SCHOOL OF MEDICINE AND HEALTH SCIENCES

RESEARCH TITLE

Exploration of factors influencing poor solid waste management in three (3) selected compounds in Lusaka district

BY

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Part-time

MASTER OF PUBLIC HEALTH

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A research dissertation submitted to the University of Lusaka in partial fulfillment of the requirements of a Master of Public Health

Declaration

Student

I, FRED NAKAANGA do declare that this dissertation is my original work. It has been guided and marked by my supervisor in accordance with the guidelines for the Master of Public Health at the University of Lusaka. It has not been submitted elsewhere for a degree at this or another University.

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I, TRESFORD SIKAZWE guided, read this dissertation, and approved it for ethical submission. I am satisfied that this is the original work of the author under the name it is presented. I confirm that the work has been completed satisfactorily and is ready for ethical submission.

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Signature  **Date:** 13TH FEBRUARY, 2024

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Dedication

I wish to dedicate this dissertation to my elder brother Mr. Joseph Neene Nakaanga for his consistent and unwavering financial, material and moral support he rendered to me to achieve my objective. I pray that our good Lord God will consistently pour his blessings upon him and his family abundantly. Secondly, my dedication also goes to my wife Belinda M. Maaka Nakaanga who was there to support me spiritually, morally and materially during this period. Further, my dedication is extended to my twins (Chipo and Changu), (Precious and Rose), Fred, Tessa, Twaambo, Nchimunya, Maggie, for their understanding of my absence from them to enable me attend to my tight academic schedules and demands. I would like to extend my dedication to my Mother Major Margaret Misozi Nakaanga for her consistent encouragement, spiritual and moral support during. My gratitude also goes to my late Sister Rose Nakaanga, late Sister Catherine Nakaanga, my late brother Jethro Nakaanga, my sisters Rita and Joyce Nakaanga, my younger brothers Kennedy and Chrispin Nakaanga for their sustained saintly and honest support during this period. To all, I convey thousands of words of gratitude for their support to enable me achieve this. Without their support, I was unable to complete this course.

Acknowledgements

I would like to send a word of gratitude to the Director Public of Health for the LSWC for authorization to conduct my research investigation in the three communities of Lusaka. Furthermore, I would like to convey a word of thanks to my supervisor, Mr. Tresford Sikazwe for being available to monitor and model my study during this period. I would also like to thank the UNILUSREC for authorization of my proposal to go ahead with the investigation.

Lastly, I say thank you to all family members and friends for the sustenance during this period of study.

LIST OF ACRONYMS

ECZ	Environmental Council of Zambia
EPPA	Environmental Pollution and Protection Act
CBD	Central Business District
CBE	Community Based Enterprises
CDF	Community Development Fund
FDG	Focus Group Discussions
LCC	Lusaka City Council
LSWMC	Lusaka Solid Waste Management Company
NHC	Neighbourhood Health Committee
NHRA	National Health Research Authority
NSWMS	National Solid Waste Management Strategy
SWMD	Solid waste Management District
UNILUS REC	University of Lusaka Research Ethics Committee
WHO	World Health Organization
ZDHS	Zambia Demographic Health Survey
ZEMA	Zambia Environmental Management Agency
UNILUS	University of Lusaka.

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Abstract

Background

In the city of Lusaka, the Local Municipal council sub-contracted franchise contractor companies to collect and dispose solid waste from zoned solid waste management districts through the private public partnership initiative. Despite this, the City of Lusaka has continued to experience sporadic indiscriminate disposal of solid waste by individuals, shop owners and communities members whose effect is clearly observed to be a factor causing blockages in the drainages resulting in running and stagnant water and pools along the roads, ponds and unused pieces of land. It is due to this cause that the author has been prompted to undertake this study.

In terms of methodology, the researcher engaged a qualitative technique to conduct this study using a sample of 39 participants. The data was analyzed and the findings were indicating that indiscriminate disposal of waste is actually still an existing practice due to a combination of social economic factors, personal and behavioral traits such as greedy, low levels of illiteracy, indifferentism, etc.

In terms of results, the participants' responses were coded using Nvivo 14 software and the findings showed that the methods used for storage of waste were rubbish pits where they deposited their waste, solid waste bins, solid waste contractors whilst others said to have resorted to using the illegal wheelbarrow collectors and drainages. A few reported to have subscribed with the CBEs whilst the rest were assumed to be the ones responsible for indiscriminate disposal of waste. In terms of factors exacerbating this cause, the responses included; negative attitudes, low knowledge and attitudes, indifferentism, and lack of money to pay to the CBEs for solid waste services.

In conclusion, the factors gathered to be exacerbating the indiscriminate disposal of solid waste were homogeneous in all the three (3) communities of study and as such some recommendations were developed such as the need to stiffen penalties and punishment to the would be offenders. Others included the need for the local councils to increase monitory visitations in these communities. The engagement of the CBEs was identified as key in helping to reduce waste in these areas though there is need to scale up the monitory of operations and coverage.

CHAPTER ONE: INTRODUCTION

1.1 Background to the study

Fallavier et al (2005) points out that in Zambia, after independence, the local municipal council had adequate resources to collect, transport and dispose of municipal solid waste generated in households, business centers and public facilities. But after privatization of parastatals in 1990 by the Zambian government, the author further reveal that a number of changes were made which included the emergence of multi economic challenges which led to the reduction in the standards of living of people and that uncollected waste remained one of the major causes of pollution especially in informal and unplanned settlements leading to widespread pollution'' Fallavier et al (2005) reveal that the health systems are not an exception to these challenges which included the emergence of shortcomings in the delivery of quality health services due to inadequate resources. As such, most residents suffered from respiratory diseases, diarrhea, cholera and malaria diseases due to unhealthy environments. This situation prompted the Zambian Government to come up with an initiative by establishing the Environmental Council of Zambia through an Act of Parliament. The ECZ (2008) document reveal that this Act (Environmental Protection and Pollution Control Act of 1990) of the Laws of Zambia encompassed and addressed all challenges surrounding environmental and pollution control to create good health of people and a sustainable environment. One pertinent issue provided in this Act included issues to do with the management of solid waste, countrywide.

Furthermore, the LCC (2004) show the model undertaken by the local municipal council and other government stakeholders where they came up with a system of solid waste management were they engaged the franchise contractors to undertake the responsibility of managing waste in Lusaka district. Through this strategy a department was established under the LCC to control, regulate and enforce issues to do with garbage in the city. The LCC (2004) documented further that The Danish government gave financial, material and technical support to the unit to fully function the system, which included the upgrading of the Lusaka's chunga landfill to a modern one. To support the implementation of this project, on 29th October, 2004,

the local municipal council and other government stakeholders decided to develop by-laws to enforce the effectiveness and efficient management of solid waste under the newly adopted system in the district. The Lusaka city council (2004) clarifies in its document that this initiative also provided for a solid waste collection system in the peri-urban compounds of Lusaka city through a “cost-cross subsidization system” where part of the revenue mobilized from tipping fees at the landfill from high income areas, be used to cover the cost of collection and disposal of garbage generated from Low income areas (Peri urban). Under this system, the council strategically positioned waste receptacles (hook lifts) centrally for waste disposal by residents in the slums and markets. Mulugeta & Simelane (2016) reveal that despite all these efforts, there are still sporadic indiscriminate disposal of solid waste activities in drainages, open spaces and corridors of the Central business districts which consequently cause disease outbreaks especially diarrhea diseases, upper respiratory conditions. Overcrowding has also been identified as a causative factor of poor waste disposal of waste and pollution. Mulugeta & Simelane (2016) further highlights that the poor water and sanitation systems in most peri - urban areas including Lusaka’s Chawama, Kanyama and Mandevu compounds are as a result of poor disposal and uncollected solid waste which have continued to affect the residents through blocked drainages and flowing of dirty water in the streets and around households. This situation is still prevalent despite all these systems put in place by responsible local authorities.

1.2 Statement of the problem

Mulugeta & Simelane (2016) reveal that currently, there is an existing challenge on discarding of solid waste in Lusaka city despite having systems in place by the local authorities which the researcher has identified and acknowledged as a problem. Mulugeta & Simelane (2016) demonstrates further that the City of Lusaka is still experiencing sporadic indiscriminate disposal of solid waste by individuals, shop owners and community members whose effect is clearly observed to be a factor causing blockages in the drainages resulting in running and stagnant water and pools along the roads, ponds and unused pieces of land. Further, Mulugeta & Simelane (2016) further state that this has resulted in health effects of diarrhoea and respiratory diseases. As such, the author has been prompted to ask questions as to why these problems are still prevalent when there are systems of disposal of waste

in place. However, Mahayuddin et al, (2008) demonstrate the ideal situation as having in place a legislation which is sufficient for implementation and enforcement on solid waste disposal. To Fallavier et al (2005) supplements this, that in the year 2003, the Zambian Government established the Environmental Council of Zambia through an Act of Parliament to respond to the solid waste management and pollution challenges. Today, this legislation is still governing the management of solid waste in Lusaka. Under this provision, all households, shop owners, markets, and other business entities are expected to subscribe with franchise waste management companies to manage their waste. However, despite this, it is sad to note that in the midst of people subscribing to the contractors a lot more people are still disposing waste indiscriminately, in the city. Mwesigye et al (2009) substantiates this in the integrated assessment report on waste management which demonstrates the current poor position of Africa environmentally due to unfriendly waste management practices. The author further points out that good waste management system should take care of all solid waste generated and transported to the recommended landfills where some of it is recovered for re-use and others products are recycled into useable products. This report demonstrates further that indiscriminate dumping of garbage is the main cause of poor sanitation system in many parts of Africa leading to serious outbreaks of diarrhoea and upper respiratory diseases such as cholera, dysentery, etc. Unnisa & Rav (2013) emphasises that the engagement of the 3Rs, being Recovery, Re-use and Recycle, is the best strategy to manage municipal solid waste. These methods have proven to be operative in some industrialized countries like Sweden and the United Kingdom (Unnissa & Rav, 2013: 03). The techniques have helped greatly in the minimization of waste process which in turn increases the life span of the landfill as a great deal of waste is recovered and re-used or recycled leaving only very minimal bio-degradable waste to be deposited. Therefore, it is due to this cause that the investigator found it imperative to conduct a study intended to explore factors responsible for poor dumping of solid waste in Kanyama, Chawama and Mandevu compounds of Lusaka districts.

1.3 Justification of the study

Mwiinga, F (2015) reported that the problem of poor disposal of solid waste was a widespread and serious hazard to health throughout the country and the local authorities were grappling with the task of maintaining a clean environment in the

City of Lusaka. Oguru (2022) adds that people lived in unhealthy environments with perennial outbreaks of diseases like cholera, dysentery, diarrhoea and malaria, all resulting from poor disposal of waste and industrial pollution especially during the rainy season. Whiteford & Padros (2015) reveal that studies conducted in the 21st Century have persistently demonstrated the perennial outbreaks of diarrhoea diseases as a result of poor solid waste management. The authors reveal that during the period "….2003-2004, there was another……outbreak of cholera…..resulting from vegetable contamination" (Whiteford & Padros, 2015; 75). The situation of Cholera is described by the authors as having become a common place in Zambia during the period 1991, 1992 and 1999 (Whiteford & Padros, 2015; 75). This situation is envisaged to improve as long as the interventions by the local authorities are sustainable through implementation and consistent enforcement. The maintenance of cleaner compounds is very important to address the problem of diarrheal disease outbreaks. A clean environment, at a macro level is seen to be able to increase the socio status of Lusaka province and Zambia at large and therefore attract investment. The findings of this study, therefore, are envisaged to explore factors influencing poor solid waste management in three (3) selected compounds, namely, Chawama, Kanyama and Mandevu areas, in Lusaka district. Further, the findings will help to enhance efforts of the Municipal councils to sustainably expand the retort in the management of waste. This research is also envisaged to fill the gaps exacerbating the indiscriminate disposal of waste. Once these are established, then the impact of good waste management system is expected to have an impact on the health sequels resulting from the solid waste interventions. The study will also help to mitigate the challenges currently being faced at the land fill especially during the rainy season. It will further facilitate the mainstreaming of the strategies on waste Management into the national strategic plans and reduce consequent disease outbreaks in the aforesaid areas.

1.4 Scope of the study

This research investigation was restricted in the three (3) compounds in Lusaka district specifically dwelling on assessing factors influencing poor waste disposal tendencies; investigate the knowledge and attitudes of community members on health effects arising from poor disposal of garbage; manage challenges and opportunities associated with solid waste management. Unlawful dumping of waste

is the major factor in the blockages of drainages and consequent overflowing of dirty water in the streets and around households (Mulugeta & Simelane, 2016) The study was limited as it is not making generalizations to the whole of Zambia but rather represent the actual situation in the three aforementioned compounds.

1.5 Research objectives

1.5.1 General objective

This research study was intended to exploring factors influencing poor solid waste management in three (3) selected compounds, namely, Chawama, Kanyama and Mandevu shanty compounds of Lusaka.

1.5.2 Specific objectives

(i) To identify methods of storage, collection and disposal of solid waste that communities are currently using in three (3) selected compound.

(ii) To assess factors influencing poor disposal of solid waste in three (3) selected compounds in Lusaka District

(iii) To investigate the knowledge and attitudes of community members on health effects arising from indiscriminate disposal of solid waste in three (3) selected compounds Lusaka.

(iv) To determine the extent to which communities in three selected (3) compounds manage challenges and opportunities associated with solid waste management.

1.6 Research questions

(i) What are the current storage, collection and disposal methods which communities are using in three (3) selected compounds of Lusaka district?

(ii) What are the factors influencing indiscriminate disposal of solid waste in three (3) selected compounds in Lusaka district?

(iii) What knowledge and attitudes do community members have on health effects arising from indiscriminate disposal of solid waste in three (3) selected compounds Lusaka?

(iv) How do communities in three selected (3) compounds of Lusaka district manage challenges and opportunities associated with solid waste management?

1.7.1 Definition of operational terms

1.7.2 Bio-degradable - a substance or object capable of being decomposed by bacteria or other living organisms thereby avoiding pollution

1.7.3 Compounds - a fenced or walled-in area containing a group of buildings and especially residences.

1.7.4 Diarrhoea Diseases - diseases characterized with passage of 3 or more loose or liquid stools per day, or more frequently than is normal for the individual.

1.7.5 Disposal of waste - the collection, sorting, transport and treatment of waste and storage which may also include re-use recovery or recycling.

1.7.6 Franchise Contractors - Sub contracted solid waste private companies to manage waste in zoned areas by the local council

1.7.7 Indiscriminate disposal of waste – random disposal of waste

1.7.8 Landfill - A site reserved and restricted for the purpose of dumping waste, rubbish or debris.

1.7.9 Low density areas - Areas with low concentration of people/households per Km square. Also referred to as high cost areas

1.7.10 Disease Outbreaks - A sudden appearance of a disease in an area

1.7.11 Perennial outbreaks - continuing outbreaks without interruption e.g. cholera outbreaks in rain season in an area or country.

1.7.12 Peri- Urban areas - non-urban landscapes or communities adjacent to or surrounding metropolitan settlements.

1.7.13 Re-covery - the process of giving a value to a material believed to be waste

1.7.14 Re-use - the practice of using a material over and over again in its current form

1.7.15 Recycle - the process of converting waste materials into new materials and objects

1.7.16 Slums - a highly populated urban residential area consisting of densely packed housing units of weak build quality and often associated with poverty.

CHAPTER TWO: LITERATURE REVIEW

Overview

Literature review can be defined as a systematic, thorough and critical evaluation of existing literature on a particular research question (Ridley, 2012). It helps identify gaps in literature, synthesize existing knowledge, evaluate the credibility and reliability of sources and provides a theoretical framework for research (Fink: 2014). The author highlights that scientific literature is required to expand knowledge and understanding by the researcher during exploration of factors influencing poor solid waste management. However, very few studies have documented factors influencing poor solid waste managment, types of storage and the knowledge of communities of poor waste management. This research study derived most of the literature from Google library, and National Center for Biotechnology Information and many other public health journals and books.

2.1 Theoretic review of literature

In Lusaka city, the Local council sub-contracted franchise contractors to collect and dispose solid waste from zoned solid waste management districts through the private public partnership initiative. This has also extended to the peri-urban compounds where waste generated from these areas was collected and disposed of at designated landfills. The Lusaka city council also manages waste from the heart of the city and the peri - urban compounds. Despite sensitizations on proper disposal of waste, poor disposal behaviours are still prominent and it’s a problem which needs urgent attention by the Lusaka city council and all the stakeholders. Consequently, the city of Lusaka has not been spared from perennial outbreaks of water and air bone diseases due to blocked drainages caused by indiscriminate disposal of waste. The NSWMS (2004), documents that Zambia has had a problem of waste management to an extent where lives of people have been adversely affected and even lost. The existing garbage collection systems by the Lusaka city council in these peri- urban compounds did not successfully mitigate the poor disposal of garbage in the peri-urban area which has perpetuated the outbreak of water related diseases in the recent past. Mwiinga, F (2015) reported that “the issue of poor waste disposal is even more significant in the urban set up as exacerbated by the rapidly growing populations. This has caused overcrowding to an extent were hygiene has been compromised. The paper further reveals that there has been recurrent disease

outbreaks such as cholera and diarrhea due to the problem of uncollected garbage. Some of the excuses mentioned to have perpetuated this included shortage of man power, lack of funds and negative bad mind sets of citizens in the city. It is further highlighted that these outbreaks have been experienced in Chawama, Kanyama and Mandevu compounds of Lusaka City. A number of factors have been reported to have contributed to the problem of poor disposal of garbage in the aforesaid compounds. Some of these factors included; bad attitudes by residents; deliberate littering of waste as the talk of the day in the city due to factors such as low education levels; lack of awareness amongst residents in these peri-urban compounds on existing waste management system; lawlessness by some residents due to overcrowding leading to deviance; bad attitudes, failure by the responsible local authorities to collect and dispose of waste from primary transfer stations to the designated landfill in Chunga. Another factor which came out was failure by the responsible local authorities to enforce the laws, policies and legislation governing the management of solid waste in the peri urban areas and the entire city of Lusaka.

2.1.1 Global Context

Achankeng (2003) indicates that management of solid waste in most developing countries remained a challenge for a long time and different approaches were being employed to try and overcome the problem. In most developing countries, some middle and low class households may hardly afford to contribute a coin towards solid waste collection due to the high cost of living. This was perceived to perpetuate the indiscriminate disposal of waste in undesignated sites contributing to the outbreaks of various diseases which in turn caused high mortality. In squatter compounds, outbreaks of waste related diseases were rampant in the rain season due to uncollected waste. The article ‘’Habitat international’’ (1999) reveal that in Ghana, in an urban area called, ‘’Kumasi’’ residents were willing to contribute a fee towards the solid waste collection system. This substantiates the existence of a garbage collection system in place. However, Rydhagen (2007) showed that within the city of Kumasi, a second largest city in Ghana, recorded the highest figures of water bone disease outbreaks like diarrhea, dysentery, typhoid, Hepatitis A and vector bone diseases such as malaria, causing severe human suffering responsible for many deaths. Though the communities were willing to contribute towards solid waste collection activities through payment of fees, a great deal of them had difficulties to

do so due to high poverty levels. This negatively impacted on the existing waste management system giving rise to accumulation of uncollected solid waste and its related health problems to the residents. However, despite high poverty levels, most communities were willing to participate in solid waste activities as long as their contributions were visibly related to the benefits. This scenario shows that despite residents' willingness to contribute fees towards the existing garbage collection system, fees were not properly utilized causing a challenge in the entire environment. As a result, the entire initiative was perceived as a barrier to health promotion, rather than an intervention.

Similarly, Pariatamby & Tanaka (2014) reveal in their study that in three cities of South Asia namely; Colombo (in Sri Lanka), Dhaka (in Bangladesh) and Faisalabad (in Pakistan) despite the willingness by households to contribute towards garbage collection services, there were still outbreaks of diarrhea, cholera and other water and air borne diseases in these areas, arising from poorly managed solid waste and pollution in residential areas and municipal cities. The author adds that one of the factors that contributed to accumulation of solid waste was non-compliance of residents due to low levels of awareness on the relationship between the importance adhering to recommended solid waste disposal methods and disease outbreak. Communities which were not adequately informed on waste disposal practices were characterized with bad attitudes. This consequently, led to the accumulation of waste and hence blockage of drainage systems which led to the outbreaks of diarrhea, dysentery and creating breeding sites for mosquitoes which caused malaria in the area.

WHO (2014) revealed that in the United Kingdom, waste was tightly regulated and it included generation, collection, transportation and disposal. This included remediation of waste sites to reduce the hazards and further prepared the landfill sites for change of use. All such innovations indicated existence of solid waste system in place. Despite these measures, however, WHO (2014) revealed that there were still adverse health effects on humans especially those who lived around incinerators and landfills wh0 were presenting with significant reproductive health effects such as low birth weight (Less than 2,500g), fetal and infant mortality, spontaneous abortions and occurrence of birth defects. Similarly, Okada (2010) et al

reported outbreaks of cholera in Thailand in the year 2007 with the highest incidences in the months of September and November. This occurred in the presence of existing waste management system in place. Okada (2010) further points out that the contributing factors to these outbreaks included lack of awareness of existing solid waste management systems in place and bad attitudes by residents. In addition, the introduction of garbage collection fees by local municipal councils also contributed to this problem. In some cases, residences were willing to contribute towards waste collection services but the money was not put to good use by the responsible authorities which resulted in waste accumulation and blockage of drainages which were a recipe to disease outbreaks in the area.

2.1.2 Regional Context

At the regional level, the local municipal councils have experienced this role as the most difficult task in most southern African countries. Waste was viewed to be generating at a faster rate posing a serious danger to humanity. The accumulation of heaps of solid waste went uncontrolled despite existence of waste management systems in place. Downmore et al (2011) highlighted this through the story of the city of Chinhoyi in Zimbabwe, where there was accumulation of heaps of solid waste that led to the blockage of drainage systems which promoted breeding sites for micro-organisms causing outbreaks of communicable diseases which claimed a lot of lives. The IFRC (2010) revealed that, between, 2008-2009, there was an incidence of outbreak of cholera, caused by accumulated waste in chinhoyi town of Zimbabwe, which claimed over 3,500 people. The question which arises is; why did solid waste had to accumulate to such an extent, when a system was in existence? A number of factors are responsible for this trend. The American Journal of Social and Management Sciences (2012) indicate that lack of awareness, bad behaviour and negative attitudes of residents played a significant role in the management of solid waste. The findings of the study showed that negative behaviour and bad attitudes had a direct effect on the rate waste accumulated in their residences. Residential areas which had accumulated heaps of solid waste were characteristic of bad behaviour and negative attitudes towards waste disposal causing outbreaks of water and air bone diseases.

2.1.3 Zambian Context

In the city of Lusaka, the LCC has sub-contracted private companies to collect and dispose solid waste from zoned waste management districts through the private public partnership initiative. The LCC has partnered with the communities in the peri-urban compounds to manage waste generated from their areas. The LCC also collects and disposes waste from the central business district of the City. Despite these efforts, the City of Lusaka has not been spared from perennial outbreaks of water and air bone diseases. The NSWMS for Zambia (2004), documents that Zambia had a problem of waste management to an extent where lives of people have been affected and lives have continued to be lost. The existing garbage collection systems initiated by the Lusaka council in these peri- urban compounds did not successfully mitigated the poor disposal of waste and consequent disease outbreaks in the recent past. Majura, P.B. (1997) observed that the dirty–free ambience resulting from poor disposal of waste is even more significant in the urban set up due to overcrowding Mulugeta & Simelane (2016) substantiates that this has caused overcrowding to an extent were hygiene has been compromised. Further, the authors reveal that there have been perennial outbreaks of cholera and diarrhea due to the problem of uncollected garbage particularly in Kanyama compound of Lusaka. Some of the excuses mentioned to have perpetuated this included shortage of man power, lack of funds and bad mind set of citizens in the city. Diarrhoea and upper respiratory diseases outbreaks had been experienced in the recent past in Chawama, Kanyama and Mandevu compounds of Lusaka City (Mulugeta & Simelane, 2016: 229). A number of factors have been reported to have contributed to this problem. Some of these factors included bad attitudes by residents. Littering of waste is the talk of the day in the city due to factors such as low education levels, lack of awareness on existing waste management system, amongst residents in the peri- urban compound, lawlessness by some residents due to overcrowding, bad attitudes, failure by the Local council to collect and dispose of waste to the designated landfill.

CHAPTER THREE: STUDY METHODOLOGY

Overview

The Study Methodology used was a logical, systematical way to resolve a research problem as it details a researchers approach to ensure that results are reliable and valid (Indeed editorial team 2023). The importance of the methodology in this study is that it gave the research legitimacy and provided scientifically proven sound findings. It helped to provide a detailed plan to enable the researcher keep track of the process and effective production of scientific facts (Harun et al, 2022).

3.1 Study Approach

The research approach employed in this investigation was a qualitative approach as it helped to seek to understand and interpret social phenomena through collection and interpretation of non-numerical data. Creswell (2017) points out the pros of using this method as being able to allow for in depth exploration and contextual understanding of the subject matter. He further highlights that qualitative research allows for flexibility and adaptability to new responses and findings as well as ethical consideration that is taken into account particularly with regard to sensitive topics as the research study. Denzin et al (2018) added further that the cons include limited generalizability as a smaller sample was required, time resource constraint as there is need for conducting interview and then coding and transcribing the data. The research paradigm used was the Interpretivism approach where the scholars believe in socially constructed multiple realities, and therefore that reality is subjective. Creswell (2017) highlights further that, unlike the positivism paradigm, (quantitative approach), Interpretivism is about understanding the subjective world of human experience which the researcher found it suitable for this qualitative study to explore factors causing poor solid waste disposal in the selected aforesaid parts of Lusaka district.

3.2 Study design

Being a qualitative research paper, then the suitable study design employed was the exploratory case study design which focused on the discovery of ideas and insights in defining public health issues to come up with potential intervention and alternative courses of action. This study being a qualitative research design, automatically it qualifies to employ the Interpretivism research design because the respondents differ in a variety of ways and may have varying opinions on the same subject, and

different perspectives for a social reality. Guba & Lincoln (1989) assimilate that in their studies such as this one, where the chief investigator is assumed to comprise the interviewees in order to appreciate the syntax of the phrases and contexts that the interviewees are implying. Guba & Lincoln (1989) substantiates this statement that the intention is to appreciate the perceptions of the interviewees and not that of the researcher. The approach is intended to fill up the minds of the respondents so that they speak, understand and interpret what the subjects were thinking or what they meant in their own context(s). The study engaged an interview guide to conducting in-depth interviews with the participants. Michael (2002) substantiated this method as being suitable for this kind of study as it enables more complex aspects of respondents' experiences to be explored. The approach facilitated investigation of non quantifiable issues such as individual experiences on disposal of waste which are the integral part of this study. Respondents were further given an opportunity to provide data in their own words and in their own way.

3.3 Study population

Cooper and Schindler (2001) define 'population' as the sum of components about which the measurement is being taken. In this case it was the populations who were of interest to the researcher who are the people in the peri-urban compounds of Lusaka where there had been recurrent outbreaks of waste related diseases, in the past 5 years, namely Chawama, Kanyama and Mandevu Compounds. In these areas, the targeted categories of people included the neighborhood health committee members (NHCs), ordinary members of the community, a Head of Community Based Enterprises (CBEs) for each compound, Three (3) NHCs were selected from each compound bringing the total number of NHCs to nine (9). A total of thirty (30) community members were selected from the three compounds. This implies that ten (10) participants were chosen per selected area/compound. This brings the total sample size for the study to 39 participants.

3.4 Study setting or Study site

The outbreaks of diarrhoea and upper respiration illnesses were perceived to be prominent in peri - urban compounds of Lusaka particularly those with very high density of population. Due to this, the study was restricted to three selected peri - urban compounds of Lusaka city namely Chawama, Kanyama and Mandevu compounds.

3.4 Sample size

The total number of participants interviewed was 39. However, availability of resources and time were the determining factors in the increase or decrease in the size of the sample.

Table 1 below shows the distribution of the sample size by type of methods used to collect data:

Table 1. Sample size by data collection method

	IN DEPTH INTERVIEWS (IDI)	**FOCUS GROUP DISCUSSIONS (FGD)**	**TOTAL SAMPLE SIZE**
Proportion of sample size	6	3	**39**

The table 2 below shows the distribution of the sample for all participants;

There were six in-depth interviews conducted with one member from each of the three target communities making a sample of 6 participants. And there were 3 focus group discussions with each focused group discussion comprising 11 members from each target community giving total sample size of 39. This information can also be presented as follows;

Number of in-depth interviews (IDI) conducted

1. 3 IDI (i.e., with one member selected from each of the 3 CBEs from the 3 target communities)
2. 3 IDI (i.e., with one member selected from each of the NHCs from the 3 target communities)

Number of FGDs conducted

FGDs (i.e., 3 FGD comprised of 10 members per FGD selected from each of the 3 target Communities)

Table 2. Sample size by type of participants

	CHAWAMA COMPOUND	KANYAMA COMPOUND	MANDEVU COMPOUND	TOTAL
NHC members	2	2	2	6
CBEs	1	1	1	3
Community Members	10	10	10	30
TOTAL	**13**	**13**	**13**	**39**

Sampling procedures

In this study, non-probability design was used to draw the sample. Therefore, criterion purposive sampling, a non-probability design was applied where the three (3) compounds of Lusaka City with a history of concurrent outbreaks of waste related diseases in the past five years were selected according to the sample size. Kombo & Tromp (2006) substantiates that purposive sampling picks data which is characterized with opulent cases for in-depth scrutiny. This approach was used because it helped to choose respondents who were characterized with some similar attributes. Patton (1990) demonstrated that this approach is commonly employed in Interpretivism research. The technique used for choosing the three compounds of Lusaka city was restricted to those compounds which were characterized with a record of perennial outbreaks of diseases resulting from poor waste disposal for at least in the past five years.

The Zambia Demographic Health Survey (ZDHS) report was accessed to identify the compounds which were characteristic of the study topic as outlined above. The committee / CBE chairpersons from Chawama, Kanyama and Mandevu compounds were contacted to purposively select ten (10) residents from each of the three (3) peri-urban compounds bringing the total number of resident respondents to thirty (30). To do this, the researcher had to engage chairpersons of the committees/CBEs as the key informants to help select community members who are eligible to participate on purpose. This approach helped to ensure that members who

participated were those characterized with the problem under study. The selection was done using snow bow method through the community members who had relevant information on their neighborhood inhabitants.

All the household owners who had lived in the compound in less than five years were excluded from the study and replaced. The total sample size was thirty nine (39) participants. These respondents were engaged in a focus group discussion. (FGD) whilst the three (3) committee/CBE chairpersons were engaged on a one-on-one in-depth interview with the researcher. A total of three focus group discussions were conducted i.e. one from each compound and three in-depth interviews.

3.5 Data collection methods

This study utilized both In-depth and focus group discussion (FGD) approaches gather information and data from respondents. In-depth interviews helped to allow for the collection of a large amount of data about the behavior, attitude and perception of the respondents. The in-depth interviews were conducted per individual to the NHC and CBE members who were be selected purposively using a snow bow method after receiving consent from them and were done in English and translated into the languages they were comfortable with. In-depth interviews were conducted using an interview guide by the researcher. All responses were recorded using a digital audio recorder to ensure that all the data and important information are collected. The in depth interview guide were conducted by the use of a semi-structured questionnaire on a one-on-one basis between the interviewer and the interviewee. For the Community members, the Focus groups discussions were used to collect data from the groups of 10 members per group. This means that the total number of groups to be interviewed were three (3) groups. This approach helped to gather in-depth information on experiences of participants. The topic was introduced to the groups before starting to discuss on it.

3.6 Data analysis

The data collected using the digital recorder was subjected into Nvivo 14 software for analysis which was later metamorphosed into a verbatim. This verbatim was then re-read over and over by the principal investigator. Then a thematic analysis was conducted by way of coding into a total of six (6) phases with a view of formulating designs which are reasonable and sensible. Braun and Clarke (2006) reveal these

phases as data familiarization, generating initial codes by the guide of the research questions. Then the researcher searched through for themes among codes by looking at the scripts of the interview guides and identifying common responses by categorizing them. The next step was reviewing themes to ensure that common themes are labeled and described for easy understanding. This was followed by a process of creating definitons and giving the themes names and then generating the conclusive report through hierarchical charts for each of the research questions. During this process, the researcher undertook a process of reading the data over and over paying special attention to important designs and incidence on information / data which respond to the research question. The researcher then looked through to capture key themes and groups contained in the data. This was achieved by drawing an analysis to single out the description of all themes and their importance. Then, the principal investigator evaluated the final themes developed and then went ahead to develop a report in line with the themes that were characterized with significant inputs towards responding to the research objectives. For validation assurance purposes, the principal researcher subjected the participants to a process aimed at confirming if the information gathered was the same as what was discussed during the interview by giving them typed scripts to go through.

3.7 Ethical considerations

The study proposal was first submitted to the University of Lusaka academics after the supervisor ratified. Later, it was then submitted to the UNILUSREC for approval and clearance before conducting it onto the subjects. To conduct this study on residents of the named compounds, permission was sought in written from the Director of Public Health at the LCC authorizing to carry out the study. The ward Councilors and committee members chairpersons will be informed through the office of the Director of Public Health for Lusaka City Council. During the study, sseveral issues were experienced, however, the researcher ensured to adhere to the ethical specifications which include; Informed Consent, Confidentiality, Anonymity, possible outcome risks, benefits, and fairness. Informed consent is referred to as a situation where participants are told that their participation is on a voluntary basis after all the details of a research are explained to them so that they fully understand the outmost goal and any risks that may be incurred during the process would be informed to them. They were told that a written consent form will be shared with the respondents

by the researcher to read and sign if they agree to the instructions given. This is intended to guarantee respect of participants' rights and fairness. The participants' right to choice is part of the research. They can either decide to participate or not (Levy et al. 2003). In terms of anonymity, the participants were informed that the study investigator will not collect any identifying information of individual persons but by the order of the number that the participant that has been interviewed on. The participants were notified that all the data gathered strictly be used for academic purposes only and that it will not be shared to any third party without informing respondents. Beneficence is the other significant issue of ethical importance. All respondents were guaranteed that the information gathered will be used only for the purpose intended for and they will not be affected in any way possible by the process or effects of the study. This process is important as it helped respondents to be free to give information which may seemingly to be sensitive and privileged to them. Justice was also another ethical issue which was upheld and adhered to during this study. To reduce uncertainties and suspicions, the participants were given full explanation selection method used for them to be included in the study. Further, they were also educated on their rights as participants to withdraw whenever they wish or to remain in the study process.

CHAPTER FOUR: PRESENTATION OF RESULTS AND ANALYSIS

OVERVIEW

Thematic analysis technique was employed to process the data where the themes were subjected to Nvivo 14 software. This process led to the discovery of different factors influencing poor disposal tendencies amongst inhabitants of the three (3) selected areas, namely, Chawama, Kanyama and Mandevu compounds of Lusaka district. Hierarchy tables designed in pie chart form were developed for all the research questions. A codebook was also developed and populated with all the codes from the analysis giving a description of the generated themes.

4.1 Demographic characteristics /data (for participants)

The characteristics of the demography of populations from which the participants were derived from is shown below as drawn from the three (3) selected target areas of Chawama, Kanyama and Mandevu compounds.

4.1.1 **Age**

The age group was ranging from 25 and above

4.1.2 Gender

The composition of the gender was both males and females where about 60% were women whilst 40% were men.

4.1.3 Ethnicity

The respondents were of mixed ethnicity from all provinces of Zambia though dominated especially by Easterners, Northerners, Southerners, Westerners, North westerners and Central provinces of Zambia.

4.1.4 Educational attainment

The average educational attainment for all the respondents from all the three (3) selected compounds of Lusaka, were ranging from primary to Secondary educational levels of education.

4.1.5 Source of income

Generally, the livelihood of most of them was dependent on small scale business entrepreneurship within their areas such as ‘tuntemba’(small shops), piece-works, volunteer work engagements such as working for CBEs to get something for survival. A few of them had houses left by their parents and /or husbands which they rent out for income. However, very few of them were employed formally.

4.1.6 Socio-economic status

The respondents were all from a lower social status who have to strive on a daily basis to make ends meet.

4.2 Presentation of results

4.2.1 Methods of storage, collection and disposal of solid waste

The first research question aimed at investigating the storage, collection and discarding of solid waste which are currently being used in these compounds as depicted in the pie chart below. The responses from the interviewees were coded using Nvivo 14 software. During the interviews, the findings revealed that communities interviewed utilized a wider variety of methods to store, collect and dispose solid waste. From the findings, it was identified that almost all, of the participants had similar responses which were coded into main themes. These themes were then reproduced into the hierarchical chart as shown in figure one. The methods of storage, collection and disposal were an important theme to learn on regarding the approaches communities were currently using to manage their waste. It was also noted that all the participants responded to this question by highlighting the methods used in their respective compounds for managing their solid waste. Some of the responses from the raw data gathered included statements outlined below from which codes were derived. These direct statements from interviewees were extracted exactly as mentioned by respondents and were as follows;

“As CBEs we try to pass through door to door to talk about the dangers of irresponsible solid waste disposal, they always say most of the times that they have rubbish pits…. Community based enterprise.”

"especially that the population is growing just like in Kabanana and Mandevu the bins door to door cannot be possible so better they check those that have not paid up and don't have bins the council should query them and penalize them so that they should have proper solid waste disposal behavior using the local council... (resident)" The results imported from the coded themes from the hierarchical table showed the responses as depicted in Figure 1. (*The hierarchical table shows the coded statements extracted from the interviewees statements and are shown in figure 1)*

Pie chart indicating coded statements from Participants

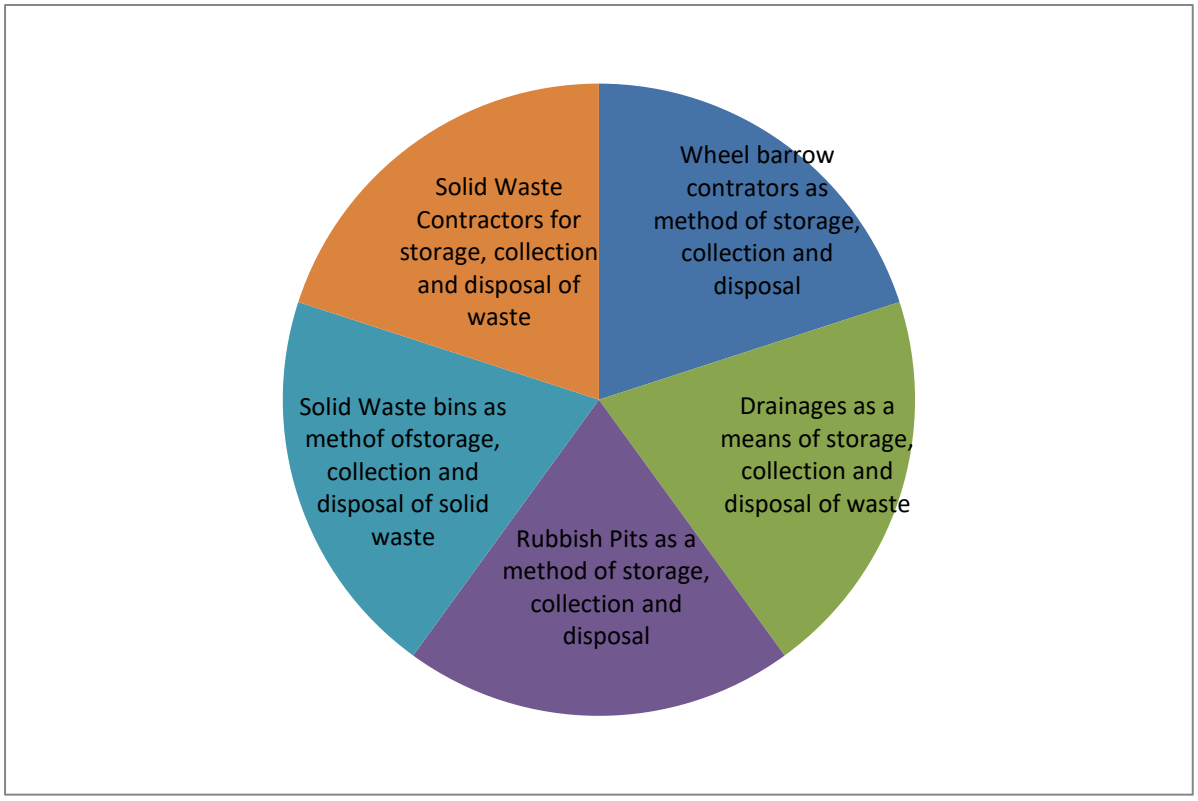

Figure 1. The methods of storage, collection and disposal

To answer to the question on methods used by residents for storage of solid waste, most respondents' answers bordered on the use of *'rubbish pits'* as a main theme. The other response which followed was the use of '*solid waste bins*' and also indiscriminate dumping into the *'drainages along the road sides*'. When it came to the question on the collection of solid waste, almost all the interviewees' responses pointed at the engagement of the illegal '*wheel barrow contractors'.* However, other participants responded that they do use the legitimate solid waste contractors popularly known as *Community Based Enterprises (CBEs)* where they pay a monthly

fees of K30 per household and their waste is collected on a weekly basis, though this price varied from area to area depending on variations in intra-community factors. When it came to the question on the disposal of solid waste, the responses were generally pointing at the '*use of rubbish pits'* except for those who were able to pay for their waste to CBEs to collect and dispose it at the designated dumpsite in Chunga.

4.2.2 Factors influencing indiscriminate disposal of solid waste

The second research question was intended to assess factors influencing indiscriminate disposal of solid waste in the three aforesaid study compounds of Lusaka district. Several responses were given by respondents during the interviews and the common themes gathered were coded which included; issues on policy, none payment of waste fees, negligence, low literacy levels, lack of resources by the waste management companies, area councilors not available to coordinate the communities and last but not the least unemployment levels. Below are some of the raw data gathered and included in the creation of the themes;

"The problem is that people don't want to use the waste disposal initiative by us the CBEs, we don't know if it's because people don't have money or not……"Community Based Entrepreneur"

"The cause is being scared to pay, regardless of them having money they still don't want to pay but the garbage collectors are always collecting solid waste with or without pay. The fee is only 50 or 60 kwacha monthly per household…. Kanyama Site and Service"

"I don't know why the council has put up an initiative to be collecting waste and hence people still want to be solid waste disposal anyhow…"Community based Enterprise"

Pie chart showing factors influencing indiscriminate disposal of solid waste

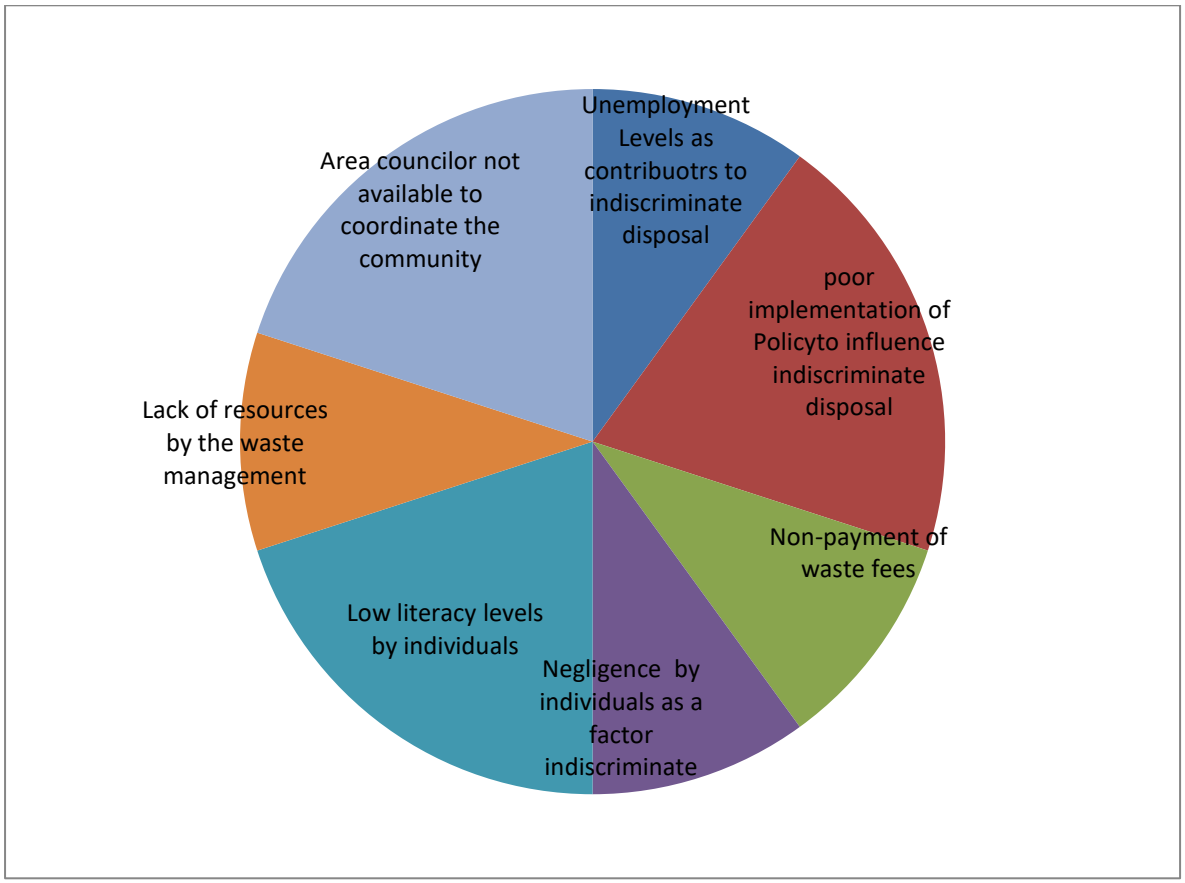

Figure 2: Factors influencing indiscriminate disposal of solid waste

4.2.3 Knowledge and attitudes of community members

The third research question was aimed at investigating the knowledge and attitudes of community members on health effects arising from indiscriminate disposal of solid waste in the three target compounds. And thus, the theme; *knowledge and attitudes of community members* was created. There were several responses from the raw in-depth interviews and after transcribing the data, more common themes were coded which included; poor attitude to waste disposal, not afraid of illness, greedy, avoiding fees and they were able to mention and explain at least one effect of indiscriminate waste disposal as shown in Figure 3 below.

Some of the raw data responses were; “poor solid waste management has got health effects that lead to development of cholera or typhoid, because of throwing garbage in drainages which causes blockages and causing floods in the central business district, sometimes even just waste is not hygienic “…..Chawama Kuomboka residents”

“Citizens should just change in behavior and more health education should be given on the dangers of irresponsible waste disposal, some could have money but just feel greedy and would rather go to throw rubbish in the drainages …”Community Based Enterprise”

“Some are able to pay but they just want to throw anywhere of which we can’t all understand especially in rains season they just want to throw in the drainage…Kanyama site and service”

Pie chart showing identified Knowledge and attitudes of community members

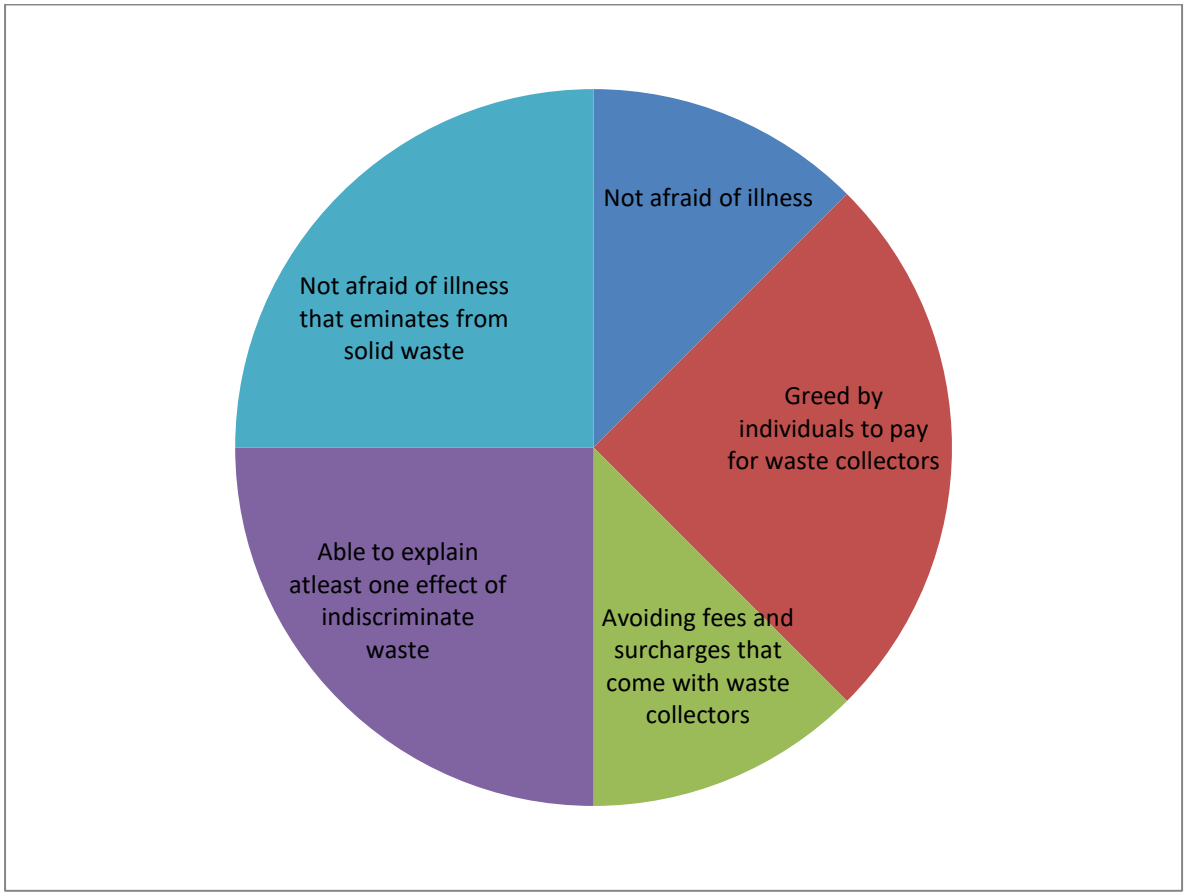

Figure 3. Knowledge and attitudes of community members

4.2.4 Extent to manage challenges and opportunities

The fourth research question aimed at determining the extent of the problem in the three selected communities and management of challenges and opportunities

associated with solid waste disposal. The responses that were given by the participants from the in-depth interviews were coded into four themes as; “regardless of no payment we still collect solid waste as one of the way of coping with the challenge of individuals not wanting to pay for waste collection and later maybe they will make the payment; illegal collectors who pretend to be council workers are taking an opportunity in a bad sense; engage CBEs who act as the contractors and make a living out of the contracts with the local council and collect waste at a discount to make ends meet for the contractors”. These are the themes which came up from the participants and are depicted in figure 4, a hierarchical chart produced from NVIVO 14. Some of the raw data gathered is shown below;

“sometimes those that refuse we do agree to dispose of waste for them at a discount if people disagree …”Community based Enterprise.”

“especially that the population is growing just like in kabanana site and service, mandevu, the bins’ door to door cannot be possible so better they check those that have not paid up and don’t have bins the council should query them and penalize them so that they should have proper solid waste disposal behavior using the local council...(residents)”

“I would like to air my view of that the garbage collectors should seek to know from those who have their garbage collected and ask them where they throw their waste and so they should still be collecting for them (resident)”

Pie chart showing the extent to manage challenges and opportunities

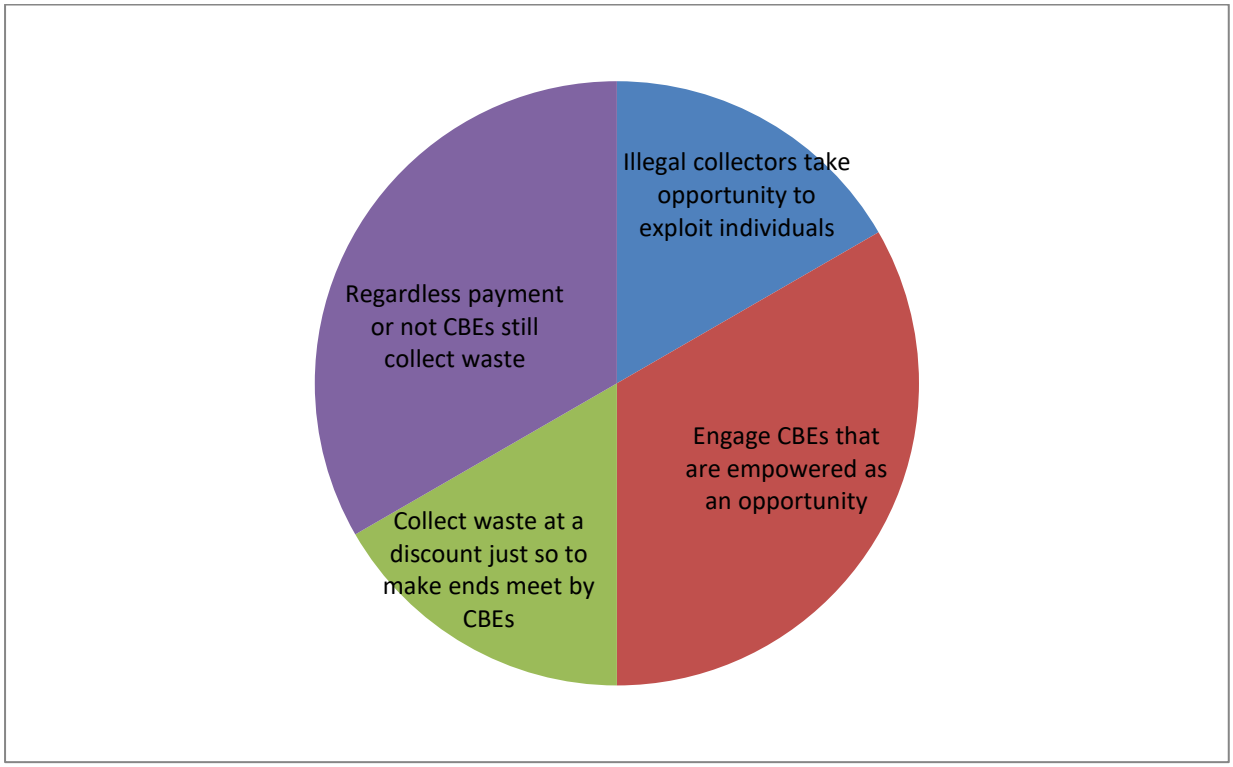

Figure 4. Extent to manage challenges and opportunities

At the end of each interview, interviewees were asked one by one to give recommendations on what the local municipalities are expected to do to improve solid waste management system especially on changing the mind-sets of people. The common responses where coded into the themes as follows; need for transport, increase tariffs, CBEs to engage council inspectors, council officials to be on the ground, to ensure policy enforcement.

Some of the raw data gathered from the respondents were as follows;

“Again the use of legislature and policy to ensure that everyone in largely populated and high density areas is mandated to pay for lawful disposal of waste…. (Resident)”

“government should come up with a policy that will ensure that everyone pays for bins and if they don’t they should be fined and because they know will be done and so they are not worried about wherever to throw the garbage … (CBE))

Pie chart representing the recommendations from participants

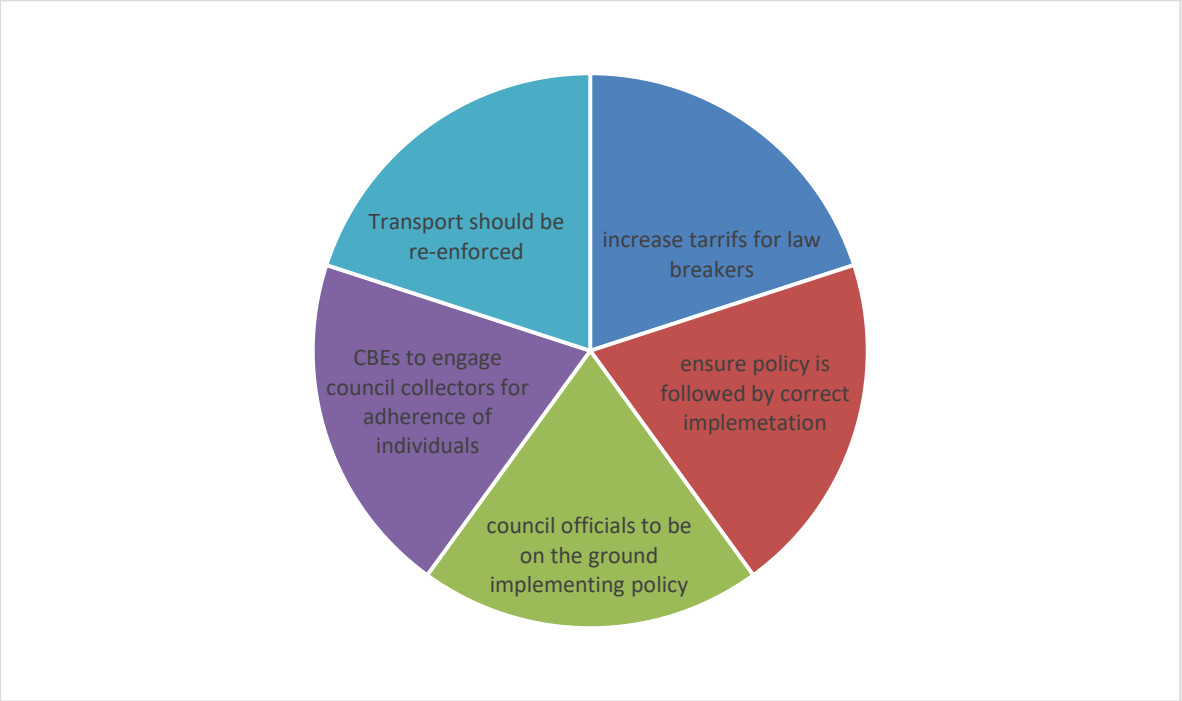

Figure 5. Recommendations from participants

Summary of the above recommendations from participants

1. Increase in tariffs - Most participants complained that tariffs for waste collection were high and that this could have been one of the factors causing increased lawlessness in the disposal of solid waste in these communities.
2. Policy - It was recommended during the interviews that there is need for the local municipal councils to ensure that policy is adhered to and enforcement strengthened.
3. The Council officials to be on the ground - It was recommended that the enforcement officers from the local councils should be on the ground to ensure that law and order are maintained.
4. CBEs to engage council Inspector - It was recommended that the CBEs should work closely and consistently with inspectors from the LCC to ensure that there is sanity on the ground.
5. Transport - It was recommended that the CBEs should be empowered with a good number of specialized trucks per community to transport waste to the landfill.

Figure 6 CODE BOOK from Nvivo 14

Name	Description
extent to which challenges and communities are managed	answer to objective three
Collect waste at a discount just so to make ends meet by CBEs	Some CBEs at times still collect waste at a negotiated price just to ensure waste disposal is done for certain residents
Engage CBEs that are empowered as an opportunity	The compounds have engaged CBEs and comply with so that they can dispose of their waste at council designated places
Illegal collectors take opportunity to exploit individuals	Too many illegal collectors in the name of council and then they collect the money for their own profits
Regardless payment or not CBEs still collect waste	Some CBEs still collect waste for certain residents at times even though they have not paid up for the service hoping they will pay next time
Factors influencing indiscriminate disposal of solid waste	answer to objective number two
Area councilor not available to coordinate the community	This entails that the councillor facilitating and educating the residents about importance of solid waste disposal methods that are healthy
LACK OF RESOURCES BY THE WASTE MANANAGMENT	Lack of resources by the Lusaka city council on managing solid waste disposal
Unemployment Levels as contribuotrs to indiscriminate disposal	The residents lack knowledge on the importance safe solid waste disposal

Name	Description
Negligence by individuals as a factor indiscriminate	The mindsets of individuals are in such a way that they are negligent to the initiatives which are in place
Non-payment of waste fees	The residents don't want to pay for the solid waste disposal services provided for by the council
poor implementation of Policyto influence indiscriminate disposal	The policies put in place are not implemented due to political inclination by residents of ruling political parties
Unemployment Levels as contribuotrs to indiscriminate disposal	Unemployment levels are too high such that some individuals opt out of the services being offered and that is a challenge for the collectors
Knowledge and attitudes of community members on health	answer objective three
Able to explain atleast one effect of indiscriminate waste	The individual residents are able to explain the consequences of solid waste disposal
Avoiding fees and surcharges that come with waste collectors	One other attitude of individuals is that they avoid service fees and resort to indiscriminate dumping of solid waste
Greed by individuals to pay for waste collectors	Certain individuals seem to be greedy despite affordable service fees
Not afraid of illness that eminates from solid waste	This is because these individuals tend to always throw solid waste in undesignated places
POOR ATTITUDE TO WASTE	Despite the service fees for waste disposal being affordable some individuals just don't want to pay

Name	Description
DISPOSAL	
methods of storage ,collection and disposal of solid waste	answers to the first objective
Drainages as a means of storage, collection and disposal of waste	Method of solid waste disposal
Rubbish Pits as a method of storage, collection and disposal	These are dug in the household compounds
Solid Waste bins as method of storage, collection and disposal of solid waste	The main method is storage
Solid Waste Contractors for storage, collection and disposal of waste	These are the CBEs that transport solid waste in the compounds
Wheel barrow contrators as method of storage, collection and disposal	As a means of transporting solid waste material to the dump sites
Recommendations	Recommendations by the respondents
CBEs to engage council collectors for adherence of individuals	The recommendation is for CBEs to engage council inspectors so that they will punish the perpetrators of the law impunity
council officials to be on the ground	The council officials should be on the ground to see the magnitude of the problem at hand

Name	Description
implementing policy	
ensure policy is followed by correct implementation	this by enforcing stiff laws that will punish offenders that don't pay-up the service collection fees
increase tarrifs so that resources are enough	recommendation was to increase tariffs so that the resources are increased as k30 per person is not enough
Transport should be re-enforced	Transport is needed to ensure that waste is collected on time from the resident dust bins to the solid waste designation site gazetted

To back up the results, a codebook was generated as shown below in figure 5 that will help understand the themes and coding. Besides this, the code book also shows the description of every code that is presented in the hierarchical tables as displayed in figure 1, 2, 3, 4 and 5 above respectively.

CHAPTER 5: DISCUSSION OF RESULTS

OVERVIEW

5.1 Discussion of Key findings with supporting literature

In Lusaka, the local municipal Council sub-contracted franchise contractors Manage solid waste generated from WMDs through the private public partnerships initiative. This has also extended to the peri-urban compounds where waste generated from these areas is transported to the chunga dump site In this study the researcher's initial attempt was to first answer the questions on the; current storage, collection and disposal methods which communities are using. The common responses highlighted and themes created where; solid waste bins that the council contractors distribute upon payment of a service fee this is as supported by the an article written by LSWMU (2021) which highlights that they give franchise contracts to private waste collection companies to collect waste in WMDs on a franchise basis; the storage method as being rubbish pits where trash from the households is disposed. Waste is thrown in these rubbish pits which are dug within the confines of household premises. The other storage method which came out was that of some other residents who would rather dispose of their solid waste directly into the drainages for their own reasons. Among the methods of collection highlighted included approaches used by the franchise contractors and the local municipal authorities as from the findings in an article by Mojisola O (2012) from which it was stated that most of the methods of solid waste disposal in Ndola were by the local municipal authorities. Others include the illegal and independent wheel barrow contractors who use their own initiatives to go and dispose waste mostly in illegal un-designated solid waste material deposit sites. The other part of the question aimed at assessing the kind of solid waste disposal methods used in the three target compounds which most participants responded that they used rubbish pits and that some residents engage the CBEs to collect their waste regularly from bins, door to door from households and transport it to the dump site. This information is also supported by an article uploaded on the United Nations Habitat engine (1999) which clarifies further that in Lusaka, the CBEs have entered into contracts with the local municipal councils to collect and transport waste to landfills. The second question on the interview guide was intended to explore factors causing poor disposal of waste in the three target compounds. The most frequent responses where coded and produced and some

responses included; negligence of the residents and some individuals who opt to dispose of solid waste in un-designated waste sites and that they just openly dispose this waste indiscriminately for reasons that the participants in this study did not know. The other factor that was highlighted was the issue bordering on policy on waste management where the participants emphasized that if only the local authorities would get to the ground to formulate and enforce policies that would stiffen penalties for perpetrators of indiscriminate solid waste disposal, the non-compliers would be controlled and poor disposal can be avoided. This outcome is very similar to a research study done by Chulu, I (2017) who revealed that "monitoring by the local municipal council authorities was conducted on a weekly basis and not on daily basis" which is not adequate to overcome this kind of a challenge. Another factor which came out during the interviews was that the communities were characterized with low literacy levels, a situation which is similar to the findings by Nwafor, M. et al. (2019), who studied and came up with solid waste management problems at a University. These findings included; low environmental education and income status of individuals, non-payment of user fees to the contactors by some individuals simply because they don't just want and that they always want free services. Others were described by respondents as the unemployed who would rather spend that money on something else other than on solid waste collection. The issue of the councilors not supporting the residents / communities on providing sensitization / education on the importance of hygienic solid waste disposal was another pertinent factor which surfaced from the interviews. The third question that needed to be responded to was one which aimed at investigating the knowledge and attitudes of community members on health effects arising from indiscriminate disposal of solid waste in the three target communities. The responses where that (i) they are not afraid of illness simply because they lack the knowledge despite sensitization having been made time and again in the communities (ii) Secondly, most of the participants said some residents do have the money but just won't want to pay for the service fees for waste disposal to the council / CBEs and would rather dispose of waste indiscriminately around or across roads in drainages along their houses. This is similar to what Mwiinga, F (2015) highlighted in an article that some residents won't just pay service fees but would rather indiscriminately dispose solid waste in drainages. This brings us to the other response with regard to the attitude of defaulters shunning the solid waste disposal fees which is (iii) avoiding fees as a common practice of most of the

residents who shun payment of fess and opt for other modes of collection for their waste which is free. With regard to the part of the question on ‘attitudes’ the responses were that knowledge is very good as all the participants did answer and explain at least one effect of indiscriminate disposal of solid waste with emphasis that most attributing factor to this practice being that the current cholera endemic being experienced now as a real scenario at the moment during this study in Zambia. The final part of the study was to determine the extent to which communities in three selected (3) compounds manage challenges and opportunities associated with solid waste management. The findings show that these challenges do exist and that it is from these challenges that some individuals have decided to take opportunities from them to come up with innovative ways of resolving the problem of waste and generate some revenue for themselves. One of the challenges is that the local authorities do not have enough resources to collect and dispose solid waste for free from each household, this was one of the findings from the study that was done by Mwiinga, F (2014), of Choma, where it was stated that “ the waste management unit had a lot of challenges which included under staffing which leads to poor environmental education and consequent poor attitude change among individuals” and so the opportunity has come for the community based entrepreneurs who are sub contracted to collect solid waste at a fee to the people because the municipal council cannot do that by itself, this is also supported by the findings by Sambo J (2020) that suggested that insufficient finds and equipment are some of the challenge that have hit the local municipal councils in terms of solid waste management. Now this brings about another challenge that emanated from the study findings that regardless of the fees being affordable ranging between K50 to K80 per household per month, most of the residents in the communities were said to be voiding these fees and continued to dispose of their solid waste, carelessly. Besides this, another challenge which emanated during the interviews was that of the tendency of communities avoiding payment service fees and being greedy resulting from the perception that most CBEs provided the service at a discount not to help the people but to ensure that they bring as many people as possible on board just to make ends meet for themselves. Some of the recommendations by the Participants included stiffening the solid waste policies and penalties; having local authorities urged to visit the communities to see the magnitude of the solid waste disposal problem; and lobby to provide transport by the council for solid waste disposal.

CHAPTER 6.0: CONLUSION AND RECOMMENDATIONS

6.1 Conclusion

The research study conducted, explored factors influencing poor solid waste management in three (3) selected compounds, namely, Chawama, Kanyama and Mandevu compounds in Lusaka District by seeking answers from participants in the actual communities and the results have been documented and discussed in the presentation chapters in full detail. After the in-depth interviews from three (3) communities, the findings and results were analyzed and presented in Nvivo 14 showing the factors that influence management of garbage in the three compounds. The research questions and results have been answered and highlighted, respectively. The challenges and recommendations were taken note of and the study suggests; the need to review legislation on service fees garbage collection; local authorities to get on the ground and monitor routinely the areas and also stiffen penalties for defaulters; need for local councils to provide transport for solid waste transportation to designated dump sites. These recommendations constitute the solutions suggested to try and strengthen the solid waste system in these areas.

6.2 Limitations of the study

Festive season - The study was conducted in the month of December which is a festive season and it was not easy because people were busy making arrangements for festive celebrations. This had a negative effect on my study because concentration by participants was divided.

Rainy season - Similarly, during the rainy season, the attendance were affected due to the rains especially for participants who came from distant communities. Others had gone to the fields to cultivate.

Expected an incentive from the researcher - Despite explaining to the participants that the study process does not privilege them to get an incentive in terms of money, the researcher still deduced expectations for payment for their attendance.

High expectations from participants that the principal researcher was there to resolve their garbage problems - Despite explaining that the study was meant for academic purposes only, participants still perceived and expected the principal investigator to have gone there to resolve their existing garbage problem in their areas, especially

that there were outbreaks of cholera in the three (3) areas during the same period of the investigation.

Limited time and resources to interview as many people as possible - This limitation affected the study in the sense that it could have been richer if more were people reached and interviewed than the targeted in the study so as to have a comprehensive conclusion about the state of solid waste in the entire district of Lusaka.

6.3 Recommendations

6.3.1 During the interviews in almost all the three (3) communities, one of the common recommendations noted was the need to sensitize communities on disposal of waste and effects of indiscriminate disposal of waste.

6.3.2 The local councils were urged to work to towards strengthening and stiffen the enforcement of laws and legislation governing solid waste storage and disposal, especially on illegal collectors to mitigate and / or eradicate the challenges of storage and indiscriminate disposal of solid waste in the drainages, road sides, etc. This process is envisaged to work well with active community engagement and involvement.

6.3.3 The area councillors were urged to get involved closely to facilitate the mobilization of resources required for solid waste management in their respective areas. This approach will help to create demand for increased participation and involvement by community members.

6.3.4 The local council should improve the road(s) heading to the tipping sites at the landfill to reduce the turn-around time for waste disposal process.

6.3.5 The local municipal councils and the Ministry of local Government should give special priority to the empowerment of the CBEs in the process of expression of interest to access the CDF funds to enable them procure specialized trucks for collection and transportation of solid waste in the compounds of Lusaka.

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APPENDICES

APPENDIX 1: PARTICIPANTS GENERAL INFORMATION SHEET

I, Fred Nakaanga, are a student at the University of Lusaka (UNILUS) studying a Master of Science degree in Public health. I am conducting a research study to explore factors influencing poor solid waste management in three (3) selected compounds in Lusaka district. I am and as such, it is a partial fulfilment of this study under the named Institution. The institution is affiliated to the University of Lusaka Research Ethics Committee under which the study will be subjected for ratification and approval by the ethics committee called UNILUSREC.

Title of the study: To explore factors influencing poor solid waste management in three (3) selected compounds, namely, Chawama, Kanyama and Mandevu compounds in Lusaka District.

Procedure of the study

The participants will be told that in this study, you will be requested to grant the researcher authority to go ahead with the study or not, that you will be requested to give your opinions their perceived factors which contribute to poor disposal of garbage and giving the challenges causing these problems. You will be told further that this study will be done by conducting interviews with the researcher. It will also be clarified to them that even before conducting the interview, with them, the researcher will request their consent and a form will be signed by them. You will be told that they have a right to sign or not to sign the consent form before proceeding with the interview. The study will only be conducted when you consent to interview which will be conducted at any local authority structure in the vicinity convenient to you. I will also request you to grant me permission to record the process of the interview or not, using a digital recorder. Consent will still be sought despite that the questions to be recorded during the interview are available on the interview schedule. Feel free to inform if me if you are not comfortable for me to record any of specific piece of information and your position will be respected and final. Kindly note, that the interviewer will not capture any of your personal details by way of recording.

Apart from this, you will be required to respond to questions as asked by the researcher and may you will also be assigned to a group for focus group

discussions. You will be asked to respond to questions on factors which you perceive to lead to poor disposal of solid waste in your community. If you feel you cannot answer certain questions, you are free to remain silent. During the focus group discussions, questions will be directed to the group and not towards individual participants. As a participant, you have the right not to respond to a question or can even withdraw from the study any during the interview. Everyone in the team will be requested to avoid repeating what others have already mentioned though chances are there that others may still do so. The researcher will ensure that everything you mention is kept as confidential information.

The questions you will be required to respond will boarder on the questions as follows; What are the current storage, collection and disposal methods in your community?; What are some of the factors perceived to influence poor disposal of garbage in your community?; What knowledge and attitudes do community members have on health effects arising from poor disposal of garbage in your community?; How do communities in three selected (3) compounds of Lusaka district manage challenges and opportunities associated with solid waste management?

Participation

Participation is on a voluntary basis, and participants may opt to excuse themselves from participating and they will neither be penalized nor discriminated in any way. You may opt to be excused from participation in the study and dot need to give a reason for that. You may proceed to request that all the data you gave been withdrawn and shredded and you will not be penalized for that. Despite this, you will still be eligible to get your transport refund. You are also allowed to leave out certain questions and will not attract any penalty.

You are free to ask to questions about the procedures answered (if not answering these questions will affect the study outcome). You may ask the principal researcher any questions which you may have after reading this script of the information sheet before the study starts.

Voluntarism

Participation in his study is purely on a voluntary basis and you are allowed to be excused from the study any time you wish to do so. If you decide not to participate in the study, or you decide to go ahead, you can still rescind your decision later and withdraw from participation. If you decide to withdraw from the study, all information submitted earlier on, will be destroyed and thrown away.

Guarantee of confidentiality

Be rest assured that all the data which will be captured from you and all other participants not have personal data about you but will contain only pertinent information required for the research study. All the data you will provide will not be connected to the identifier information which you gave such as your name, address or emails etc. Be rest assured that all the information which will be gathered from this study will be strictly used for the purpose of this study. In case this information provided is used in a presentation, your personal information will remain synonymous and there will be no link to you as the owner. All the pieces of data and information gathered will be strictly stored under key and lock. In an eventuality that access is biometric and/or electronic the pass key(s) will be kept by the researcher only. A master list will be stored separate from any form of discernable information till the end of the investigation. Only the researcher and the supervisor will access the information provided when need arises. A code will be used to store all the information collected during the study so that we are able to match you with your responses.

Risk

The researcher will ensure that that all your information provided during this study is kept safe and secure. .Any information which likely to link you to be identified will be kept safe to ensure that you are protected with confidentiality and avert possible risks to breach ethical guidelines.

Benefits

Participant may not have any direct value from this study now but later in the future, the recommendations of the study will be used by policy and Law makers to develop policies and laws which will make the management of solid waste perfect in your area and avert many diseases which are as a result of poorly disposed garbage.

Cost

Participants will not incur any costs for their participation in the study and as such no payment will be made for being part and parcel of the study. Your inclusiveness is purely on voluntary basis. .

Compensation / Re-fund

You shall not receive any payment for your time for participating in this study however you will be given a lunch allowance for your time and inconvenience.

Questions

Any questions regarding this study now or later, can be directed me, Fred Nakaanga using my contact numbers as follows: 0977376469 0r 0960913746. In case you need clarity on your rights as a participant, you can get in touch with The Chairperson - UNILUSREC, Lusaka.

Contact details for Principal Investigator

For further information

I will be available to respond to any questions from you on this study ant time you may contact me through my details availed below as;

NAKAANGA FRED
C/O CITIMOP LIMITED
P.O. BOX 51323,
LUSAKA.
EMAIL: frednakaanga@yahoo.com
MOBILE NUMBER: 0977376469

In case you may want to know about the publication of the findings of the study, you can contact the Chairperson of the University of Lusaka Research Ethics Committee (UNILUSREC) as follows;

THE CHAIRPERSON
THE ETHICS COMMITTEE,
TELEPHONE: ,UNILUSREC
LUSAKA, P.O. BOX , TELEX:
E-MAIL: postgraduate@unilus.ac.zm

APPENDIX 2: PARTICIPANT CONSENT FORM

CONSENT FORM

Study Topic: To explore factors influencing poor solid waste management in three (3) selected compounds, namely, Chawama, Kanyama and Mandevu compounds in Lusaka District.

I have read and explained to all the entire information sheet with regards to the study and have appreciated what the study objectives. The researcher has responded to all my questions satisfactorly. I have also been enlightened further o my right to request for more information anytime during the process of the study.

I understand that:

- My inclusiveness in the study is purely voluntary;
- I have a right to withdraw from the study any time and will not have any implication on me.
- All data and information collected from me will not contain key identifiers and will be shredded after the study.
- The findings of the study may be publicized or included in some and I will remain anonymous.

I consent participate in this study

.....	**.....**	**.....**
Print Name	Signature/Thumb print	Date
.....	.....	
Contact number	…….....	
Contact Address……..		
.....	.....	.....
Researcher	Signature	Date
Contact number.....		
.....	.....	.....
Witness	**Signature/Thumb print**	**Date**

Appendix 3: Data collection tool

3.1 INTERVIEW GUIDE

3.2 Interview schedule

Theme: exploring factors To explore factors influencing poor solid waste management in three (3) selected compounds, namely, Chawama, Kanyama and Mandevu compounds in Lusaka District.

Note to Interviewer: *Instructions to interviewee are in italics. Questions for interviewer to read out are in* normal *print.*

Interview reference numbers for re-interviewed subjects should match up with their original reference.

Interview Reference Number:

Read out the following:

I am carrying out a study to explore factors influencing poor solid waste management in three (3) selected compounds, namely, Chawama, Kanyama and Mandevu compounds in Lusaka District. Would you mind answering a few questions on your experience regarding this problem? (*If they decline, discontinue the interview and thank them.*)

Your answers will be treated with confidentiality for the purpose of research and the production of the report. All responses will remain anonymous.

How would it be best to contact you later on?

Record contact details here: Name: _____

*Physical Address*_____

*Postal Address:*_____

*Telephone Numbers (H)*_____*(W)*_____

*Mobile number(s):*_____

I. Opening

A. (*Establish Rapport*) [shake hands] My name is Fred Nakaanga, a student with The University of Lusaka. I thought it would be a good idea to interview you, so that I can get to know more about you and to also hear your view on factors influencing poor solid waste management in three (3) selected compounds, namely, Chawama, Kanyama and Mandevu compounds in Lusaka District. (Purpose) I would like to ask you some questions about your background, your education,

your experiences on waste management and disposal in your area.

B. (*Motivation*) I hope to use this information to help me complete my studies and also see possibilities of recommending some findings to the local authorities to improve the public health system in Lusaka district.

C. (Time Line) The interview should take about 15 -20 minutes. Are you available to respond

to some questions at this time?

(Transition): Let me begin by asking you some questions about yourself, your surrounding environment and the waste collection services.

II ***Body***

(Topic) General demographic information

1 Gender – Female Male

3 How old are you?_____

4 Are you married? _____

5 If so, how many children do you have?_____

What is your highest level of education? _____**(To be recorded)**

6 What is your profession/occupation? _____

Could you explain to me what you understand by solid waste management? **(To be recorded)**

Prompts: aspects of garbage collection, transportation and disposal in your area.

7 Are you aware about the current solid waste management services in your area? **(To be recorded)**

- Yes
- No

Prompt: if yes, explain to me in detail what you know.

Are you subscribing to it?

If yes, explain any benefits to you and the immediate surrounding Environment

If not, could you share with me how and where you are disposing your waste?

Prompts: If you are not participating or subscribing to it, give reasons why

8 Could you explain to me your views towards the existing garbage collection service in your area? **(To be recorded)**

Prompts: Do you appreciate it?

Is it helpful to the community to enjoying a clean environment?

Prompts: If not, explain why?

9 Could you share with me what you think are the possible causes of poor disposal of waste in your area? **(To be recorded)**

Prompt: In your view, explain some of the issues that contribute to poor garbage disposal in your area?

10 Do you contribute any fees towards garbage collection in your area?

Prompt: if yes how much?

Prompt: is the fee fare or it's on the high side?

11 What is your view regarding payment of fees towards garbage collection in your area?

(To be recorded)

Prompt: Are you happy with it? Explain

Prompt: What are your perceptions regarding poor waste disposal and the outbreaks of diseases in your area?

Prompt: Do you think the attitudes of communities can be a contributing factors to poor disposal of waste in your area? And if so what do you think can be done to avert this situation?

Prompt: Is the LCC or company managing waste in your area doing a good job? Explain

Prompt: Do you think high service fees could be a factor to poor waste management services? Please explain.

12 What do you think should be done to make the waste management system be meaningful to the people in your area? **(To be recorded)**

13 Explain what you think on the knowledge and attitudes of community members on health effects of poorly disposed solid waste in your community. **(To be recorded)**

14 Give your views on what you think about how the people in your community manage challenges in solid waste.

15 Do you have any comments or recommendations regarding solid waste collection, disposal, and public health in your residential area? **(To be recorded)**

16 What do you think should be done to improve the health of people in your area?
(To be recorded)

Prompts: Waste collection methods and approaches

Government support through policies and by-laws
Infrastructure development

Increased community participation

17 Do you have any questions or contributions?
(To be recorded)

Thank you for your time to attend to my study.

APPENDIX 4: WORK PLAN

GANTT CHART: TIME LINE	**MONTH**					
ACTIVITY	**Aug 2023**	**Sept 2023**	**Oct 2023**	**Nov 2023**	**Jan 2024**	**Feb 2024**
Review of research proposal						
Submission of research proposal to UNILUS						
Approval by UNILUSREC ethics committee						
Mobilization of research tools						
Data collection						
Data Compilation						
Data analysis, documenting & dissertation report preparation						
Submission of research report to University of Lusaka						
Dissemination of study findings						

Appendix 5: Budget

S/N	DESCRIPTION	QTY	UNIT	FREQ	UNIT/COST	TOTAL
	Stationery					
1	Pens	1	box	1	50	50.00
2	Bond paper	5	reams	1	90	450.00
3	Box files	5	Files	1	45	225.00
4	Batteries	3	sets	1	80	240.00
5	high lighters	3	sticks	1	10	30.00
6	Folders	10	folders	1	8	80.00
7	File Fastener	1	box	1	25	25.00
8	Writing Pads	5	pads	1	25	125.00
9	Fuel costs	50	litres	1	25	1,250.00
10	Lunch costs	25	Plates	1	85	2,125.00
11	Data analysis and processing	1	contract	1	3,500.00	3,500.00
12	Dissemination meeting	20	people	1	85	1,700.00
GRAND TOTAL					**ZMK**	**9,800.00**

APPENDIX 6: Authorization letter from the NATIONAL HEALTH RESEARCH AUTHORITY (NHRA)

NATIONAL HEALTH RESEARCH AUTHORITY

The Health Research Act

(Act No. 2 of 2013)

MINISTRY OF HEALTH

ONE ZAMBIA ONE NATION

National Health Research Authority ZAMBIA

CERTIFICATE OF REGISTRATION

THIS IS TO CERTIFY THAT

Fred Nakaanga

has been registered as a Health Researcher

Dated this 12th February 2024

Registration number NHRAR-R-1313/10/02/2024

A/DIRECTOR AND CHIEF EXECUTIVE OFFICER

PROF. VICTOR CHALWE

APPENDIX 7: Authorization letter from the University of Lusaka Research Ethics Committee (UNILUSREC)

UNIVERSITY OF LUSAKA
SCHOOL OF MEDICINE AND HEALTH SCIENCES
LEOPARDS HILL CAMPUS
Plot No. 37413, Off Alick Nkhata Mass Media. P. O Box 36711, Lusaka.
Phone: +260211258505, 258409 Fax +260211233409; Cell +260976075850,961917862,
E-mail:unilus@zamnet.zm,ictar@zamnet.zm

SCHOOL OF MEDICINE AND HEALTH SCIENCES RESEARCH ETHICS COMMITTEE

Ref no: FWA00033228-00511/23

Date: 10th November 2023

STUDENT NAME: NAKAANGA FRED; STUDENT NUMBER: MPH22113504

STAKEHOLDERS' PERSPECTIVES ON INDISCRIMINATE DISPOSAL OF SOLID WASTE IN LUSAKA, A CASE OF THREE (3) SELECTED COMPOUNDS IN LUSAKA DISTRICT, NAMELY; CHAWAMA, KANYAMA AND MANDEVU COMPOUNDS

The above research was submitted to the research ethics committee for review. The study has no major ethical problems and is approved subject to the following:

1. The study cannot be changed without express permission of the UNILUS research ethics committee.
2. Approval from the necessary authority should be sought.

Congratulations and the committee wishes you success in your work.

Prof Kasonde Bowa
MSc(Glasgow),M.Med(UNZA),FRCS(Glasgow),FACS,FCS,DPH(LSTMH),MPH(UCL)
Chairman- UNILUS REC
Professor of Urology and Consultant Urologist
Executive Dean
University of Lusaka and University Teaching Hospital
School of Medicine and Health Sciences.

APPENDIX 8: Authorization letter from LISWC

LUSAKA INTEGRATED SOLID WASTE MANAGEMENT COMPANY LIMITED
Telephone +260 211 250357
Mobile number: + 260 952 721 937
Email: liswmc@gmail.com

Church Road
Plot No. 2020
LUSAKA

REF: LISWMC/

15th December, 2023

Mr. Fred Nakaanga
Citimop Ltd
P O BOX 51323
LUSAKA

Dear Sir,

RE: REQUEST TO CONDUCT A RESEARCH IN SOLID WASTE IN MANDEVU, KANYAMA AND CHAWAMA COMPOUNDS

The above captioned subject refers.

Lusaka Integrated Solid Waste Management Company is in receipt of your letter dated 28th November, 2023 in which you requested for permission to conduct a Research study on "**Exploration of factors that contribute to poor disposal of solid waste".**

In view of the above, the Company has no objection to your request, furthermore, ensure that you share a copy of the report with the Company.

For further details contact Mr. Gift Mwiinga the Senior Inspector and Standards Officer on **0979127423**.

Yours faithfully
LUSAKA INTEGRATED SOLID WASTE MANAGEMENT COMPANY

Imuwana Mwanamwalye
INTERIM CHIEF EXECUTIVE OFFICER

LUSAKA INTEGRATED SOLID WASTE MANAGEMENT COMPANY LIMITED
OFFICE OF THE CHIEF EXECUTIVE OFFICER