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WHO DOES WHAT? ANALYSIS OF THE ROLES OF ACTORS IN AFFORDABLE SANITATION SERVICE DELIVERY IN INFORMAL SETTLEMENTS IN KUMASI, GHANA

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ABSTRACT

Evidence suggests that the majority of people living in informal settlements lack affordable basic sanitation services. This situation has been explored in numerous development discourses worldwide. Previous studies have argued for harnessing the potential of local actors involved in delivering sanitation services to provide affordable sanitation to informal settlements. However, limited research has focused on the specific roles sanitation service providers play in delivering affordable sanitation services in informal settlements. This study employs a qualitative approach, drawing on document reviews and semi-structured interviews, to ascertain the roles of sanitation service delivery actors in delivering affordable sanitation services to informal dwellers. The results show a tripartite system of collaboration in the delivery of affordable sanitation service in informal settlements in Kumasi, Ghana. With regard to specific roles, the findings reveal that the state plays a planning, regulatory, and policy-making role, whereas non-state actors mostly spearhead the delivery of sanitation services through financing, advocacy, management, research, training, and capacity building. The study emphasizes the crucial role of diverse actors in service provision and stresses enhanced coordination among these actors through effective participatory approaches in the delivery of affordable sanitation services to informal urban communities.

KEY WORDS: Informal settlements, Actors, Sanitation Service, Affordable, Kumasi.

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1. INTRODUCTION

Informal settlements are often characterized by poor housing, overcrowding, insanitary conditions, squalor, and increasing poverty. It has been noted that a large number of urban residents living in informal settlements lack improved sanitation. Improved sanitation is seen as a fundamental human right, and it offers economic benefits that often exceed its cost). Target 6.2 of the Sustainable Development Goals (SDGs) demands that governments and stakeholders achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, with much emphasis on the needs of women and girls, by the end of 2030 (United Nations, 2018). Lack of proper sanitation, especially in informal settlements, contributes to a high incidence of diarrhoea and cholera (Nguyen et al., 2021; Sinharoy et al., 2019). This has impelled governments and stakeholders in developing countries to place much importance on improved sanitation.

A report by the WHO indicates that over 1.5 billion people worldwide lack access to basic sanitation services, such as private toilets or latrines (WHO, 2023). In low- and middle-income countries, only 30% of the population has access to basic sanitation services (WHO, 2023). Conventional literature has highlighted enormous challenges in providing adequate sanitation services in informal settlements at both the micro (individual households) and macro (community and public)[1] levels1 (Sprouse et al., 2025). Regarding these challenges, Schrecongost and Wong (2015) highlighted four impediments to the provision of improved sanitation services in informal settlements. These include little evidence about the scale and nature of the problem; little or no advocacy; inadequate financial capability; and security of tenure on the part of residents. They noted that these challenges are often a result of a weak, implicitly adverse political commitment to ensure adequate sanitation services in informal settlements. Limited or shared sanitation, often characterized as substandard, has become the main option for most urban informal dwellers due to barriers such as insecurity of land tenure, overcrowding and high population density, among others (Sprouse et al., 2025).

Arguably, governments' posture on infrastructure and service provision in informal communities is often complex and elusive. Many scholars submit that informal communities are often overlooked in service provision by city authorities (Borofsky and Caprotti, 2025; Chumo et al., 2025). This phenomenon is attributable to a lack of proper urban governance systems, including the absence of legal recognition and official data, which makes the responsibility for service provision unclear. However, recognizing basic infrastructure and services as public goods, thereby improving people's well-being, necessitated public expenditure on service provision for informal communities (Gaisie et al., 2018). Subsequently, governments in many developing countries, especially in Africa, have historically assumed the role of providing services to informal communities, usually provided entirely for free or heavily subsidized. In South Africa, for instance, the government's Informal Settlements Upgrading Programme and the Finance Linked Individual Subsidy Programme provide basic services such as water, electricity, and basic sanitation, as well as housing subsidies for informal dwellers, respectively (Mgidlana et al., 2025). This nature of service provision often leads to a lack of ownership among beneficiary communities and households. Thus, publicly owned and operated infrastructure, like sanitation facilities, is often characterized by poor maintenance, mismanagement and inefficiencies (Ewnetu and Seo, 2025). It is asserted that such issues have led to the shift towards more commercial-driven or private provision of infrastructure in order to ensure efficiency, enhance innovation and enforce standards that ensure the well-being of people (Ewnetu and Seo, 2025; Gaisie et al., 2018).

In general, the private sector is touted as more efficient at delivering infrastructure and services (World Bank, 2012). However, private companies are often more profit-oriented and may not necessarily consider the public health implications of providing affordable sanitation services or readily see the public good relevance of serving informal communities. Consequently, this necessitated pro-poor Public-Private Partnerships (PPPs) in the delivery of basic infrastructure and services, which continues to be a major model for service provision to informal and low-income urban communities (Muheirwe et al., 2024; Tanveer et al., 2025). Besides PPPs, Civil Society Organizations (CSOs) and Non-Governmental Organizations (NGOs), through donor-sponsored funding, play a very active role in infrastructure and service provision to informal communities (Borofsky and Caprotti, 2025; Muheirwe et al., 2024). The various models of service provision to informal communities use different levels of participation to engage beneficiaries. Certainly, this engenders several conversations about the complex interactions among the actors involved in delivering sanitation services to informal and low-income urban communities.

The above discourse shows that recent scholarship has increasingly highlighted the provision of infrastructure and services in informal settlements. Despite this growing body of work, important questions in service provision in informal settlements remain underexplored, particularly regarding the specific roles actors play in delivering affordable sanitation services. Using two informal communities in Kumasi as a case study, this paper seeks to achieve the following objectives: (1) examine the typologies of actors in the delivery of affordable sanitation in informal communities in Kumasi, Ghana, and (2) analyze the roles that sanitation delivery actors play in the quest to deliver affordable

[1] Communal toilets are usually located within residential neighborhoods and shared by multiple households within a community. Public toilets are usually located in public areas of the city, such as bus terminals and markets.

sanitation services to informal dwellers in Kumasi, Ghana. Further, the paper conceptualizes the nature of actors' roles in sanitation service delivery in informal settlements in Kumasi. The results presented in this paper are expected to contribute to efforts towards slum and informal settlement upgrading by guiding sanitation service delivery planning, design, and policy-making in developing countries.

2. INFORMAL SETTLEMENTS IN GHANA – GROWTH, MANAGEMENT, AND SANITATION SERVICE PROVISION

2.1. The growth and management of informal settlements in Ghana

Over the years, Ghana has introduced measures to regulate the use of land resources to achieve desired human settlements. For instance, by 1892, a Town Planning Ordinance was passed to regulate the development of towns, the siting and construction of individual structures, and the promotion of sanitation and public health within the Gold Coast Colony (now Ghana) (Mensah, 2010). In recent years, the decentralization system of Ghana and the quest of successive governments to improve and guide the planning, development, and management of settlements, has led to the enactment of new laws, including the Local Governance Act (Act 936) of 2016, the Land Use and Spatial Planning Act, (Act 925) of 2016 to regulate physical developments in the country (Gaisie et al., 2018). However, these laws and regulations have not been able to curb the sprouting of informal settlements in Ghana.

This is largely blamed on the lack of enforcement of laws and regulations, and on the inability of city authorities to manage the rapid urban expansion, which has not been commensurate with infrastructure provision (Hakeem et al., 2022).

According to the existing literature, four main factors have been identified as triggers for the growth of informal settlements in urban areas (Centre on Housing Rights and Evictions (COHRE), 1995; Sietchiping, 2004; Mensah, 2010; Gaisie et al., 2018). They encompass physical, socio-economic, socio-cultural, and institutional factors. Physical factors may include advantageous locations of areas and the nature of the land that the dwellers occupy. Also, socio-economic factors such as low levels of education, low income, unemployment, high rent, migration, and social connections. Socio-cultural factors such as religious beliefs, traditional systems and family ties may also contribute to why dwellers settle on illegal and unplanned lands. Institutional factors may include corruption, bureaucracies, and inadequate enforcement of regulations. In addition to these factors, Mensah (2010) asserted that political and historical factors have also caused the rise of informal settlements in urban areas, especially in Ghana. There is also an apparent lack of political will to stop the emergence of informal settlements and the expansion of existing ones.

The Centre on Housing Rights and Evictions (COHRE) found, in a study of informal settlements in Ghana, that rural-urban migration is one of the drivers of growth in these settlements. They reported that this type of informal settlement exists in places such as Agbogbloshie[2], an area in Accra that grew significantly when people from conflict areas in northern Ghana migrated to the capital city to escape the tribal conflict of 1995. Several scholars also report that the inadequacy of rural employment opportunities, cycles of economic contraction, an absence of effective urban planning, and private sector preference in building luxurious and high-end apartments for rent are some of the influences on people's decision to reside in informal settlements in Ghana (Azunre et al., 2021; Hakeem et al., 2022).

Afranie (2013) identified three main forms of informal settlements in Ghana, as shown in Table 1. He asserted that the forms of informal settlements in Ghana comprise migrant communities or "Zongos"[3], Indigenous communities, and newly emerging squatter communities. In addition, Gaisie et al. (2018) identified a fourth form of informal settlement called "unauthorized subdivision settlements", which exist in many urban areas in Ghana. This form of informal settlement is characterized by large agricultural lands that are subdivided into residential plots for housing developments without observing local planning laws and regulations.

Table 1: Types of Informal Settlements in Ghana

Typology	Land Status	Housing Quality	Infrastructure	Housing Status
Indigenous Communities	Traditional Homes	Mixed	Fairly good	Without Permits
Migrant Community (Zongo)	Released by the landowner	Poor	Poor to Good	Without Permits
Newly Emerging Squatter Community	Illegal (No title)	Very Poor	Non-existent	Without permits

Source: Afranie, 2013

[2] Densely populated (103/km2) Informal settlement near the center of Accra (capital city of Ghana) with an estimated population of 40,000 people.

[3] A migrant community found in almost every urban area in Ghana with heterogeneous ethnic groups and the majority being Muslims (Casentini, 2018; Afranie, 2013).

The management of informal settlements in Ghana predates the independence era, when their emergence became imminent. During the pre-independence era, the British government implemented housing schemes to improve the health and sanitation conditions in informal settlements. Housing estates were built in Kumasi in the early 20th century after a cholera outbreak, and in Accra after an earthquake in 1939 (Acquaah-Harrison, 2004). Other housing estates were built to provide housing for low-income earners in Accra, Kumasi, Takoradi, and Cape Coast. It is worth noting that these estates were provided with basic water and sanitation services on a communal basis (Acquaah-Harrisson, 2014). By extension, this has had a subtle influence on the provision of water and sanitation services to low-income and informal urban communities in Ghana. Until the recent SDGs era, most interventions targeting informal and low-income urban communities focused on providing communal or shared sanitation facilities. Over time, due to urbanization and population growth, several of these communities have expanded without a commensurate increase in basic infrastructure and social amenities (Peprah et al., 2015).

2.2. Sanitation Service Delivery to Informal Communities in Ghana – An Overview

Until the 1980s, urban sanitation in Ghana was managed through a decentralized system (Thrift, 2007). City councils were mandated to build, control, and maintain public toilets and to manage waste-treatment areas for residents, mostly at the state's expense. Local government authorities, which were responsible for sanitation, were mandated to ensure the installation and adoption of domestic latrines by enforcing bylaws on sanitation facilities provided by landlords. These were the main attempts by the state to help communities access improved sanitation.

The structure of sanitation service delivery in Ghana has been largely shaped by political regimes, leading to changes in service delivery modes. The World Bank (2004) postulated that, since the early 1990s, local government authorities have been attempting to reduce reliance on public latrines for household toilet delivery by vigorously collaborating with families. Also, historical accounts posit that inefficient management and challenges with communal and public toilets across the country, hitherto managed by local authorities, led to the privatization of public toilet management and maintenance in the early 1990s (Ayee & Crook, 2003). Yet, as of the late 2000s, available data indicate that the total access to basic sanitation service in Ghana was estimated at 21% (GSS, 2018). Consequently, limited access to basic sanitation, especially in low-income areas, including informal urban communities, led to greater involvement of the private sector in the sanitation service delivery value chain (Thrift, 2007). This led to a radical transformation in access to sanitation services, with people living in informal communities relying on private vendors.

Over the years, safely managed sanitation has received relatively less attention, partly due to underinvestment in the sector (Appiah-Effah et al., 2019). Although Ghana gained notable progress in expanding access to safe water supply by 2022, improvements in basic sanitation lagged significantly, with only 29% of Ghanaians having access within the same period – an increase from 21% in 2018, but still markedly low relative to water provision (Abu et al., 2024). While informal settlement upgrading has received increased government attention with the establishment of specific ministries and the strengthening of relevant bylaws, local authorities consistently refuse to adequately extend sanitation services to informal settlements because of their illegality and informal nature (Doe and Aboagye, 2022; Nkrumah Agyabeng and Preko, 2021). The situation has contributed to the prevalence of diseases, including cholera, malaria, and genitourinary infections within these communities (Ayelazuno and Tetteh, 2025). Ghana also faces the risk of not attaining the SDGs 6 and 11, which seek to ensure "clean water and sanitation for all" and make "cities and human settlements inclusive, safe, resilient, and sustainable", respectively. Accordingly, informal dwellers are left to rely primarily on non-state actors, such as sanitation entrepreneurs operating public toilets, NGOs, and CSOs (Doe and Aboagye, 2022). Others also depend on local artisans to construct compound and household sanitation facilities, amid issues with land tenure and a lack of funds. (Antwi-Agyei et al., 2020). Whereas this situation depicts a failure by the state to adequately provide basic sanitation services to the people, it also presents a collaborative pathway in which the state's efforts can be enhanced by non-state actors' activities. Interventions by non-state actors are often relevant for complementing governments' efforts to increase access to improved sanitation services in informal communities.

Notably, a plethora of studies have espoused the contributions of non-state actors, such as development partners, CSOs, NGOs, and private companies, in providing opportunities for informal urban communities in Ghana and across many African countries to access basic sanitation services over the past years (Abu et al., 2024; Asumadu et al., 2023; Chumo et al., 2022). A common limitation across these studies is the failure to critically explore the nature of existing collaboration and the specific roles of state and non-state actors in providing affordable sanitation services in informal settlements. Clarifying these roles, particularly in urban settlements that are complex to govern, helps identify existing structures that can be leveraged for efficient informal settlement upgrading. It will also provide an understanding of areas where support mechanisms to enhance actors' efficient contributions may fall short.

3. METHODS AND STUDY AREAS

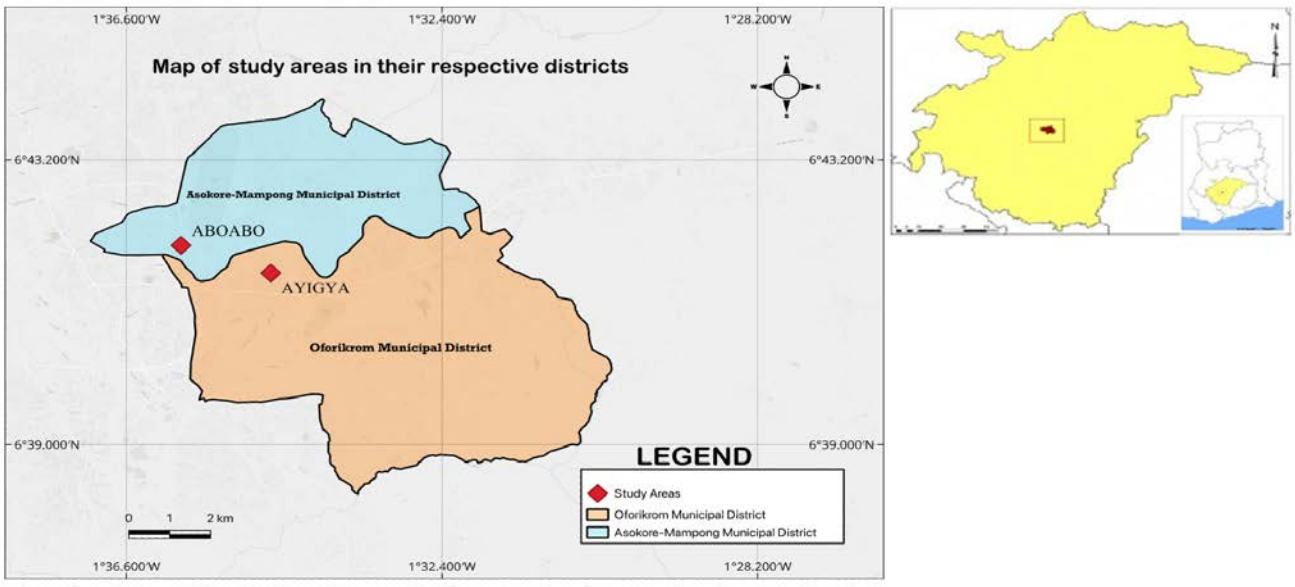
3.1. Study Setting

The study areas (Aboabo and Ayigya) are two informal settlements in Kumasi, Ghana's second largest city. The most current data on Kumasi depicts rapid urban population growth and accompanying complex features (including access to toilet facilities, types of toilet facilities, affordability, and operation of faecal sludge treatment facilities) in providing sanitation service to low-income households (Ghana Statistical Service, 2014; Cobbinah et al., 2019; Doe & Aboagye, 2020). The study areas were purposively selected in Kumasi due to conventional knowledge of their severe sanitation challenges, despite benefiting from various sanitation interventions and projects (Kumasi Metropolitan Assembly, 2011; 2017; WSUP, 2014; Adubofour et al., 2013; Asokore-Mampong Municipal Health Directorate, 2016; Basiru et al., 2018).

Aboabo is a migrant community, with a majority of its inhabitants coming from the northern parts of Ghana to Kumasi. The residents of Aboabo have, over the years, built and occupied unauthorized permanent structures. Aboabo has an estimated population of 60,136, with a mean household size of six, making it one of the largest communities in the Asokore Mampong Municipality (GSS, 2014). It is characterized by inadequate sanitary conditions, largely attributable to the insufficient provision of sanitation facilities to complement the growing population in the area and weak enforcement of local sanitation by-laws (Basiru et al., 2018).

The second case study area, Ayigya, is an indigenous informal settlement with an estimated population of 55,476 (GSS, 2014). A larger part of the community has developed organically due to natural population growth, low-cost housing, and migration (Takyi et al., 2021), preceding the planning of the area. Most households in these organically developed settlements lack private toilet facilities and, as a result, rely on public facilities (Doe & Aboagye, 2020). Figure 1 shows the location of the selected study areas in their respective Municipalities.

Figure 1: Location of the study areas (Source: Author's Construct, 2025).



3.2. Methods

The study generally adopted a qualitative research approach, involving a case study and an in-depth document review to comprehensively ascertain the roles of actors in affordable sanitation delivery in the two informal settlements in Kumasi. According to Maxwell (2012), the qualitative research strategy has a flexible structure that helps present a thorough and appropriate analysis of issues such as the roles, methods, and procedures of sanitation delivery in complex settings, such as informal settlements. In this respect, the qualitative strategy captures these dynamics and gives respondents the freedom and flexibility to respond to the complex issue. The case study enabled a flexible description and in-depth understanding of the actors and their roles in the sanitation service delivery value chain in the study areas (Coombs, 2022). Using the case study approach makes it possible for the findings and recommendations of this study to be generalized for similar contexts and adapted for designing and managing sanitation policies and interventions in other informal settlements (Bunkar et al., 2024).

3.2.1. SAMPLE SIZE AND SAMPLING PROCEDURE

A multi-stage sampling procedure was adopted for this study. The first stage involved purposively selecting Kumasi because of the city's rapidly growing population, the complex nature of delivering sanitation services to its informal areas, and its relatively better performance in faecal sludge management, as found by Furlong & Mensah (2015). The second stage involved sampling informal areas with extreme sanitation challenges but have benefited from or are benefiting from various sanitation interventions and projects. A review of literature and analysis of the areas led to the purposive selection of Aboabo and Ayigya as case study areas. At the third stage, 15 institutions known by prior research to be key actors and play critical roles in the sanitation delivery value chain in the two study areas were purposively selected for interviewing. These institutions included the Environmental Health and Sanitation Departments (EHSDs) of the municipalities and the Development Planning Units (DPUs) of the two municipalities. Also, micro-finance institutions, NGOs and CSOs, local artisans, and private latrine desludging companies. Heads of these selected institutions, who were assumed to have relevant knowledge on the subject matter, were interviewed. One official was selected from each institution of the two municipalities – Oforikrom (Ayigya) and Asokore Mampong (Aboabo). However, one NGO official was interviewed for the study. This is because prior expert information on the study areas revealed that only one recognized NGO is involved in sanitation service delivery in the two municipalities. It was then imperative to interview only one NGO to avoid duplicate data. Table 2 depicts the total number of participants selected for the study. Given that these institutions are the primary actors in delivering sanitation services in Kumasi, their inclusion in the study was crucial.

Table 2: Number of respondents from institutions interviewed

Institution	No. of Respondents
Environmental Health and Sanitation Department	2
Development Planning Unit	2
Local Artisans	4
Private Latrine Emptying Companies	2
Non- Non-Governmental Organizations	1
Civil Society Organizations	2
Community-based financial institutions	2
Total	**15**

The semi-structured interview technique was used to interview respondents from these institutions. The semi-structured interviews provided sufficient flexibility in engaging with the various agencies while addressing key aspects of the study (Cobbinah & Aboagye, 2017). The semi-structured interview guides were informed by a literature review of concepts and theories on the research topic. The guide considered only thematic items related to the study's objectives. The instruments were simple, unambiguous, and avoided leading questions. Although the instruments were written in English, they were translated into Twi (the local language) during engagements with local artisans and respondents from private latrine-emptying companies. This is because the local artisans and the respondents from private latrine-emptying companies interviewed as part of the study were not conversant in English. With the respondents' consent, all interviews were audio-recorded, along with notes taken.

Additionally, secondary data were retrieved from relevant published and unpublished sources, including institutional and administrative reports and media reports. Key data collected include the activities required for sanitation delivery and the roles and efforts of relevant actors in executing these activities to facilitate the provision of sanitation services. Data from transcribed interviews and secondary sources were analyzed using the thematic analysis method. Using inductive and deductive coding, preliminary codes were assigned to the data to describe the content. Further, different themes were sought, reviewed and used for the analysis. As espoused by Nowell et al. (2017), the use of thematic analysis helps researchers to generate unanticipated insights and summarize key features of large amounts of data collected. Informed consent from the respondents was received during the data collection, as expected in common research ethics.

4. FINDINGS AND DISCUSSIONS

Sanitation service delivery in informal settlements exhibits unique characteristics compared to other settlements. Data from the study indicate that sanitation service delivery and its management in informal communities in Kumasi are shared responsibilities between the state and non-state actors (including private sanitation entrepreneurs, private waste management companies, CSOs, NGOs, financial institutions, and local artisans). The analysis of the specific roles played by state and non-state actors revealed distinct yet complementary roles. The study shows specific areas where the state is playing a leading role, and where non-state actors are also playing complementary roles in facilitating access to affordable sanitation services for informal communities.

4.1. Main roles of state agencies in the delivery of affordable sanitation services in informal communities

4.1.1. REGULATORY ROLE OF THE STATE IN ENSURING ACCESS TO SANITATION

Generally, the state's role in sanitation delivery includes formulating WASH policies, setting standards and guidelines, enforcing, and providing technical backstopping at the local level. The study found that the state plays a regulatory role in the management and delivery of sanitation services within the study areas. Interactions with the Environmental Health and Sanitation Department (EHSD) and the Development Planning Unit (DPU) revealed the state's supervisory role in ensuring the effective and efficient provision of affordable sanitation services in the two study areas. The government's regulatory role is evident in the EHSD's activities in the two study areas, including inspections, corrections, and abatements of nuisances related to household sanitation services. For instance, the department ensures proper desludging of septic tanks from household and public toilets for treatment. This regulatory role of the state is embedded in the updated National Environmental Sanitation Policy, which holds the state responsible for enforcing sanitation rules and regulations (Ministry of Environment, Science, Technology, and Innovation, 2017). In responding to the key roles of the state in sanitation service delivery and management, the EHSD in the two areas asserted that:

Our [EHSD] main role is that anytime we find out that septic tanks are full, we make sure the households empty/desludge them. If households/public toilet owners refuse to desludge, they risk being taken to court by our department [EHSD]. For the public toilets, when the septic tanks are full, they alert the department [EHSD], and we issue a letter to them for the desludging process. However, it is not really compulsory to always alert the department [EHSD] when you want to embark on desludging. However, when it is full, and they don't desludge, we [EHSD] step in and order them to desludge it (EHSD respondent, Asokore Mampong Municipal Assembly).

We [EHSD] are responsible for going into houses to inspect, correct, and abate nuisances. Those who will prove stubborn will be summoned to the law court (EHSD respondent, Oforikrom Municipal Assembly).

Further, the study's findings indicate that before a permit is issued for the construction of a new house, the MA, through the EHSD, ensures compliance with the Municipality's sanitation bylaws. The byelaws concerning liquid waste state that every house must have a toilet, with one designated toilet facility for each occupant. This is done to reduce future pressure on public facilities and to provide households with access to improved sanitation facilities.

4.1.2. PLANNING, COMMUNITY MOBILISATION, AND DEMAND GENERATION

At the local government level, the DPU serves as the secretariat for the District Planning Coordinating Unit (DPCU), which is responsible for preparing the District Medium-Term Development Plans (MTDPs), Annual Action Plans, and Monitoring and Evaluation (M&E) Plans to monitor planned activities. According to the respondents, these plans often include sanitation projects geared towards improving sanitation infrastructure in the MAs. The study found that the MAs supervise such projects in the municipality through the EHSD and the Physical Planning Department (PPD). Again, it was observed that this role of the MAs has not directly delivered sanitation facilities to households in informal communities, but rather through demand-generation activities, and most households are recognizing the need to acquire household toilets. The EHSD plays a key role in demand generation by educating families on the need to acquire affordable, safe household toilet facilities. This is consistent with the World Bank's (2004) assertion that, since the early 1990s, local government authorities, in their efforts to increase access to household toilets and reduce overdependence on public latrines, have been collaborating with families to educate them on the need for household toilet facilities. The EHSD also conducts siting for household toilet construction and encourages the use of improved toilet technologies such as the Kumasi Ventilated Improved Pit (KVIP), Ventilated Improved Pit (VIP), Aqua Privy, and Water Closet (WC). These findings confirm previous studies that assert that government stakeholders provide an enabling environment for sanitation delivery in informal settlements rather than directly delivering sanitation facilities (African Ministers' Council on Water, 2015).

4.1.3. BUILDING LOCAL CAPACITY AND PARTNERSHIPS

The study found that the state partners with various development agencies to deliver affordable sanitation services in the study areas. Through this role, the state can connect artisans trained by NGOs and CSOs to prospective households seeking to install a toilet facility. This saves the household time and money that would have been spent contacting an artisan. Also, it helps create jobs for local artisans and supports local businesses. Evidently, this role reflects the government's efforts to create an enabling environment for non-state actors to provide households with safe, affordable sanitation services (Shaheen, 2021). Beyond that, the study also revealed that the MAs have strategic partnerships with CSOs and academic institutions towards research into sanitation delivery and technology development.

The study also revealed that the emptying or desludging of septic tanks has been left to private sanitation service providers registered with the KMA as Vacuum Tanker Operators (VTOs). This means their activities are directly regulated by the KMA. The VTO's role in the sanitation service value chain is basically to empty, transport and dispose of faecal sludge. However, it was revealed that these companies play additional roles, including advocacy and awareness-raising, educating households and public toilet managers on the safe management of toilet facilities. They also offer technical advice on maintaining septic tanks. In responding to this, the respondents asserted that:

Yes, we [EHSD] have NBU [No Business as Usual] in collaboration with MAs Toilet companies, the Clean Team and WSUP (EHSD respondent, Asokore Mampong Municipal Assembly).

Yes, we [EHSD] collaborate with "KNUST (for research), WASUP and Clean Team for research, advocacy and the provision of affordable sanitation service (EHSD respondent, Oforikrom Municipal Assembly).

4.2. Main roles of non-state actors in affordable sanitation service delivery in informal communities

4.2.1. DEMAND GENERATION

The study discovered that the main non-state actors involved in delivering affordable sanitation services in the study areas are CSOs, NGOs, local financial institutions, and local artisans. The interviews revealed that CSOs' main roles include demand generation and marketing affordable sanitation services. At Ayigya, for instance, the study revealed that a CSO called Clean Team Toilets provides affordable toilet technologies to households. This finding aligns with studies by Mansour and Esseku (2017), who argue that increased efforts by CSOs in Ghana's WASH sector have led to the emergence of affordable, improved sanitation technologies and services that meet the needs of informal communities. The CSOs embark on sensitization programs to educate households on the need to have their own toilet facility. CSOs used radio advertisements, community durbars, institutional visits, and house-to-house visits to generate demand and market affordable household toilets. This increased the delivery of affordable sanitation services in the study areas. This was evident in the number of affordable toilets delivered to households by a CSO, Clean Team, working in the two study areas. Although the majority of households in the two study areas have no access to household toilet facilities and depend on public toilets (Doe & Aboagye, 2020), the study discovered that the Clean Team, at the time of the study, had provided about 126 affordable container-based toilet facilities to households in Ayigya and about 100 in Aboabo. In responding to the activities of CSOs in the delivery of sanitation services in the municipalities, the respondents stated as follows:

We [CSOs] tell them how affordable having their own household toilet will be rather than accessing public toilets. We [COSs] also educate them on the environmental hazards that emanate from open defecation (CSO respondent, Ayigya).

4.2.2. TRAINING OF LOCAL ARTISANS/ BUSINESSES

In addition, the study found that CSOs and NGOs (e.g., WSUP) were involved in training service providers, such as local artisans, and in supporting them in introducing innovative, affordable sanitation options for informal communities. The study revealed that WSUP had trained about 50 local artisans within the municipalities who operate in collaboration with the MA and their Unit Committee members. Again, it was observed that a CSO in Aboabo began training local artisans to install modern toilet technologies, such as biogas toilets, in individual households. A peculiar social business practiced by the CSO in Aboabo, which seemed to help deliver household toilets, is to provide households with toilets on a hire-purchase basis. The study also reveals that the Clean Team is implementing a non-sewered sanitation system.

We [CSO] provide affordable toilet facilities to households in informal settlements and improvised communities. We provide biogas toilet facilities for them on a hire-purchase basis, which is, we [CSO] install the toilets for them, and they pay in instalments over time. We [CSO] also train local artisans to be able to install the biogas toilets. Currently, we [CSO] have trained and educated about 200 people in the Municipality on ensuring that they have toilet systems in their homes and also to keep their environment clean for a healthy living. We [CSO] also use the radio and various public forums to train people on ways and means to keep their environment clean and free of open defecation (CSO respondent, Aboabo).

Moreover, it was observed that the local artisans were mainly responsible for the construction and maintenance of household and public toilets in the areas. These local artisans include masons, plumbers and carpenters. The study revealed that, apart from the identified and trained local artisans trained by

CSOs and NGOs, most local artisans who construct toilet facilities in the study areas had no formal training. Interactions with these local artisans revealed that they acquired their skills through apprenticeship, leaving them lacking the necessary skills for the construction of emerging affordable toilet technologies. Interviews with the artisans show that most of the materials used to construct toilet facilities are sourced locally. Materials such as cement, sand, iron rods, wire-mesh, PVC pipes, wood, nails and roofing sheets are manufactured locally, whilst toilet organic solvents and ceramic toilet bowls are mostly imported from China. It was revealed that most of these local artisans do not belong to any association that is related to their work. The findings show that local artisans can only construct toilet facilities such as KVIP/VIP, WC, Aqua-Privy latrines, and Pit Latrines. However, the artisans revealed and expressed their readiness to learn and provide modern and affordable toilet technologies if they are identified and trained, as captured succinctly below:

I don't have the required skills and capacity to construct those toilets. I have made up my mind to learn how to construct it (Mason, Aboabo).

I have now decided to learn the construction of the Biogas latrines. I am not constructing them because I don't have the skills to do so (Plumber, Ayigya).

4.2.3. ADVOCACY AND DEVELOPMENT OF AFFORDABLE SANITATION TECHNOLOGY OPTIONS

The increasing demand for affordable sanitation services in Ghana led to the establishment of various sanitation-related NGOs. Findings from the study indicated that NGOs in the study area engaged in research, training, advocacy and the delivery of modern toilet technologies to households. For instance, the analysis showed that a few international NGOs work in Water and Sanitation provision in Kumasi (Furlong & Mensah, 2015). These NGOs support efforts to increase access to affordable toilet technologies and potable water, and to build capacity for efficient faecal sludge management.

According to a respondent:

For us at this NGO, we continue to explore various ways to provide affordable and improved sanitation services to the urban poor. In our quest to provide affordable sanitation services, we brought in various toilet technologies, and our technologies are currently one of the affordable ones in the market (NGO respondent, Kumasi).

4.2.4. SANITATION SERVICE FINANCING

The study revealed that the only known financial institution providing soft loans for the construction of low-cost toilet technologies in the two study areas is Sinapi Aba Savings and Loans Bank. However, it was revealed that most households feel reluctant to access their loans due to high interest rates (about 16% - 36% per annum). This finding confirms existing research, which espouses that high interest rates on loans and credit facilities significantly increase the water and sanitation access gap and highlights financing and investment challenges within the sector (Machete and Marques, 2021). Apart from Sinapi Aba Savings and Loans Bank, the study did not find any known community-based financial institution that has loan facilities to be accessed for sanitation services. Interactions with other community-based financial institutions in the study areas revealed that they offer loan facilities accessible to any qualified individual or group. However, their loans are not designed specifically for sanitation services. Some of the institutions interviewed explained that:

Our loans are open. You tell us the purpose for coming for the loan; we will assess you and see if you qualify based on your ability to generate funds to pay back the loan. We don't have specific loans for sanitation development, but if you have the capacity to pay back, we will give you the loan for you to use it for whatever you want to use it for. The client should have a regular income that he/she can use to pay back the loan (Community–based financial institution, Aboabo).

We don't have specific loans or credit facilities for sanitation development, but we have a housing development policy that qualified candidates can access. It is not named a sanitation credit facility or loan. We wish those who are saving with us and have the intention to build household toilets will come and access the loans (Community–based financial institution, Ayigya).

Nevertheless, the study's findings showed that existing community-based financial institutions in Ayigya are ready to introduce sanitation service finance schemes to provide affordable sanitation. In expressing their motivation to help in financing sanitation development, they asserted that:

Our motivation is that, as human beings, we need to live in a clean environment for healthy living. Aside from making a profit from the venture, I think healthy individuals make a great country, so this will motivate us (Community–based financial institution, Ayigya).

On the contrary, the community-based financial institutions interviewed in Aboabo did not express any plans to introduce financing schemes for affordable sanitation service provision in the area. It was revealed that there was no motivation for the financial institution to introduce sanitation development finance schemes. The interviewee explained that:

Elsewhere, grants are given to banks specifically for sanitation development, especially the building of toilets. So, if those grants are given to us, we will do so, or if there is a reduced rate for our cost of funds, then why not? Currently, the rates are high, and we need to put them into a business venture that will generate equally high profits for us to be able to pay. So, for now, we are not motivated enough to channel our loans to sanitation (Community–based financial institution, Aboabo).

The above implies that households in informal settlements in Kumasi rarely access loan or credit facilities for sanitation development. This is largely due to the absence of collateral and the lack of documented tenure among low-income households when accessing loan/credit facilities (Balana et al., 2022). The results, however, indicate that CSOs play a crucial role in helping households access loans from financial institutions to acquire affordable toilet facilities. They also collaborate with other NGOs to market affordable toilets to households. One of the respondents explained that:

We aid them financially to access loans in order to acquire a toilet facility. We are currently working in collaboration with Sinapi Abi Savings and Loans to give loans to individual households for sanitation development. We have been able to acquire toilet facilities for about 10 households in the Municipality, including Ayigya (CSO respondent, Ayigya).

4.3. Conceptualizing the provision of affordable sanitation services in informal settlements in Kumasi

The conceptual framework aims to provide a synthesis of the roles of the sanitation service delivery institutions selected for the study. It was established in the study that the provision of sanitation services relies on state and non-state actors in the sanitation service value chain, and each plays a vital role at a certain stage in the chain. In the conceptual framework, the non-state actors are categorized into social actors (NGOs and CSOs) and private-sector entities (local artisans, community-based financial institutions). The study revealed that the demand side in the sanitation service delivery value chain is the household. The supply side includes state and non-state actors (including local artisans, NGOs, CSOs, community-based financial institutions, and VTOs).

The synthesis showed a tripartite framework of functions in which three main role categories, each supporting the provision of affordable sanitation, are played by state and non-state actors (Figure 2). These roles include creating an enabling environment to support service delivery, capacity building and partnerships required to deliver services, and advocacy and development of the sanitation business. In terms of interrelationships among the roles, the state sets the agenda by creating an enabling environment, including policies, strategies, regulations, and projects that aim to deliver sanitation services to informal communities. Such an enabling environment is created to provide technical guidelines for the provision of sanitation services. Non-state actors, including community-based financial services, also provide loans and credit facilities to households to create an enabling environment and reduce the financial burden of affordable sanitation service delivery in informal communities.

Advocacy and the development of sanitation businesses provide significant support in delivering sanitation services. The study showed that non-state actors (including NGOs and CSOs) usually engage in advocacy to generate attention, raise awareness of the sanitation challenges faced by residents of informal communities, and call for action. In the same way, non-state actors equally undertake demand generation and community mobilization activities to trigger residents of informal communities to act on their sanitation situation. Further, non-state actors establish sanitation businesses that serve as a channel for delivering affordable sanitation products and services to informal communities. Through innovation, appropriate technology options and services are designed by non-state actors, such as local artisans, CSOs, and NGOs, to fit the socio-economic context of informal communities. State actors, such as local authorities, play a key role in advocacy and demand generation by educating families on the importance of installing affordable, safe household sanitation facilities.

Another major interrelationship exists in capacity building and partnership for the delivery of sanitation services. The complex nature of sanitation service provision shows that the government cannot deliver alone, and in recent times, non-state actors, mainly NGOs and CSOs, have often entered into partnerships with the state to train and build the capacity of local artisans to develop and deliver affordable sanitation services. In addition to the above, state and non-state actors, such as academic institutions, provide support through research into various affordable sanitation technologies. Over the years, such studies have provided insight into the context and sanitation needs of informal settlements.

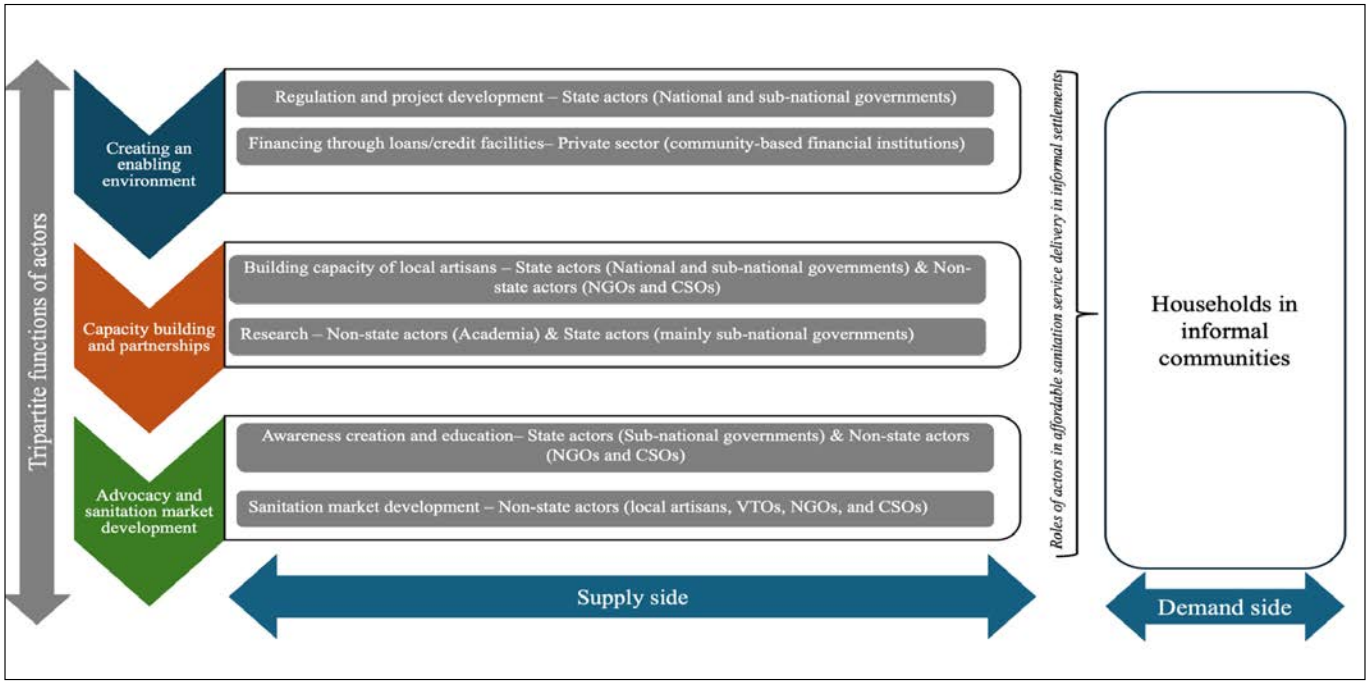


Figure 2: A conceptual framework of the tripartite functions and actors' roles in affordable sanitation service provision in informal settlements in Kumasi (Source: Author's Construct, 2025)

5. CONCLUSION

Access to affordable sanitation services remains critical to the socio-economic development of informal dwellers and to achieving SDG 6. However, little is known about the typology of actors and their unique roles in delivering affordable sanitation services to informal communities. This study provides a better understanding of the value chain, the actors involved, and their roles in delivering affordable sanitation services to informal settlements in Kumasi, Ghana. This research has become more imperative due to the vulnerabilities and exclusion faced by informal settlements in various cities across the globe.

The study revealed that various institutions collectively provide different services along the sanitation service value chain. The study is clear that no single actor can manage sanitation delivery in informal settlements. The state plays peculiar roles, and the same is true of non-state actors. However, the supply-side roles played by the state and non-state actors are not mutually exclusive, and thus, it is necessary to harmonize these relationships to offer affordable sanitation services to informal settlements. For instance, the study showed that the state plays a supervisory, demand generation, marketing of affordable sanitation, advocacy and law enforcement roles in the sanitation service delivery chain. The effectiveness of this role can prevent or limit collective-action challenges. In effect, over the years, due to advocacy by CSOs, NGOs, and CBOs in the study areas, the state has begun taking initiatives to improve sanitation in informal communities. Again, non-state actors have partnered with local authorities to introduce affordable toilet technologies suitable for households in informal settlements. These toilet options are affordable and best fit for the available spaces in informal communities. The study observed that the private sector engages in the delivery of sanitation services, advocacy, marketing and demand generation, research and training of service providers who construct latrines in the various communities. This shows a kind of public-private partnership in the delivery of affordable sanitation services in informal settlements in Kumasi.

Financing for sanitation remains a critical barrier to accessing safe, affordable sanitation in informal communities. However, the study found traces of a collective-action challenge regarding the absence of motivation in the form of grants or funds for community-based financial institutions to introduce and make accessible loans/ credit facilities for affordable sanitation service provision. These are useful enabling environment issues that will require policy direction from the state. Interestingly, existing local authorities lack financing mechanisms, such as subsidies, to support households interested in acquiring household toilets. Households in such areas are usually vulnerable and marginalized, and as such, will require some financial support to acquire safe and affordable toilet facilities. In some instances, such households may not be able to afford sanitation facilities. In the public health interest, such households must be identified through a transparent, community-based selection process and provided with a full subsidy to acquire a household toilet. It is expected that the state, through further collaborations with the non-state actors, can design subsidy support mechanisms that can support households obtain toilet facilities.

The study recommends placing strong emphasis on developing the capacity and capabilities of actors in the sanitation service market. These capacities and capabilities should include, but not be limited to, increasing the number of local artisans trained in emerging affordable sanitation services, as well as in funds, grants, and logistics. This recommendation has the potential to increase the number of toilets constructed in informal communities each year and to provide numerous affordable toilet options and opportunities for households in informal settlements. The study also calls for strengthening stakeholder coordination and the use of participatory approaches to effectively deliver sanitation services that meet the needs of informal dwellers.

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