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An Evaluation of the Accessibility of WASH services to People Living  
with Disabilities in Peri-Urban Areas: A case study of Kanyama of  
Lusaka

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## **ABSTRACT**

In Zambia, inadequate access to water, sanitation, and hygiene (WASH) has been identified as one of the most pressing public health issues, particularly in the densely populated peri-urban areas (PUAs). The residents of PUAs are faced with increased risk for water-borne infections (i.e. cholera, typhoid) due to WASH facility shortages, extensive toilet-sharing, and groundwater contamination. The current situation for WASH services is further exacerbated for people living with disabilities (PWD) as many disability statuses are often linked with physical, social, and economic disadvantages. To assess and improve the accessibility and inclusiveness of WASH services for PWD, we focused on Kanyama, a PUA in Lusaka. Our research evaluated the current state of WASH through literature review, stakeholder interviews, and site visits; the prominent challenges faced by PWD and the current WASH-related programs are analyzed. From the guidance of our findings which highlighted the significance of disability advocacy and coordination between policy actors, we devised a series of recommendations.

## **ACRONYMS**

7NDP - Seventh National Development Plan

ACO - Africa Call Organisation

CDC - Center for Disease Control

GRZ - Government of Republic of Zambia

KWT - Kanyama Water Trust

LCC - Lusaka City Council (Public Health Department)

LuWSI- Lusaka Water Security Initiative

LSP - Lusaka Sanitation Project

LWSC - Lusaka Water and Sewerage Company

LWSSD - Lusaka Water Supply, Sanitation and Drainage

MOE - Ministry of Education

MOH - Ministry of Health

MWDSEP - Ministry of Water Development, Sanitation and Environmental Protection

NGO - Non-Governmental Organization

PUA - Peri-Urban Area

PWD - Persons with Disabilities

QPS - Quality Programme Standards

RWSN - Rural Water Supply Network

SDG - Sustainable Development Goal

SHN- Special Hope Network

UN - United Nations

UNICEF - United Nations Children's Fund

USD - United States Dollar

UNZA - University of Zambia

ZAPD - Zambia Agency for Persons with Disabilities

WASH - water, sanitation, and hygiene

WfW - Water for Water (WASSER FÜR WASSER)

WSUP - Water and Sanitation for the Urban Poor

## **INTRODUCTION**

### **Background**

According to the UN 2030 Agenda for Sustainable Development, SDG six strives to ensure available and sustainable management of water and sanitation for all (United Nations, 2015). While the agenda presents disability-inclusive goals, it does not mention ensuring the availability of water and sanitation for PWD. As of 2017, 2.2 billion people lacked safe drinking water and 4.2 billion people lacked proper sanitation (United Nations, 2020).

Among the most vulnerable are PWD. The UN defines a person with a disability as one who has a 'long-term physical, mental, intellectual, or sensory impairment which interacts with various barriers to hinder their full and effective participation in society on an equal basis with others' (Central Statistical Office & Ministry of Community Development & Social Services, 2018).

PWD are at an increased risk of being socially and economically disadvantaged. They often lack access to safe WASH conditions and are faced with heightened risk of diseases (Wilbur, 2011). PWD who live in low-income countries are more likely to experience barriers when accessing WASH services than those in more developed nations, and these barriers may be physical, institutional, social, or attitudinal (Wilbur, 2011). It is estimated that 80% of PWD live in low-income countries (White et al., 2016); (Tsetse & Tucker, n.d.).

In addition to the increased physical, social, and economic barriers, the current interventions often overlook the fundamental causes that prevent PWD from participating in the WASH programs, contributing to institutional discrimination. PWD have greater and distinct WASH needs. For instance, people with incontinence need to obtain larger

quantities of water more frequently to wash their clothes and body regularly. Also, people with albinism must collect water at different times than others to avoid intense sunlight. Therefore, they may experience a lack of water during the daytime (White et al., 2016).

## **Brief Overview of Access to WASH services in Zambia, Lusaka and Kanyama**

### ***WASH in Zambia***

There have been considerable attempts to improve WASH services in Zambia. Vision 2030 and the 7 NDP identify universal access to water and sanitation as a developmental goal (Ministry of National Development Planning, 2017)); (Republic of Zambia, 2006). Yet, access to improved water and sanitation services remains a national challenge (Walker & Webster, 2016); (Hubbard et al., 2020);(Kennedy-Walker et al., 2015). According to the 2018 Zambia Demographic and Health Survey, 72% of Zambian households have access to water from improved sources (piped water, public taps, standpipes, tube wells, boreholes, dug wells, springs, and others) (Zambia Statistics Agency et al., 2020). However, when disaggregated, the most common improved sources of water are boreholes (24%). Only 19% of households have piped water within their premises. Approximately 25% of the population does not have a fixed handwashing place, 58% have no soap, and 4% have other cleaning agents. People with access to improved sanitation constitute 54% of the population (Vonk, 2021). There is also a high risk of waterborne disease in households without piped water and poor management of fecal sludges (Cofie et al., 2020); (Vonk, 2021); (Hubbard et al., 2020).

The country suffers economic losses and casualties related to waterborne diseases caused by unimproved WASH services. In 2012, financial losses related to WASH services cost

Zambia 194 million USD (1.3% of GDP), a per capita loss of 16.4 USD (Coombes et al., 2012). The country also experienced 8,700 diarrhea-related deaths, with 6,600 being children aged below five years. The financial costs for the treatment of diarrheal infections amounted to more than 10 million USD (Coombes et al., 2012). The cholera outbreak in 2017-18 caused 5,900 deaths and disrupted economic activities (World Bank, 2020). The WASH conditions are more severe in Lusaka, where water and sewerage infrastructure initially built for the then 300,000 residents of the city in the 1960s and 1970s has become inadequate for its now 2.8 million inhabitants (Vonk, 2021); (Kalumbi et al., 2013).

### ***WASH in Lusaka***

Access to a well-developed WASH service is a challenge to the majority of households in Lusaka. The population growth surpasses investments in water and sanitation (Hubbard et al., 2020); (WSUP, 2020). Other bottlenecks related to access to safe water and sanitation services include inadequate provision of clean and safe water, poor storage of water, non-usage of handwashing, underdeveloped sewerage facilities, several households sharing the same toilets, and contamination caused by poor sewage sludge.

The situation is worse in unplanned and informal settlements, known as peri-urban areas (PUA), where 60% - 70% of the 2.8 million inhabitants live. Only 24% of households in PUAs have access to water, 60% of the residents collect their water from kiosks (communal water taps), and the rest use wells. Several households that purchase water from the communal taps use water from wells for domestic purposes (Coombes et al., 2012); (Nyambe et al., 2020); (Kennedy-Walker et al., 2015).

In addition, the conventional sewerage system is underdeveloped. It caters for 10% - 20% of the population living in the formally planned settlement and barely reaches the PUAs (Kennedy-Walker et al., 2015). Like households in planned settlements, residents in PUAs utilize on-site sewerage systems. Unlike the planned (middle to high income) residential areas, the PUAs lack properly constructed septic tanks. Indeed, a survey in various PUAs in Lusaka from the CDC (Brunkard et al., 2019) revealed that 90% of households use pit-latrines (Hubbard et al., 2020) ; (Nyambe et al., 2020). These unplanned settlements also lack a proper drainage system, and there is a problem of water contamination with sludges from pit latrines not lined with concrete (Sasaki et al., 2009). The polluted water is drawn from wells and used by households relying on wells and boreholes throughout Lusaka, especially within the PUAs (WfW, 2013).

### ***WASH in Kanyama***

Kanyama is the largest and the most populous PUA in Lusaka, with an estimated population of over 400,000 (WfW, 2013); (Chundama, 2013). Like most PUAs, Kanyama is an unplanned settlement that originates from the rural-urban migration before independence. The housing infrastructure is mostly informal in that 69% of the houses do not meet the established housing standards (van Eeden & van Niekerk, 2014). The area lacks social services and the underdevelopment is further highlighted by the low accessibility of WASH services. According to Oxfam, only 33% of households had piped water and 71.4% had improved sanitation facilities in 2012 (Vonk, 2021).

The condition of WASH in Kanyama is influenced by both economic factors and topography. Kanyama lies on the lowlands of the plateau where Lusaka sits, making it more vulnerable

to flooding (*Appendix, Figure 1*). The poor waste management in the area and open pit-latrines creates a health hazard during the rainy seasons as flood water mixes with human waste. The compound saw a 61.8% increase in the incidence rate compared to the previous outbreaks as residents used polluted water containing *Escherichia coli*. The situation is exacerbated by toilet sharing (Nyambe et al., 2020).

### **Provision of WASH services to PWD**

A physical disability restricts access to water and sanitation services. To achieve universal access to WASH services, there is a need for inclusiveness at the household, community, and institutional levels (Enfield, 2018). However, the accessibility of WASH services to PWD has received limited attention (Groce et al., 2011). Various studies have shown that PWD are more prone to complications related to inadequate access to WASH services (Groce et al., 2011); (Mtonga et al., 2014); (Enfield, 2018); (Singh et al., 2014). Their predicament is even worse in the rural areas and PUAs where access to WASH services is problematic.

Several barriers inhibit the access of WASH services for PWD, one of them being a technical barrier. PWD often face difficulty utilizing the waterpoints (Singh et al., 2014); the improved water sources in most households do not accommodate PWD, and most community kiosks are not suitable to address the distinct needs of PWD. Also, the designs of boreholes and wells are difficult to navigate. Therefore, PWD often depend on others for assistance to collect water, which negatively affects their dignity and self-esteem. Besides, water wells can pose physical dangers to people with impaired sight and other physical impairments (Enfield, 2018); (Groce et al., 2011). Moreover, the toilets with steps and



slopes are usually inaccessible to PWD and the width of the latrines is often too small for those on wheelchairs (Mtonga et al., 2014). During the flooding seasons, PWD struggle to cross the puddles of the water-fecal mixture. If these puddles are not managed, PWD are exposed to higher chances of contracting cholera, typhoid, and/or diarrhea.

The challenges experienced by PWD are not limited to the physical barriers. Due to the stigma associated with disabilities, discrimination against PWD is prominent (Mtonga et al., 2014). They are treated as the contaminants of public water sources or latrines and are scorned for taking a longer time to use the public latrines (Groce et al. 2011).

### **Purpose of the Research & Objectives**

The purpose of the study is to assess the accessibility of WASH services to PWD in Kanyama, a PUA in Lusaka District. To achieve this, we have divided the research into the following five objectives:

1. Identify barriers to accessing WASH services.
2. Analyze previous intervention on improving WASH services among those living with disabilities.
3. Suggest ways to eliminate barriers and improve access to WASH services.
4. Assess the influence of COVID-19 on the accessibility of WASH services to PWD.
5. Provide recommendations on how to improve the accessibility of WASH services to PWD.

## **Significance of the Research**

The study intends to inform various stakeholders about the accessibility of WASH services in Kanyama. The research was done in partnership with WaterAid, an organization that intends to implement WASH programs targeted for PWD in the compound. We expect our findings to bridge the gap in understanding physical, social, and institutional barriers presented upon PWD to satisfy their basic needs for WASH. Expanding beyond the public health implications in Zambia, our research can further elaborate the attitudinal and institutional barriers around disabilities.

## **LITERATURE REVIEW**

Several studies were reviewed during the course of the study. In most of the studies it was evident that the general state of WASH is poor in low-income countries. PWDs in low-income countries do not only have to overcome the challenges associated with accessing quality WASH but also those associated with their disability status. The evidence suggests that disability is linked to poverty in a cycle. Poverty increases the risk of disability, and disability increases the risk of poverty (Wilbur et al., 2018). Likewise, poverty is both the cause and consequence of disabilities, further leading to heightened burden of disease.

Therefore, mitigating WASH accessibility problems in low-income countries necessitates differential provisions that can target both the economic and social implications concurrently.

In Malawi, a low-income country that borders Zambia, a team of researchers used the social model of disability and the World Health Organization's International Classification of Function, Disability, and Health framework to study the barriers that those with disabilities

face when accessing WASH (White et al., 2016). Overall, the participants, which included those with physical or sensory impairments and their caregivers, reported a total of 50 barriers that prevented them from accessing water and sanitation. Some of the reported barriers include environmental and physical barriers, social barriers, institutional barriers, and barriers associated with bodily functions. For those with visual impairments, the physical barriers include unmarked and bumpy pathways to water points and toilets, unclean toilets that lead to dirty clothes and hands, difficulties finding holes for pit latrines and soap. At the institutional level, they face challenges in accessing the informational materials regarding WASH due to the lack of braille availability. Those with hearing impairments experience social barriers; due to the communication difficulties, they are often thought to be unintelligent. Also, their privacy is undermined when they are unable to hear others' approach in latrines or hand washing facilities.

The same study also revealed that among all the daily challenges associated with disabilities, the participants indicated that WASH-related challenges ranked in the top three. These include obtaining enough water, bathing, getting to or using the toilet, managing urination and defecation, disposal of feces, and clothes washing. When prompted to elaborate, many participants mentioned that the lack of access to WASH leads to increased health risks, dependency, and negative self-image. Similarly, caregivers indicated that WASH-related activities take up a substantial amount of their time, pose a physical and psychological impact on other household members, and present adversity for long term care.

In another cross-sectional study of Bangladesh, Cameroon, India, and Malawi, researchers sought to evaluate the access to water and sanitation among PWD (Mactaggart et al., 2021). They found that there was no difference in accessibility to adequate water or sanitation between households with and without members with disabilities. However, in Bangladesh, households with members who have a disability were more likely to share a WASH facility with another household and spend over thirty minutes collecting drinking water. Additionally, PWD indicated that they face challenges when attempting to collect water and use sanitation facilities that non-disabled family members use.

In a study conducted by the same research team in Vanuatu, a country in the South Pacific Ocean, they found that PWD faces significant challenges in accessing safe, affordable, and appropriate WASH services (Mactaggart et al., 2021). Specifically, they found that PWD were more likely to experience WASH-related barriers in the form of stigma and reliance on caregivers.

As suggested by the above studies, improving the accessibility to WASH services is a global health issue not confined to Zambia. Inclusive WASH is a pivotal step towards the enhancement of public health, poverty reduction, and socioeconomic development at both global and national levels. By examining the institutional barriers and self-reported challenges expressed by PWD in other countries, we anticipate applying the current standards in the context of Zambia and further suggesting strategies to alleviate the disparity in WASH access.

Specifically in Zambia, a team of researchers consulting for the Zambian Federation of Disability Organizations (ZAFOD) investigated the accessibility of WASH for PWD in the

Chawama and George compounds of Lusaka (Mtonga et al., 2014). The report is extensive, but it focuses on the following: statistics of PWD, water and sanitary accessibility, and knowledge about human and disability rights. One of the major findings is that 68% of the residents in Chawama and George have no access to water within their home vicinity. Regarding knowledge about human rights, 99% of the PWD who participated in the study were unaware of the Disability Act (The Persons with Disabilities Act, 2012, 2012). The study further reported that of the 5 million people in Zambia who do not have adequate access to water, 6.5 million are lacking access to improved sanitation, and 13% of these are likely PWD (Mtonga et al., 2014).

When discussing barriers to accessing water and sanitation, the study reported that a person with physical impairments is presented with greater difficulty when using a hand pump or latrine. People who are deaf or have intellectual disabilities are more likely to be teased or abused when accessing facilities. The researchers also collected data on the most common types of disabilities in the areas, finding that 68% of PWD are physically disabled, 11% are blind, and 7% are mentally challenged (Mtonga et al., 2014). This information is relevant for determining the state of WASH services directed towards PWD and which types of disabilities should be focused on for future initiatives.

## **METHODOLOGY**

### **Review of Secondary Sources**

We reviewed various secondary sources to gain a greater understanding of WASH accessibility both globally and in Zambia. Additionally, our literature review sought to enrich our discussion of the research findings from the interviews and site visits. When

searching for literature, we primarily focused on journal articles and reports that were written by relevant research groups and possible stakeholders in Zambia.

### **Stakeholder interviews**

A total of eight semi-structured interviews were conducted with stakeholders from diverse backgrounds. Stakeholders were contacted via email or phone call. Participation in the interviews was voluntary and consent forms were collected prior to the interviews with options for confidentiality upon request. Six of the interviews were conducted on Zoom and two were in-person, each lasting about 45 to 60 minutes. The questions were catered towards individual stakeholder's expertise. Both hand-written and typed notes were taken during the interviews upon permission, and the findings were categorized in a theme-book for analysis.

### **Site Visits**

A member of the research team in Lusaka visited Kanyama. He made two visits to the area, the first being a guided tour with the KWT and the second being an independent visit. The purpose of the visits was to observe the state of WASH and help the research team understand the infrastructure in the area. The visit was centered around Kanyama wards 10 and 11, as well as the periphery of these wards. Several pictures of the WASH infrastructures including underground water well (*Appendix, Figure 2*), communal water kiosks (*Appendix, Figure 3*), pit-latrines (*Appendix, Figure 4*), and septic tanks (*Appendix, Figure 5*) were taken with a mobile phone camera.

## **INTERVIEW FINDINGS**

## State of WASH

### *General State of Water and Sanitation in Kanyama*

*Mariangela Tarasco*, a Programme Coordinator with Africa Call Organization (ACO), an Italian NGO located within Kanyama, mentioned that the founders of ACO specifically chose to operate within Kanyama because they wanted to work in the most challenging area where no other NGOs wanted to operate. Kanyama is the largest PUA in Lusaka with a population of about 1 million people, but the population is vulnerable due to a lack of infrastructure. For example, *Stakeholder X*, a health related expert level stakeholder from the government who asked for their identity to remain confidential, emphasized that overcrowding is the major issue with blocked drainages. As a result, during the rainy season sewer sludges from pit-latrines often mix with flood water, leading to contamination. Furthermore, Kanyama is a “cholera hotspot”, with one of the highest burdens of disease in the country.

The state of WASH in Kanyama compound was described as unfavorable by most of the stakeholders. *Dr. Kenneth Kapalu Muzata*, a Lecturer and Researcher at the Department of Educational Psychology, Sociology and Special Education of UNZA, previously investigated mainstreaming PWD into Urban WASH services in Chawama and George Compound in 2014 (Mtonga et al., 2014). Although the project focused on George and Chawama, he mentioned that their findings can be generalized to other PUAs in Lusaka. He also acknowledged that a lot could have changed in six years but believes that there have not been significant improvements in WASH services. Based on their research, he described the state of WASH services in PUAs as poor. *Susan Chomba Chimfwembe*, a Public Health Scientist and Health

Promotion Officer at Kanyama First Level Hospital, also described the general state of water and sanitation in Kanyama as worse than in other PUAs. There is a shortage of WASH facilities. Toilet-sharing is common with up to thirteen households sharing a single toilet. There are few water kiosks and a declining yet still high prevalence of waterborne diseases.

In wards 10 and 11, water and sanitation services are provided by the KWT. According to *Pastor Kamwendo Isaac*, an Acting Scheme Manager at KWT, the KWT provides clean piped water to residents using two methods: house connection and communal water kiosks. Piped water household connection is provided to households that can afford the connection fee of 850 ZMW (38 USD). Households that cannot afford to pay the connection fees are supplied water using the communal water kiosks at 50 Ngwee per 20 litres. KWT has 136 kiosks within their catchment area. KWT has a target of supplying water to 10,000 households. It has reached 68% of this target, currently supplying water to more than 6800 households within the catchment area. Despite challenges, they have sustained their operations and delivery of services to the community and increased their clientele.

### ***Access to Water and Sanitation for PWD***

According to *Jessica Cramer M.A. CCC-SLP*, a Speech-Language Pathologist at Special Hope Network, PWD have different needs for WASH, especially their water supplies. Due to the increased risk for comorbidities, PWD are more prone to contracting infectious diseases from contaminated water. Moreover, individuals restricted to liquid diets or thickened liquids face more challenges without access to clean water. Also, bathing and treating bedsores necessitates a higher frequency of water and therefore a more reliable water



source. Despite an increased need for water, *Pastor Kamwendo Isaac* said that the KWT does not consider PWD in the delivery of its services.

The interviews with the several various stakeholders made it evident that PWD face several challenges when accessing quality WASH services. Implementation of programs to alleviate these challenges has become imperative. The following two sub-section are a specified description of the barriers and current plans to eliminate barriers outlined by the stakeholders.

## **Barriers**

### ***Challenges in the Provision of Clean Water and Improved Sanitation***

*Bwalya Nachula*, a Hygiene Behavior Change Specialist at WaterAid Zambia, said that access to water is particularly challenging in Kanyama due to the fact that it is uniquely located directly above a high water-table. Underground water contamination is common due to poorly constructed septic tanks and pit-latrines which further affects the delivery of improved sanitation. The contamination of underground water is a critical factor limiting the availability of piped water to only about 30% of the population in the area. This renders the quality of sanitation facilities suboptimal despite WaterAid's support for household toilet improvements.

In addition to a high water table, clean water is much harder to access during the rainy season. For example, roads are often flooded, making it difficult to travel to water kiosks. *Mariangela Tarasco* even stated that there are at least two months out of the year where Kanyama is almost impossible to reach due to extreme flooding. *Stakeholder X* further explained that there is generally a scramble for water in the flood season in Kanyama. Even when water kiosks are reachable, some taps are dry or inconsistent. As a result, some people still prefer to drink from shallow wells despite its lack of safety due to contamination.

*Pastor Kamwendo Isaac* also said that the underground water and the rocky terrain makes delivery of water in Kanyama costly. Pipes are usually close to the surface and prone to damage. KWT also experiences power outages and their alternative source of power, diesel generators, have an inadequate capacity. The KWT faces additional challenges because certain areas of Kanyama cannot be accessed using vacuum tanks. Therefore, the KWT empties septic tanks and latrines using buckets.

Generally, greater emphasis has been placed on access to water and sanitation, and less effort has been put into addressing hygiene accessibility. According to *Susan Chomba Chimfwembe*, this is partly due to an insufficient allocation of funds for WASH services. There are also challenges regarding a lack of resources. For example, the public health office usually has one vehicle to use for the entire Kanyama sub-district. The lack of finances also disincentives the local volunteers.

While these challenges regarding access to WASH apply to everyone in Kanyama, PWD are among those who must contend with even greater challenges. The barriers faced by PWD

when accessing inclusive WASH services can be broken down into three major categories: environmental, attitudinal, and legal.

### ***Environmental and Physical Barriers for PWD***

Most WASH facilities in the community are not accommodative to persons living with disabilities. *Dr. Kenneth Kapalu Muzata* described that access to water is scarce in part because water must be brought from water kiosks and boreholes, which are sparsely located. One must travel far distances to get to a water point. The journey to get water is particularly challenging for PWD who may need to navigate flooded roads with a wheelchair or visual impairment. Once a PWD arrives at a water point, the kiosks may be inaccessible to those with physical disabilities. For example, kiosk handles can be very difficult to reach for a person in a wheelchair. On the same topic, *Pastor Kamwendo Isaac* stated that communal kiosks and household water taps are not suitable for PWD. He also said that it is unfair that a person who cannot manage to carry a 20 litre of water would have to pay a 50 Ngwee (minimum price for water) even when using a smaller container.

When *Stakeholder X* explained that people had a particularly difficult time accessing water during the rainy season, he stated that it can be difficult for PWD to compete with people who are well-abled. For example, when people draw water from a stream or a lake, this disadvantages PWD because it often requires climbing and other physical exertion.

*Dr. Kenneth Kapalu Muzata* noted that it is generally difficult for PWD to access sanitation facilities. In many cases, toilets are not flushable, and the facilities are poorly lit. In addition, the toilets built under the LSP are not accommodative to PWD and do not include features such as ramps, handrails, and wide doors. Facilities are often elevated because of the water

table, have steps, and lack supportive infrastructure inside. Therefore, those who need physical assistance have trouble fitting into small spaces and accessing facilities that have steps.

In terms of barriers for children with disabilities trying to access WASH, *Mariangela Tarasco* said there are varying degrees of severity. Some children are lucky to have a bathroom in their own houses while others must utilize public toilets while still others do not have access at all. *Jessica Cramer M.A. CCC-SLP* mentioned that the community centers operated through SHN have disability-friendly sanitation services for children with disabilities including toilet rails, wider doors, ramps, and sink handles. However, she emphasized that these accommodations are limited or non-existent in most public settings.

Specifically regarding those who are blind or deaf, *Dr. Kenneth Kapalu Muzata* and *George Mumbi*, the Director of Research and Rehabilitation at ZAPD, mentioned that the barriers to WASH are more extreme. People who are blind have difficulties navigating the facilities while those who are deaf encounter challenges related to signage. There is currently no system in place for signage regarding WASH facilities. For those who are combined deaf and blind, the challenges are even more massive to overcome.

### ***Attitudinal and Social Barriers for PWD***

Regarding attitudinal barriers, there are issues of discrimination at the community levels. *Susan Chomba Chimfwembe* emphasized that some PWD even face intimidation, harassment and verbal abuse. *George Mumbi* added that some community members are against sharing the same water sources as PWD believing disability status is contagious. *Mariangela Tarasco* mentioned that the stigma for children with disabilities is very strong

in the community. As a result, there are reports that some mothers neglect and reject their children with disabilities. They are often hidden away in their houses so that they are isolated from society. Among community members, *Stakeholder X* indicated that there seemed to be a general knowledge gap and concerns of misinformation surrounding PWD and WASH.

*Dr. Kenneth Kapalu Muzata* stated that PWD can also become a burden on family members who must take care of them. However, some PWD do not have the good fortune of having a caretaker, so they must become self-sufficient in terms of toilet and latrine usage. This further emphasizes the need for disability friendly facilities in homes. Additionally, people who are disabled are more likely to live in poverty, so they often need to raise money in order to buy water.

### ***Legal and Political Barriers for PWD***

*Dr. Kenneth Kapalu Muzata* cited that one of the major problems regarding WASH accessibility for PWD was a lack of recognition of the rights that PWD have. He mentioned that the problem regarding the rights of PWD is twofold where PWD don't often know which rights are in place for the protection of their welfare, and there is no proper enforcement of these rights such that they are actually realized. Additionally, there has also been a failure to provide autonomy to PWD. For example, when a PWD wishes to petition their local government officials, they often have no way of doing so due to a lack of access to phones, computers, or internet connection.

The research paper from *Dr. Kenneth Kapalu Muzata* also mentioned that community leaders' apathy was one of the study limitations (Mtonga et al., 2014). When asked to

expand upon this, he mentioned that inaccessible WASH is an issue faced by everyone in PUA communities, not just PWD. If community leaders understood that there was a need to help PWD and improve WASH inclusivity, this would also work to the advantage of the general population. This action would result in increased access to water in their homes and communities. He also claims that research itself is part of the problem. Considering that his study was conducted in 2014, and no major changes have been made, community members have become skeptical of researchers and believe that they may be powerless in actually paving the way for improvements.

Further, *George Mumbi* believes that one of the biggest issues related to WASH accessibility is a failure to include PWD in the decision-making processes. When designing facilities, the council and the planning department fail to take PWD into consideration. Specifically, *Bwalya Nachula* added that the MWDSEP is not actively promoting inclusiveness in terms of ensuring access to WASH services for PWD. Therefore, PWD do not have an opportunity for their voices to be heard. Furthermore, *George Mumbi* mentioned that there are no systems in place to implement and enforce policy changes regarding accessibility for PWD. He also mentioned that the problems are compounded since the government has been reactive rather than proactive.

*Mariangela Tarasco* also identified that there was a governmental gap when it came to providing equal WASH services for PWD, claiming that the government's involvement was significantly inadequate. Further, *Mariangela Tarasco* mentioned that ACO is often constrained by financial challenges. There is running water in the centers, but sometimes the water is contaminated. This creates challenges because it can be financially prohibitive

to keep the chlorination systems running. As a closing remark, she mentioned that WASH challenges are expansive despite the NGO's best efforts to improve the lives of PWD. She stated that their work cannot reach their full potential without the government's financial and logistical support.

Interestingly, *Stakeholder X*, believes there has been adequate support from the government towards improvement of WASH accessibility for PWD in Zambia. However, he did admit that funding was the government's biggest challenge in terms of improving access to WASH. He noted that he was unsure if there was specific funding related to WASH for PWD. In addition to issues of funding, he also mentioned that there is fragmentation and lack of coordination among people and organizations working in the WASH sector.

Organizations often have their own agenda and prefer working on topics of their own preference rather than finding a way to work together for the overall betterment of WASH (*Appendix, Table 1*).

## **Current Programs and Plans**

### ***Government level***

According to *Susan Chomba Chimfwembe*, the Public Health Division of the MOH uses an integrated health education approach that allows public health officials to take advantage of other health-related education programs (e.g. family planning education) to teach the importance of using safe and quality WASH services. She further mentioned that they also work with LuWSI on a campaign for schools in Lusaka, including schools in Kanyama. Moreover, *Jessica Cramer M.A. CCC-SLP* mentioned the expansion of disability-specific classrooms at public schools in an effort to mitigate education inequality.

*George Mumbi* stated that Social Cash Transfer, which is financed by the World Bank, supports food, water, healthcare, and education expenditures of households with PWD. Also, the quota system promoted by the MOH and MWDSEP incentivizes employers to recruit PWD through tax rebates. In addition, the GRZ established The Persons with Disabilities Act in 2012. However, this has yet to be fully embraced by PWD due to lack of awareness.

*Stakeholder X* emphasized that the government aims to consider everyone in Zambia in the planning process regardless of their genders and physical differences. To develop inclusive planning, individuals from multiple sectors are recruited for decision making and creating new infrastructure. The SDGs guide the government's approach to implementing a strategic national development plan regarding WASH. As part of this plan, the MOH established measures to accommodate PWD more effectively in terms of healthcare coverage and ensure their rights to quality care. In order to improve the water and sanitation in Kanyama, the government has developed the Millennium project to install pipes, deflood pit-latrines, and clear drainages.

### ***Community level***

*Bwalya Nachula* emphasized the importance of community education, awareness, and advocacy regarding WASH, particularly for PWD. For example, WaterAid's Hygiene Intervention Packages focus on behavioral modification to encourage proper washing and waste management. According to *Susan Chomba Chimfwembe*, Kanyama First Level Hospital has been working in partnership with WaterAid and LCC on the Kutuba Campaign to promote COVID-19 awareness and encourage the use of improved WASH services. For



the individuals partaking in the campaign, weekly checks and awards were distributed to incentivize participation.

Similarly, the recent development of the Community Outreach Program by the SHN has engaged community leaders such as health clinics, pastors, and schools to host Disability Advocacy Trainings. At the local Community Care Centers established by the SHN, *Jessica Cramer M.A. CCC-SLP* mentioned that they provide water transport services to reduce the burden of traveling far distances for water. Also, PWD are able to access inclusive WASH facilities equipped with toilet rails, wider doors, ramps, and sink handles.

*Mariangela Tarasco* said that ACO delivers education for children with disabilities through inclusive classrooms and specialized courses within their primary and secondary schools. Outside the classroom, ACO also offers programs to teach professional skills such as taking care of an urban garden or being a cashier. ACO's on-site locations provide inclusive WASH services. *Mariangela Tarasco* also noted that ACO has intervened in some cases to build ramps in public WASH facilities as well.

### ***Household level***

*Pastor Kamwendo Isaac* stated that within Kanyama and other compounds within Lusaka, the LWSC initiated the LSP. This project provided immediate improvement in the toilet qualities for the household by constructing new sewer lines at subsidized fees. Also, the toilets were elevated to minimize the effects of underground water contamination. The KWT added a fixed K30 to the prepaid water bills for households supplied with piped water for emptying their septic tanks and latrines. Also, it was the first to provide Faecal

Sludge Management services to its clients in Lusaka. However, there has been no accommodation for disability inclusion by the KWT and LWSC.

*Jessica Cramer M.A. CCC-SLP* stated that in collaboration with APTERS, the SHN has implemented disability accommodation tools to individual households with PWD. The construction included handrails, ramps, and lower sink designs. In terms of more direct financial support, the organization also provides monthly subsidies for families living in over-crowded, impoverished communities throughout the city of Lusaka. In addition, food packs and COVID-19 hygiene products were delivered to individual households with children with disabilities. Along with material support, the training programs offer parents and caregivers specific health guidance and nutritional support.

To instill proper hygiene behaviors, *Mariangela Tarasco* said that ACO provides training programs to the relatives and caregivers of the children with disabilities, mainly divided in three phases: The Shalom Center training, community-based rehabilitation, and home-based rehabilitation. In addition to physical therapy, there are educational courses regarding nutrition, personal hygiene, toilet usage, menstruation, and care for individual children. In the wake of COVID-19, some of these programs have been disrupted, but they have made an effort to provide kits containing chlorine, soap, toothbrushes, toothpaste, sanitizers, masks, and other personal hygiene products.

According to *Stakeholder X*, the government has engaged local authorities to construct WASH facilities at people's residential places to improve the living standards in Kanyama (*Appendix, Table 4*).

## **Future Actions**

For future planning, *Dr. Kenneth Kapalu Muzata* mentioned that the most effective approach to improving WASH accessibility for PWD would be to focus on education, increasing the number of WASH facilities, and changing toilet designs. The government should be playing a more active role in ensuring that public facilities are disability friendly. The government should collect data on PUAs to determine the number of PWD living in these communities so that they can be better equipped to provide necessary services. For example, they should be placing PWD on social programs in addition to empowering PWD to become active members of the community.

*George Mumbi* added that there needs to be more sensitization and advocacy for inclusive WASH. Specifically, the government should work to mainstream PWD in addition to implement environmental programs that target access and infrastructure. The organizations that are planning initiatives should also focus on involving PWD in the design and decision making. Beyond the Social Cash Transfer mentioned previously, *George Mumbi* also believes that the government should provide free services to PWD including free access to education and WASH services. Furthermore, they should implement laws to ensure that all public facilities are accessible to PWD. Public defecation is humiliating and unsanitary for PWD, and more efforts are needed to combat stigma and ensure accessible facilities. While WASH facilities should be inclusive, he does not recommend separate WASH facilities built solely for the use of PWD as this may exacerbate the negative sentiments towards PWD and create more inequalities. Rather, inclusiveness must be at the forefront of all facility designs. For example, water kiosks should have buttons or handles

that are within the reach of PWD using wheelchairs. Furthermore, the government should provide community education to help community members overcome negative attitudes, and laws should be in place to prevent discrimination of PWD.

Considering the challenges encountered by PWD in terms of their unique WASH needs, *Jessica Cramer M.A. CCC-SLP* believes that encouraging individuals with disabilities to advocate for their own needs and building community awareness is crucial in reducing the barriers to WASH services.

*Pastor Kamwendo Isaac* mentioned that if the KWT were provided with a model for an inclusive water and sanitation facility, they would be willing to participate in the implementation of the project. The LSP must consider promoting inclusive toilets as the current designs are not suitable for PWD.

### **Impact of COVID-19**

According to *Susan Chomba Chimfwembe*, the COVID-19 pandemic has exacerbated discrimination, harassment, and abuse towards PWD. They are shunned by members of the community and even their caretakers out of fear of contracting the virus. PWD are perceived to be dirty and spread the virus.

According to *Pastor Kamwendo Isaac*, the Covid-19 pandemic has caused a negative trend in the revenue of the KWT. The depreciation of Zambian Kwacha has increased the prices of the imported chemicals for water treatments. KWT has been lobbying the government for a financial relief package. However, if no relief is provided, they will be unable to afford the chemicals for water treatment.

Furthermore, Covid-19 has restricted the NGOs' outreach efforts, especially at the community level. In the case of ACO, most of the in-person services were closed including the rehabilitation center and the school. As a result, they resorted to doing more home visits, which revealed that the situation for many children with disabilities has deteriorated. Furthermore, there has been an increased challenge to implement measures to prevent the spread of COVID-19 for a variety of reasons including limited access to running water, soap, masks, and sanitizer. PWD have been affected more than others, in which the situation was harsher for those who had hearing impairments due to marginalization in the process of information dissemination.

However, the Covid-19 pandemic has helped strengthen the message on WASH. There has been increased sensitization on observing proper hygiene. Also, *Jessica Cramer M.A. CCC-SLP* mentioned that COVID-19 has allowed parents and caregivers to take more ownership in care for their children with disabilities. However, due to unstable employment, many households were faced with financial difficulties to navigate food, water, and healthcare access. In addition, social distancing challenged the solidarity of PWD, further ostracizing individuals.

According to *Stakeholder X*, COVID-19 has changed the way that the government approaches providing WASH services, especially for PWD. Prior to the pandemic, many people knew that WASH was important, but COVID-19 has reinforced the importance of WASH and has highlighted that the golden rule for preventing infectious diseases is hand washing. The changes that have been implemented to prevent COVID-19 have also helped to prevent other diseases like cholera. Moving forward, he emphasized the need to maintain high standards

of hygiene in addition to inviting more partners to contribute to the WASH sector. As a result of COVID-19, there have been many infrastructure changes. For example, there has been new construction of WASH facilities in addition to a reorganization and repurposing of existing facilities. The utility companies in Zambia have also been cooperative in supplying people with more constant access to water. Overall, the pandemic has helped the government revolutionize the way they think about WASH.

## **OBSERVATIONS**

The poor state of WASH facilities in Kanyama is evident from the site visit observations (*Appendix, Figures 2-5*). Several households still use water from wells with an underground source, which is unsafe to drink because of the large number of pit-latrines in the area. These latrines are not properly constructed and abandoned when full. The water kiosks are sparsely located and often limited with low water pressure. Some areas are not connected to the LWSC water supply system and lack proper drainage for rainwater. Also, poor waste disposal and management are prevalent along with large piles of garbage beside the roads.

## **DISCUSSION OF FINDINGS**

### **Barriers to Accessing WASH services**

During the interview, *Dr. Kenneth Kapalu Muzata* mentioned multiple physical and legal barriers for PWD in accessing WASH. For example, PWD who need a longer time to use WASH facilities experience discrimination by other people sharing the public facilities. When PWD are unable to use toilets or latrines, they often resort to open defecation which is both unsafe and humiliating. To avoid social ridicule, PWD have reported that they prefer to go at night

when no one can see them. This puts PWD at greater risk for accidents, rape, and other forms of attack. *Dr. Kenneth Kapalu Muzata's* further discussed the issues of low dignity due to diminished physical autonomy and reliance on others to assist them in accomplishing basic tasks.

In terms of the legal barriers, he reported that failing to recognize the rights of PWD is the major obstacle to inclusive WASH. According to The Persons with Disabilities Act 2012, the following principles apply to persons with disabilities: (a) respect for the inherent dignity of persons with disabilities, individual autonomy including the freedom to make one's own choices, and independence of persons; (b) non-discrimination; (c) recognition as persons before the law; (d) respect for physical and mental integrity; (e) independent living; (f) full and effective participation and inclusion on society; (g) respect for difference and acceptance of persons with disabilities as part of human diversity and humanity; (h) equality of opportunity; (i) accessibility; (j) gender equality; (k) respect for the evolving capacities of children with disabilities; and (l) respect for the right of children with disabilities to preserve their identities (The Persons with Disabilities Act, 2012, 2012).

While *Dr. Kenneth Kapalu Muzata* did not verbatim mention each of these rights, he emphasized the importance of promoting a clear understanding of their rights for all PWD. Also, a legal provision must protect and enforce the rights as stated.

Many of our stakeholders specified the need for increased government involvement in combating the barriers encountered by PWD. *George Mumbi* noted that the government has been reactive rather than proactive in terms of WASH provisions. His point corresponds to the WaterAid's 2014 report citing minimal progress in forming partnerships between NGOs

at local, district, or national levels and the governmental agencies (Groce et al., 2014). The report describes this as a “lost opportunity” in the effort to reduce institutional barriers to WASH.

Specifically for children with disabilities, our interview with *Jessica Cramer M.A. CCC-SLP* revealed that they have a lower likelihood of graduating from primary and secondary schools. She stated that the first issue is the denial of enrollment. However, even if these children are allowed to enroll, they are not supported with the necessary accommodations to successfully continue and complete their education. Provided that *Jessica Cramer M.A. CCC-SLP* also mentioned that disability-friendly WASH facilities are uncommon in public places including schools, inaccessible WASH services may also contribute to disadvantages in education for PWD. This is particularly concerning for people who menstruate and need access to proper hygiene. However, children with disabilities are less likely to benefit from school-based WASH initiatives because only 50% of children with disabilities attend school globally (United Nations Department of Economic and Social Affairs, 2019) (*Appendix, Table 1*).

### **Analysis of Current Interventions on improving WASH services for PWD**

To ensure QPS, the on-site water quality tests are conducted by the Environmental Health Technologists from the MOH and the routine water quality checks are used for maintenance (WaterAid, 2020). The standard assesses the quality of WASH services in healthcare facilities in an evidence-based approach. Also, the LuWSI’s aims to 1) improve understanding through assessing, prioritizing, and monitoring water security threats and solutions 2) inspire change through creating awareness, education, and advocacy for



change 3) strengthen collaboration through mobilizing stakeholders, as well as strengthening capacity, for improved multi-stakeholder collaboration 4) deliver projects through developing and implementing projects and mobilizing new actors and resources (LuWSI, 2020). This approach, according to *Susan Chomba Chimfwembe*, brought positive impact in the Kanyama First Level Hospital.

At these upstream level planning, the concrete establishment of water security goals has been the primary motive. However, they are not specific to PWD and rather focus on distributing improved quality of water to the broader population. On the other hand, other governmental sectors such as the MOE have paid more attention to disability inclusion. Although not specific to the context of WASH, increased involvement of PWD in employment and education opportunities are conducive to inclusive WASH; both aspects are correlated with poverty, which is in turn closely linked to access to quality water and sanitation for PWD. However, the statutory instrument for the enforcement of these provisions is currently lacking and there is no systematic method in place to collect data on the exact number of PWD who are employed (Chitalu, 2017). Also, multiple interviewees have revealed stigmatization against PWD perpetuates, and denial of their enrollment in schools from a young age limits their places in higher education.

In terms of more downstream interventions, one of the major focuses was on promoting hygiene behavior and WASH awareness. The personnel working on the ground believe that programs like the Hygiene Intervention Packages and the Kutuba campaign are effective. However, the interventions specific to PWD were virtually unavailable outside of particular locations such as community centers, health clinics, and specialized schools for PWD. At

these institutions, much effort has been put on advocating and empowering PWD by enhancing their informational and social capital. For instance, educational training encourages community members to take a more direct role in empowering PWD and reducing the stigma.

Considering that poverty and an individual's disability status are closely linked, providing financial assistance for WASH services seems to be accommodative to PWD. The reduced price for toilet improvements, monetary incentives from the Kutuba campaign, and monthly subsidies from the NGOs attempt to reduce the financial burden for improved WASH services. However, many households with PWD still find the subsidized prices to be unaffordable.

As exemplified by the ACO's current programs, training caretakers along with their children seem to enhance the outcomes by allowing the impacts of education to extend to their home environments. Also, professional training promotes self-sufficiency by empowering PWD to secure a position in society. However, many NGOs are inhibited by the lack of government support for funding and execution of their programs. *Mariangela Tarasco* indicated that despite the local NGOs' efforts to improve the lives of PWD, their works cannot reach their full potential without coordination with the government.

On the contrary, *Stakeholder X* expressed a more optimistic viewpoint regarding the progress made with WASH accessibility. He mentioned that although the government has not yet conducted any structural evaluation of its previous interventions, there have been visible improvements in the accessibility of WASH services for PWD. He stated that the commitment of MOH and MWDSEP to inclusive WASH is clear, evidenced by the ongoing

constructions for sanitation facilities, improved water supply, and inclusive toilets for public use.

Further contrasting to some other stakeholders' observations, the government believes that the implementation of inclusive WASH projects has not met with any form of community resistance. If anything, he mentioned that there seems to be higher demand from people to improve WASH accessibility for PWD in their areas. Considering this observation on extensive resident engagement prior to WASH implementation, there seems to be an increasing effort from the local authorities to attend to the voices of the community members.

Due to the lack of quantitative data and ambivalent stakeholder interview findings, we cannot make a concrete conclusion about the exact impact of current WASH interventions for PWD on their access to water and sanitation. However, there seems to be continuous progress in improving both the quantity and quality of inclusive WASH facilities, yet the current condition is still inadequate to match the needs of the population.

### **Eliminating barriers and improving access to WASH services**

To improve access to WASH services for PWD, both the general barriers to WASH and specific barriers for PWD must be addressed collectively. First, the expansion of waterway connections and communal water kiosks is essential. However, the RWSN reported tariffs as the major obstacle limiting equitable access to water. Thus, coordination between local stakeholders and the government can help cover the cost of continuous services and protect PWD who would be adversely affected by the inconsistency in the water supply.

Currently, the KWT is affected by underfunding and the shortage of water supply, which limits its capacity to provide extensive distribution of water to households in Kanyama. Therefore, allocating more support towards the operation of KWT will not only enhance the accessibility of clean water but also facilitate inclusion. In fact, the cost of exclusion is greater than that of inclusion (Enfield, 2018).

Eliminating technical barriers entail the adoption of inclusive designs at the water points and sanitation facilities. The KWT has been working within its capacity to expand service delivery, yet the WASH facilities still lack the necessary accommodations for PWD. In addition to increasing the number of kiosks, they must also be modified to allow ease of navigation for PWD. However, it has been noted that having separate facilities would be insensitive to the dignity of PWD.

To improve sanitation, increasing the number of toilets in the area must be prioritized to minimize toilet-sharing. Also, sufficient lighting, toilet rails, wider doors, ramps, elevated seating, and sink handles should be implemented to assist PWD.

In addition to increasing the number of water kiosks, houses with piped water, and improved toilets, community sensitization should be integrated into all WASH education programs. Doing so will alleviate the challenges faced by PWD. Additionally, empowering community members to work with PWD in their communities will allow for mutual benefits regarding accessible WASH.

## **Assess the influence of COVID-19 on accessibility of WASH services to PWD**

According to the stakeholder interviews, COVID-19 posed both positive and negative implications on the accessibility of WASH services for PWD. The organizations at both the governmental and local levels increased their emphasis on hygiene behaviors through education and material assistance. However, although the need for inclusive WASH was recognized, there have been no significant changes to the infrastructure. Also, social distancing and restrictions to community outreach services inhibited the effort to determine the well-being of PWD and accommodate their needs in healthcare and education.

Due to their disability status, PWD are more prone to co-morbidities. Therefore, the lack of safe water and sanitation has a greater implication on PWD. Also, financial struggles associated with lost employment and education opportunities due to COVID-19 deteriorated their access to WASH services. Furthermore, a publication from the Maboshe Memorial Centre reported that of all the preventative and safety information related to COVID-19 being released to date, none has been made accessible in braille or sign language (The Maboshe Memorial Centre, 2021). The report also discusses the lack of effective strategies to target adolescents with disabilities despite the previous political efforts, which aligns with *George Mumbi's* emphasis on the need for increased sensitization and disability advocacy. With the lack of effective strategies to mitigate stigmatization and discrimination against PWD, it is apparent that the population experienced increased tension in the wake of COVID-19.

## **CONCLUSION**

The purpose of the study was to assess the accessibility of WASH services for PWD in PUAs of Lusaka, focusing on the Kanyama compound. Through a comprehensive literature

review, interviews with expert stakeholders, and site visits, we analyzed prevalent barriers and current interventions for WASH. The challenges associated with WASH services for PWD were categorized into the four overarching themes: environmental/physical, attitudinal/social, legal/political barriers. Also, our findings revealed that despite current programs and interventions at the national, community, and household levels, most WASH efforts are primarily focused on improving the access to the general public without much emphasis on attending to the distinct needs of PWD. Furthermore, the planning, implementation, and evaluation processes of WASH services lack the engagement of PWD.

## **RECOMMENDATIONS**

To propose recommendations and enhance the accessibility of WASH services for PWD, information from literature review, stakeholder interviews, and previous interventions were combined. According to UNICEF, good practices in accessible and inclusive WASH can be divided into three categories: enabling environment (e.g. upstream policy and legal framework, capacity building, innovation), community based and participatory/consultative process (e.g. consultation with local NGOs), and comprehensive accessibility (e.g. sensitization, technical and hardware solutions) (Testse & Tucker, 2015).

### **Enabling Environment**

#### ***Government Involvement***

To support the NGOs providing inclusive WASH for PWD, the government should be proactive and allocate more budget. Also, an emphasis must be placed on ensuring equitable access to social opportunities (i.e. education, employment) and mandating

inclusive WASH at all public facilities. Specifically, a set of standards must be established for schools to incorporate disability accommodations.

### ***Empowerment of PWD***

Developing programs aimed at the empowerment of PWD is crucial for improving WASH accessibility. It is crucial to enlighten PWD on their rights and involve them in the decision-making processes at the local and national levels.

### ***Surveillance program***

Establishing a strategy to monitor infrastructures and ongoing interventions is the key to evaluating their effectiveness and maintenance. The system can also identify the gaps in accessibility to further improve the inclusiveness of WASH services across multiple sectors such as schools, healthcare facilities, and individual households. By committing to quantifiable data collection, the government can mobilize evidence-based approaches for its upstream interventions.

### ***Increased Provision of Safe WASH service***

There is a need to increase the provision of water, improve sanitation services, drainages and waste disposal and management in PUAs. This will attenuate the annual cost of WASH related calamities and illness on the economy.

### **Community Based & Participatory/Consultative Process**

#### ***Community Sensitization***

It is imperative to tackle the stigma around disability by raising awareness, building community understanding, and increasing tolerance for PWD. Equipping local community centers with both material and informational resources for inclusive WASH can enhance the education of the public about the significance of upholding disability rights.

### ***Community mobilization***

Developing a mechanism to hold community leaders accountable for ensuring inclusive WASH can enhance their capacity to include PWD into the decision-making process and voice their needs. Also, providing support for PWD to actively engage in the community workshops, discussions, and development meetings can empower them to self-advocate for improvements to WASH accessibility.

### ***Promotion of Hygiene Behavior Changes***

Considering the implications of the cholera outbreaks and COVID-19 pandemic, the promotion of hygiene practices is vital. PWD should be the primary target population for improving hygiene behaviors because they have a greater risk of contracting infectious diseases from contaminated water. Therefore, providing awareness programs, distributing hygiene kits, and arranging sanitary products will increase proper engagement in hygiene practices.

### ***Unity of Leaders***

To effectively manage current WASH facilities and install new inclusive WASH facilities, the community's traditional, religious, and political leaders must coordinate. Further, there



needs to be an increased unity among the authorities in the public and private sectors to improve WASH for all members of society.

## **Comprehensive Accessibility**

### ***Guidelines for inclusive water points***

A series of comprehensive criteria for public water points must be developed to include accommodations for PWD. For instance, including buttons at a lower point on kiosks will help the reach of PWD. Also, installing ramps at boreholes will allow people on wheelchairs to draw water more easily. Lastly, we anticipate implementing more water points at closer proximity to the residents and/or establishing wheelchair-accessible roads to reduce the barriers associated with distance.

### ***Guidelines for inclusive sanitation facilities***

A series of comprehensive criteria for public sanitation facilities must be developed to include accommodations for PWD. These must ensure that all facilities have a minimum width of entry points, ramps, handrails, and lower-height sinks to assist people with mobility challenges. Also, the toilet designs can be improved with raised seats and support handles. To assure that people who are deaf and/or blind are not neglected in the communication of WASH-related information, visual aids, hearing support, and braille must be available at every WASH facility.

### ***Financial support for PWD***

Considering the link between poverty and disability status, there need to be more programs to reduce financial barriers. The minimum price for water (50 Ngwee) should be

reduced for PWD who are unable to carry the full 20 liters of water. Also, subsidies for installing disability accommodation tools at individual households and communal facilities can extend the accessibility of WASH.

## **LIMITATIONS**

There are several limitations in this study. The project was restricted by time constraints and physical distance. Regarding time, we had only eight weeks to contact relevant stakeholders and conduct interviews. As a result, the study may be lacking key perspectives from stakeholders who may not have been available. The limitations imposed by physical distance were a result of the COVID-19 pandemic. Due to travel restrictions, a portion of our research team was unable to travel to Zambia and were required to work remotely from the United States. This created logistical challenges because we were unable to interview stakeholders in-person, we needed to rely on our research member in Zambia to conduct site visits, and there were issues with internet connection. Further, the time zone differences posed challenges because there were fewer times available to meet with stakeholders at a time that was convenient for both the stakeholders and the researchers.

The study is further limited because we were only able to interview expert-level stakeholders. Being unable to interact with PWD in Kanyama limited our understanding of their experiences with WASH accessibility. Although valuable insights were provided by the stakeholders who regularly work with PWD, our discussion about the barriers and future recommendations may not comprehensively articulate the challenges and needs of PWD without obtaining their account of their own experiences.

Furthermore, our research team sought to gain in-depth understanding about the accessibility of WASH services specifically for people who are deaf and/or blind. However, due to the limited availability of literature and insufficient information from stakeholders

regarding people who are blind and/or deaf, our findings instead discuss WASH accessibility for a broad array of disabilities.

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## APPENDIX

**Table 1:** List of barriers present for people with specific impairments.

Impairment	Environmental / Physical Barriers	Attitudinal / Social Barriers	Legal / Political Barriers
Physical (Ex: People with joint pain/arthritis, people with restricted growth, people who use wheelchairs, people with limb/joint pain, people with amputations, etc.)	<ul style="list-style-type: none"> <li>- Long distances to WASH facilities (including kiosks, boreholes, and toilets / pit latrines)</li> <li>- Inability to travel through flooded roads with physical aids such as wheelchairs and walkers during the rainy season</li> <li>- Kiosk handles may be challenging to reach from a wheelchair</li> <li>- Some PWD are not strong enough to carry the minimum amount of water for which they are required to pay</li> <li>- Unable to physically draw water from wells</li> <li>- WASH facilities (e.g toilets) have stairs, making it difficult to utilize the facility without access to a ramp</li> <li>- WASH facilities tend to be poorly lit, making it hard to navigate</li> <li>- WASH facilities often don't have wide doors, making it impossible for someone with a</li> </ul>	<ul style="list-style-type: none"> <li>- Issues of discrimination, intimidation, harrassment, and verbal abuse</li> <li>- Some are neglected despite requiring physical and nutritional support</li> <li>- Often perceived to be a burden on family members</li> <li>- Emphasis is often placed on assisting caretakers rather than exploring ways to empower PWD and promote independence</li> <li>- Thought that disability status is contagious</li> <li>- Socially isolated</li> </ul>	<ul style="list-style-type: none"> <li>- Not taken into account during the construction of water points</li> <li>- Some PWD have less access to services of NGOs like SHN and Africa Call Organization</li> <li>- Community meetings are often not accessible to people who are homebound</li> </ul>

	<p>wheelchair to use the facility</p> <ul style="list-style-type: none"> <li>- Standard toilets may be difficult to use due to issues squatting</li> <li>- Uneven ground, forcing people to crawl</li> <li>- Crawling results in additional contact with unsanitary surfaces</li> </ul>		
Visual	<ul style="list-style-type: none"> <li>- Face difficulties when navigating facilities without assistance</li> <li>- Toilets and surfaces may be unclean, but they may not be able to see this</li> <li>- Challenges with locating the toilet / pit latrine hole and the soap</li> <li>- Lack of information available in braille</li> </ul>	<ul style="list-style-type: none"> <li>- Issues of discrimination, intimidation, harrasment, and verbal abuse</li> <li>- Often perceived to be a burden on family members</li> </ul>	<ul style="list-style-type: none"> <li>- Not taken into account during the construction of water points</li> </ul>
Hearing	<ul style="list-style-type: none"> <li>- Lack of information available in sign language</li> <li>- Privacy is difficult to maintain because they cannot hear others approaching</li> </ul>	<ul style="list-style-type: none"> <li>- Issues of discrimination, intimidation, harrasment, and verbal abuse</li> <li>- Often perceived to be a burden on family members</li> <li>- Often have deficits in communicating and are therefore perceived to be less intelligent</li> </ul>	<ul style="list-style-type: none"> <li>- Not taken into account during the construction of water points</li> <li>- Cannot participate in community discussions due to lack of interpreters</li> <li>- WASH information is often conveyed verbally</li> </ul>
Intellectual / Cognitive		<ul style="list-style-type: none"> <li>- Often perceived to be a burden on</li> </ul>	<ul style="list-style-type: none"> <li>- Struggle to communicate needs</li> </ul>

		family members -Mental health issues may not be recognized -Little effort is made to increase autonomy	to community leaders
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**Table 2: Stakeholders interviewed**

<b>Name</b>	<b>Position/role</b>	<b>Organization</b>
<i>Jessica Cramer M.A. CCC-SLP</i>	Speech-Language Pathologist	Special Hope Network
<i>Mariangela Tarasco</i>	Programme Coordinator	Africa Call Organisation
<i>Dr. Kenneth Kapalu Muzata</i>	Lecturer and Researcher	University of Zambia, Department of Educational Psychology, Sociology and Special Education
<i>Pastor Kamwendo Isaac</i>	Acting Scheme Manager	Kanayama Water Trust
<i>Bwalya Nachula</i>	Hygiene Behaviour Change Specialist	WaterAid Zambia
<i>Susan Chomba Chimfwembe</i>	Public Health Scientist and Health Promotion Officer	Kanyama Level One Hospital
<i>George Mumbi</i>	Director of Research and Rehabilitation	Zambia Agency for People living with Disabilities (ZAPD)
<i>Stakeholder X</i>	Confidential	Health related Government Expert Stakeholder

**Table 3: Barriers to accessing WASH for PWD**

<b>Organization &amp; Interviewee</b>	<b>Environmental/Physical</b>	<b>Attitudinal/Social</b>	<b>Legal/Political</b>

<p>WaterAid: Bwalya Nachula (Hygiene Behaviour Change Specialist)</p>	<p>-Lack of wheelchair access, braille, or hearing support</p>	<p>-Social stigma</p>	<p>-The Ministry of Water Development, Sanitation and Environmental Protection is not actively promoting inclusiveness</p>
<p>ZAPD: George Mumbi (Director of Research and Rehabilitation )</p>	<p>-Long distances to inclusive facilities -Lack of inclusive design aspects such as ramps and handrails -People who are blind have difficulties navigating the facilities - Those who are deaf encounter challenges related to signage. There is currently no system in place for signage regarding WASH facilities -People who are physically disabled face challenges due to a lack of ramps, rails, landing spaces, and disability friendly toilets</p>	<p>-Issues of discrimination at the community levels -Some even believe that disabilities are contagious -Correlation between disability status and increased prevalence of water-borne diseases -Lack of sensitization and advocacy for inclusive WASH</p>	<p>-Failure to include PWD in the decision making processes -PWD do not have an opportunity for their voices to be heard in terms of the design of inclusive WASH facilities -No systems in place to implement and enforce policy changes regarding accessibility for PWD</p>
<p>KWT: Pastor Isaac Kamwendo (Acting Scheme Manager)</p>	<p>-Communal kiosks and household water taps are not suitable for PWD -It is unfair that a person who cannot manage to carry a 20 litre of water would have to pay a 50 Ngwee</p>	<p>-The KWT does not consider PWD in the delivery of its services</p>	

	(minimum price for water) even when using a smaller container -Toilets built under the LSP are not accommodative to PWD. They are elevated because of the water table, have steps and no support infrastructure inside		
Africa Call Organisation: Mariangela Tarasco (Programme Coordinator)	-Lack of accommodative sanitation services and water pumps -Accessible WASH facilities are not common in public places	-Lack of resources and teachers who are willing and able to cater to students with disabilities	-Financial challenges -Government's involvement is significantly inadequate
Kanyama First Level Hospital: Susan Chomba Chimfwembe (Public Health Scientist and Health Promotion Officer)	-WASH facilities in the community are not accommodative to persons living with disabilities	-PWD face intimidation, harassment and verbal abuse -PWD are shunned by members of the community -They are perceived to be dirty	-PWD are overlooked during construction of toilets and water kiosks
Special Hope Network: Jessica Cramer M.A. CCC-SLP (Speech-Language Pathologist)	-WASH facility accommodations outside the community centers are limited -Some children require more quantity of water to treat bedsores, which is challenging without a	-Individuals with disabilities are not offered opportunities to advocate for their own needs	

	<p>consistently reliable water supply</p> <ul style="list-style-type: none"> <li>-Children who are restricted to liquid diets or thickened food encounter greater challenges when access to clean water is limited</li> </ul>		
<p>University of Zambia: Dr. Kenneth Kapalu Muzata (Researcher and Lecturer)</p>	<ul style="list-style-type: none"> <li>-One must travel far distances to get to a water point. The journey can be particularly challenging for PWD</li> <li>-Kiosk handles can be very difficult to reach for a person in a wheelchair</li> <li>-those who are blind have difficulty navigating their way</li> <li>-Those who need assistance or physical aids like a wheelchair or walker have trouble fitting into small spaces</li> <li>-Buildings and facilities that have steps make it inaccessible to people on wheelchairs</li> <li>-Lack of signage that prevents the blind and deaf from understanding their surroundings.</li> </ul>	<ul style="list-style-type: none"> <li>-Considering that people who are disabled are more likely to live in poverty, they often need to raise money in order to buy water</li> <li>-Lack of recognition of the rights that PWD have</li> <li>-Community members are skeptical that researchers are powerless in actually paving the way for improvements</li> </ul>	<ul style="list-style-type: none"> <li>-Lack of recognition of the rights that PWD have</li> <li>-Community leaders' apathy</li> <li>-When a PWD wishes to petition their local government officials, they often have no way of doing so due to a lack of access to phones, computers, or internet connection.</li> </ul>
<p>Zambian Government:</p>	<ul style="list-style-type: none"> <li>-Long distance to water supply</li> </ul>	<ul style="list-style-type: none"> <li>-Knowledge gap and concerns of</li> </ul>	<ul style="list-style-type: none"> <li>-Issues with funding</li> <li>-Fragmentation and</li> </ul>



<i>Stakeholder X</i> (health related expert level stakeholder from the government)	-Lack of consistency for water supply -Unable to compete with able-bodied people for water (for example, they cannot lift heavy containers)	misinformation regarding WASH -PWD who live in poverty must share water and sanitation facilities	lack of coordination among people working in the WASH sector -Construction of water points did not take PWD into account
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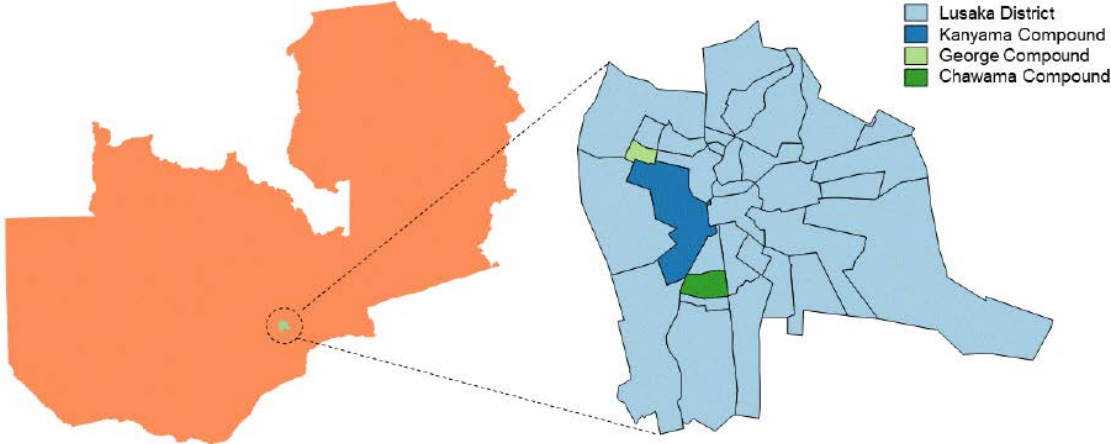
**Table 4: Current Programs and Plans**

<b>Organization &amp; Interviewee</b>	<b>Government</b>	<b>Community</b>	<b>Household</b>
WaterAid: Bwalya Nachula (Hygiene Behaviour Change Specialist)	-QPS established laboratory standards for clean water -MOH has focused on children's hygiene education -Center for Infectious Disease Research in Zambia for cholera prevention	- Hygiene Intervention Packages for door-to-door outreach -Disability-friendly toilet installation	-Toilet improvements
ZAPD: George Mumbi (Director of Research and Rehabilitation)	-Employment quota system in MOH and MOE	-Community education -Sensitization and advocacy for inclusive WASH	
KWT: Pastor Isaac Kamwendo (Acting Scheme Manager)	-Lusaka Water Supply Sanitation and Drainage Project -WHO standards in water treatment -MOH water assessments and	-Faecal Sludge Management	-Fixed K30 bills -Lusaka Sanitation Program

	public sensitization		
Africa Call Organisation: Mariangela Tarasco (Programme Coordinator)	-Build ramps at public WASH facilities	-Sensitization promotion among mothers of children with disabilities -Primary and secondary school with inclusive classrooms -Education for professional skills for PWD -Community based rehabilitation -Inclusive WASH at community centers	-Home-visit hygiene trainings for caretakers -Free courses on nutrition, personal hygiene, toilet usage, menstruation care -Intervention monitoring programs -COVID-19 education for people who are deaf
Kanyama First Level Hospital: Susan Chomba Chimfwembe (Public Health Scientist and Health Promotion Officer)	-Integrated healthcare approach from MOH -LuWSI for school focused campaigns	-Kutuba campaign for hygiene behavior promotion	-Weekly checks and rewards for hygiene adherence
Special Hope Network: Jessica Cramer M.A. CCC-SLP (Speech-Language Pathologist)	-PWD advocacy - Creation of disability specific classrooms at public schools	-Community Care Centers in five different Lusaka compounds -The new community outreach program engaging community leaders -Disability friendly toilet and sink designs at the community centers -Water transport support	-Parent training programs for nutritional support and hygiene awareness -Food pack deliveries -COVID-19 hygiene product distribution -Monthly financial assistance -Collaboration with APTERS to implement disability

			accommodation tools for toilets and sinks
University of Zambia: Dr. Kenneth Kapalu Muzata (Researcher and Lecturer)	-The Persons with Disabilities Act, 2012 -Social Cash Transfer financed by the World Bank		
Zambian Government: <i>Stakeholder X</i> (health related expert level stakeholder from the government)	-PWD demographics documentation -Millennium project to install pipes, deflood pit-latrines, and clear drainages	-Engage local authorities for planning - New construction of WASH facilities - Repurposing of existing facilities -Collaboration with NGOs	

**Figure 1:** Image of Zambia indicating the location of Lusaka. Within the enlarged image of Lusaka, multiple PUAs are highlighted including Kanyama, George, and Chawama (Eubank, 2014); (Vonk, 2021).



**Figure 2 (Left):** Water being drawn from an underground water well

**Figure 3 (Right):** Communal water kiosk



**Figure 4 (left):** Inside of a pit-latrine

**Figure 5 (right):** Septic tank and a toilet