

The community lived experiences of sanitation in the peri-urban areas of Lusaka, Zambia

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ABSTRACT

The study is significant as it contributes to Sustainable Development Goal number 6, for which countries are expected by 2030 to achieve sanitation services for all the citizens. In response to the global vision and also in alignment with the National Water and Sanitation Policy, the government has implemented a number of sanitation interventions across the country and in Lusaka peri-urban areas. The objective of this paper was to identify stakeholders' perceived sanitation challenges in Lusaka's peri-urban areas. The study adopted an interpretive phenomenological paradigm, anchoring on the relativist ontology, which posits that there is no single reality but rather multiple realities in the understanding of sanitation challenges. The paper was informed by the 29 participants, disaggregated as 10 males, 15 women, and 4 key informants. The data was analyzed using a reflexive thematic analysis, which was used in line with Braun and Clarke's framework for thematic analysis. The study found that due to limited demand for the pit emptying services, the pit emptier's are sometimes forced to move to other to leverage business opportunities hence they are expected to get either new operating license for that area or probably sign a new service contract; hence, this raises the cost of doing business. Moreover, the study disclosed that there are no dedicated structures to deal with sanitation, given that the community-level structures, such as the D-WASH, Water and Sanitation committees, are neither well-coordinated at the community level nor integrated into the sanitation programs. Moreover, the study uncovered that culture is embedded in sanitation and affects pit emptying services because women use pit latrines to dispose menstrual pads, hence when they fill up, the women tend to be uncomfortable to allow emptying of the toilets. The study concludes that there is a need for policymakers to consider a single operating licensing regime to ease the cost of operations for the service providers. This policy direction will improve sanitation in most of the peri-urban areas of Lusaka.

Keywords: On-Site Sanitation, Pit Emptying Services, Sanitation Challenges, Sanitation Regulations

I. INTRODUCTION

Most of the peri-urban areas face unique sanitation challenges, particularly at the household level, which often has compromised public health and safety in different areas. To understand these challenges, this paper was guided by an objective that sought to identify stakeholders' perceived sanitation challenges in Lusaka's peri-urban areas. This section covers the study background, methodology, findings, conclusion, and recommendations. The sanitation challenges remain severe in peri-urban areas of Lusaka, where approximately 70% of the city's two million residents reside (Brown et al., 2019). Most households in Lusaka Province rely on on-site sanitation facilities, while only 15% are on the sewerage network. Thirteen percent of the facilities used were improved toilets, such as the Ventilated Improved Pit (VIP) latrines, which can be safely managed if constructed to standard, while 19% of facilities were traditional and considered as 'unimproved' sanitation facilities (National Water Supply and Sanitation Council [NWASCO], 2018).

Globally, most governments, including Zambia, are committed to the Sustainable Development Goals (SDGs) and the African Union's Agenda 2063. Sustainable Development Goal 6 is to ensure the availability and sustainable management of safe water and sanitation for all by 2030. The water and sanitation goals are defined by eight targets that specify the objectives, and progress towards the 2030 Agenda for Sustainable Development is measured using 11 indicators as metrics by which the world aims to track whether these targets are achieved (Rajapakse et al., 2023). A study conducted by the United Nations (2015) shows that most countries are not on track to meet their objective of ensuring the availability and sustainable management of water and sanitation for all. The United Nations General Assembly (2010) posits that water and sanitation are recognized as human rights under international law. Furthermore, international monitoring data show that the world still has a long way to go to ensure everyone has access to safe services (Howard, 2021). According to a study conducted by Kivunja & Kuyini (2017), over 2.3 billion people all over the world still lacked basic sanitation service, and 844 million people still lacked basic drinking water. According to the global statistics, there are an estimated 3.4 billion people, or 45% of the population, who used safely managed sanitation services in 2017 (World Health Organization & United Nations Children's Emergency Fund [WHO/UNICEF], 2019).

Moreover, the World Health Organization and UNICEF (2019) established that the available data are limited, and the national estimates were only available for 96 countries, representing 54% of the global population.

Regionally, water and sanitation are anchored on Agenda 2063, whose aspiration is that Africa shall have equitable and sustainable use and management of water resources for socio-economic development, regional cooperation, and the environment (Agenda 2063, 2015). Moreover, global think tank institutions, such as the World Health Organization, observed that safe water and sanitation are essential to the health of all Africans as well as to the social and economic development of their countries, yet millions lack access to both.

Nationally, the country's water and sanitation regulatory institution, the National Rural Water Supply and Sanitation Program (2006), reveals that inadequate water and sanitation infrastructure is mainly due to low financial investments in the sector, with an annual allocation of less than 3% of the national budget. Moreover, the National Rural Water Supply and Sanitation Program (2006) further notes that the investments have been skewed towards water supply as opposed to sanitation, and this situation has been compounded by a lack of a clear policy on sanitation issues. Subsequently, Zambia has developed a comprehensive policy to guide the development and management of the sanitation and water sectors. The specific policy measures for rural water supply and sanitation include a community-based approach, the promotion of appropriate technology, and capacity building at all levels (National Rural Water Supply and Sanitation Program, 2006). The study aim was to explore sanitation programs' lived experiences among the stakeholders in Lusaka's George Compound.

1.1 Statement of the Problem

The Government of Zambia remains committed to accelerating universal access to water supply and sanitation to achieve a healthy and productive nation (National Water and Sanitation Council, 2018). Pit latrines are the dominant form of sanitation in peri-urban areas, used by about 88% of households (ECA, 2018). Thus, to improve public health, the government, with support of AfDB, constructed 5000 household toilets in peri-urban areas (Brown et al., 2012).

The sanitation challenges remain severe in peri-urban areas of Lusaka, where approximately 70% of the city's two million residents reside (Brown et al., 2012). Most households in Lusaka Province rely on on-site sanitation facilities, while only 15% are on the sewered network. 13% of the facilities used were improved toilets, such as the Ventilated Improved Pit (VIP) latrines, which can be safely managed if constructed to standard, while 19% of facilities were traditional and considered as 'unimproved' sanitation facilities (National Water and Sanitation Council, 2018).

Moreover, in most peri-urban areas, poor infrastructure and weak regulatory enforcement exacerbate sanitation issues (Lerebours et al., 2021). Equally, the roles and enforcement mandates among key regulatory actors remain poorly defined, resulting in fragmented implementation of sanitation laws and standards (SNV, 2024).

As a result of the poor sanitation situation in Lusaka, there have been recurrent outbreaks of cholera, typhoid, and dysentery, contributing to significant morbidity and mortality (Brown et al., 2012). Furthermore, the disease outbreak makes the government lose an estimated US\$194 million annually due to poor sanitation—equal to 1.3% of Gross Domestic Product [GDP]. (Brown et al., 2012). Similarly, approximately 3.4 million deaths occur each year from water-related diseases at a global level (WHO/UNICEF, 2017). Therefore, the researcher explored the stakeholder's lived experiences in sanitation programs in Lusaka's George Compound.

1.2 Study Purpose

The study purpose was to explore sanitation programmes lived experiences among the stakeholders in Lusaka's George Compound.

1.3 Research Objective

The study was guided by the objective, which sought to identify stakeholders' perceived sanitation challenges in Lusaka's peri-urban areas.

1.4 Research Question

The study answered the research question: What are the beneficiaries' perceived sanitation challenges in Lusaka's peri-urban areas?

II LITERATURE REVIEW

2.1 Theoretical Framework

2.1.1 Systems Theory

The researcher adopted the Systems theory which was first introduced in the 1940s by biologist Ludwig von Bertalanffy. Systems theory is a conceptual framework which is based on the principle that the component parts of a system can best be understood in the context of their relationships with each other and with other perceiving parts of the systems, rather than in isolation. (Wilkinson, 2011). Systems theory has significantly influenced our understanding of organisational behaviour and change, and a system approach can increase our ability to identify the underlying causes

of problems and determine the optimal solution. (Wilkinson, 2011). Systems thinking is the examination of systems from the perspective of the entire system, interrelated subsystems, and repetitive patterns occurring among subsystems. Systems thinking provides a holistic analytical method to analyse how a system's integral components relate and function over time and within the context of larger systems. Systems thinking is useful for complex or complicated problems that cannot be solved by a single entity, because complex systems cannot be effectively understood from only one perspective (Beehner, 2025).

The theory is in alignment with the study's ontological position, which holds that reality is multiple, which requires understanding of the whole by its various parts. In this context, applying systemic thinking helped in understanding various stakeholders' experiences of sanitation programme implementation as well as how systems interact to address sanitation programme challenges in the study area, thus helping the researcher in the interpretation and in the discussion of findings.

2.2 Empirical Review

2.2.1 Limited Systematic Investigation on Access and Availability FSM Services

A study conducted by Kakar et al. (2023) disclosed that, despite an obvious need for safe fecal sludge emptying, treatment, and disposal in such settings, there has been little systematic investigation of the availability and access to safe fecal sludge management (FSM) services for pit latrine owners in developing country cities. Similarly, there has been limited systematic study of households' emptying and replacement behaviors to understand the factors associated with unsafe emptying and the challenges and constraints of poor urban residents in managing full latrines. In view of the little available studies done, this study explored participants' experiences with the pit-emptying services in the study area, thus bridging a knowledge gap in the study area.

2.2.2 Low Demand for Pit Emptying Services

Through surveys of 942 households and a real-money voucher trial with 646 households, we found that stated and revealed demand for formal emptying services were both low, with less than 20% of households willing to pay full market prices. Our results suggest that improving fecal sludge management in these neighborhoods via the private sector will require large subsidies, ranging from 55.1–81.4 million KES (551,000–814,000 USD) annually, to address the gap between willingness-to-pay and market prices. Raising and administering subsidies of this scale will require the development of a city-wide sanitation master plan that includes investment, management, and regulatory procedures for fecal sludge management. In the absence of government investment and coordination, it is unlikely that the private sector will address safe sanitation needs in low-income areas of Kisumu (Peletz et al., 2020). The above study notes the logistical challenges and limited demand for formal pit emptying services faced in the sanitation services, particularly in Kenya, creating a contextual gap since limited studies have been conducted in Lusaka, George Compound.

2.2.3 Expensive and Unavailable Pit Emptying Services

A study conducted by Kakar et al. (2023) revealed that most residents in Dar's unplanned settlements use unhygienic methods to empty their latrines and do not empty pits as often or as thoroughly as they should, partly to save money or because they cannot afford better and partly because hygienic services are unavailable to them. As a result, populations are regularly exposed to fecal sludge in overly full pits during use and from frequent releases into local communities. Appropriately scaled hygienic emptying and haulage services based on operationally viable manual or mechanical pump technologies that can extract sludge from existing latrine pits in dense unplanned communities and move it from the plot to a controlled discharge point are part of the solution to the current problem. A large latent demand for such services was measured in Dar, including willingness to pay varying amounts up to and beyond the estimated small-business costs of delivering services by over 50% of property owners. However, without sustainable financing mechanisms to subsidize the service for the poorest owners, and make payment more affordable by spreading costs over multiple frequent payments for most others, and eventually regulatory efforts to promote the use of safe services and regular emptying, demand and uptake of services is unlikely to materialize at the scale and frequency needed to resolve FSM problems in Dar through the market alone.

2.2.4 Limited Spaces for Pit Latrines

Another study conducted by Greene et al. (2021) revealed that the urban facilities typically need to be emptied due to space constraints, which limit capacity for rebuilding new facilities. On the other hand, rural onsite sanitation facilities potentially can be safely decommissioned when they fill up. However, a single cycle of decommissioning full pits will affect over 400 million latrines, serving a population of 2 billion. In this scenario, this population will rely on latrines being constructed—with the potential for slipping back temporarily, or even permanently, to open defecation. As such, all onsite facilities were considered as requiring sludge removal in this assessment. This study will also explore the beneficiaries' experiences with pit-emptying challenges in the study area, thereby contributing to empirical evidence peculiar to the study area.

2.2.5 Limited Access Challenges

Non-mechanized emptying exists in countries with dry, inaccessible facilities, or facilities that may have trash, preventing their emptying using conventional means. Non-mechanized facilities are emptied by using buckets, shovels, and garden tools, and are often performed by informal businesses that indiscriminately dispose of waste. Improvements in this emptying servicing segment represent an urgent area of intervention (Greene et al., 2021). The study also focused on non-mechanized emptying methods, hence the study explored beneficiaries' experiences or views on these interventions in the study, contributing to empirical evidence in the study area where little is known about the subject matter.

Another study conducted by Chumo (2021) revealed that in Nairobi's informal settlements, there are several mechanical emptying services, but many parts of the settlements are inaccessible to desludging vehicles, even where long extension hoses are used. This is consistent with the above study, although little studies have been conducted in the study area, thus creating a contextual gap.

2.2.6 Lack of Coordination of Stakeholders in Sanitation Value Chain

A further study conducted by Chumo (2021) disclosed that, more importantly, sanitation stakeholders are not coordinated along the sanitation value chain so that emptiers in the informal settlements are licensed. There is limited empirical evidence to ascertain if the informal pit emptiers are licensed; hence, this study helped in filling the empirical evidence in the study area.

2.2.7 Exposure to Health Risk

Manual pit emptiers are exposed to risks, and some of them experience poor health conditions associated with their working conditions and a lack of collaboration of stakeholders linked to health, safety, and lack of PPE of pit emptiers (Chumo, 2021). The above study conducted in Kenya concluded that there is lack of collaboration of stakeholders linked to health, safety, and lack of PPE of pit emptiers. This study explored these aspects, thus contributed to empirical evidence which is limited in the study area. While the data demonstrate that latrine replacement has been and will continue to be a choice of some households in Dar, full latrines are increasingly being emptied rather than replaced. The high prevalence of unsafe emptying—over three quarters of emptying events—combined with increasing rates of emptying, point to access to safe pit-emptying services being at least as important as access to sanitation facilities to protect the population from exposure to faecal pathogens (Jenkins et al., 2015a). Similarly, this study explored whether the above challenges were also experienced in the study area.

2.2.8 Solid Waste into Pit Latrines

Solid waste such as “needles, bottles, and broken glass” (FGD, male emptier) was disposed of in the pits, leading to more rapid fill-up and posing safety risks to emptiers, while hindering pump-emptying. Additionally, five tenants noted that they discharged faecal sludge into nearby ditches to avoid emptying fees. To prevent inappropriate toilet management, the public sector, NGOs, and international organizations have provided households with education about “the importance of WASH” and “why (households) need to pay for sanitation” (KII, public officials) (Tomoi et al., 2025). The study conducted in Nairobi, Kenya, disclosed that inappropriate toilet management such as solid waste leads to quick filling of the toilet and hinders pump emptying. Moreover, people discharge fecal in the nearby ditches to avoid emptying fees. However, there are limited studies that have been conducted in the study area. It explores the people's challenges of pit emptying in the area, creating empirical gaps, which this study explored in George Compound.

2.2.9 Fill Up Time and Poor Emptying Services

Moreover, for sanitation, results showed that the main challenges faced are septic tanks filling up within short periods, the cost and poor pit latrine emptying services, and poor construction of pit-latrines, among other things. This study concludes that the inadequacy in the provision of water and sanitation by LWSC, given the population increase and growth of new settlements, leads to on-site provision of water and sanitation by residents. This is, however, unsustainable and may cause both environmental and health problems due to the increase in the number of boreholes drilled and septic tanks built. As such, there is need to come up with a more sustainable way of providing these services to residents as areas are planned (Chipuwa, 2019). The above study was conducted in Kwamwena in Lusaka; however, there is no similar study that has been conducted in the study area, creating a knowledge gap, and moreover, the study was conducted in 2019 and very little studies have been conducted in the study area, creating a time frame gap. Moreover, there is a gap in sustainability on the on-site sanitation, creating a gap in this aspect.

2.2.10 Poor Management of Faecal Sludge

Additionally, in sub-Saharan Africa, on-site technologies are used by 65–100 per cent of the urban population. Faecal sludge is often poorly managed, which can create environmental and public health risks; these are intensified in settlements that are unplanned and informal in nature (Kennedy-Walker et al., 2015). People's perceptions, knowledge,

and reported behaviors regarding WaSH facilities such as latrines reflect their knowledge of healthy WaSH practices. Due to inadequate knowledge on the importance of improved sanitation and hygiene, some people are reluctant to change their behavior and learn how to use the introduced latrine facilities (Chunga et al., 2016; Sibiyi & Gumbo, 2013). This was seen in places where community members practiced open defecation. There are limited studies that have been conducted to explore stakeholders' knowledge on improved sanitation, particularly house facilities; hence, this study contributed to knowledge on the above nuances by exploring people's understanding in the area on the sanitation facilities.

III. METHODOLOGY

3.1 Research Paradigm

The study was anchored on the Phenomenology paradigm and viewed reality from a relativist ontology that believes in multiple realities. Scotland (2012) asserts that reality is relative to how individuals experience it at any given time and place. According to Scotland (2012), ontology is defined as a branch of philosophy concerned with the assumptions we make to believe that something makes sense or is real, or the very nature or essence of the social phenomenon we are investigating. Therefore, collaborating with the above definition, the researcher studied reality by integrating multiple perspectives. Moreover, in terms of epistemology, the researcher adopted a subjective epistemological stance in which knowledge is generated through my personal experiences and interaction with participants (Kivunja & Kuyini, 2017). Using this epistemological stance, the study generated knowledge through interpreting meaning from the participants' experiences. Further, the study adopted a value-bound axiological stance, hence acknowledging that one's positionality in terms of personal background, experience, values, and beliefs influenced the study while prioritizing ethical considerations. (Kivunja & Kuyini, 2017) define axiology as the ethical issues that need to be considered when planning a research proposal. Given the nature of the study approach adopted, the research was value bound, hence was part of what was being researched and could not be separated (Saunders et al., 2009). Therefore, positionality in this study helped in integrating my beliefs and experiences in the construction of meaning during the study.

Lastly, the research deployed a methodology stance which covered the research approaches, designs, methods, and procedures used in an investigation that is well planned to find out something (Keeves, 1997). The inductive reasoning is a logical process in which multiple premises, believed true or found true most of the time, are combined to obtain a specific conclusion or to supply evidence for the truth of conclusion (Sauce & Matzel, 2017). The study applied inductive logic in data collection and data analysis by reasoning from the specific that were participants sampled to the general study area.

3.2 The Research Design

The study adopted the exploratory case study to gain in-depth insights about sanitation by focusing on a single case. Gerring (2004) emphasises that a case study is an intensive study of a single unit for understanding a larger class of (similar) units where the unit connotes a spatially bounded phenomenon observed at a single point in time or over some delimited period. According to Cresswell (2007), a case study is a good approach when the inquirer has identifiable cases with boundaries and seeks to provide an in-depth understanding of the cases or a comparison of several cases.

3.3 Sampling, Location, Population and Procedure

3.3.1 Study Location

The study was conducted in George Compound, one of the peri-urban areas located west of Lusaka. The location was selected based on the sanitation programmes, which involved the construction of household toilets. The programme was implemented there by the government of Zambia through the Lusaka Sanitation Program.

3.3.2 The Study Population

The study population is defined as a set of cases, determined, limited, and accessible, that constituted the subjects for the selection of the sample, and must fulfill several characteristics and distinct criteria (Arias-Gómez et al., 2016). The study sampled the beneficiaries of sanitation programmes, the Ward Development Committee, the Water and Sanitation Committee, the Lusaka City Council (Public Health Department), the Zambia Environmental Management Agency (Inspectorate), the National Water Supply and Sanitation Council, and the Lusaka Water Supply and Sanitation Company (Peri-Urban Department). The population was selected based on the participants' experiences working on the sanitation programmes in the peri-urban areas.

3.3.3 The Study Sample Size

The study adopted a qualitative research approach in which the sample size was determined based on the principle of data saturation. Suri (2011) notes that data saturation is associated with the situation when a further

collection of data provides little in terms of ‘further themes, insights, perspectives or information’. The study sample size was 29 participants disaggregated as 10 males, 15 women, and 4 key informants. The sample size was determined in the field after reaching data saturation, when no more new insights were emerging.

3.3.4 Sampling Procedure

The purposive sampling was employed, which is the intentional selection of informants based on their ability to elucidate a specific theme, concept, or phenomenon (Robinson, 2014). Furthermore, the criterion-based purposive sampling was employed in this study. This type of sampling calls for the researcher to set a specific criterion which should be followed for participants to take part in the study.

These participants were handpicked for such reasons because the criterion is set to enable the relevant data to be collected (Haruna, 2023). Samples were selected from the participants who have experienced and benefited from the sanitation programmes that were implemented by the government for the past ten years. The government stakeholders were selected based on their experience implementing sanitation programmes in the study areas. The selected study participants comprised the beneficiaries of sanitation programmes, the Ward Development Committee, the Water and Sanitation Committee, the Lusaka City Council (Public Health Department), the Zambia Environmental Management Agency (Inspectorate), the National Water Supply and Sanitation Council, and the Lusaka Water Supply and Sanitation Company (Peri-Urban Department).

3.4 Data Collection Instruments

The collection of primary raw data from the field was based on the deployment of the key informant interviews targeting government officials and community opinion leaders, and the in-depth interviews targeting the sanitation programmes beneficiaries.

3.4.1 Key Informant Interviews

Key informant interviews were deployed based on its quality to conduct intensive individual interviews with a small number of respondents to explore their perspectives on a particular idea, program, or situation. This choice of data-collecting tool is appropriate for open-ended questions for a qualitative study that were intended to be used. The key informant interviews (KIIs) are a valuable qualitative research method aimed at collecting in-depth insights and viewpoints from individuals who possess specialised expertise in a particular field. This method involved conducting one-on-one interviews with key informants to gain a comprehensive understanding of their knowledge, experiences, and perspectives, thus providing valuable qualitative data for research and analysis (Akhter, 2022). The study deployed this method targeting the government officials and community leaders based on their experience working in the sector or experiencing the sanitation programme interventions in the study area.

3.4.2 In-Depth Interviews

The study also deployed in-depth interviews to generate qualitative data. The in-depth interviews can be quite unpredictable and varied and are well suited to exploratory research and other research interested in meaning and experiences (Osborne & Grant-Smith, 2021). The data collection instrument is suited for this study as it leans on gathering sanitation beneficiaries’ lived experiences in an unrestricted manner as opposed to structured instruments which restrict participants’ responses.

3.4.3 Data Collection Procedures

Self-administered interviews were deployed in the field to elicit the participants’ views and experiences. The interviews were conducted either in English or translated into the local language spoken by the participant. The study participants to be interviewed were selected using the criterion of purposive sampling. The interview duration lasted between 50 to 60 minutes. Data collection devices such as audio recording were used after obtaining consent from the study participants.

3.5 Data Analysis

Raw data manually analysed using a reflexive thematic analytical research approach in line with the study philosophical paradigm. According to Kiger and Varpio (2020), thematic analysis is an appropriate method of analysis for seeking to understand experiences, thoughts, or behaviours across a data set. Themes are actively constructed patterns (or meanings) derived from a data set that answer a research question, as opposed to mere summaries or categorisations of codes. The study adopted the Braun and Clarke framework for conducting thematic analysis, which involves a six-step process namely data familiarization, generating initial codes, themes identification, reviewing themes, defining and naming themes, and producing the report (Kiger & Varpio, 2020). The above themes helped in building patterns for interpreting the study findings in line with the study objectives and study purpose.

3.6 The Study Trustworthiness

The study employed Lincoln and Guba's criteria to ensure trustworthiness of the study. The scholars identified four criteria of credibility, transferability, dependability, and confirmability, and this is according to Ahmed (2024). Ahmed (2024) notes that credibility and trust are built through rapport with participants over time, which allowed the researcher to gain deeper insights into their experiences, behaviours, and beliefs. The foregoing approach was employed, which helped the researcher capture rich data that might not emerge during brief interactions. Moreover, the study achieved transferability by thoroughly describing the research context, participants, and methods, allowing readers to assess similarities between my study and their own contexts and judge whether the findings might apply to their settings (Ahmed, 2024). The study also detailed the sampling methods and participant selection criteria so others could determine if the findings might transfer to similar populations or settings. Ahmed (2024) observes that documenting each step of the research process to ensure transparency and allow others to replicate the study or assess the reliability of the findings. Furthermore, according to Kakar et al. (2023), dependability refers to the consistency of findings over time. Moreover, Eryilmaz (2022) postulates that maintaining an audit trail—a detailed log of decisions made throughout the research—allows other researchers to reproduce the study, ensuring dependable results. Finally, the study ensured confirmability through member checking, giving participants the opportunity to verify that their viewpoints and experiences were accurately represented. Furthermore, Ahmed (2024) postulates that keeping a reflective journal helped to track my evolving thoughts, biases, and reflections during the research process. This practice enhanced transparency and provided insights into my own subjectivity, contributing to the confirmability of the findings.

IV. FINDINGS & DISCUSSION

4.1 Findings

4.1.1 Theme 1.1.1: Limited Access to Sanitation

The study revealed that most peri-urban areas do not have access to sewer systems, hence they depend on pit latrines. The people in the peri-urban areas face the challenges of pit emptying when the toilets fill up, as well as face the challenge of space for constructing new toilets whenever they fill up. One of the key informants disclosed that:

In terms of access to sanitation, the experience has been that most peri-urban areas do not have sewer networks, hence they depend on pit latrines. When the toilets are full, the main challenge has been to open them, and usually, when full, they tend to abandon them and dig new ones. In other areas where they don't have toilets, they ask to use toilets for their neighbours, which most of the time creates conflicts in the areas. Most of the peri-urban areas have challenges of space for constructing pit latrines. (Verbatim- KII LWSC).

The main challenge faced with sanitation is limited access to sanitation facilities and emptying services. There is also limited information and awareness about the sanitation products that are available. One of the key informants disclosed that:

The number one challenge faced in sanitation is limited information, of which very few people are aware that LWSC is offering pit emptying services in terms of cost for the service, the call centre or toll-free line. The available information is not reaching every house in the peri-urban areas. (Verbatim- KII LWSC).

Moreover, there is lack of access in terms of roads. One of the key informants expressed that:

The service providers park their big trucks and use push carts during pit emptying services in most peri-urban areas. This means that the service providers ask for additional cost. Similarly, some of the service providers do discriminate against those beneficiaries who cannot be accessed due to bad roads and opt to provide service to those who are accessible. (Verbatim- KII LWSC).

Furthermore, if the people are abused by the service providers, they may not know where to report. One of the key informants disclosed that:

Moreover, if the toilet is not built according to standards, the pit emptier may not empty it due to safety concerns. (Verbatim- KII LWSC).

The issue of inclusion is a challenge, given that the pit emptying service is relatively new and the service provider has its own challenge of information dissemination. One of the key informants revealed that:

Further, not all the households have facilities that are emptiable; thus, this has a cost implication, although toilets built under the sanitation program do not have these challenges but most of them do. (Verbatim- KII LWSC).

The study disclosed that most of the peri-urban areas are not accessible due to poorly constructed houses. This poor housing planning affects the service providers in providing emptying service when the toilets fill up. The key informant narrated that:

Most of the peri-urban areas are not accessible due to poorly constructed houses in peri-urban areas, hence most of the pit emptiers fail to access the areas. (Verbatim- KII LWSC).

4.1.2 Theme 1.1.2: Inadequate Water Supply

Water and sanitation are linked or are like a twin problem. For toilets to function properly, there is need for water supply, and moreover, some of the beneficiaries use pour-flush technologies which cannot function properly without water. One of the key informants interviewed revealed that:

Water and sanitation are directly linked. Where they use latrines, water is needed for cleaning and ensuring hygiene. Lack of water compromises sanitation. Some households use pour-flush toilets which cannot function without water. Most houses are forced to pay young boys to fetch water, creating an additional cost impacting their household income. Lack of water affects households' income, and children walk long distances to fetch water. (Verbatim- KII LWSC).

4.1.3 Theme 1.1.3: Open Defecation

Open Defecation is a public health issue and is classified as a nuisance which leads to the spread of diseases. This normally happens when the faecal finds its way into the punctured system. One of the key informants interviewed narrated that:

Open defecation borders on public health and nuisance, and this leads to water-related diseases. The faecal matter may find its way into the water system due to leakages. Moreover, open defecation is an indicator that there are limited toilets in the peri-urban areas, hence people resort to open defecation. (Verbatim- KII LWSC).

4.1.4 Theme 1.1.4: Bad Cultural Beliefs

Culture is embedded in sanitation and affects pit emptying services because women use pit latrines to dispose menstrual pads, hence when they fill up, the women tend to be uncomfortable to allow emptying of the toilets. One of the key informants revealed that:

The culture is what shapes sanitation and every other aspect of peri-urban life. If sanitation is not built to standards, it tends to affect menstrual hygiene because women dispose their menstrual towels in the pit latrines; hence, when a toilet fills up, pit emptying, for example, may pose some challenges because people would feel uncomfortable to have their sanitary pads emptied. (Verbatim- KII LWSC).

The study revealed that most of the community beneficiaries reported facing significant challenges due to cultural reasons that made it difficult to consult married women without their spouses present. Consequently, when service providers engaged with beneficiaries, men often served as the primary point of contact at the household level. However, since men were frequently away from home, women were rarely consulted. A key informant elaborated:

"Women cannot be engaged alone without their spouses because of cultural norms deeply rooted in many societies." Participant (GC 1).

4.1.5 Theme 1.1.5: Inadequate Sanitation Inclusion

Most key informants reported that challenges in engaging men and women during toilet or sanitation facility construction were largely due to poor timing. Men typically work during the week and are only available during holidays, which often causes them to miss consultative meetings. Meanwhile, women's multiple responsibilities in caring for their families and managing household tasks also hindered their attendance at sanitation meetings, resulting in their specific needs being overlooked in the construction process. One key informant noted:

"The challenges in engaging beneficiaries are primarily related to the timing of meetings, which is influenced by the methods used by project implementers. Men are usually out working during the week, so when meetings are held at that time, they are likely to miss them, leaving their needs and perspectives unaddressed. Similarly, women often use the mornings to shop for food, meaning that if meetings are scheduled during that time, they are likely to miss them as well, leading to their needs not being represented and resulting in them becoming passive users." Participant (GC 16).

Due to the unequal division of labour in cleaning and managing toilets, many community beneficiaries reported that women bear the brunt of the responsibilities. Women are tasked with cleaning toilets and caring for their children, as household sanitation falls primarily on them, and they also contribute to the construction fees for sanitation facilities. One beneficiary shared:

"Women are the ones who suffer most. They are responsible for cleaning up after their children. After we collected the application forms from the service providers, my wife was the first to make the initial partial payment." Participant (GC 19).

The study revealed that the sanitation services and interventions follow the city-wide guidelines which include integration of culture, gender, disability and social inclusion. One of the key informants narrated that:

In my opinion, the services are inclusive because the interventions, before they are provided, need to follow the city-wide sanitation guidelines which entrench culture, gender, and social inclusion. It provides for inclusion of the aged, disabled, and the children. (Verbatim- KII, Nwasco).

Inclusion in sanitation has been a challenge, given that most of the sanitation facilities were constructed with a blind eye with regards to social inclusion. However, toilets that were constructed by Lusaka sanitation program paid attention to inclusion of children through school clubs and inclusion of the old aged and people with disabilities by building toilets responsive to their needs. One of the key informants interviewed disclosed that:

The inclusion speaks to interventions by Lusaka sanitation program. Social inclusion has been a challenge because most facilities were designed with a blind eye to social inclusion aspects. The Lusaka sanitation program factored inclusion of children, disabilities, old aged, and the women. The children were included through sanitation clubs in school, hence helping them to understand sanitation matters early enough. Similarly, in terms of the disabled, the on-site sanitation gave families an option to pay for facilities which catered for disabilities such as lumps and rails. And similarly, the aged were catered for by constructing toilets with rails and lump. (Verbatim- KII LWSC).

Participation in constructing sanitation facilities varied by area. In some places, women assisted by providing bricks and fetching water needed for construction, while in others, only men participated. A 37-year-old female community member with a grade 12 education noted:

"When building, women help with blocks and contribute from their business ventures for toilet construction. They also assist by fetching water for the construction." Participant (GC 20).

Most male and female community beneficiaries noted that LWSC frequently invited them to meetings where they were educated about the sanitation project. Participants were involved in various roles, such as deciding the locations of toilets and doors, bricklaying, and supervising construction. Women tended to participate more actively during the construction process, as they also took care of children and ensured the toilets remained clean. Meanwhile, men's roles primarily involved raising funds for the construction and contributing money for locks, cleaning supplies, and other necessities. One female beneficiary shared:

"LWSC used to invite us to meetings where they explained the toilet construction project and what was needed. We helped supervise the construction and worked as bricklayers. Husbands attended the meetings but were less involved. They contributed funds for the toilets and for buying locks and toilet tissue." Participant (GC 23).

Both men and women were expected to engage throughout the entire project cycle, including preparation, implementation, monitoring, evaluation, and maintenance. A key informant stated:

"Ideally, both men and women should be involved at every stage of the project cycle, including operation and maintenance. However, women's participation often appears as an ad hoc arrangement driven by donor requirements, rather than a natural inclusion that addresses their specific needs." Participant (GC 24).

During the preparatory phase, both genders participated in community meetings and construction activities, though men were generally more involved in building. Women primarily handled the cleaning of toilets, while a few men occasionally helped with cleaning tasks, usually focusing on buying cleaning supplies. One of the male beneficiaries commented:

"Men and women attended community meetings to discuss toilet construction. While both contribute to cleaning, the majority of cleaning responsibilities fall to women because men are often not at home." Participant (GC 25).

4.1.6 Theme 1.1.6: Lack of Standards

The state of sanitation in the peri-urban areas is not structured, hence it is haphazard, as there are no standards for constructing toilets. Moreover, the emptying services are not to the expected standards. One of the key informants revealed that:

The state of sanitation in the peri-urban areas is in a haphazard manner and there have not been standards to follow when constructing toilets. The emptying services are undesirable, and the pit latrines are not standard since they are constructed by the individual households. (Verbatim- KII, LWSC).

4.1.7 Theme 1.1.7: Population Growth Challenges

Moreover, another interview conducted with key informants disclosed that the population has been growing although the sanitation facilities have not been expanding. Because of this challenge, many people in the peri-urban areas depend on pit latrines and soakaways, given that the conventional system has not been expanding. One of the key informants revealed that:

The mandate to provide sanitation is with LWSC, but as you may be aware, in Lusaka, the situation is that the population has grown at a huge rate and sanitation still remains the same, so most of the facilities have depended on now using the soakaways and septic tanks; others are also using pit latrines, so in terms of enforcement, I can only talk about what we are doing with the Millennium projects in Mtendere where we are enforcing the law to ensure that every household located about 60 meters from the main sewer system connects to the system. (Verbatim- KII, LCC).

4.1.8 Theme 1.1.8: Limited Inspectors to Enforce Sanitation Laws

Similarly, another key informant interviewed expressed that the main challenge faced by the regulators arises from the increase in population and limited presence of inspectors to help with enforcement of sanitation, particularly disposal in the open environment. One of the key informants interviewed revealed that:

From the regulatory point of view, the enforcement challenges faced are quite a number, and this includes population increase which has made it difficult for the regulator to have presence everywhere, hence posing compliance challenges on sanitation aspects to do with pollution to the environment. (Verbatim- KII, ZEMA).

The key informant further revealed that:

The responsibility of the people in the communities is to ensure that they also help in prevention of the pollution of the environment by stopping the operators from discharging into the open environment, rather than leaving the responsibility to the regulator. (Verbatim- KII, ZEMA).

4.1.9 Theme 1.1.9: Funding and Capacity Challenges

The enforcement of sanitation law faces funding challenges for logistics required to facilitate summons and transportation, among others. One of the key informants disclosed that:

Enforcement requires the local authorities, for example the council staff and public health inspectors. These need office space, vehicles, and other operational costs. Without resources, it's difficult to issue summons and make regular follow-ups to sanitation complaints; hence, limited funding does affect the sanitation by-law enforcement. (Verbatim- KII, LWSC).

4.1.10 Theme 1.1.10: Limited Capacity and Vastness of the Peri-Urban Areas

Similarly, another key informant interviewed disclosed that the people in the peri-urban areas do not have capacity to put sanitation facilities; this is because of costs associated with construction of the sanitation facilities, despite education about the importance of sanitation. The other associated regulatory challenge is because of the vastness of the city, whereas Lusaka City Council is understaffed given the size of the city. One of the key informants disclosed that:

Most of the people do not have capacity to put up sanitation facilities because they are costly. Moreover, enforcement is a challenge because of limited staffing by the Lusaka City Council, which affects sanitation enforcement in the peri-urban areas. (Verbatim- KII, LCC).

The key informant further revealed that most of the peri-urban areas started as unplanned settlements, hence this contributed to poor sanitation, and in some areas, water is limited, hence people use water from the shallow wells. (Verbatim- KII) LCC.

4.1.11 Theme 1.1.11: Poorly Constructed Pit Latrines and Operation Costs

The study established that before the construction of household sanitation facilities, community beneficiaries frequently suffered from diarrheal diseases and cholera outbreaks caused by unsanitary conditions. One of the community members shared:

"We often experienced cholera whenever the toilets filled up, and because of the poor sanitation and dirtiness of the toilets, it led to diarrheal outbreaks." Participant (GC 13).

Further, the study revealed that most of the challenges faced in the peri-urban areas are poorly constructed pit latrines. The following is the extraction from one of the key informants:

Some of the challenges faced are poorly constructed pit latrines. Most of the pit latrines are in a terrible state. Most of the super structures are made of mud and often expose the households to diarrheal diseases. In areas where commercial utilities want to provide a service, we have

informal emptiers who are not regulated or provided with protection. Pit emptiers are not regulated, hence face uncontrolled pricing of the services. Moreover, the pit emptiers are not vaccinated and normally operate without personal protective clothing. Sometimes the pits tend to collapse on them as well as the users due to their poor state. Because of the poor state of the facilities, the service providers are forced to break the toilets when emptying, hence incurring a cost for cement to fix the broken part. Moreover, most of the customers do not see the reason why they should move to the new designs since they have been all along using the toilets and hence do not see the need to move to the new designs. Without demand, it is a challenge in terms of economic viability due to huge maintenance costs. (Verbatim- KII, NWASCO).

4.1.12 Theme 1.1.12: Shared Sanitation Facilities and Multiple Users

The shared toilets facilities in the peri-urban areas is not a strange thing due to multiple units of tenants, hence this compromises hygiene due to many users of the pit latrines. Moreover, most of the people fail to take responsibility when using pit latrines, particularly when it comes to cleaning. One of the key informants interviewed expressed that:

The shared facilities in the peri-urban areas are not strange due to multiple units. It is, therefore, inevitable for the households to share sanitation facilities, hence compromising on hygiene. Because of multiple users, when a toilet is messed, there are usually conflicts among users regarding taking or failure to take cleaning responsibilities. (Verbatim- KII LWSC).

Similarly to the issue of shared facilities is lack of privacy, hence people must wait before they can access the sanitation facility. One of the key informants interviewed disclosed that:

Similarly, privacy is another challenge faced by most of the people in the peri-urban areas, in which people must wait before they can access use of the sanitation facilities. (Verbatim- KII LWSC).

Most participants noted that before the construction of the toilets, they faced significant challenges due to multiple people sharing a single facility. This often led to long waits, and women sometimes had to ask neighbours to use their toilets, which could result in insults. As one male beneficiary explained:

"We struggled with waiting for others to finish since there was only one toilet. Women would ask neighbours, and sometimes they were told to just have their landlords build toilets." Participant (GC 25).

4.1.13 Theme 1.1.13: Inequality and Urinary Tract Infections

Many female beneficiaries pointed out that sanitation challenges disproportionately affected them, especially regarding water scarcity, which increased their risk of urinary tract infections. The high number of users also heightened health risks. Additionally, the lack of water became especially problematic during menstruation, making women hesitant to use the toilets for fear of embarrassment if they stained them. One of the community members said:

"The lack of water in the toilets is particularly challenging during menstruation. Women tend to avoid using them when many people share the space because they feel ashamed if others see a mess." Participant (GC 21).

4.1.14 Theme 1.1.14: Sexual Violence Risks

The study revealed that women also voiced concerns about the safety risks associated with sharing toilets, which posed threats to girls and women, including the risk of defilement and rape. A key informant noted:

"Sharing toilets presents significant risks for women; there have been instances of girls being defiled and women being raped." Participant (GC 24).

4.1.15 Theme 1.1.15: Multiple Licensing and Jurisdiction

The study revealed that most of the people in the peri-urban areas face the challenges that service providers are licensed to operate in each area of jurisdiction. However, due to limited demand, they are sometimes forced to move to other areas where they are also expected to get a new license for that area and probably sign a contract; hence, this raises the cost of doing business. One of the key informants expressed that:

The other challenge observed is that the operators are usually licensed according to the operating areas of jurisdiction in which they operate based on the license obtained for that area, but when demand declines, they are forced to move to other areas in which they are forced to obtain another license and sign a new contract. (Verbatim- KII, NWASCO).

4.1.16 Theme 1.1.16: Limited Data on On-site Sanitation

The study revealed that there are limited studies that have been conducted on on-site sanitation. The key informant expressed that:

Limited data on on-site sanitation because most of the existing information is aligned to the sewerage facilities, hence there is need to carry out studies on the on-site sanitation to address this gap. Currently the regulator is conducting GIS mapping to address the nuances of the on-site sanitation. (Verbatim- KII, NWASCO).

The key informants further noted that it is a challenge for most of the people to put up the sewer system because it is far, and the cost is huge. The council also lacks capacity in terms of human resource to cater for the whole city. The key informant revealed that:

Yes, so in terms of sanitation challenges, most people, in as much as we educate, might not have the capacity to be able to put up sanitary facilities. In other areas, the network is very far, and the costs other people cannot manage to pay. And in terms of human resources, the council does not have enough human resources to cater for the entire city at the same time, so those could be some of the challenges. (Verbatim- KII, LCC).

4.1.17 Theme 1.1.17: Limited Stakeholders Participation

Sanitation adherence requires community participation, and this can only be attained if there is community awareness through education on their responsibilities of ensuring compliance to the sanitation laws. One of the key informants interviewed revealed that:

Communities are the key stakeholders in sanitation, hence their participation helps in ensuring adherence, and this can only be achieved if the communities are educated for them to see the reasons why they need to adhere to the sanitation laws put in place by the government. (Verbatim- KII, ZEMA).

The stakeholders are there, but most of them tend to work in silos. Moreover, stakeholders are not involved in enforcement. One of the key informants revealed that:

I think we have a lot of stakeholders, but they like to work in silos. In terms of enforcement, they don't play a role. (Verbatim- KII, ZEMA).

4.1.18 Theme 1.1.18: Limited Funding

One of the challenges affecting implementation of sanitation laws is limited funding and logistical support. The following is an extraction from one of the key informants:

As I said, we need vehicles to be mobile and to ensure sanitation in the peri-urban areas, which is a challenge. (Verbatim- KII, LCC).

The cost of constructing household sanitation facilities was a significant burden for both men and women beneficiaries, as noted by a key informant:

"We face financial challenges which affect both men and women. The cost of sanitation is high, and we were assisted to finish the part payment by our grandson." Participant (GC 11).

4.1.19 Theme 1.1.19: Environmental Challenges

Many male and female-headed households faced significant challenges with toilet emptying, largely due to overcrowding and the absence of clear road networks in the area. This made it difficult for vacuum tankers and sanitation service providers to access the facilities. Additionally, most yards were dug out for toilets, leading to contamination of the entire area, as users often had to dig new holes once the original toilet was full. A key informant noted:

"It's a challenge to access their facilities due to poor housing planning. When toilets are full, it becomes difficult to facilitate emptying because of the lack of access. They often must decommission a toilet and dig in other places, which creates unhygienic conditions as people resort to using plastics." Participant (GC 11).

During the construction of the toilets, beneficiaries also faced challenges in waterlogged areas, where toilets could fill up before construction was completed. One of the key informants revealed that:

"In some instances, certain areas were waterlogged, and toilets were filling up before the construction was finalized." Participant (GC 11).

4.1.20 Theme 1.1.20: Weak Community Structures

The study established that there are no dedicated structures to deal with sanitation, given that the D-WASH are not well coordinated at community level, and they are usually not integrated in the sanitation programmes. One of the key informants revealed that:

There are challenges in terms of structure that are dedicated to sanitation. We have D-WASH structures at community level, but these are not well coordinated, and they are usually not involved in sanitation programmes. (Verbatim- KII, LCC).

4.1.21 Theme 1.1.21: Limited Focus on On-Site Sanitation

Similarly, the study disclosed that on-site sanitation is relatively new compared to sewerage systems. The following is an extraction from one of the key informants:

The main institutional challenge is that on-site sanitation is a relatively new space in water and sanitation utilities have moved into. The company used to previously focus more on the sewerage systems. There is need to change mindset and institutional capacity, which often comes with financial constraints. Institutional coordination is not a challenge since the utility companies are a creation of the local authorities. Also, the NGO WASH Forum has helped in institutional coordination. (Verbatim- KII, NWASCO).

4.1.22 Theme 1.1.22: Resistance and Acceptability Challenges

The study revealed that on-site sanitation is a relatively new technology and that most of the people are resistant to change, hence creating low acceptability of the facilities in the peri-urban areas. One of the key informants disclosed that:

There was resistance to acceptance of the on-site sanitation because it is a relatively new technology, hence many people in the peri-urban areas are still resisting to move to this new technology. (Verbatim- KII, LWSC 2).

4.1.23 Theme 1.1.23: Lack of Prioritisation of Sanitation Services

The study noted that when given a choice to make in the peri-urban areas, people would choose water supply and other services rather than toilets. This has made it a challenge to improve the sanitation situation in the peri-urban areas. One of the extractions from the key informant disclosed that:

The people in the peri-urban areas would rather choose water services and other facilities as opposed to pit latrines. (Verbatim- KII, LWSC 2).

4.1.24 Theme 1.1.24: Poor Ground and Rock Conditions

The study found that sanitation investments have been a challenge in most of the peri-urban areas because of the ground conditions, which are usually waterlogged as well as rocky. This makes it very difficult to construct a pit latrine. The service provider instead is forced to have above-the-ground toilets as opposed to the traditional pit latrines. One of the key informants revealed that:

The toilets constructed are shallow because of the raised water table, which was affecting most of the toilet constructions in the peri-urban areas. Some of the areas were rocky, hence making it difficult to dig deeper pit latrines. (Verbatim- KII, LWSC 2).

4.1.25 Theme 1.1.25: Alteration of the Toilet Designs

The study established that Lusaka Water Supply and Sanitation Company constructed the toilets with certain design features such as showering devices and emptying provision. But the people are not comfortable with these designs, hence they resorted to the old designs, which according to them helps the toilets to fill up quickly, given the multiple users at some of the households. One of the key informants expressed that:

The toilets which were constructed by the Lusaka Water Supply Company had a certain design which made it easier for emptying. However, due to multiple users of the toilets, people are not comfortable to maintain the service providers' designs, hence they resorted to changing them to suit their needs. Some of the toilets came with shower facilities, which they removed, hence water goes directly into the latrine, causing the facilities to quickly fill up. (Verbatim- KII, LWSC 2).

4.1.26 Theme 1.1.26: Scheduled Desludging Model and Design Alteration

Moreover, due to design alterations, it is now becoming difficult to implement the company's initiative or policy direction to implement the scheduled desludging, especially in most of the toilets, particularly those which were constructed with the support from the utility. One of the informants revealed that:

Most of the toilets were tampered with in terms of initial designs, which had provision for pit emptying as well as management of grey water from the shower rooms. But this was removed, so water goes directly into the pit latrines, hence making them fill up quickly. (Verbatim- KII, LWSC 3).

4.1.27 Theme 1.1.27: Disease Outbreaks and Poor Sanitation

The study established that before the construction of household sanitation facilities, community beneficiaries frequently suffered from diarrheal diseases and cholera outbreaks caused by unsanitary conditions. One of the community members shared:

"We often experienced cholera whenever the toilets filled up, and because of the poor sanitation and dirtiness of the toilets, it led to diarrheal outbreaks." Participant (GC 13).

The study revealed that challenges faced in the peri-urban areas are the poorly constructed pit latrines. The following is the extraction from one of the key informants:

Some of the challenges faced are poorly constructed pit latrines. Most of the pit latrines are in a terrible state. Most of the superstructures are made of mud and often expose the households into diarrhoea diseases. (Verbatim- KII, NWASCO).

4.1.28 Theme 1.1.28: High Emptying Cost and Unregulated Pit Emptying

The study found that the communities face the challenge of high cost in accessing sanitation services from the service providers who are not regulated. The unregulated service providers fail to adhere to the standard operating procedures, hence face occupational risks while providing pit emptying services. One of the key informants expressed that:

In areas where commercial utilities want to provide a service, we have informal emptiers who are not regulated or provided with protection. Pit emptiers are not regulated, hence face uncontrolled pricing of the services. Moreover, the pit emptiers are not vaccinated and normally operate without personal protective clothing. Sometimes the pits tend to collapse on them as well as the users due to their poor state because of the poor state of the facilities—the service providers are forced to break the toilets when emptying, hence incurring a cost for cement to fix the broken parts. (Verbatim- KII, NWASCO).

4.1.29 Theme 1.1.29: Lack of Motivation to Embrace Sanitation Technological Changes

The study established that most of the communities are not motivated to embrace the new sanitation technologies because they are used to the traditional pit latrines. The following is an extraction from one of the key informants:

Moreover, most of the customers do not see the reason they should move to the modern designs since they have been all along using the toilets, hence do not see the need to move to the modern designs. Without demand, it is a challenge in terms of economic viability due to huge maintenance costs. (Verbatim- KII, NWASCO).

4.1.30 Theme 1.1.30: Multiple Toilet Users and Prolonged Access Time

Similarly, one of the community beneficiaries narrated that, most participants noted that before the construction of the toilets, they faced significant challenges due to multiple people sharing a single facility. This often led to long waits, and women sometimes had to ask neighbours to use their toilets, which could result in insults. As one male beneficiary explained:

"We struggled with waiting for others to finish since there was only one toilet. Women would ask neighbours, and sometimes they were told to just have their landlords build toilets." Participant (GC 25).

4.1.31 Theme 1.1.31: Disproportional Gendered Impacts

The study revealed that most of the female beneficiaries pointed out that sanitation challenges disproportionately affected them, especially regarding water scarcity, which increased their risk of urinary tract infections. The high number of users also heightened health risks. Additionally, the lack of water became especially problematic during menstruation, making women hesitant to use the toilets for fear of embarrassment if they stained them. One of the community members expressed that:

"The lack of water in the toilets is particularly challenging during menstruation. Women tend to avoid using them when many people share the space because they feel ashamed if others see a mess." Participant (GC 21).

4.1.32 Theme 1.1.32: Safety Risks and Girls' Sexual Assault

The study revealed that women face the safety risks associated with sharing toilets, which posed threats to girls and women, including the risk of defilement and rape. A key informant noted:

"Sharing toilets presents significant risks for women; there have been instances of girls being defiled and women being raped." Participant (GC 24).

5.2 Discussion

5.2.1 Access to Sanitation

The main challenge in sanitation continues to be limited access to appropriate sanitation facilities, coupled with inadequate emptying services. In many cases, communities also lack sufficient information and awareness regarding the sanitation products and technologies available to them. Existing literature indicates that the regulatory focus in many countries has historically leaned towards off-site sanitation systems. For instance, although the Water Supply and Sanitation Act recognizes sanitation services to include both off-site sewered systems and on-site sanitation, regulatory activities over the past decade have concentrated on sewerage services. Energy and Water Utilities Regulatory Authority (EWURA, 2020) highlights that while approximately 90 percent of households in the service areas rely on on-site sanitation systems, faecal sludge management from these facilities remains poorly regulated. Most of the existing pit latrines and on-site systems do not meet the required non-sewered sanitation standards, resulting in risks of environmental contamination and adverse public health outcomes. Additionally, the sanitation service chain—from containment and emptying to transportation, treatment, and final disposal or reuse—remains weak and fragmented, meaning that no segment is currently being managed safely. This situation underscores the need for improved regulatory oversight, investment in faecal sludge management infrastructure, and enhanced community sensitization to ensure effective and sustainable sanitation service delivery.

5.2.2 Limited Water Supply

The study revealed that limited water supply remains a major constraint to effective sanitation service delivery in peri-urban areas. Participants repeatedly emphasized that “water and sanitation are like a twin problem,” as the functionality of household toilets—especially pour-flush technologies—depends heavily on consistent access to water. Where water supply is unreliable, irregular, or entirely absent, households face significant challenges in maintaining hygiene practices, flushing toilets, and preventing blockages or odour build-up. As a result, sanitation facilities may fall into disuse or be used in unsafe ways, undermining public health outcomes. This finding is consistent with the literature, which establishes that water scarcity directly affects sanitation behaviour and facility sustainability. According to McConville et al. (2017), pour-flush systems require adequate and reliable water to operate effectively, and in low-income or peri-urban settings where water supply is intermittent, households may revert to unhygienic alternatives, including open defecation or the use of shallow and unsafe pits. Similarly, the World Health Organisation (2021) stresses that water insecurity increases the risk of faecal contamination pathways, especially where households must ration water between drinking, bathing, laundry, and sanitation.

The study further suggests that limited water supply disproportionately affects women and girls, who are primarily responsible for water collection and household sanitation upkeep. Where water is scarce, the burden of securing water for toilet use increases, adding to women’s labor and exposing them to health and safety risks. Therefore, addressing sanitation challenges in peri-urban areas requires not only improving toilet infrastructure but also strengthening water supply systems. Integrated planning that treats water and sanitation as interdependent services—rather than separate sectors—is essential for ensuring the long-term sustainability of sanitation improvements.

5.2.3 Open Defecation

The study revealed that open defecation continues to be a public health concern in peri-urban areas. Participants indicated that when faecal matter is not properly contained, it often finds its way into the environment or nearby drainage systems, creating unhygienic conditions that facilitate the spread of communicable diseases. Open defecation is not only a health risk but also classified as a public nuisance, as it contaminates water sources, attracts vectors such as flies, and undermines community well-being and dignity. This finding aligns with global sanitation literature. Mara (2017) observed that exposure to human excreta in the environment significantly increases the risk of diarrheal diseases, cholera, typhoid, and parasitic infections. Similarly, Cairncross (2003) emphasizes that inadequate containment of faecal matter in low-income settings is a leading contributor to environmental contamination and persistent public health challenges. Moreover, open defecation often occurs where households lack access to safe, affordable, and conveniently located toilets or where cultural and behavioural factors discourage consistent use of available facilities. The study suggests that even when toilets are present, challenges such as overcrowding, water scarcity, and poor facility maintenance can drive residents to practice open defecation as a coping mechanism (Cairncross, 2003). Addressing open defecation requires a multifaceted approach that combines infrastructure development, behaviour change communication, community engagement, and enforcement of sanitation regulations. Ensuring that all households have access to usable, safe, and inclusive toilets is critical for reducing environmental contamination and improving public health outcomes in peri-urban communities (Ibid, 2003).

5.2.4 Culture and Sanitation

The study revealed that cultural practices significantly influence sanitation behaviours and impact the management of pit latrines. Participants indicated that women often use pit latrines to dispose of menstrual pads and

other personal hygiene products. When pits fill up, these cultural practices can create discomfort or embarrassment, making women hesitant to allow pit emptying. This affects the efficiency of faecal sludge management services and may delay timely emptying, further increasing health risks and environmental contamination. This finding is consistent with literature that highlights the intersection of culture, gender, and sanitation behaviour. Sommer et al. (2015) posit that cultural norms surrounding menstruation and privacy influence women's willingness to use and maintain sanitation facilities. Similarly, Caruso et al. (2017) note that cultural taboos around menstrual hygiene can prevent women from fully engaging with sanitation services, creating barriers for both safe facility usage and effective sludge management. Cultural practices thus need to be integrated into sanitation planning to ensure that interventions are socially acceptable and responsive to community needs. Sensitization campaigns, gender-responsive designs, and community engagement can help address cultural concerns while promoting safe emptying practices. Incorporating these considerations ensures that sanitation services are not only technically functional but also socially sustainable, respectful, and inclusive (Caruso et al., 2017).

5.2.5 Population Growth

The study revealed that rapid population growth in peri-urban areas has outpaced the expansion of sanitation infrastructure. Key informants indicated that while the population continues to increase, sewerage systems and other centralized sanitation facilities have not expanded accordingly. As a result, many households rely on pit latrines and soakaways as their primary sanitation option, not out of preference but due to the limited availability of conventional sewer systems. This reliance places considerable pressure on existing onsite sanitation systems, leading to challenges with pit emptying, site selection for new toilets, and environmental contamination. This finding is consistent with Mara (2017), who emphasizes that inadequate infrastructure in rapidly growing peri-urban settlements increases the risk of groundwater contamination and the spread of faecal-oral diseases due to overuse of onsite facilities. The implications of this finding highlight the urgent need for integrated urban planning and sanitation strategies. Expanding access to lined, emptiable latrines, investing in decentralized treatment options, and planning for population growth are essential to reducing health risks and improving environmental sanitation. Addressing population pressures is thus not only a technical challenge but also a governance and policy issue that requires coordinated action between local authorities, utility providers, and communities.

5.2.6 Poorly Constructed Pit Latrines and Operation Costs

The study revealed that prior to the construction of improved household sanitation facilities, community members in peri-urban areas frequently experienced diarrheal diseases and cholera outbreaks due to unsanitary conditions. Poorly constructed pit latrines not only failed to contain faecal matter safely but also posed operational challenges for households and service providers. When pits fill up, households often struggle to finance emptying or reconstruction, and the absence of lined or durable facilities increases maintenance costs and environmental contamination risks. This finding is consistent with Strauss (2002), who notes that unlined or substandard pit latrines in informal settlements frequently overflow or collapse, making safe sludge management difficult and expensive. Similarly, Tomoi et al. (2025) observed that households disposing of solid waste into pits exacerbate filling rates and increase emptying costs, creating additional barriers to sanitation access. High operational costs and frequent facility failures often discourage timely emptying and may result in unsafe disposal practices, such as dumping sludge into drains or open spaces. The study underscores the importance of promoting durable, lined, and emptiable pit latrines that are financially accessible to households. Investing in improved construction not only enhances public health outcomes by reducing disease transmission but also lowers long-term operational costs, improves the efficiency of faecal sludge management services, and supports the sustainability of sanitation interventions in peri-urban communities.

5.2.7 Exposure to Faecal Matter and Lack of Vaccinations

The study revealed that residents in peri-urban areas face significant risks of exposure to faecal matter, compounded by limited access to essential vaccinations. This exposure creates heightened vulnerability to water- and sanitation-related diseases, such as cholera, typhoid, and diarrheal infections. Manual pit emptiers are particularly at risk due to the nature of their work, often managing faecal sludge without personal protective equipment (PPE) or adequate training. These occupational hazards are exacerbated by poor health monitoring and limited collaboration among stakeholders responsible for worker safety, health services, and sanitation oversight. This finding aligns with Chumo (2021), who observed that informal pit emptiers in most peri-urban settlements operate under unsafe conditions, lacking protective gear and access to occupational health services. The combination of faecal exposure and insufficient vaccination coverage increases both individual health risks and broader public health threats in densely populated areas. Addressing these challenges requires strengthening vaccination coverage for communities and sanitation workers, ensuring provision of PPE and training for pit emptiers, and promoting coordinated efforts among health, labour, and sanitation authorities to protect worker health and mitigate environmental contamination. Implementing these measures

would reduce the risk of disease transmission, improve occupational safety, and enhance the overall effectiveness and sustainability of sanitation interventions in peri-urban areas.

5.2.8 Poor Ground and Rock Conditions

The study revealed that sanitation investments in most peri-urban areas are significantly constrained by the physical environment, particularly the presence of waterlogged and rocky ground conditions. These geological limitations make it difficult to construct conventional pit latrines. As a result, service providers are often compelled to adopt above-ground toilet designs instead of the traditional pit-based systems commonly used in other settings. This finding reflects practical challenges that are not merely technical but structural, as the environmental context directly shapes the type of sanitation solutions that can be sustainably implemented.

Moreover, the existing literature also acknowledges that hydro-geological conditions are a critical determinant of sanitation system feasibility. Kennedy-Walker et al. (2015) argue that high water tables and rocky terrains complicate underground containment systems, increasing risks of groundwater contamination and structural failure. Similarly, studies from other Sub-Saharan African cities have reported that poor soil conditions require flexible sanitation innovations rather than uniform technology transfer (Mara, 2017). Thus, the challenge identified in this study is consistent with wider regional experiences.

The researcher observed that this study departs from existing knowledge by documenting how these environmental constraints directly influence decision-making at community and utility levels, and how these constraints shape user perceptions of new sanitation systems. While the literature typically highlights technical limitations, the present study provides insight into the social response: some community beneficiaries expressed dissatisfaction with above-ground toilet models, viewing them as temporary or less durable. This highlights an important socio-cultural dimension that is often overlooked. The study demonstrates that acceptability of sanitation technologies is not only a function of functionality but also of perception and cultural familiarity. The environmental challenges do not just call for engineering adaptations but require strengthened sensitisation, participatory design, and ongoing user engagement to build trust and sustain use of alternative sanitation models in peri-urban contexts.

5.2.9 Lack of Sanitation Standards

The state of sanitation in peri-urban areas is not structured; hence, its haphazard nature exists as there are no standards for constructing toilets. Moreover, the emptying services are not to the expected standards. Similarly, a study conducted in Tanzania disclosed that the main challenges of sanitation include low standard toilets which are not emptiable (non-emptiable toilets), leaking containments, unsafe emptying and transportation practices and facilities, inadequate faecal sludge treatment facilities, and unsafe disposal practices. In addition, in each segment of the non-sewered sanitation service chain, the institutional and regulatory monitoring and enforcement of quality of service are ineffective (EWURA, 2020).

5.2.10 Resistance and Acceptability Challenges

The study revealed that one of the core challenges in the implementation of on-site sanitation in peri-urban areas is the resistance to change among community members. On-site sanitation is perceived as a relatively new technology, and most households have historically relied on traditional pit latrines or shared sanitation facilities. As such, some beneficiaries have been slow to adopt the new models, creating low levels of acceptability of the facilities introduced through sanitation programmes. Further, reviewed literature also acknowledges that the success of sanitation interventions is shaped not only by technical feasibility but also by sociocultural acceptance. Jenkins et al. (2015b) argue that sanitation choices are deeply embedded in cultural practices, familiarity, and perceptions of convenience. Water Aid (2013) notes that low acceptability is not simply a matter of cultural resistance or lack of awareness. Instead, the resistance observed in George Compound is closely linked to practical experiences with the new facilities, including shallow pit designs, perceived fragility of the structures, and the financial burden associated with maintenance and desludging. In this context, resistance is partly a response to past frustrations and perceived risks, rather than a mere hesitation towards change. Therefore, it is established that acceptability is directly influenced by how beneficiaries experience the performance, durability, and economic implications of sanitation innovations. It underscores that adoption is not only a behavioural issue, but also a matter of trust in the sustainability and suitability of the technology within the lived reality of the community. This insight reinforces the need for participatory design, user-informed construction standards, and continuous sensitisation that connects the household's daily experiences with broader public health goals.

5.2.11 Solid Waste, Lighting, and Sludge Texture

The study revealed that the rapid filling of sanitation facilities was worsened by the practice of using the toilets as solid waste disposal pits. This resulted in a heavier and more compact sludge texture that made desludging difficult, and in some cases, impossible for the service provider. Additionally, the usability of sanitation facilities at night was

constrained by inadequate lighting, a situation aggravated by frequent load shedding. The absence of lighting discouraged proper toilet use during night hours, thereby contributing to unsafe sanitation practices within the community. The implication of this finding is that sanitation interventions must address both behavioural practices and environmental support systems. It is not sufficient to construct toilets without accompanying behavioural change communication and waste management education. The issue of lighting further demonstrates that sanitation outcomes are also linked to energy availability and household infrastructure. Therefore, achieving sustainable sanitation goes beyond facility provision to include integrated community awareness strategies, solid waste management solutions, and supporting services such as safe lighting.

The Systems Theory in this study is demonstrated in how sanitation is affected by multiple, interlinked institutional and community actors. Lusaka City Council, which holds the regulatory mandate for enforcing sanitation bylaws, plays a central role in ensuring that households construct appropriate and emptyable sanitation facilities. However, the Council's enforcement efforts depend on other actors within the sanitation ecosystem. For instance, Community-Based Enterprises (CBEs) and private waste collectors are responsible for routine solid waste collection, which helps reduce the incentive for households to dispose of solid waste into toilets. Where waste collection services are irregular or unaffordable, households resort to disposing waste in pit latrines, which directly affects the functional lifespan and desludging capacity of sanitation facilities.

Furthermore, schools within the community act as important social learning spaces where sanitation norms and hygiene behaviours can be reinforced among children, who then influence practices at household level. Lusaka Water Supply and Sanitation Company, while responsible for desludging and sludge treatment, cannot effectively execute its mandate if households fail to adhere to construction standards or if waste management fails at the community level. Therefore, sanitation service delivery is not the responsibility of a single institution but rather an interconnected system involving households, schools, regulators, and waste management entities. This systems-based interaction shows that breakdown in one subsystem—such as ineffective solid waste collection or lack of enforcement—directly weakens the functioning of another subsystem, such as desludging services. Sustainable sanitation requires continuous coordination, communication, and mutual reinforcement across all actors in the sanitation value chain.

The study findings are novel, premised on its unrelated household practices, such as solid waste disposal and lighting access, which have direct operational implications on the functionality of improved on-site sanitation systems. While literature acknowledges that infrastructure challenges and behaviour influence sanitation uptake, this study provides a contextualized insight into how the sludge composition itself becomes altered due to waste disposal behaviours, thereby complicating desludging operations. Additionally, the study introduces lighting as a sanitation access variable, a dimension rarely highlighted in peri-urban sanitation research. The finding therefore provides new empirical evidence on the multi-layered, system-dependent nature of sanitation sustainability in George Compound.

5.2.12 Environmental and Design Challenges

The study highlighted that many of the newly constructed toilets have shallow pits, which has resulted in rapid filling and frequent need for emptying. This situation places a disproportionate burden on women, who are traditionally responsible for managing household sanitation. The shallow design was attributed to environmental challenges such as high-water tables and rocky ground conditions, which restrict the depth at which pits can be safely constructed. However, while these environmental constraints were known, the community feedback indicates that the design did not fully consider the long-term usability of the facilities. As a result, the sanitation infrastructure, although improved in form, has introduced new maintenance pressures on households.

The implication of this finding is that technological and infrastructure innovations in sanitation must be informed by both environmental assessments and everyday user experiences. Design solutions that overlook the realities of household management risk reinforcing existing gender inequalities, as women bear the responsibility of repeatedly negotiating desludging services. There is therefore a need for more consultative and participatory approaches where community voices—particularly those of women—are included during the planning and design processes.

The systems theory lens helps to show that sanitation infrastructure design is not an isolated element but part of a broader, interconnected system involving households, regulatory institutions, service providers, and environmental conditions. Lusaka Water Supply and Sanitation Company constructs sanitation facilities and manages desludging services, but its effectiveness is contingent on the designs supported by the Lusaka City Council during building plan approval, the enforcement role of the Public Health Department, and the ground conditions identified by environmental assessments. When these subsystems are not aligned—for example, when construction standards do not account for environmental constraints or when women's lived realities are excluded from planning—the sanitation system becomes disjointed, resulting in inefficiencies and unintended burdens. This finding demonstrates that improving sanitation in peri-urban areas is not simply a matter of providing infrastructure; it requires coordinated planning across institutions, technical experts, and community stakeholders to ensure that the sanitation system functions as an integrated whole.

The novelty of this finding lies in showing how design limitations in sanitation infrastructure translate into gendered labour burdens in contexts where environmental constraints restrict construction options. While existing

literature acknowledges environmental challenges and gender roles in sanitation, limited empirical evidence has demonstrated how shallow pit designs directly intensify women's routine workloads by increasing the frequency of desludging activities. This study therefore contributes new insights by illustrating the socio-technical implications of sanitation design decisions and highlighting the need for gender-responsive and environmentally sensitive sanitation planning in George Compound and similar peri-urban settings.

5.2.13 Weak Community Structures

The study found that community-level sanitation coordination structures, particularly the District Water, Sanitation and Hygiene (D-WASH) committees, were either weak or not actively integrated into ongoing sanitation programmes. As a result, there were no dedicated or functional mechanisms within the community to support sanitation awareness, monitoring, or collective action. This gap in local institutional capacity limited the effectiveness and sustainability of sanitation interventions.

These findings are consistent with observations by Tidwell et al. (2018), who note that community-level WASH committees often fail to function effectively when they lack clear roles, resources, or supportive policy frameworks. Similarly, Water Aid (2013) argues that the absence of strong community governance structures undermines sanitation uptake and behaviour change, especially in informal and peri-urban settings where service delivery already faces structural challenges.

In this context, the weak coordination of D-WASH committees means that essential activities—such as hygiene promotion, toilet maintenance planning, community sensitization, and monitoring of sanitation practices—are not systematically implemented. Without a stable platform for community dialogue and accountability, sanitation becomes an individual household responsibility rather than a shared community concern. This situation contributes to fragmented responses to sanitation challenges and reduces the likelihood of long-term sustainability, as households may not prioritize maintenance or collective hygiene norms. The findings also highlight the significance of community involvement in sanitation interventions. As argued by Harvey and Reed (2007), successful sanitation programmes require local ownership, where communities actively participate in planning, decision-making, and oversight. The lack of such participation in the study area suggests that external interventions may have been implemented in a top-down manner, without adequate empowerment or capacity building at the community level.

Strengthening D-WASH committees and embedding them more effectively into local governance and sanitation programmes could therefore play a critical role in improving service delivery and ensuring that sanitation systems are used, maintained, and sustained. This may require community training, resource support, regular monitoring, and clearer coordination between local authorities and community structures (Harvey & Reed, 2007).

5.2.14 Funding and Capacity Challenges

The study further revealed that the enforcement of sanitation laws is significantly constrained by limited financial and logistical capacity. Participants noted that regulatory bodies and local authorities face persistent challenges in securing adequate resources to support routine monitoring, community sensitization, issuance of summons, and transportation for field activities. Without sufficient funding, enforcement officers are often unable to conduct inspections consistently or respond promptly to sanitation violations, which weakens the overall regulatory framework. This finding aligns with Mensah et al. (2022), who argue that even when sanitation laws are well-articulated, their effectiveness is undermined when enforcement agencies lack operational resources, staffing, vehicles, and administrative support. The funding limitations also affect community outreach and awareness-raising efforts, which are essential for achieving behavioural change. When enforcement institutions cannot complement punitive measures with public education, compliance becomes more difficult to achieve. As a result, sanitation challenges become self-reinforcing: poor compliance leads to environmental and health risks, which require greater institutional intervention, yet the institutions lack the resources to provide it. Therefore, strengthening the enforcement of sanitation laws requires not only policy commitment but also sustainable financing mechanisms to support day-to-day operations. This could include increased budget allocations to local authorities, integration of private sector cost-sharing models, or community-based enforcement structures supported by local by-laws.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

The study was guided by an objective which explored stakeholders' perceived sanitation challenges faced by the community in the peri-urban areas of Lusaka. The study adopted an interpretive phenomenology, which guided the generation of knowledge through interpretive principles such as reflexivity of data to help create meaning, thus anchoring the study on a subjective epistemology. The study leaned heavily on interpretive phenomenology because it sought to gather stakeholders' lived experiences.

In view of the study objectives, the study revealed several critical insights, including the following:

The study disclosed that, due to limited demand for pit-emptying services, service providers are sometimes forced to move to other areas to search for more business opportunities. In these new areas, the service providers are also expected to obtain new licenses to operate and probably sign a contract to enable them to do business, thus raising the cost of operations. Moreover, the study revealed that there are no dedicated structures to deal with sanitation, given that community structures such as the D-WASH are not well coordinated at the community level and are usually not integrated into the sanitation programmes.

The study is significant as it contributes to the global agenda on Sustainable Development Goal number 6, and also cascades to the national water and sanitation policy regarding sanitation provision. This, therefore, demands that the government of Zambia should seriously consider having a single licensing regime to optimize demand for sanitation emptying services, as well as attract more players in the provision of sanitation services.

5.2 Recommendations

5.2.1 The Government

The Government needs to realign the licensing regime for on-site sanitation. Currently, there are multiple permits and licenses required by on-site sanitation service providers. The service is relatively new, hence there is limited demand, which forces sanitation players to move into other areas where they are made to obtain a new license. This thus complicates the cost of business operations. There is also need for Government to ensure that the sanitation players are coordinated to avert fragmentations and duplication of mandates in some of the roles. Furthermore, there is need for the government to recognize the bottom-up regulatory enforcement of the on-site sanitation.

5.2.2 The Water and Sanitation Utility Companies:

The water and sanitation utility companies should integrate toilet construction with complementary services, including reliable water supply and lighting, recognizing that inadequate lighting affects night-time safety and usage. The water and sanitation utility company should construct pit latrines that integrate solar-powered lighting and pumping systems, ensuring uninterrupted sanitation service at night due to loadshedding. The water and sanitation utility companies should also adopt a co-design approach that involves residents and artisans at each stage of toilet design and siting to prevent pit depth problems and shallow lining failures. Furthermore, the water and sanitation utility companies should intensify community sensitization programs on preventing vandalism, misuse, and unauthorized design changes, which were highlighted as major implementation setbacks in the study.

5.2.3 Community Stakeholders

Community stakeholders should be sensitized against vandalism of the sanitation infrastructure in peri-urban areas. There is also need for community stakeholders to coordinate with service providers and regulators to ensure community participation in the sanitation services.

5.3 Ethical Consideration

The researcher conducted this study by ensuring protection of human rights through the following guiding principles, principles of dignity, integrity, right to self-determination, privacy, anonymity, beneficence and confidentiality. (Yip et al., 2016). The researcher navigated ethical issues by obtaining consent from the University of Zambia (UNZA), School of Humanities & Social Science research ethics committee under the Directorate of Research and Post Graduate Studies (DGRS). Furthermore, the researcher obtained consent from the institutions and the Community participants who consented to participate in a study voluntarily and without coercion. Moreover, the researcher provided information sheet to the participants in to furnish them with more information on the procedures to participate in the research study as well as to withdraw thus highlighting potential risks.

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