews are the cornerstone of qualitative research. The interviews were semi-structured, allowing participants to elaborate on their experiences. The transcribed interviews were then uploaded on Atlas ti software. This facilitated the coding process, which enabled the identification of recurring themes and patterns related to institutional factors and O&M practices in schools.

### **3.6.2 Observation Checklist**

Observation studies involve the systematic recording of observable behaviours or phenomena within a natural environment (Gorman & Clayton, 2005). In a research context, checklists serve as a valuable tool to support standardized observations. They function as structured lists that guide observers through a series of specific criteria to be verified during evaluation. This tool was used to assess the conditions of the school toilets. A detailed breakdown of the summary data collection methods and targets can be found in Table 1.

*Table 1: Summary of Data Collection Methods and Targets*

S/N	Method	Respondents/ Documents	Documents / Sample size	Justification for sample size
1	Document review	AMA quarterly report, GAMA-SWP reports, ESP 2010, WASH in Schools Facility Planning and Management Guide (2014), and GES Technical Guide for WASH in schools facilities.	5 reports and national documents were reviewed	These reports and national documents lay the foundation for the general overview of sanitation and its provision in schools. These documents established a baseline knowledge.
<b>NATIONAL LEVEL PARTICIPANTS</b>				
2.	Interviews	GES/SHEP, MSWR, GAMA-SWP, & CONIWAS	MSWR (1), SHEP Head Office (1), GAMA-SWP (1) from the Project Coordinating Unit, and CONIWAS (1).	In-depth interviews were employed to gather data and engage key actors on the O&M of school toilet facilities in AMA. A uniform interview guide was used. This approach was appropriate because it helped the researcher to capture the knowledge variation from different actors.
<b>DISTRICT LEVEL</b>				
3.	Interview	AMA	AMA (1)	An in-depth interview was employed to gather data from implementers.
<b>SCHOOL LEVEL PARTICIPANTS (3 SCHOOLS)</b>				
4.	Interview	School Heads, School Prefects, & Compound Overseers	3 School heads (1 from each of the 3 schools), 6 School Prefects & Compound Overseers (2 from each school).	This approach was valuable in getting the perspective of these users.
<b>COMMUNITY LEVEL PARTICIPANTS</b>				
5.	Interview	Assembly Members / Unit committee members & Parents Teacher Association representatives.	Assembly members/ Unit committee members (3), 1 from each Sub-metro/community. Parents Teacher Association representatives (3), 1 from each sub-metro/community.	The Assembly member is the representative of the entire electoral area. He represents the government and also serves as a development agent. The Parent-Teacher Association is the representative body for parents within these schools. Their perspective was invaluable.
<b>TOILET FACILITY ASSESSMENT CHECKLIST</b>				
6.	Checklist	Toilet facility checklist	1 uniform checklist was used in the three schools.	Covers various aspects (cleanliness and hygiene, functionality, operation and maintenance, accessibility and privacy, and additional observations.

### **3.7 Ethical Consideration**

As Bos (2020) defined, ethics explores the moral dimensions of research, focusing on appropriate actions for researchers. This research was carried out with utmost regard for the rights and privacy of all participants. Participation in the interview was optional. There was no exertion of force or manipulation. The research objective, methodology for data collection, and intended utilization of the material were discussed with the participants. As Lundy et al (2011) noted, children's participation in research should be aligned with their best interests, as stipulated by the UN Convention on the Rights of the Child (1989). To safeguard the well-being of minor participants, special measures like data anonymization, child-friendly languages, and secured data storage were implemented when interviewing school prefects. Only prefects aged 16 years and above were included and this was based on their capacity to understand what the study seeks to achieve. Additionally, age verification, consent seeking, and data usage were discussed thoroughly with pupils in collaboration with school heads to prevent the involvement of minors in the study. Bovarnick et al. (2018) and Pavarini et al. (2019) whose study suggested that children's participation in research can enhance the quality of data and findings, as evidenced by the refinement of data collection tools and the increased richness and relevance of results.

### **3.8 Validity and Reliability**

In scientific research, ensuring the trustworthiness of findings is paramount. As discussed by Mischler (1990) and Stiles (1993), this concept hinges on validity and reliability. Maxwell (2010) mentioned that validity ensures the accuracy of the findings; this implies that validity in research assesses the strength of a study's findings in two key ways; internal validity – focuses on whether the research design effectively measures the intended relationship between variables. External validity considers the generalizability of the findings. It asks whether the results can be applied to a broader population or context beyond the specific study population or setting. Nobel and Smith (2015) talking about reliability stated that it focuses on the methodological soundness and consistency of the research process. This means that the research methods should be well-defined and replicable, allowing other researchers to achieve similar results if they follow the same procedures in a similar context. In response to the above statements, this study demonstrates the potential for replication in other regions or municipalities facing similar sanitation challenges in Ghanaian schools. The research objectives, data collection method employed, and analysis of findings would be valuable for future researchers investigating the O&M of school toilet facilities. Additionally, this study provides a clear definition for its indicators, supported by relevant literature.

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

Researchers employing a case study strategy frequently encounter a substantial quantity of data collected from various sources (Baxter & Jack, 2008). These authors mentioned that the vast amount of information often requires the utilization of computerized methods to handle and examine the data. Consistent with Miles and Huberman (1994), data reduction was the initial face of the analysis. Qualitative data and content analysis were conducted. To identify patterns

and themes from the transcribed interview content for this study, open coding as described by (Neuman, 2014) was employed. Data analysis using the software “Atlas ti” was used for data coding, thematic analysis, and information management until saturation was achieved. To arrive at comprehensive conclusions, the combined use of primary and secondary data was systematically analyzed for recurring patterns and disparities to draw a robust conclusion for this study. A total number (9) codes were created to categorize the variables in this study and were applied to the textual data using Atlas ti software. The code list is provided in Appendix 10. Atlas ti query tools were utilized to perform descriptive analysis, identifying patterns and the relationships between the variables.

## CHAPTER FOUR

### DATA ANALYSIS AND RESEARCH FINDINGS

#### 4.1 Overview

This chapter presents the findings from the data collected and offers analytical interpretations of the findings presented. Firstly, background information on the current state of sanitation in schools in Ghana is given. Subsequently, it offers a descriptive analysis of existing institutional structures responsible for O&M, summarizing the key findings regarding their roles and responsibilities. The chapter further discusses O&M activities within these structures, highlighting any areas of strength and weakness. Finally, it draws a key conclusion on how current institutional arrangements influence the overall effectiveness of O&M for school toilet facilities in AMA.

#### 4.2 Background of Sanitation Facilities in Schools in Ghana

Ghana's sanitation struggles persist, with nine percent of open defecation occurring in urban areas (PHC, 2021). Schools are not immune, with a staggering 25% of public basic schools lacking proper sanitation facilities as of 2020 (GES/EMIS, 2020). In the Greater Accra region, 10% of schools lack access to basic sanitation. Even for schools fortunate to have them, concerns linger about the effectiveness and safety of these facilities for students, teachers, staff, and the surrounding community. Inadequate O&M can lead to a vicious cycle: facility deterioration, abandonment, a return to open defecation by school children, and ultimately, a potential outbreak of disease within the community.

##### 4.2.1 Conditions of Sanitation Facilities in the Three Case Study Schools

To evaluate the effectiveness of O&M in school sanitation facilities, the researcher assessed the conditions of three school toilet facilities in AMA during the study period with a facility checklist. The assessment was conducted under five categories; Hygiene and Cleanliness, Functionality, O & M, Accessibility and Privacy, and Overall Impression. Under each category, there were corresponding aspects/indicators to determine the conditions of that category for each school facility. The number of aspects/indicators for each category was used as a rating system for the facilities (see Appendix 8). A category such as functionality with five indicators had a rating of 1-5 and so on. School toilets with lower numbers for the categories indicated the lack of vital facilities for the specified category. The following definitions informed the indicators which were applied to the assessment of the facilities during the fieldwork.

**Hygiene & cleanliness:** This was assessed by the absence of visible dirt and debris, availability of toilet papers, functioning handwashing facility with soap and running water, unpleasant odors, and adequate lighting and ventilation (Duijster et al. 2022).

**Functionality:** This refers to the toilet not being broken, the toilet hole not being blocked, water availability for flush/pour-flush toilets, proper wastewater drainage, and the absence of leaks (JMP, 2018).

**Operation & Maintenance:** It entails all necessary activities required to ensure that sanitation system functions effectively throughout the entire value chain, including collection enhancement, transportation, treatment, and final disposal (Tilley et al. 2008).

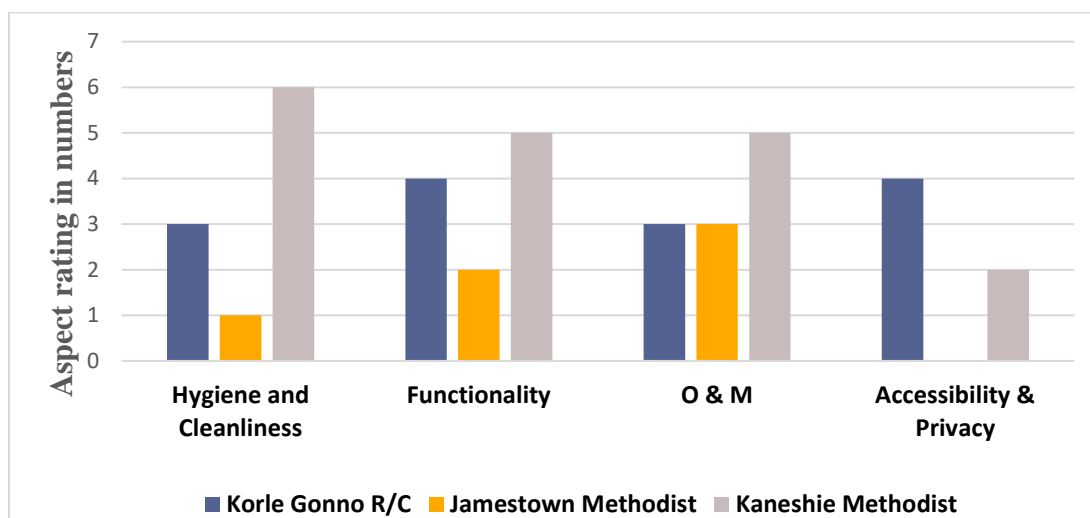
**Accessibility and privacy:** This refers to toilet facilities available to students with unlocked doors, or a readily accessible key at all times. Privacy during use means the facilities should have closable doors that are locked from the inside, lack any significant structural gaps, and be gender-separated at the time of data collection (JMP, 2018).

Figure 4 shows the conditions of three school toilet facilities in AMA at the time of the study. Hygiene and Cleanliness had 1 to 7 aspects of rating. Korle Gonno R/C Boys Basic School had only three (toilet paper availability, soap availability, and ventilation) out of the seven ratings. Ventilation was the only aspect present for Jamestown Methodist Basic School. Kaneshie Methodist 2 Basic School had six out of the seven aspects under the hygiene and cleanliness category.

- i. Functionality with a 1 to 5 rating, Korle Gonno R/C rated 3 because it satisfied 3 indicators under this category. This school showed a lack of functioning urinal and water sources for flushing. Jamestown Methodist rated 2 out of 3 because the toilet facility lacked proper wastewater drainage (pit latrine). Kaneshie Methodist rated 4 out of 5 with proper wastewater drainage as the identified problem.
- ii. For O & M, it was assessed with a 1 to 7 rating. Korle Gonno R/C scored 3 out of 7 which shows the toilet facility had damaged walls/floors, was subjected to vandalism/graffiti, showed crude dumping of waste, and lacked minor repair tools. Jamestown Methodist scored 3 out of 7 which showed the toilet facility lacked a designated O & M person, proper waste disposal, and minor repair tools with damaged walls/floors. Kaneshie Methodist also scored 5 out of 7, showing the toilet lacked a designated O & M person with vandalism/graffiti present.
- iii. Accessibility and Privacy were rated between 1– 4. Korle Gonno R/C scored 4 out of 4 which means the facility had all aspects present. Jamestown Methodist toilet rated zero as it lacked all accessibility and privacy indicators (sufficient toilets for students, adequate stall separation, door locks, and disability access). Kaneshie Methodist scored 2 out of 4 which showed the toilet lacked (sufficient toilets for students and disability access).

The overall impression of the three toilet facilities in these schools showed the condition of Korle Gonno R/C school toilet was fair, Jamestown Methodist poor and Kaneshie Methodist being good as at the time of study. See appendices 1-3 for visual presentation.

**Figure 4: Conditions of sanitation facilities of the case study schools**

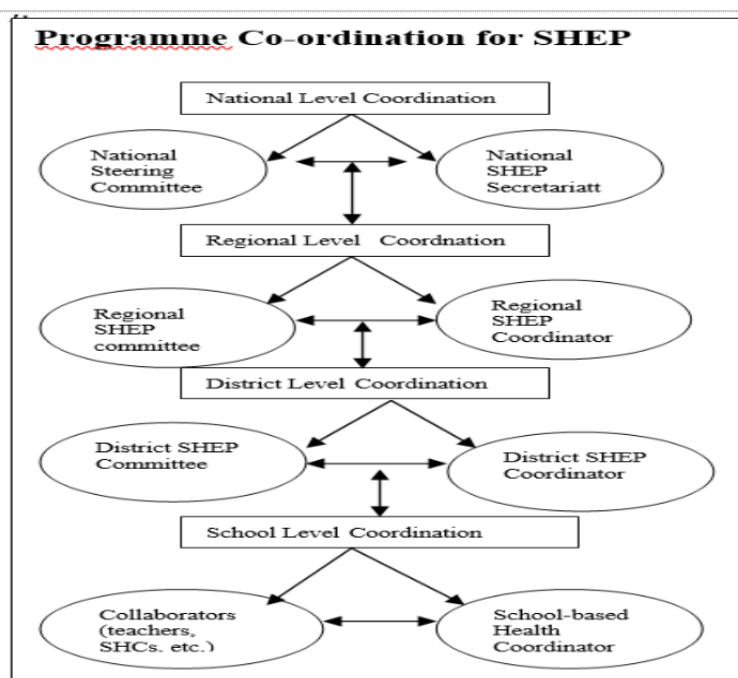


Source: Field Survey, 2024

### 4.3 Institutional Framework – WASH in Schools in Ghana

An efficient WASH in schools operation involves a diverse range of actors required to undertake WASH interventions in schools. This suggests a collaborative approach, fostering broader consultation and soliciting ideas across various levels for the provision of WASH facilities. The institutional framework for WASH in schools in Ghana outlines actors and set-up to guide WASH initiatives. This is shown in Figure 5.

**Figure 5: Institutional Framework – WASH in Schools in Ghana**



Source: (Adapted from GES, 2012)

### 4.3.1 Role of the Various Actors in the O&M of School Toilet Facilities in AMA

According to IRC (2018), anyone or organization that directly or indirectly impacts the WASH system is considered an “actor”. This includes government departments, communities, schools, and NGOs. Effective O&M of WASH services rely on clearly defined roles and responsibilities with minimal gaps between different actors. These actors can be broadly categorized into three groups:

- Regulatory bodies: They set the rules, like the Ministry of Education
- Service providers: These are the ones who deliver the service, such as AMA, School administration, or a designated project team.
- Service users: These are the beneficiaries, in this case, the students.

This research identified the MoE, GES/SHEP, MSWR, AMA, Assembly members/Unit Committee members, CONIWAS, GAMA-SWP, PTA, Headteachers, and Pupils as the key actors involved in the O&M of school sanitation facilities. These actors can be categorized into four levels: **national, district, community, school, private sector, and NGOs**. At the national level, actors primarily focus on oversight responsibilities, formulating policies, strategies, and guidelines to promote sustainable access to WASH facilities. The following actors at the national level provide the following mandates:

- i. Ministry of Education (MoE): responsible for procuring services, contract negotiation for WASH infrastructure, awarding construction contracts, and offering technical guidance on facility design aligned with site-specific requirements and budgetary allocation, etc. (GES, 2014; NESSAP, 2010).
- ii. Ghana Education Service (GES)/School Health Education Programme (SHEP): provision of administrative support for the effective functioning of steering committees at both national and sub-national levels, coordinating and monitoring WASH activities, collating school health intervention reports from all actors, provision of advocacy, leadership, and capacity building for SHEP implementers, and facilitating logistical support for SHEP programs implementation (GES, 2014).
- iii. Ministry of Sanitation and Water Resources (MSWR): evaluating national policy frameworks to create a supportive environment for improved school conditions. Additionally, the Ministry facilitates the construction of environmentally friendly, gender-inclusive, and accessible water and sanitation facilities in schools. Through a partnership with GES and other actors, the MSWR develops comprehensive strategies for integrating hygiene education into school curricula and promoting behaviour change through Social and Behavioural Change Communication /Information, Education, and Communication materials.
- iv. Accra Metropolitan Assembly: monitoring, maintenance, and prioritization of user safety, certifying food vendors, facilitating school sanitation facility desludging, and ensuring WASH in schools designs adhere to national standards, etc. (GES, 2014; ESP, 2010).
- v. Community: through its Assemblymember/Unit committee, champions intervention of appropriate WASH facilities in their jurisdiction, undertakes consistent monitoring of

- school WASH facilities to prevent community vandalism, and ensures WASH in school facilities are operated and maintained following the established standards (GES, 2014).
- vi. Parent Teacher Association (PTA), Headteachers, and Pupils: The PTA spearheads local campaigns to enhance WASH facilities in schools, mobilizes funds to support improvement plans with directors and teachers of the school, assists in the O&M of school sanitation facilities, and supports access to hygiene supplies, including soap to promote good hygiene practices (GES, 2014). However, Headteachers are responsible for the day-to-day management of schools in Ghana by collaborating with the District Assembly, SMC, PTA, and other actors for smooth implementation of WASH interventions, planning, and budgeting for WASH activities in school, and ensuring their prioritization in the disbursement of the capitation grant, ensures the incorporation of WASH activities in end of school term report (GES, 2014). Also, pupils are responsible for the day-to-day management of environmental sanitation of school facilities by ensuring proper use of school WASH facilities, promoting the sustainability of WASH infrastructure, and acting as agents of WASH behaviour change within the community (GES, 2014).
  - vii. Private sector/NGOs: GAMA-SWP and CONIWAS were identified during this study. The Greater Accra Metropolitan Area-Sanitation is a project unit under the MSWR that seeks to improve access to WASH facilities in low-income communities in the Greater Accra Metro Area (GAMA) (gamaswp.org). The project supports the design, capacity building, and training for WASH actors, and the development of O&M plans (GES, 2014). However, the Coalition of NGOs in Water and Sanitation serves as an advocacy body collaborating with the district SHEP office and Environmental Health Unit to facilitate WASH provision in schools. The Coalition actively advocates for increased funding to support WASH initiatives and facilities, while also partnering with the District SHEP office to equip schools with the necessary training and resources for effective WASH implementation. (GES, 2014).

The GES (2014) guide establishes the key actors involved in the sustainability of school toilet facilities as indicated above. However, its implementation in reality is different. As deduced from the interviews, respondents described their roles and responsibilities in the O&M of school toilet facilities in AMA as schools are responsible for ensuring the day-to-day cleanliness and functionality of their toilets, the maintenance of WASH facilities, planning and allocating resources for school WASH activities, and ensuring their prioritization in the disbursement of the capitation grants (GES, 2014). In interviews, both Head Teachers emphasized their hands-on approach, ensuring the school's smooth daily operations, including the O&M of toilet facilities. Interestingly, some schools have designated sanitation teachers, while the municipality also plays a role by regularly providing capacity-building and student education programs (R6). This highlights the proactive role of Headteachers and the presence of sanitation teachers in some schools, going beyond the basic roles outlined in the guidelines.

R1 (Deputy Director) indicated that the Ministry of Sanitation and Water Resources has a policy oversight and described MSWR's role as *“MSWR plays an indirect role through monitoring, technical support and training of downstream project staff and the District Assemblies [...]”*.

R5 (Executive Secretary) highlighted *“CONIWAS plays an indirect role when it comes to O&M of school sanitation facilities. We are an advocacy body and a network of NGOs working in the WASH sector to remove barriers and ensure everyone has access to safe water and sustainable sanitation”*.

Furthermore, another respondent mentioned that their institution plays a direct role when it comes to the O&M of school sanitation facilities stating that *“[...] SHEP role is a direct one as we make plans, coordinate, and collaborate with actors on WASH implementation in schools”* R3 (National SHEP Coordinator). The GES (2014) guide clearly states that the Assemblies are responsible for O&M activities. However, the reality on the ground paints a different picture. When asked about their role, one respondent disclosed that: *“Normally AMA’s role should have been a direct one, but because of the presence of SHEP Coordinators at the school level, it is a collaborative role and O&M activities are to be undertaken by SHEP whiles AMA play the monitoring role”* R4 (Metro Public Health Director). This lines up with the role of Assembly Members, who reiterated their role as a bridge between the communities and the government R7 (Assembly Members) in separate interviews. They stressed on full community support to ensure that sanitation facilities have lasting value, raising concerns about the lack of cooperation from the PTA. This correlates with Sohail's (2001) argument that sanitation facilities O&M extends beyond municipal authorities. Community organizations, school administration, and individual households all play a significant role in ensuring their effectiveness. Such collaborative efforts have the potential to prolong the lifespan of WASH facilities.

It was revealed by respondents that the institutional roles and responsibilities of actors in the O&M of school toilet facilities in AMA were not too clear. The facility management plan clearly outlines the Assembly’s role. While Assemblies are generally responsible for providing and maintaining these facilities, inconsistent implementation was observed at the district level. Although a well-structured system exists at the national level, its effectiveness at the district level varies. R5 (Executive Secretary) *“[...]The Assembly adheres to existing guidelines for repairs but often prioritizes major repairs due to limited funds. Minor repairs are frequently left to schools, PTAs, or SMCs, which may also lack sufficient resources. If these minor repairs are not addressed promptly, the facilities can deteriorate over time”*. Typically, upon completion of WASH facilities construction, a formal handover ceremony is conducted involving the District Director of Education. For instance, if the construction was funded by the Assembly, the District Education Oversight Committee, chaired by the Chief Executive of the respective assembly, and with the District Director of Education as Secretary, would be responsible for addressing any operational and maintenance challenges that may arise. However, due to fragmented responsibilities, these O&M activities are not taken care of leading to the poor state of sanitation facilities in most schools.

*“[...]the Assembly is not the lead when it comes to operation & maintenance but rather GES is, and the GES is collaborating with the Assembly to build schools for GES, so GES manages the school, including the O&M of sanitation facilities, and reports back to the Assembly”* R4 (Metro Public Health Director) established. The ESP (2010) and GES (2014) guide outline the Assembly’s responsibility for infrastructure provision. This mandates collaboration between

the Environmental Health Department and Works Department in developing plans and cost estimates for environmental sanitation facilities (ESP, 2010). However, despite these, the interview reveals confusion about roles, particularly at the District level where O&M takes place. Findings indicate that Assemblies are reluctant to make financial commitments to WASH interventions in schools due to the lack of potential revenue generation from such investments and the prioritisation of different projects hence the reason for not undertaking their responsibilities as assigned to them. As IRC (2018) emphasizes, clearly defined roles and responsibilities are fundamental. Additionally, the distinction between major and minor and rehabilitation of sanitation facilities should be established. The absence of a clearer distinction has impacted the undertaking of O&M interventions among actors at the sub-national level. Some actors believe that certain repairs or maintenance interventions fall outside their purview and therefore ignore them, leading to the worsening condition of these school sanitation facilities.

The GES (2014) guide outlines clear roles and responsibilities for various actors involved in WASH in school programs. At the national level, policymakers are responsible for developing comprehensive strategies and guidelines to promote sustainable WASH practices. District-level authorities play a crucial role in implementing these policies and ensuring their effectiveness. Routine inspections by Environmental Health Officers are essential for maintaining high sanitation standards in schools. Community engagement facilitated by the Assembly member/Unit committees is vital for the success of WASH in school interventions. School-based actors, including PTAs, headteachers, and pupils, are responsible for the day-to-day operation and maintenance of sanitation facilities. While the guide delineates roles and responsibilities, there is evidence that some actors do not adhere to their designated duties. This was reiterated by Naz et al. (2015) who highlighted that the involvement of multiple actors in O&M can lead to fragmented roles and responsibilities, resulting in scheduling lapses and subsequent infrastructure deterioration.

#### **4.4 System of Rule**

WASH in school programs in Ghana have been enshrined in a strong legal foundation. The two notable legislation frameworks are the Education Act of 2008 (Act 778) and the Education Service Act of 1995 (Act 506). To the first official, these documents mandate collaboration between the Education Service and other relevant actors to ensure the overall safety of pupils throughout their education. R1 (Deputy Director) highlighted “*[...] yes, there are several existing policies that govern infrastructure management in the education sector. These include the Ghana Education Service Operation and Maintenance Costed Guidelines, developed in 2014 to guide schools on effective O&M practices. The 2010 Environmental Sanitation Policy also ensures that schools are provided toilet facilities*”. This statement stresses the concept of rule as described by (Ostrom, 2011), who indicated that such guidelines essentially outline required, permitted, or forbidden actions among actors. This helps create order and predictability when different actors interact within the system. The rules are established through implicit and explicit agreements defining each actor's roles and responsibilities. These roles then dictate what actions actors are obligated to take, allowed to do, or restricted from doing, ultimately impacting the overall success of WASH in schools O&M.

#### 4.4.1 Institutional Relationship

Per the GES (2014) guide, actors are expected to communicate, collaborate, and share information peculiar to WASH in schools with each other. The interview with national-level actors revealed a claimed “cordial relationship” with sub-national-level actors. This assertion aligns with institutional relationships as described by Williamson (1979), and Breton & Wintrobe (1982), who stated that time and resources are invested in building and maintaining them as well as the additional value an actor places on establishing a reputation for reliability and trustworthiness plays a significant role. While actors acknowledged bureaucratic challenges, the national-level actors emphasized the importance of direct reporting of O&M challenges and issues at the sub-national level. This suggests a level of cooperation and information sharing, considered as an essential component of institutional relationships. Furthermore, district officers are regularly involved in national-level WASH monitoring activities to strengthen these ties. To her, they prioritize the involvement of the District in assessing WASH facilities during monitoring. R3 (National SHEP Coordinator) “[...] during our field visits, we allocate budgets to the districts for their involvement because they are the grassroots officers who are most familiar with the specific challenges in their areas ”. Conversely, at the school level, respondents reported weak relationships with the assembly and community, alluding to the lack of consistent communication and infrequent site visits by district stakeholders. This weak relationship between the relevant stakeholders has affected the school toilet facility's operation and maintenance. The structural defects and their accompanying shortage in logistics supplies such as cleaning tools and equipment and other external support expected from these stakeholders have not been forthcoming leading to the schools having to shift the financial burden onto parents which in turn affects the school attendance rate of the children due to the unaffordability of these costs.

#### 4.4.2 Financing Mechanism

Effective O&M of school sanitation facilities requires a well-structured system, responsible financial management, and clearly defined roles (IRC, 2018; SuSanA, 2012; ESP, 2010). However, interviews conducted for this brought to light a major constraint: a lack of diverse funding sources for sustainable sanitation. Several respondents pointed to the inadequacy of the capitation grant, a government-provided fund for school maintenance.

R2 (Sanitary Engineer) “...the grant, which has not increased since 2020, allocates a meager GHC10 (\$0.65) per student per year for O&M activities across the board including sanitation. This amount which averages about 10% or less for O&M is woefully inadequate [...]” R1 (Deputy Director) made similar revelation by mentioning “Schools do not have the right to collect fees directly from parents for the O&M of school toilet facilities, which further restricts their options”. An article posted on (gbcgghanaonline.com, 2024) indicates that schools previously imposed additional charges on parents to support daily school operations, including O&M. However, recent directives from the GES have restricted these practices, hindering school management and limiting funding for O&M activities. When questioned about the rationale behind this directive, R2(Sanitary Engineer) explained the rationale behind this restriction by detailing that “some parents complained to the GES about schools charging fees/levies despite the government’s promise of free compulsory basic school education, leading to students' dismissal for non-payment [...]”

This study also explored the contributions of actors beyond the implementation level. Interviews revealed that some actors provide schools with additional funding and logistical support, primarily focused on training and capacity building. These activities aim to encourage student involvement in maintaining facilities and equip teachers with the necessary skills.

For instance, R3 (National SHEP Coordinator) explained that “...in terms of funding, SHEP annually incorporates WASH needs into GES budgets and annual work plans, ensuring some funding reaches schools. Also, our minimum standards have been incorporated into the education sector’s plan, so WASH in schools interventions will be catered for at least when there is funding”. Additionally, the MSWR representative R1 (Deputy Director) shared similar thoughts by indicating that the Ministry has consistently been supportive when it comes to the mobilization of funds for O&M activities in schools. Stating that “...a comprehensive training has been conducted for over 600 actors including District Directors of Education, Directors, Teachers, School Management Committee, Parents, etc. on how to manage school facilities, seek funds from old students to be able to improve the management of the schools, and outsource some of the services to third parties to be able to support several activities at the school level”. He proceeded to add: “It became important for us to form that group or bring that group together because of the challenges we have with the O&M of our school sanitation facilities”.

At the implementation level, funding comes from various sources. R4 (Metro Public Health Director) explained that “...The Assembly allocates funds for O&M from its Internally Generated Funds and government bonds. So, the works department plans for these schools and maps them out within the year and their plans for the subsequent year as well to undertake these interventions”. A careful review of the Assembly’s 2024 Annual Action Plan corroborated this assertion. While the plan outlines initiatives such as providing toiletries to selected schools and implementing water harvesting in fifteen basic schools, with clear timelines and locations, it notably lacks a dedicated focus on O&M planning for school sanitation facilities.

R5 (Executive Secretary) when asked about their contribution in securing funding to support O&M activities revealed that “Some of our members who do provide WASH facilities for schools have been supporting SHEP in the training of the school-level implementers. The GES minimum standards for WASH in schools require that schools develop a localized plan and commit to facility management but normally, they are implemented well when there is a project. So, the only way these facilities can be well maintained is mostly through advocacy”.

R6 (Headmaster, Kaneshie Methodist Basic 2) revealed that “...PTA has been very supportive in terms of funding for O&M intervention in the school. Parents have been contributing GH¢1.00 (\$0.07) per student per week to support the school in the payment of a janitor’s salary and provision of other essential toiletries”. On the contrary, another teacher R6 (Sanitation Teacher, Jamestown Methodist Basic School) revealed a concerning reality by highlighting that “...Mostly we the teachers sometimes pay for the maintenance of minor repairs. If you tend to ignore it, the facility will deteriorate gradually. It is difficult sometimes to fund these repairs

*and we do not have any budgetary allocation at the school level to cover such costs*’. It can therefore be concluded that the varying levels of community support for school sanitation facilities in some schools can place undue financial pressure on teachers and hinder the long-term sustainability of school sanitation facilities.

Furthermore, to understand the community's perspective regarding funding provisions to support the O&M of school toilet facilities, an Assembly member R7 (Assembly member) was engaged and disclosed that *“Ooh, there is nothing like community support to fund O&M interventions. Maybe it is only a few individuals who have their wards in the schools who are more concerned about school sanitation but the community as a whole does not assist”*. This highlights the need for a more sustainable approach, as proposed by Koseoglu (2021). Shifting from overreliance on individual teachers towards a collaborative leadership structure with community engagement can create a more dependable and long-term solution for maintaining sanitation facilities.

#### **4.5 Communication and Coordination Channels for O&M of School Sanitation**

Due to the multifaceted nature of WASH, effective coordination mechanisms and structures are essential for the various actors. These mechanisms should establish communication and collaboration platforms that enable joint efforts and efficient information flow across the entire WASH sector (similar to what IRC suggested in 2018). While interviews revealed consistent communication and information sharing among actors in the O&M of school sanitation facilities, a gap exists between national policymakers and local-level implementers. This seems to stem from weak communication structures at the grassroots level.

R5 (Executive Secretary) highlighted the need for GES to play a more active role in coordinating efforts. She added *“[...] normally, GES is expected to be the one to take the coordination role and bring the community, assemblies, and SMC together to work on how to operate and maintain or at least manage these facilities”*. R3 (National SHEP Coordinator) emphasized the sharp drop-off in coordination at the sub-national level. She pointed out that: *“For instance, facilities are sometimes constructed without the knowledge of national authorities due to a lack of information flow”*.

However, the interviews also revealed some promising existing communication channels:

R1 (Deputy Director) described the Water and Sanitation Sector Working Group, chaired by the Hon. Minister of Sanitation and Water Resources. Citing that this quarterly meeting brings together relevant actors, including the GES, and the Ministry of Education, to address critical issues related to school sanitation O&M. This highest decision-making body also has sub-committees, such as the National Technical Working Group on Sanitation, which provide technical expertise. The involvement of GES officials in these committees ensures that crucial information reaches the grassroots level. He continued by mentioning *“... Similarly, at the regional level, a Regional Inter-Agency Coordinating Committee on Sanitation exists, bringing together stakeholders to address sanitation issues, including school sanitation”*.

Efforts are also underway to improve communication at the implementation level. One respondent R4 (Metro Public Health Director) mentioned that: *“The Environmental Sub-Committee of the General Assembly is working to establish a dedicated O&M committee for schools in AMA. This committee is envisioned to take the lead in addressing any issues related to the school's WASH facilities”*. While these existing communication channels are positive steps, the challenge of bridging the gap between national and local levels remains. Strengthening communication structures at the grassroots level will be crucial for ensuring efficient information flow and successful WASH program implementation in schools. This aligns with Saleth & Dinar's (1999) opinion that the efficacy of policy implementation is contingent upon legislative authorization, well-defined goals, and dedicated administrative backing.

#### **4.5.1 Power Dynamics**

Within a system, power dynamics refer to the complex interplay of forces that influence its operation (IRC, 2018; Ostrom, 2011). This concept is particularly relevant when considering the O&M of school sanitation. As R3 (National SHEP Coordinator) aptly noted *“All the various actors have varying degrees of influence, especially when it comes to their capacity to address challenges at their respective levels”*. This highlights the interconnectedness of political and economic factors in determining what can be realistically achieved in the context of O&M.

#### **4.5.2 Decision-making for O&M**

The National Environmental Sanitation Strategy and Action Plan (2010) highlighted how community involvement in decision-making is critical for effective plan dissemination. This notion was hammered by (Marks & Davis, 2012) indicating a positive correlation between active participation in WASH programs, involvement in decision-making and significant financial contributions, and a heightened sense of ownership among actors. This, according to the authors, is believed to be a key factor in ensuring the sustainability of WASH services. R1 (Deputy Director) highlighted *“So it's interesting to see how issues surrounding school O&M are discussed at the highest-level decision-making platform, our National Technical Working Group, chaired by the Honourable Minister of Sanitation and Water Resources [...]”* This exemplifies how high-level decision-making can benefit the sustainability of WASH facilities in schools.

### **4.6 Community Engagement for O&M of School Sanitation Facilities**

As research by Brikké (2000) suggests, the ideal management model for school sanitation depends on factors like the capacity of local community organizations and the skills available within the community. Beyond the involvement of external actors, schools themselves undertake various initiatives by incorporating messages or slogans into morning assemblies. This highlights the efforts within the school environment to promote sanitation. They emphasized a spirit of equality, stating, *“both seniors and juniors clean the facilities together”* R9 (Pupils). However, interviews revealed a lack of clarity regarding community responsibilities in O&M of school sanitation facilities.

#### **4.6.1 Community Level of Participation for O&M of School Sanitation facilities**

Many schools, like the one led by the Headmaster (R6), do not anticipate external support. This Headmaster explained *“We rely on our Parents Teacher Association for minor repairs. They have been dependable whenever O&M issues arise”* (Headmaster, Kaneshie Methodist Basic 2). However, he also expressed hesitation about full community involvement, fearing damage to the facilities (Respondent - 6). It is worth noting that the MSWR through the GAMA-SWP project has constructed an ultra-modern 14-seater disability-friendly toilet facility for this school which is yet to be commissioned alongside a 4-seater toilet currently in use to augment the school population.

The story is less encouraging in Jamestown Methodist where there is no PTA support for the O&M of sanitation facilities and also relies on the usage of pit latrines. However, they receive some financial support from the Methodist Church (previously responsible for the school). It was mentioned that although there is no collaboration with the community, however, *“potential engagement with the community in the O&M of school sanitation facilities will go a long way to strengthen, enhance, and also provide us with sufficient revenue to undertake these interventions”* (Sanitation Teacher - Jamestown Methodist Basic School).

Echoing these concerns, R6 (Headmistress) described an initial attempt to engage the community, but not specifically on O&M support. Unfortunately, the response from both the community and PTA has been discouraging. She also mentioned holding several meetings with the area’s Assembly members. However, their primary concern seems to be disruptions and unpleasant odors emanating from nearby houses. The Headmistress elaborated *“There is a cattle ranch right behind the school, and the noise and stench during school hours are unbearable”* (Headmistress, Korle Gonno R/C Basic Boys). The Assembly member when interviewed mentioned that the community engagement and support for O&M has not been encouraging. Stating that there is a need for the community to come together and support the school since it is their very own children schooling there (R7). The absence of community participation has increasingly hindered the O&M of school sanitation in AMA particularly at Jamestown Basic School. WASH facility's conditions in the school are despicable, posing serious health risks and potentially leading to public health outbreaks. This situation could have a far-reaching impact on the community as a whole.

#### **4.6.2 Community Ownership, Attitudes, and Perception for O&M of School Sanitation Facilities**

It was noted through the interviews that sanitation in the study communities has traditionally been seen as an individual and household concern, not a communal responsibility. This is coupled with limited space, perceived resources, and authority constraints. As a result, *“most households lack toilets and the public toilet facilities close at 10:00 pm daily, some community members resort to using the school’s toilets or practice open defecation at night”* R7 (Assemblymember, Korle Gonno).

The School Prefect for Jamestown Methodist Basic School responding to how their facility is being vandalized by the community stated “...Community boys come to play football at our school when it’s closed. They use our toilet without throwing the tissues into the toilet basket. Instead, they scatter them all over the washroom. Then when they see us in town, they make derogatory comments about our school, saying it’s not good and that our washrooms smell terrible” R9 (Pupils). These remarks by respondents bring into line the general perception among community members regarding school sanitation facilities. One of the respondents at the national level described and acknowledged the problem as:

“Communities often see the school as a separate entity. Collaboration between the School Management Committee and the community is crucial. In some instances, when there are no toilets in the communities, people use the school's facilities when they are not in session, leaving them in an unusable state for the students upon arrival. There have been complaints about such behaviour” R1 (Deputy Director). The revelation suggests a fragmented institutional arrangement for O&M. The school is expected to manage sanitation for both students and the community, exceeding its intended capacity. This puts a strain on the already limited resources for WASH facilities in these schools, resulting in their dire states. As Ostrom (2011) and Cox and Ostrom (2010) noted, action situations change over time as the way sanitation was managed in the past has shaped the current perception of different actors at the community level.

#### **4.7 Summary of Findings and Implications for various actors.**

Chapter 4 presented the results on how institutional arrangements affect the O&M of school toilet facilities in AMA. In summary, it is obvious from the analysis that four factors depicted as contributors to institutional arrangements in the conceptual framework (section 2.9) do influence O&M activities in schools within AMA. The presence of multiple actors in WASH in schools O&M in AMA is consistent with definitions presented in section 2.4 (Ostrom, 2011; IRC, 2018). Therefore, this case study does not deviate from what is suggested in the literature on institutional arrangements and its contributing variables.

The comparison between the actual WASH in school implementation and the actual situation in AMA was developed to analyze WASH interventions in schools under study. To illustrate the level of institutional arrangement factors, the researcher assigned scores ranging from 1-5 to each indicator used in this study, where 1 rating star means low, 3 moderate, and 5 the highest. 5 stars were assigned to an ideal situation based on the GES (2014) guide. The scores assigned to the AMA situation were based on the findings from this study. The interpretation of these findings was based on both primary and secondary data including project reports, articles, policies, strategies, and guidelines. A detailed summary showing the level of institutional arrangements under each indicator and their corresponding scores is shown in Table 2 below.

As shown in the table, the score for structure is the same for both the actual situation and AMA. Depicting that there is a structured presence in the WASH in the school framework with the assembly. The three key structures (regulatory body, service providers, and service users) were all present during this study.

The key actors ranged from national, district, community, schools, private sector & NGOs on institutional size. All these actors are considered critical to the sustainability of WASH interventions in schools.

Furthermore, institutional roles and responsibilities had a rating score of 3 out of 5, indicating that some actors were not playing their roles as stated in the GES (2014) guide. Notably, while some actors fulfilled their responsibilities for WASH in schools, the assembly's responsibilities have been neglected more often than not. Also, the community's role has been less effective and efficient within the study areas. These two actors have negatively impacted the sustainability of WASH facilities within the three study communities.

Institutional relationships between the various actors were generally positive based on the findings from the interview. There were instances where national-level actors collaborated with implementers in undertaking monitoring and evaluation activities. On the contrary, the relationship between the schools and the communities has been weak, which has led to vandalism of school WASH facilities and the use of derogatory comments on school children.

Effective WASH in school requires a responsible financing mechanism. While GES is responsible for budgetary allocation to these schools, the only available financial means have solely been the capitation grants, which several actors considered as woefully inadequate. The Assembly often defaults on its responsibility and does not seem to make any financial commitment to support the schools which has put a lot of pressure on the school administration, hence the rating of 2 stars.

Power dynamics vary among actors due to the power each actor wields. National level actor's power lies in policy-making, strategies, and guideline development. The assembly's power lies in the enforcement of its bylaws and ensuring effective compliance. Community actors are recognized as gatekeepers to ensure the sustainability of WASH interventions. However, Headteachers are responsible for the day-to-day management of schools in Ghana by collaborating with the District Assembly, SMC, PTA, and other actors for smooth implementation of WASH interventions, planning, and budgeting for WASH activities in school while students also ensure the sustainable use of WASH facilities within the school.

Decision-making involving the collective participation of WASH in school actors in this study was not encouraging. While WASH issues were discussed at the highest decision-making level, and also a committee has been constituted by the General Assembly to oversee WASH issues, the same cannot be said about community-level actors. Schools often engage the PTA in decision-making. However, the involvement of the communities as a whole has not been encouraging, and community members do not see the need to contribute to such discussions, which has also impacted the sustainability of WASH facilities.

The community level of participation for WASH in schools within the three study communities was low. No willingness was shown by community members to support any WASH interventions undertaken by the school.

Community ownership, attitudes, and perception had the lowest star as the community often isolated the schools and considered them as different entities. The vandalism coupled with derogatory comments made by some community members contributed to the current deplorable state of WASH facilities in these schools.

**Table 2: Comparison between the actual WASH in school implementation situation vs AMA situation from interview findings**

	Sub-variable	Indicator	Actual situation (based on theory and practices)	Rating	
				Actual situation	AMA situation
<b>Institutional arrangement</b>	Institutional presence	Structure	<ul style="list-style-type: none"> <li>✚ Regulatory bodies: They set the rules, like the Ministry of Education</li> <li>✚ Service providers: These are the ones who deliver the service, such as AMA, School administration, or a designated project team.</li> <li>✚ Service users: These are the beneficiaries, in this case, the students.</li> </ul>	★★★★★	★★★★★
		Size	✚ Effective WASH in schools consists of all levels of actors ranging from national, district community, schools, private sector & NGOs	★★★★★	★★★★★
		Roles and responsibilities	✚ Institutions in WASH in schools framework assume responsibilities	★★★★★	★★★
	System of rule	Institutional relationship	✚ The formal and informal relationship that exists between WASH in school actors	★★★★★	★★★★★
		Financing mechanism	✚ Responsible financial management	★★★★★	★★
	Communication and coordination	Power dynamics	✚ The complex interplay of forces that influence WASH service operation	★★★★★	★★★★★
		Decision-making	✚ Involvement of all WASH in school actors	★★★★★	★★★
	Community engagement	Community level of participation	✚ The capacity of local community organizations and the skills available within the community	★★★★★	★★
		Community ownership, attitudes, and perception	✚ The willingness and effective measures in place to sustain school WASH facilities	★★★★★	★

**Authors own construct (2024)**

The relationships reveal that some variables do not have the same influence on the O&M of WASH facilities in schools as others. However, the analysis highlights that some variables notably actors involved (institutional factors), financial factors, communication and coordination, and community engagements strongly influence O&M activities in schools. It was observed that schools with strong community and external support demonstrated superior WASH facilities compared to those without any support. While vandalism was a common challenge across all three case study schools, Kaneshie Methodist School stood out with notably good toilet facilities as it is situated in a middle-income community and generally exhibited better conditions than those in low-income areas. Jamestown Methodist and Korle Gonno R/C Basic schools, both coastal communities, received the most negative feedback regarding school sanitation. The prevalence of open defecation and lower household toilet ownership in these areas likely contribute to a greater reliance on school sanitation facilities.

This research further suggests that policymakers consider a comprehensive re-evaluation of institutional arrangements governing school sanitation. This includes enhancing coordination and collaboration among actors involved and ensuring adequate, timely funding for the sustainability of sanitation facilities, and the involvement of the private sector through PPP arrangements which was also considered as a critical approach in ensuring sustainable sanitation in school. Implementing a robust monitoring and evaluation system is essential to track progress, inform policy decisions, and measure the impact of sanitation interventions. Future researchers can significantly contribute to delving deeper into the effectiveness of different intervention strategies on school sanitation. Understanding the nuances of these approaches will be instrumental in developing sustainable solutions.

For students and communities, improved sanitation facilities directly translate to enhanced health outcomes limiting health risks associated with the facility's exposure which will automatically enhance environmental health, students, and the broader community.

## CHAPTER FIVE

### CONCLUSIONS AND RECOMMENDATIONS

#### 5.1 Overview

This chapter concludes by summarizing the findings of the literature used in this study. The objective of this research is to understand how the roles of various institutions affect the operation and maintenance of school toilet facilities in AMA. This study found that the role of actors in the O&M of school sanitation in AMA was too fragmented, coupled with defaulting responsibilities, and a lack of community support and ownership. The chapter proceeds to provide policy and theoretical recommendations based on findings.

#### 5.2.1 What has been the role of the various actors in the O&M of school toilet facilities in AMA?

In many developing countries, access to basic sanitation is still a challenge. This lack extends to schools, where sanitation coverage is often inadequate. Many schools lack sustainable toilet facilities, and even those with functioning toilets face managerial issues. Literature on actors' role in the Ghanaian context in the O&M of school toilet facilities has been under-explored. This research aims to address this gap by examining the limitations of school toilet facilities in meeting the urban sanitation challenge, using a case study focused on AMA.

To answer the main research question, this study utilized the IAD framework (Ostrom, 2011). This framework provides a lens to analyze how institutional arrangements affect implementation projects at the local level. The concept has been applied across various contexts to understand how institutions interact to influence outcomes. This highlights the importance of considering the specific context when applying the framework. This study employed all three components of the IAD framework to conceptualize the institutional factors at play: the actors involved, the system of rules, and the biophysical conditions in school sanitation O&M. When the framework was applied to school sanitation, we observed how institutional roles were defined and inhibited by both formal and informal rules. This aligns with the framework's action situation: the social space where individuals interact, make decisions and engage in activities related to the issue at hand (in this case, WASH in schools). For instance, the responsibility of school-level actors in maintaining WASH facilities was not only dependent on existing policies and frameworks but also the societal responsibility and cultural norms.

Additionally, three external variables with significant influence on the analysis were controlled for. To address the sub-research questions, the study adapted the determinant factors for WASH intervention outlined in the IRC (2018) building blocks. These building blocks were employed to illuminate how WASH systems can be strengthened.

This study compared the GES (2014) guide with interview findings on the outlined roles and responsibilities of actors involved in the O&M of school WASH facilities. The research revealed while the roles are clearly outlined in the (2014) guide, adherence to these responsibilities has been a challenge. This is evident in the conflicting responsibilities between the assembly and the Ministry of Education in the provision of O&M interventions, as well as

the lack of a sense of responsibility for the maintenance and management of these WASH facilities among communities, as revealed during the interviews.

Adding on to individual actors' roles, the relationship between actors is beneficial to the success of school sanitation interventions. As shown in the literature, weak institutional coordination contributes to the failure of WASH interventions (IRC, 2018; Chatterley, 2013; SuSanA, 2012). Citing that the planning, designing, implementing, and managing WASH facilities should be the responsibility of all actors to coordinate and keep the focus on ensuring effective O&M of sanitation facilities is necessary SuSanA (2012) as highlighted by IRC (2018) identified that pinpointing core challenges and ensuring institutions adapt to emerging needs is essential.

### **5.2.2 To what extent have institutional relationships between the key actors and the communities affected the O&M of school toilet facilities constructed in AMA?**

Increased community involvement and ownership is a necessary roadmap tool as it ensures good coordination resulting in the long-term sustainability of school sanitation facilities. The findings revealed that communities do not play a significant role in the O&M of WASH facilities adding that there is no existing collaboration between the various actors and the communities. For instance, this study found that there was a low level of community ownership of schools with communities sometimes viewing schools as separate entities. This corresponds with the findings from Ostrom (2011) and Cox & Ostrom (2010) underlining that situations can change over time. The way sanitation was perceived in the past has shaped the current perception of community actors. The challenge of O&M in AMA, particularly at the community level, further contributes to this. The mismanagement of sanitation facilities has created a situation where school toilets are seen as the only potential sanitary facility available for community use. This situation is present as a result of the low sanitation coverage in the communities which discourages a sense of community ownership and involvement in sanitation interventions, as evidenced by the community's reluctance to own a household toilet facility.

Moreover, securing diverse and sustainable funding sources is a vital component to ensuring the long-term sustainability of WASH interventions in schools within low and middle-income countries. The study shows that different streams of funding for O&M activities have been a major challenge at both the national and sub-national levels within the AMA. Inadequate capitation grants often delayed in disbursement are frequently diverted for other expenditures leaving insufficient funds for both minor and major repairs. This has resulted in significant lapses in operating and maintaining school toilet facilities. Similar difficulties, as seen in the literature (Chatterley et al 2013; Nigussie et al 2018), hinder effective O&M of WASH interventions. Schools, sometimes represented by Parent-Teacher Associations (PTA), occasionally contribute to purchasing toiletries. However, in Jamestown Methodist School where no support is provided for the school, their current toilet facilities are dilapidated due to the lack of effective O&M interventions and community support. The lack of alternative funding sources as confirmed by respondents in this study leads to frequent and further deterioration of the sanitation facilities.

Furthermore, the lack of effective O&M also stems from the inadequate capacity of sub-national level actors. The ESP (2010) emphasizes the role of the Assembly in enforcing sanitation standards through effective monitoring and evaluation. This study identified that national-level actors have been building the capacity of sub-national-level actors over time. This is done to enhance facility management with a relatively strong sense of common purpose among actors, prioritizing O&M issues in schools at the highest decision-making levels. This prioritization can potentially contribute to addressing O&M challenges in Ghanaian schools. In contrast, effective and sustainable WASH interventions which require consistent monitoring and evaluation (M&E) is a problem. In the AMA, the lack of effective M&E of school sanitation facilities by relevant actors has contributed to the deplorable condition of these facilities in some schools. According to this study, it was discovered that the Assembly's M&E activities have been ineffective, particularly regarding baseline assessments and regular data collection on the status of WASH facilities within the case study schools.

This study on the other hand identified that the majority of the students at Jamestown Basic School complained of genital infections after using the school's sanitary facility as reported by some parents even though that was not the focus of the study.

To ensure the long-term sustainability of school WASH facility's operations and maintenance by addressing contemporary challenges, it is important to factor in the deficiencies in broader consultative engagements to safeguard the environment and the actors involved.

### **5.3 Recommendations**

This study recommends a combined approach to enhance the institutional framework for O&M of school sanitation facilities in AMA. Key areas for improvement include strengthening institutional arrangements, improving communication and coordination, fostering community engagement and ownership, mobilizing resources and ensuring financial sustainability, capacity building, and enhancing effective M&E. While government funding is necessary, the absence of the private sector has significantly impacted the overall efficiency of these facilities. No external support or PPP arrangements currently exist between these schools and the private sector. Careful consideration and the involvement of the private sector could contribute to ensuring the sustainability of school sanitation and its overall O&M.

Additionally, to achieve sustainable sanitation facilities, addressing the focus areas outlined in the proposed roadmap in Table 3 below is necessary while engaging in extensive community awareness and sensitization campaigns about the importance of household toilet ownership. Additionally, enforcing existing bylaws and reviewing the current WASH in schools guide to reflect contemporary complexities in dealing with urban sanitation challenges will ultimately lead to the attainment of sustainable WASH in schools.

This study again, recommends the need for the development of more sustainable, affordable, environmental-friendly, sanitation technologies and practices through research and innovation with academicians. Such an initiative will have a far-reaching impact on urban sanitation.

#### **5.4 Proposed Roadmap for Long-term Sustainability of School Sanitation Facilities**

The findings from the interview with principal actors necessitated the development of this matrix to effectively operate and maintain WASH facilities in schools. Inspirations were taken from the study by Koseoglu et al. (2021) whose study adopted a mixed method to assess conditions of sanitation facilities in government schools in India and examined the linkages between user value, community-based capacity, and external support in determining the long-term operational and maintenance costs of these facilities. In this research, a matrix was developed as a proposed roadmap to achieving sustainable WASH facilities in schools in AMA based on the findings of this study. This approach consisted of document reviews, interviews, and observations using a specifically designed checklist. The findings stated emphatically that to achieve a sustainable sanitation facility, institutional collaboration and communication, community engagement and ownership, resource mobilization and financial sustainability, capacity building addressing skills gaps, and monitoring and evaluation (M&E) have to be present. To systematically evaluate the importance of these areas of focus within the school setting, the areas of focus were categorized into three: goals, priority, and intervention years, offering a well-defined strategic plan for enhancing O&M practices in schools within AMA.

Table 3 presents the matrix results.

**Table 3: Proposed Roadmap for Improving School Toilet Facilities O&M in AMA**

Area of focus	Goal	Priority	Interventions (Year 1)	Interventions (Year 2-3)	Interventions (Year 3-4)
Institutional collaboration and communication	To establish clear roles, responsibilities, and communication channels.	Essential & Intermediate	<ul style="list-style-type: none"> <li>➤ Organize multi-stakeholder workshops</li> <li>➤ Establish dedicated O&amp;M committee</li> <li>➤ Develop communication channels</li> </ul>	<ul style="list-style-type: none"> <li>➤ Refine roles and responsibilities based on workshop outcomes</li> <li>➤ Committee leads communication and coordination efforts</li> </ul>	<ul style="list-style-type: none"> <li>➤ Monitor the effectiveness of communication channels</li> <li>➤ Make adjustments when needed</li> </ul>
Community engagement and ownership	To increase community involvement and ownership	Essential, Intermediate, and advanced	<ul style="list-style-type: none"> <li>➤ Organize community sensitization campaigns</li> <li>➤ Facilitate school-community partnerships</li> <li>➤ Establish community support groups</li> </ul>	<ul style="list-style-type: none"> <li>➤ Develop and implement joint cleaning initiatives</li> <li>➤ Community groups contribute to minor repairs</li> <li>➤ Support groups participate in monitoring facilities</li> </ul>	<ul style="list-style-type: none"> <li>➤ Refine and expand community engagement strategy based on feedback</li> <li>➤ Community groups contribute financially</li> </ul>
Resource mobilization and financial sustainability	To secure diverse and sustainable funding sources	Essential, intermediate, and advanced	<ul style="list-style-type: none"> <li>➤ Advocate for increased capitation grants</li> <li>➤ Explore PPP</li> <li>➤ Develop a mechanism for community contribution (labour or any form of contribution).</li> </ul>	<ul style="list-style-type: none"> <li>➤ Secure funding commitment from partners</li> <li>➤ Implement chosen community mechanisms</li> </ul>	<ul style="list-style-type: none"> <li>➤ Monitor the effectiveness of funding strategies</li> <li>➤ Adjust strategies when needed</li> </ul>
Capacity building addressing skills gaps	To equip schools with the knowledge and skills for effective O&M	Essential & intermediate	<ul style="list-style-type: none"> <li>➤ Organize training programs for school staff</li> <li>➤ Collaborate with NGOs and experts</li> <li>➤ Offer skills development programs for communities</li> </ul>	<ul style="list-style-type: none"> <li>➤ Expand training programs based on needs assessment</li> <li>➤ Provide ongoing technical assistance to schools</li> </ul>	<ul style="list-style-type: none"> <li>➤ Evaluate training effectiveness</li> <li>➤ Offer refresher courses</li> </ul>
Monitoring and evaluation (M&E)	To ensure the effectiveness and sustainability of interventions	Essential	<ul style="list-style-type: none"> <li>➤ Develop M&amp;E framework</li> <li>➤ Conduct baseline assessments</li> <li>➤ Establish regular data collection</li> </ul>	<ul style="list-style-type: none"> <li>➤ Analyze data and report on progress</li> <li>➤ Identify areas for improvement</li> </ul>	<ul style="list-style-type: none"> <li>➤ Refine the program based on the findings</li> <li>➤ Disseminate evaluation reports to stakeholders.</li> </ul>

**Authors own construct (2024)**

Reflecting on the applicability of the Institutional Analysis and Development framework for this research, the IRC (2018) building blocks for WASH intervention were adapted to complement the IAD framework's analysis. While the IAD framework provides a valuable lens for examining institutional arrangements, it lacks specific metrics for assessing their effectiveness.

Consequently, the IRC (2018) building blocks were instrumental in this study. Future debates should explore the development of standardized measurements for institutional arrangements within the IAD framework.

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## APPENDICES

### Appendix 1: Korle Gonno R/C Basic School toilets



*Source: Field Survey, 2024*

### Appendix 2: Jamestown Methodist Basic School toilets



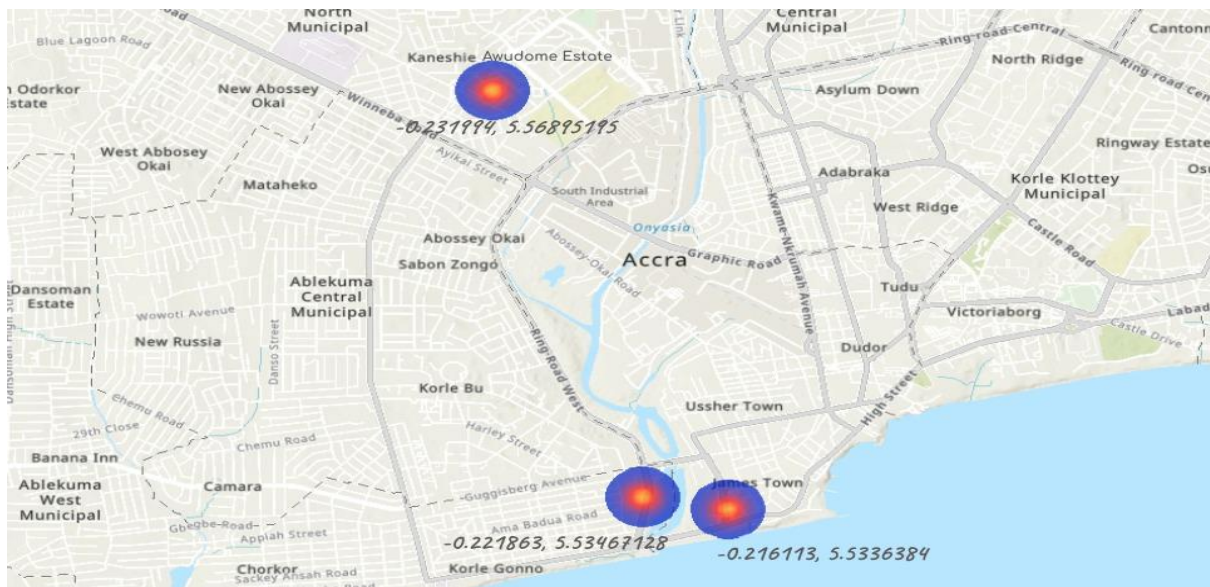
*Source: Field Survey, 2024*

### Appendix 3: Kaneshie Methodist Basic 2 School toilets



Source: Field Survey, 2024

### Appendix 4: Geographical locations of the Case study schools



Source: Author's own construct, (2024)

## **Appendix 5: Interview Guide for National-level Participants.**

### **Introduction**

A brief self-introduction

### **The purpose of the interview**

I am a research student pursuing an MSc in Urban Management and Development at Erasmus University, Rotterdam. This interview guide has been designed to solicit your view and information regarding the topic: “The Operation and Maintenance of School Toilet Facilities and their Contribution to Meeting Sanitation Needs: A Case Study of Accra Metropolitan Assembly (AMA)”.

The main objective of the research is:

- To understand how the roles of various institutions affect the operation and maintenance of school toilet facilities in AMA.

### **Duration of the interview**

If you decide to participate, we will spend 35 minutes together.

### **The nature of the interview**

This interview is composed of 13 closed and open-ended questions.

### **Privacy and anonymity**

Please note that it is within your power to either participate in this interview or not. All information and data provided will be treated confidentially and anonymized in any publications resulting from this research.

### **Informed consent to participate and record.**

I would like to seek your consent to record this conversation. This recording will only be used for the academic purpose it was intended for. Should you have any concerns about the recording, please feel free to withdraw your consent. In the absence of any doubts, do I have your consent to record this conversation?

### **Opening question**

What have been the major challenges associated with the operation and maintenance of school toilets in Ghana?

### **Interview questions.**

#### **Background Questions**

1. Which institution do you work for?

2. What is your current position?
3. Do you play any direct role in the O&M of school toilet facilities?
4. How long have you been involved in this area?

### **Open-ended questions**

#### **National Policies and Strategies**

5. What national policies and regulations on the O&M of school sanitation facilities are in place?
6. How are these policies and regulations communicated to schools?

#### **Institutional Roles, Responsibilities, and Collaborations**

7. Does your institution train school authorities on hygiene and O&M?
8. How does your institution collaborate with other actors on school sanitation initiatives?

#### **Monitoring and Evaluation Approaches**

9. What mechanisms are in place to monitor and evaluate the effectiveness of school sanitation facilities?

#### **Health Implications of Poor Sanitation in School**

10. What are the main health risks associated with poor school sanitation?

#### **School Toilet Facility Standards**

11. Do you know if there are construction standards for school toilet facilities? If yes, what are they?

#### **The Role of the Community in School Sanitation Provision**

12. Do communities have a role to play in the provision of school toilet facilities? What role?

#### **Existing Advocacy Plan for Sanitation in school**

13. Describe the main advocacy efforts to improve sanitation in schools.

### **Concluding Remark / Question**

**Thank you for your participation.**

## **Appendix 6: Interview Guide for Headmaster/mistress.**

### **Introduction**

A brief self-introduction

### **The purpose of the interview**

I am a research student pursuing an MSc in Urban Management and Development at Erasmus University, Rotterdam. This interview guide has been designed to solicit your view and information regarding the topic: “The Operation and Maintenance of School Toilet Facilities and their Contribution to Meeting Sanitation Needs: A Case Study of Accra Metropolitan Assembly (AMA)”.

The main objective of the research is:

- To understand how the roles of various institutions affect the operation and maintenance of school toilet facilities in AMA.

### **Duration of the interview**

If you decide to participate, we will spend a maximum of 30 minutes together.

### **The nature of the interview**

This interview is composed of 10 closed and open-ended questions.

### **Privacy and anonymity**

Please note that it is within your power to either participate in this interview or not. All information and data provided will be treated confidentially and anonymized in any publications resulting from this research.

### **Informed consent to participate and record.**

I would like to seek your consent to record this conversation. This recording will only be used for the academic purpose it was intended for. Should you have any concerns about the recording, please feel free to withdraw your consent. In the absence of any doubts, do I have your consent to record this conversation?

### **Opening question**

What has been the major sanitation challenge in this school?

### **Interview questions.**

#### **Background Questions**

1. Can you tell me about yourself and your role in this school?

2. In your opinion, how important is access to clean and well-maintained toilets to a school?

### **Closed and open-ended questions**

#### **Teacher Role and Observation**

3. As a head, do you have any specific responsibilities related to the O&M of school toilets?
4. How often do you observe students using the toilets?
5. Based on your observations, would you say the toilets are generally clean and functional?
6. Have you witnessed any negative student behaviour relating to toilet usage?

#### **Challenges and Impact**

7. What are your biggest challenges in managing the school toilet facilities?
8. In your opinion, how does the condition of toilets impact student learning and well-being?

#### **Suggestions and awareness creation campaigns**

9. Are there any specific actions or policies the school could implement to improve the cleanliness and functionality of the toilets?
10. Is there any awareness campaign or education program in the school on proper hygiene practices and responsible toilet use?

#### **Collaboration and community involvement**

11. In your experience, is there any collaboration between the school and the community regarding the O&M of the toilets?
12. If yes, please elaborate on the nature of the collaboration.
13. If no, do you see the potential for increased community involvement in this area?
14. Is there anything you would like to share about the sanitation facilities or hygiene practices at the school?

**Thank you for your participation.**

## **Appendix 7: Interview Guide for Community-level Participants (Assemblyman/woman, Unit committee member, and PTA representative).**

### **A. Introduction**

A brief self-introduction

#### **The purpose of the interview**

I am a research student pursuing an MSc in Urban Management and Development at Erasmus University, Rotterdam. This interview guide has been designed to solicit your view and information regarding the topic: “The Operation and Maintenance of School Toilet Facilities and their Contribution to Meeting Sanitation Needs: A Case Study of Accra Metropolitan Assembly (AMA)”.

The main objective of the research is:

- To understand how the roles of various institutions affect the operation and maintenance of school toilet facilities in AMA.

#### **Duration of the interview**

If you decide to participate, we will spend 30 minutes together.

#### **The nature of the interview**

This interview is composed of 10 closed and open-ended questions.

#### **Privacy and anonymity**

Please note that it is within your power to participate in this interview. All information and data provided will be treated confidentially and anonymized in any publications resulting from this research.

#### **Informed consent to participate and record.**

I would like to seek your consent to record this conversation. This recording will only be used for the academic purpose it was intended for. Should you have any concerns about the recording, please feel free to withdraw your consent. In the absence of any doubts, do I have your consent to record this conversation?

#### **Opening question**

What has been the major sanitation challenge in this community?

### **B. Interview questions.**

#### **Background Questions**

1. Can you tell me a bit about yourself and your role in this community?

2. In your opinion, how important is access to clean and well-maintained toilet facilities to a community?

### **Closed and open-ended questions**

#### **Awareness of school WASH facilities**

3. Are you aware of the sanitation facilities available at the school in this community?
4. How do you see the overall condition of the school toilets?

#### **Community involvement and challenges**

5. In your opinion, is there any involvement from the community in the O&M of school toilets?
6. Do you think the community will be willing to play a role in improving the sanitation conditions at the school?
7. What are the biggest challenges you see in relation to the sanitation facilities at the school?
8. In your opinion, what are some of the potential solutions to address these challenges?
9. Have you ever witnessed any negative impacts on students due to the condition of the school toilets?  
If yes, what were they?
10. Is there anything else you would like to share about the sanitation facilities at the school?

**Thank you for your participation.**

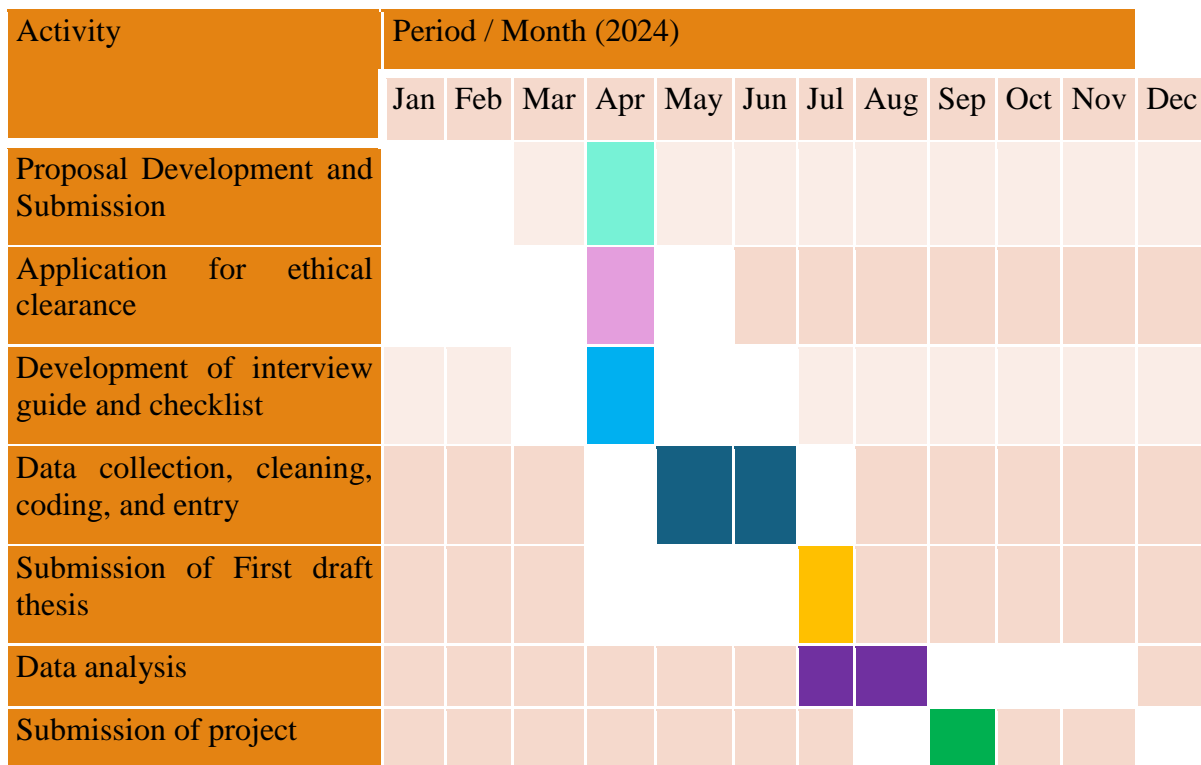
## Appendix 8: Observation Checklist

To evaluate the effectiveness of O&M, the researcher assessed the toilets' accessibility, functionality, privacy, and overall quality through direct observation of their physical characteristics as proposed by JMP (2016).










S/N	Category	Aspect	Yes/No	Remarks
1.	General Information: School Name: Date: Sub-Metro: Construction year:			
2.	<b>Hygiene &amp; cleanliness</b>	a. Visible dirt & debris		
		b. Toilet paper availability		
		c. Soap availability		
		d. Handwashing facility functionality		
		e. Unpleasant odors		
		f. Adequate lighting		
		g. Ventilation access		
S/N	Category	Aspect	Yes/No	Remarks
3.	<b>Functionality</b>	h. Toilet function (flushing/squatting)		
		i. Urinals function (if applicable)		
		j. Water source for flushing		
		k. Proper wastewater drainage		
		l. Leaks or blockages		

S/N	Category	Aspect	Yes/No	Remarks
4.	<b>Operation &amp; Maintenance</b>	m. Cleaning schedule		
		n. Availability of cleaning supplies		
		o. Minor repair tools available		
		p. Designated O&M person		
		q. Damaged walls/floors		
		r. Vandalism/graffiti		
		s. Improper waste disposal		
S/N	Category	Aspect	Yes/No	Remarks
5.	<b>Accessibility and privacy</b>	t. Sufficient toilets for students		
		u. Adequate stalls separation		
		v. Door lock functionality (if applicable)		
		w. Disability access		
6.	<b>Overall impression</b>	x. Facility condition	Excellent	
			Good	
			Fair	
			Poor	

## Appendix 9: Gantt chart (Timelines)



## Annex 10: Code list

Group Code	Code
Institutional presence	<ul style="list-style-type: none"> <li> Structure</li> <li> Size</li> <li> Roles and responsibilities</li> </ul>
System of rule	<ul style="list-style-type: none"> <li> Institutional relationship</li> <li> Financing mechanism</li> </ul>
Communication and coordination	<ul style="list-style-type: none"> <li> Power dynamics</li> <li> Decision-making</li> </ul>
Community engagement	<ul style="list-style-type: none"> <li> Community level of participation</li> <li> Community ownership, attitudes, and perception</li> </ul>

## Appendix 11: IHS copyright form

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