

**COMMUNITY PARTICIPATION IN SOLID WASTE MANAGEMENT  
IN AVONDALE LUSAKA ZAMBIA**

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**COMMUNITY PARTICIPATION IN SOLID WASTE MANAGEMENT  
IN AVONDALE LUSAKA ZAMBIA**


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**A project report to be submitted to the Department of Geography at the University of Zambia in a partial  
fulfillment of the degree B.Sc. Natural Resources**

**NOVEMBER 2003**

**DECLARATION**

“I MWEETWA MUDENDA, declare that this report has been composed and compiled by me and that the work recorded has been done by me, that the sources of all material referred to have been specifically acknowledged, and that the project report has not been accepted in any previous application for academic award”

Signature.......... Date..... 21 / 10 / 03 .....

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May  
God bless you all

## **ABSTRACT**

Presence of uncollected waste on roadsides, empty plots and on residencies is becoming a common feature in Avondale.

*The aim of the study was to identify a solid waste collection system that residents of Avondale and the type of support residents were willing to offer to the selected system.*

There is no solid waste collection in Avondale. The current situation has been linked to the inability of the city council to effectively collect waste. Poor finances and planning have been cited as the major contributing factors.

The research has shown that the residents of Avondale want to have a solid waste collection system that they will be able to support. The collection system that was chosen is the curbside liftable container system. The residents are willing to pay money to a desirable service provider.

## **TABLE OF CONTENTS**

	<b>Page</b>
Declaration	i
Acknowledgement	ii
Abstract	iii
Table of contents	iv
List of tables	vii
List of figures	vii

### **CHAPTER ONE**

1.0 INTRODUCTION	1
1.1 Background of the study	1
1.2 Problem statement	1
1.3 Aim	2
1.4 Objectives	2
1.5 Hypothesis	2
1.6 Rationale	2
1.7 Preview of the organization of the report	2

### **CHAPTER TWO**

2.0 LITERATURE REVIEW	4
2.1 Solid waste management	4
2.2 Principles of solid waste management	4
2.3 Impacts of solid waste on the environment	5
2.4 Solid waste management issues in Zambia	6
2.5 Government policies and legal framework on waste management	6
2.6 Limitations of government policy and legal framework	7
2.7 Solid waste collection in Lusaka	8
2.8 Collection methods	10
2.9 Community participation in solid waste management	11
2.10 Gaps in research	12

**CHAPTER THREE**

3.0 LOCATION AND DESCRIPTION OF THE STUDY AREA 13

3.1 Study area 13

3.2 General description 13

3.3 Climate 13

**CHAPTER FOUR**

4.0 RESEARCH METHODS 16

4.1 .0 Methods of data collection 16

4.1.1 Primary data collection 16

4.1.1.1 Structured interviews 16

4.1.1.2 Unstructured interviews 16

4.1.1.3 Field observation 17

4.1.2 Secondary data collection 17

4.2 .0 Sampling method and sample size 17

4.3 .0 Coding and analysis of data 17

4.4 .0 Limitations of data collection 18

**CHAPTER FIVE**

5.0 PRESENTATION AND ANALYSIS OF RESULTS 19

5.1 Profile of the respondent 19

5.2 Solid waste collection and disposal situation 21

5.3 Community participation 26

**CHAPTER SIX**

6.0 DISCUSSION 28

**CHAPTER SEVEN**

7.0 Conclusion and Recommendations	30
7.1 Conclusion	30
7.2 Recommendations	31

<b>REFERENCES</b>	32
-------------------	----

<b>APPENDICES</b>	33
-------------------	----

5.1 Summary	
5.2 Summary	
5.3 Summary	
5.4 Summary	
5.5 Summary	
5.6 Summary	
5.7 Summary	
5.8 Summary	
5.9 Summary	
5.10 Summary	
5.11 Summary	
5.12 Summary	
5.13 Summary	
5.14 Summary	

<b>LIST OF</b>	
1.	
2.	



**LIST OF TABLES**

2.0 Estimated yearly quantities of waste generated in Lusaka in 1996	8
2.1 Mass of solid waste generated per person per day	9
5.1 Summary of family size of respondents	19
5.2 Summary of the education status of respondents	19
5.3 Summary of economic activities of respondents	20
5.4 Summary of income levels of respondents	20
5.5 Summary of solid waste collection status	21
5.6 Summary for reasons of poor solid waste collection	22
5.7 Summary of private company involvement in solid waste collection	22
5.8 Summary of residents interest in solid waste collection service	23
5.9 Summary solid waste disposal methods	24
5.10 Summary of final destination of solid waste generated	24
5.11 Summary of preferred solid waste collection methods	25
5.12 Summary of frequency of preferred solid waste collection methods	26
5.13 Summary of respondent’s willingness to participate in waste management	26
5.14 Summary of money residents are willing to pay for solid waste collection	27

**LIST OF FIGURES**

1. Street map of Avondale	14
2. Map of Zambia showing the location of Lusaka	15

## **CHAPTER ONE**

### **1.0 INTRODUCTION**

This study focuses on solid waste collection methods and the role of the community in supporting waste management in their neighborhood. A Suitable waste collection will help garbage collectors easily collect garbage from households. Clandestine dumping makes it difficult to manage waste. The community should support the waste collection method to ensure its sustainability. The study is also intended to discourage poor waste disposal methods such as burying and burning, which are detrimental to the environment in the long run.

#### **1.1 Background of the study**

In the early 1970s and 1980s, garbage was collected from most residential areas in Lusaka. The city council used to provide metal dustbin to each household. Each household was mandated to dispose of waste in dustbins and on appointed dates, residents line up their dust bins along the road. The garbage collection crew empties the contents of the garbage bin into a compactor truck for final disposal.

However, during the early 1990s to date, there are no such services provided by the Lusaka city council anymore. This study will also look at the possibility of resuming garbage collection with community and private sector participation.

#### **1.2 Problem statement**

Currently there is no sufficient solid waste collection in Avondale as indicated by the by the presence of uncollected waste on empty plots and along roadsides. This problem has been exacerbated by the poor financial status of Lusaka city council.

The accumulation of solid waste in Avondale has potential to reduce property values and pose health risk. There is therefore need for the residents to identify a suitable solid waste collection system that the will support.

### **1.3 Aim**

The aim of this project is to identify a solid waste collection system that residents of Avondale will support.

### **1.4 Objectives**

1.4.1 To find out if residents are interested a solid waste collection service,

1.4.2 To identify a solid waste collection method preferred by the majority of the residents,

1.4.3 To identify forms of support that residents are willing to offer to solid waste management and

1.4.4 To make recommendations to stakeholders interested in solid waste management.

### **1.5 Hypothesis**

Residents of Avondale want to have a solid waste collection system that will be supported by the members of the community.

### **1.6 Rationale**

This study is intended to show the most preferred solid waste collection method and the role the community would play in the waste management. The results can utilised by stakeholders in waste collection. Private companies interested in collection of waste would be furnished with the necessary information.

### **1.7 Preview of the organization of the report**

In the first chapter, the background of the study, the statement of the problem, the aim and the objectives have been introduced. In chapter two, literature relevant to the subject has been reviewed while chapter three gives the location and characteristics of the study area. The fourth chapter outlines the study methodology, sources of data, sampling procedures, and sample size.

In chapter five, research findings are presented. This forms the analytical part of the report. The sixth chapter discusses the results and the last chapter concludes the study restating the summary of the findings and offering recommendations to solve the studied problem.

## **CHAPTER TWO**

### **2.0 LITERATURE REVIEW**

#### **2.1 Solid waste management**

Solid waste management consists of three sub components. The collection system, transportation system and disposal system. The collection system collects garbage from the sources of generation. The third component is final disposal, which consists of sanitary landfill, incinerators and composting.

Due to rapid urbanisation of Lusaka, LCC is unable to cope with the increasing demand for solid waste management that has resulted in garbage and sanitation situation being in a chaotic state. Various research studies have shown that industrial processed goods have led to changes in the composition of waste from biodegradable to non-biodegradable.

#### **2.2 Principles of solid waste management**

The primary objectives of solid waste management are to protect human life from disease acquired by poor sanitation and pollution of water and air, and to protect the environment and natural resources.

The following principles are essential for environmentally sustainable solid waste management. (ECZ, NORAD 2001)

##### **2.2.1 Precautionary principle:**

This principle assumes that all waste is harmful until proven otherwise. Applying this principle will result in treating all waste with caution and disposing it in a safe manner.

##### **2.2.2 Polluter pays principle:**

This principle states that the natural environment is not free of charge. Individuals or industries that pollute the environment should pay for the pollution they cause. This principle deters would be polluters from polluting the environment anyhow.

### 2.2.3 BAT Principle (Best available technology principle)

Poor technical solutions are no excuse for pollution if better technology is available. Therefore, better technology should be sought for to reduce levels of pollution.

### 2.2.4 Cradle to grave principle:

All stages of production process should be examined with regard to pollution. The packaging materials of products should be biodegradable or reusable to reduce the amount of solid waste generated by the end users.

### 2.2.5 Critical load principle:

This refers to the limit of pollution that the natural environment can withstand without becoming permanently damaged. The critical load should not be exceeded. Waste should thus be collected from the residences before it becomes a danger to the environment and to human health.

## 2.3 Impacts of solid waste on the environment

The environmental impacts of various waste have become apparent due to poor disposal practices. Disposal of waste on illegal dumpsites may result in the leaching of the contaminants into the soil and eventually into the water table. This may eventually result in water pollution.

Mining operations generate huge amounts of rock, slag and small quantities of toxic hazardous chemical waste. Poor incineration results in emission of toxic substances such as Lead, Mercury, Chromium, Tin and Zinc into the atmosphere. (ECZ, NORAD 2001)

According to Mayeya (1997), dumps are not just aesthetic disasters but also serve as breeding grounds for disease carrying organisms such as rats, cockroaches and flies.

Rats are reservoirs for disease such as *Plaque*, *Murine*, *Typhus*, *Leptospirosis* and *Samonellosis*. (National Academy of Sciences 1984)

## **2.4 Solid waste management issues in Zambia**

A study of municipal solid waste in Uganda and Zimbabwe concluded that many least developed countries do not have well formulated sector strategies for solid waste management. (Mwiraira, et, al 1991). The need for an environmentally acceptable waste management strategy has become an urgent issue in Zambia. (ECZ, NORAD 2001)

The countries that receive aid from the World Bank have to heed to its demands. The World Bank demands that issues of development must be tied to environmental sustainability and in line with the United Nations Conference on Environment and Development resolution. The lead to the formation of the Environmental Council of Zambia (ECZ), the Ministry of Environment and Natural Resources (MENR) was later created in 1994.

The ECZ facilitates environmental quality control. This done through the enforcement of the Environmental Protection and Pollution Control Act (EPPCA), of 1990.

In 1994, the government came up with the National Environmental Action Plan (NEAP) to deal with issues of environment and natural resources degradation.

## **2.5 Government Policies and Legal Framework on waste management**

During the last few years, Zambia has been trying to establish various control systems for the management of waste and is giving increased attention to waste management strategies.

Some of the regulatory measures to minimise and ensure its safe disposal are outlined below.

Environmental Pollution and Control Act number twelve of 1990; this act empowers ECZ to give specific or general directions to District Councils on their functions in relation to collection and disposal of waste. The ECZ has issued a series of regulations such as the waste management regulation relating to licensing of solid waste transportation and control at landfill and waste disposal sites.

(ECZ, NORAD 2001)

Public Health Act, cap 535. This act gives powers and imposes duties to local authorities regarding disposal of liquid and solid waste.

The Local Government Act and Council by-laws have regulations that relate to solid waste management such as the;

- i. Prohibition of burning refuses in public places,
- ii. Prohibition of the deposition of refuse in public places,
- iii. Property owners have an obligation to provide dust bins with lids,
- iv. Frequent collection should be done in order to keep all parts of the city clean and
- v. Finally, Zambia is a signatory to the Basel Convention on the control of Trans-boundary Movement of hazardous Waste and their disposal. This led to the passing of the statutory instrument number 171 to control municipal waste.

## **2.6 Limitations of government policy and legal framework**

Some legal aspects of waste management are not yet adequately covered by the Zambian legislation. There are no specific guidelines in place to regulate the management of hospital, special and hazardous waste. The legislation does not provide strict system of inspection to ensure laws are being followed and illegal activities identified and prevented.

The delegation of power to local authorities by ECZ has proved to be futile since local authorities have no capacity to perform their functions in relation to solid waste management. Most of the council's problems of mismatch between assumed responsibilities and available resources, inadequate qualified personnel and enforcement of penalties for non-compliance are not strict. (Steer, 1979)



## 2.7 Solid waste collection in Lusaka

Most of the solid waste generated in the city is collected by LCC. This is mainly done in the city center and low-density areas such as Chudleigh, Jesmondine, Kalundu, Roma, Olympia, Thornpark, Kabulonga and Woodlands. Avondale and Chelstone are sporadically served. It is also estimated that only half the houses are served in the areas mentioned above. (ECZ, LCC 1997)

The waste collection services in most developing countries consume 30%-60% of available municipal revenues. In many instances, these costs can be reduced by 30%-50%. (World Bank 1991). Excessive expenditure on collection service takes limited financial resources away from addressing other urban needs such as public education. The table below shows a summary of annual waste in various categories.

Table 2.0 Estimated yearly quantities of waste generated in Lusaka and its density in 1996.

Category of waste	Estimated Quantities (tons/year)	Percentage of total quantity	Density (Kg/m3)
<b>Domestic</b>			
High Density	169,143	69.50%	395
Medium Density	36,493	15.00%	309
Low Density	13,678	5.60%	447
<b>Trade and industry</b>			
Hotels	1,392	0.60%	277
Markets	11,783	4.80%	207
Industry and commerce	5,559	2.30%	51
<b>Others</b>			
Hospitals	52,811	2.20%	Not analysed
Total	243,329	100%	-

*Source ECZ, LCC and CIDA 1997. Solid Waste Management Master Plan Project For City of Lusaka. Phase 1-Diagnosis*

The annual average increase of waste in Lusaka alone is expected to grow from about 243,000 tons in 1996 to 530,000 tons in 2011, an increase of 14%. (ECZ, NORAD 2001). According to a joint study carried out by the Lusaka City Council and the Environmental Council of Zambia in 1996 revealed that only 10% of domestic waste generated in the city is disposed at landfill sites. This means that the remaining 90% is heaped in various parts of the city, buried in rubbish pits and littered along roadways.

Of the 243,000 tons waste, more than two thirds was generated in high-density areas, where almost no waste is collected. A collection rate of 12.3 per cent was recorded in Lusaka in 1996. (ECZ, LCC 1997)

The table below shows domestic waste generation rates for the city of Lusaka

Table2.1 Mass of solid waste generated per person per day

Low density	0.41 kg/person/day
Medium density	0.54 kg/person/day
High density	0.56 kg/person/day

Source; (ECZ, LCC 1997)

Domestic waste in high-density area accounted for are about 70% of total waste in Lusaka and consists 66% and 25% putricibles. Of all the domestic solid waste generated in Lusaka, Lusaka City Council effectively collects only 12.4%. Private companies only collect about 2.0%( ECZ, LCC 1997).

Private companies offer waste management on commercial basis. Economic fees are charged for collection and disposal of waste. Residents of medium to high-income residential areas usually hire them. Non-Governmental Organisation (NGOs) and Community Based Organisations (CBOs) work with low-income communities to carry out sold waste management activities.

## **2.8 Collection methods**

Collection is by far the largest cost element of municipals. Collection can be based on one person collector or a collection crew that moves through a service area with a vehicle for collecting waste. In some countries, the local authorities use private contractors for the collection of waste especially from households.

The following are the common solid waste collection methods that are used in most countries. (ECZ, LCC 1997)

### **2.8.1 Collection of liftable containers from roadsides (curbside collection system)**

Households dispose off waste in liftable containers made from plastic material. On appointed days, they line their waste receptacles along the street roads and the collection crew empties the contents into a waste collection truck. This method is popular in low-density areas.

### **2.8.2 Collection from central dumping place.**

Communal dumpsites are allocated to a particular community. The residents dump their household waste on that site and when it accumulates, the refuse collection crew loads it onto a collection truck for final disposal. This method is common in high and medium density areas.

### **2.8.3 Collection from communal portable container.**

Waste collectors provide large metal containers. When a container is full, specialised trucks lift and load the container to be delivered to a final waste disposal site. This method is common in high and medium density areas.

## **2.9 Community Participation in Solid Waste Management**

Community participation is the process by which individuals or families assume responsibilities for their own welfare and for those of the community and develop the capacity to contribute to theirs and the community development. ([www.iges.org.jp](http://www.iges.org.jp) 2002)

The key element of successful public participation is the involvement of communities in various phases of the project such as planning, implementation, operation and evaluation of projects. It is reported that means for building political support for environmental improvement is public participation in environmental management activities.

(World Bank 1994).

In high density areas community involvement in projects such as solid waste management is very common. It is not difficult to contact participants compared to low-density areas. CARE Zambia has been involved in solid waste management projects in N'gombe compound in Lusaka. The compound has Residential Development Committees (RDCs) that collaborates with the LCC officials and other stakeholders on development issues. In Matero compound, during the out break of Cholera, CARE assisted by providing tools tractors and protective clothing to clear waste from their surrounding.

(ECZ, LCC 1997)

In medium and low-density areas, it is difficult to bring people together to achieve a common goal. Most of them a willing to participate only by providing financial resources to carry out an activity.

There are a number of benefits for communities that participate in community activities. Communities have increased knowledge, opinion and understanding of the major issues that affect them. They are able to set realistic objectives and targets that will be locally acceptable, meaningful and implementable. The overall gain is the buildup of commitment, accountability and transparency of the group involved. Community participation gives greater political credibility than for strategies that are drawn by technocrats and bureaucrats who use the top bottom approach in dealing with community concerns. (World Bank 1994)

## 2.9 Gaps in research

The only easily accessible document that addresses issues of solid waste management in Zambia is the *Solid Waste Management Plan Project For City of Lusaka. Phase 1-Diagnosis* and *The State of the Environment in Zambia*. Other documents only cover issues of solid waste in general. However, the two documents do not concentrate on collection methods and the roles of the community with regard to solid waste management. Both documents focus on improvement of waste management by analysing the waste management situation in Lusaka.

This research focuses on identifying a suitable solid waste collection system and the role the community would play in supporting the selected system.

## **CHAPTER THREE**

### **1.0 Location and Description of Study Area**

This chapter describes the geographical location and description of important features in Avondale.

#### **3.1 General description**

Zambia is a land locked country lying south of the equator at an altitude of between 1000 and 1600 meters above sea level Its total surface area is about 752,972 square kilometers, most of which is plateau (NCS 1985). Lusaka city has a total surface area of 360 square kilometers. In 1980, the population of Lusaka was 538,469(Williams 1984), in 1990, the population of Lusaka was 1.1 million (CSO 1990).

Avondale is located in the capital city of Zambia, Lusaka. It is about 7 km east of Lusaka along the Great East road and shares boarders with Chelstone, Chainta and Villawanga. The area has paved roads throughout.

Figure 1 shows the street map of Avondale in relation to its neighbors and figure 2 shows the geographical location of Lusaka in relation to other provinces in Zambia.

#### **3.2 Climate**

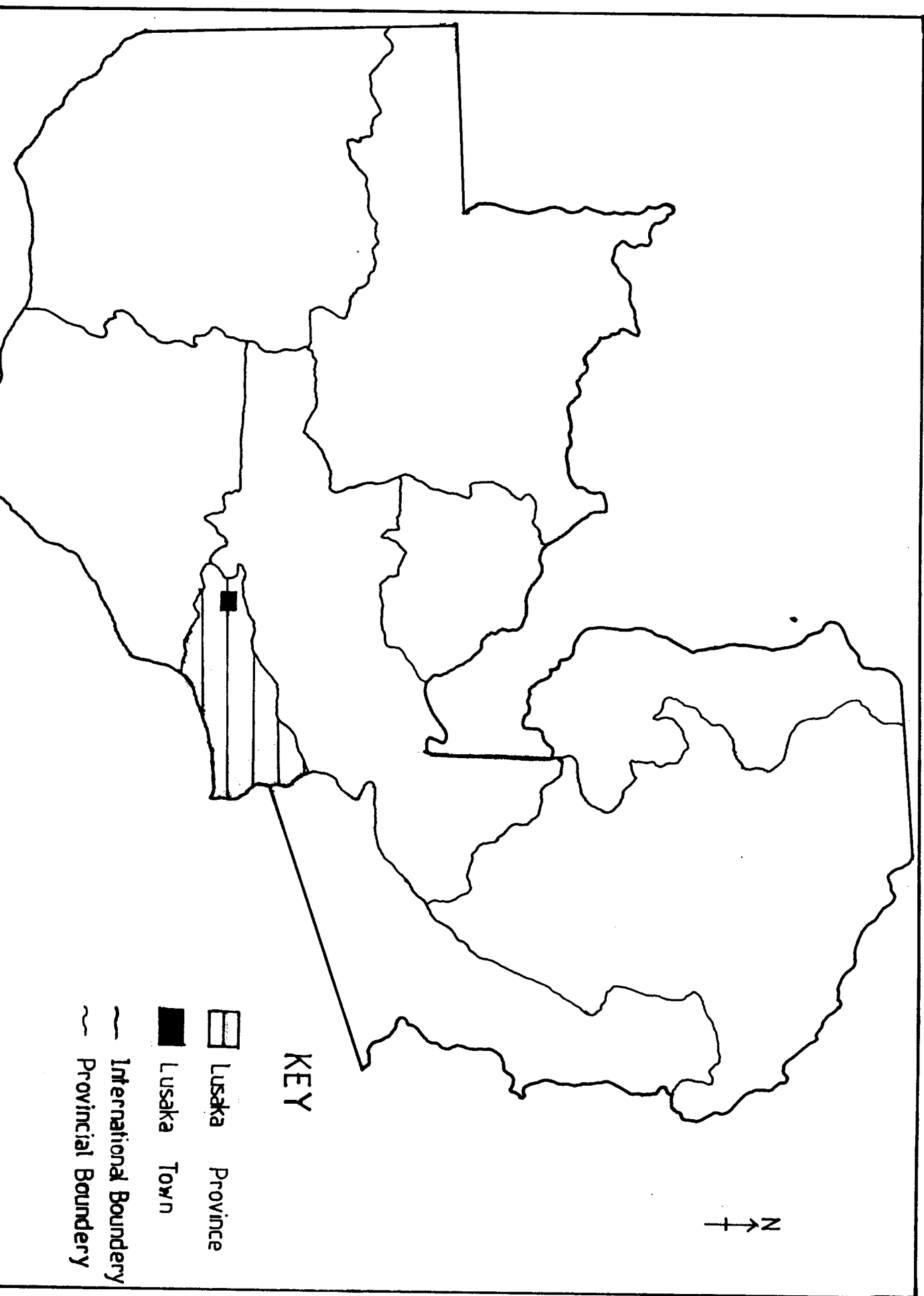
The city of Lusaka is in the tropics and so is Avondale. Its altitude is about 1300m above sea level. Three major seasons are observed; the hot dry season, the cool dry season and the hot wet season. The average temperature range from 10 degrees Celsius to the cold season to about 25 degrees Celsius in the cold season to about 25 degrees Celsius in the hot season. The annual rainfall of Lusaka is about 800mm.

Fig. 1

# STREET MAP OF AVONDALE



FIGURE 2: MAP OF ZAMBIA SHOWING THE LOCATION OF LUSAKA





## **CHAPTER FOUR**

### **4.0 RESEARRCH METHODS**

The methodology used for this report comprises methods of data collection used, sampling procedure, data analysis and problems encountered by the researcher during the research period.

#### **4.1.0 Methods of data collection**

##### **4.1.1 Primary data collection**

The primary data was collected by use of structured interview schedules directed to residents of Avondale. Unstructured interview schedules were directed to Lusaka City Council officials and private companies collecting waste. Additional primary data was collected through field observation done by the researcher while in the field. This method was beneficial in that the researcher got first hand information that represented the true feelings of the situation prevailing at the time of data collection.

##### **4.1.1.1 Structured interviews**

The researcher directly administered the structured interview schedules. This was done in order to reduce the amount of time taken to fill in the responses and to ensure that all unclear issues are clarified on the spot.

The questions were designed in such a manner that they can gather necessary information to meet the objectives of the study. (See Appendix 1)

##### **4.1.1.2 Unstructured interviews**

Unstructured interview schedules were administered to a Lusaka City Council official and a Clean Fast Limited official, a private company involved in waste collection. The interview aimed at finding out the reason for the current poor solid waste collection situation in Avondale and the terms and conditions private companies offer to their clients respectively. (See Appendix 11)

#### **4.1.1.3 Field observation**

While In the field, the researcher carried out simple field observations. This was done by checking for the presence of solid waste on roadsides, residences and empty plots. This enabled the researcher to get the general scenario about the prevalence of solid waste in Avondale.

#### **4.1.2 Secondary data collection**

The secondary data was obtained from published literature. The literature was sourced from the Environmental Council of Zambia library and the University of Zambia library in Lusaka. The information acquired from these two sources enriched the researcher's understanding on issues of solid waste and helped in the preparation of literature review.

#### **4.2.0 Sampling method and sample size**

The households interviewed were selected using simple random sampling. Random numbers from a random table were used to select a particular household. The first 40 random numbers that matched the house numbers were selected. Those households that were selected twice, the second selection was ignored. This method was used because the house numbers of houses was available. This method was also selected because it is scientific and not biased.

It is important to note that only 40 respondents were selected for this study due to limited time available for data collection.

#### **4.3.0 Coding and analysis of data**

The field data collected was coded and analysed manually by the researcher. The data was analysed both qualitatively and quantitatively. Qualitative analysis was done by narration while quantitative analysis was done by use of percentages and tables.

#### **4.4.0 Limitations of data collection**

The researcher encountered a number of problems during fieldwork. The following were the problems faced:

- i. Respondents in government institutions such as the LCC were not willing to give out information especially when they know that you are a UNZA student. Most of the information accessed from individuals within the institution on condition of anonymity,
- ii. Some of the respondents interviewed were not heads of households. This resulted in inaccurate information being given out in some cases,
- iii. Some households that were randomly selected were either vacant or no member of the family was available to answer questions or the owners did not want any interview. The next household was interviewed in such cases and
- iv. Some respondents were not willing to reveal their monthly earnings. Others exaggerated the values of their income.

## CHAPTER FIVE

### 5.0 RESEARCH FINDINGS

This chapter looks at the research findings under the following major headings: the profile of respondents, solid waste collection and disposal situation and community participation in solid waste management.

#### 5.1 Profile of the respondent

Questions one to four examined profile characteristics of forty respondents such as family size, level of education, employment status and expected income.

Table 5.1 Summary of family size of respondents

Family Size	Total	Percentage (%)
1-5	12	30.0
6-10	23	57.5
>10	5	12.5
Total	40	100.0

The table above shows that of all the respondents, 57.5% have a family size of 6 to 10 members and 30% have families of 1 to 5 members. Only 12.5% of respondents have a family size of more than 10 members. These family sizes include extended family and dependants that belong to the household.

Table 5.2 Summary of the education status of respondents

Education class level	Total	Percentage (%)
None	1	2.5
Primary	0	0.0
Secondary	1	2.5
Tertiary	38	95.0
Total	40	100.0

The education status of the respondents indicated that 2.5% of the respondents had not attained any formal education, 2.5% had secondary education and 95% had tertiary education. It is important to note that most respondents of Avondale are literate. Therefore, they are more likely to understand and appreciate the danger of uncollected waste and the benefits of a cleaner environment. Such a group of respondents is more likely to support initiatives to improve solid waste management in their communities. However, it should be noted that the 2.5% of respondents have attained secondary education and the other 2.5% never got any opportunity to get formal education.

Table 5.3 Summary of economic activities of respondents

Occupation class	Total	Percentage (%)
Formal and informal	34	85
Not employed	6	15
Total	40	100

A large number of the respondents (85%) are engaged in economic activities in formal and informal sector. Only 15% of the respondents were not involved in any income generating activity. Respondents generating income are more likely to financially support waste management in Avondale than the 15% that is not employed.

Table 5.4 Summary of income levels of respondents

Income range (Kwacha)	Total	Percentage (%)
200,000-900,000	13	32.5
1,000,000-3000,000	16	40.0
4,000,000-9,000,000	6	15
10,000,000-15000,000	5	12.5

Income ranges give an impression of how much money respondents earn and their ability to financially support waste management. The majority (40%) of respondents earn

between K1, 000,000 and K3, 000,000 per month. A proportion of 32.5% earn between K200, 000 and K900, 000 per month. Those who earn between K4, 000,000 and K9, 000,000 account for 15% and 12.5% earn between K10, 000,000 and K15, 000,000. The average income amounted to K2, 920,000 per month. The researcher observed that respondents were reluctant to reveal the incomes they earned. This resulted in extreme values of K200, 000 and K10, 000,000 per month. Renting a house in Avondale is in the range of K500, 000 to K1, 500,000 per month. It is therefore not possible to rent a house in Avondale with an income of K200, 000 unless the particular respondents own the houses.

There was also a possibility of trying to impress or mislead the researcher by giving extreme values. However, the average income of the forty respondents amounted to K2, 920,000 per month.

**5.2 Solid waste collection and disposal situation**

In this section issues such as solid waste collection status, reasons for current status, involvement of private companies, residents interest, preferred collection and disposal methods and frequency of collection were considered.

Table 5.5 Summary of solid waste collection status

Collection status	Total	Percentage (%)
Done	2	5
Not done	38	95
Total	40	100

Almost all respondents (95%) claimed that there was no solid waste collection service in Avondale by the City Council. Only 5% of the respondents claimed that there was solid waste collection. They have however not benefited from the service and they neither know the companies that provide the services nor the frequency of collection. It was therefore observed by the researcher that these respondents had no facts but merely offered their opinion that they could not substantiate.

Table 5.6 Summary for reasons of poor solid waste collection

Reasons	Total	Percentage (%)
Lack of transport	10	25.0
Poor planning	8	20.0
Poor funding	8	20.0
Poor participation by residents	4	10.0
Negligence	7	17.5
No idea	3	7.5
Total	40	100

Knowledge of the reasons for the failure by the City Council to effectively collect garbage will help find a solution. The table above shows that 25% of the respondents think that lack of transport is a major contributing factor to the current situation in Avondale. Poor planning was suggested by 20% of the respondents while the other 20% suggested poor funding. Some respondents (10%) however felt that if the community participated in solid waste management the situation could be better than it currently is. Negligence by the City Council to manage waste was highlighted by 17.5% of respondents and 7.5% had no clue regarding the cause of the current situation.

Table 5.7 Summary of private company involvement in solid waste collection

Involvement of private company	Total	Percentage (%)
Yes	37	92.2
No	3	7.5
Total	40	100.0

Since the council is unable to carry out its duties, the researcher wanted to find out if respondents would welcome the involvement of private companies to save the situation. The table above shows that 92.5% want participation of a private company. Since 95% of the respondents have tertiary level of education, the researcher assumes that the residents

will not expect a free service to be provided. However not all respondents favored the idea, 7.5% felt that it was unfair to bring in private companies as the residents are already paying land rates which are supposed to be used for such purposes. The majority who want involvement of the private companies in solid waste management have overshadowed this contrary view.

The table below shows whether the respondents were interested or not interested in a solid waste collection service. See the table below.

Table 5.8 Summary residents interest in solid waste collection service

Interest in solid waste collection	Total	Percentage (%)
Need solid waste collection service	28	70
Don't need solid waste collection service	12	30
Total	40	100

Respondents that need solid waste collection service were 70% and 30% did not need the service. The researcher observed that those that needed the service either generated a lot of garbage, had higher income, or were just interested in having a clean and healthy environment. On the other hand, those that did not need the service claimed that the quantity of waste they generate does not warrant the involvement any waste collection service.

The difference 22.5% between those that need the involvement of private companies and those that need solid waste collection service indicates that some respondents only support the idea of private company involvement but are not really interested in solid waste collection service.

There are several solid waste disposal methods that residents of Avondale practice. The table below shows the methods and the percentages of residents that utilise these methods.



Table 5.9 Summary solid waste disposal methods

Disposal method	Total	Percentage (%)
Rubbish pit	31	77.5
Empty plot	3	7.5
Dust bin	6	15.0
Total	40	100.0

From the table, 77.5% of respondents prefer dumping waste in rubbish pits than the 15% and 7.5% who utilise empty plots and dust bins respectively. The researcher observed that the rubbish pits are within the premises. There a very few empty plots in Avondale, these have become dumpsites. Households whose surroundings are not well maintained are littered with waste such as plastics, papers bottles and rubble. Some of the respondents that used dustbins empty the contents on empty plots and in rubbish pits.

The final destination of generated waste is crucial because it determines the quality of the environment in a particular area. The table below shows various final destinations of waste generated.

Table 5.10 Summary of final destination of solid waste generated

Final Destination	Total	Percentage (%)
Burying	29	72.5
Burning	7	17.5
Dumping on empty plot	4	10.0
Total	40	100.0

Most of the respondents (72.5%) burry the waste in rubbish pits and 17.5% burn the burnable waste. The waste dumped on empty plots is abandoned by 10% of respondents. Burying in rubbish pits is the most common method of disposing off waste in Avondale. This method does not allow non-biodegradable materials to be separated thereby

reducing soil quality. This method could have become popular due to the absence of an effective solid waste collection service.

There are various methods of collecting solid waste from the source of generation. The method selected has to be convenient to both the depositors and the collectors of waste. The table below shows the suggested methods and the percentage preference of each method.

Table 5.11 Summary of preferred solid waste collection methods

Collection method	Total	Percentage (%)
Curb side liftable container	28	70.0
Central dumping place	7	17.5
Communal portable container	5	12.5
Total	40	100.0

Curbside liftable container system was the most preferred by 70% of respondents because they only have to leave the garbage bins or plastics by the roadside for collection by the service providers. However, 17.5% of the respondents preferred the central dumping place because the frequency and quantity at which waste is discarded is not defined. A central dumping place would allow disposing off garbage such as rubble and metals that can not be easily handled in a plastic container or dustbin. Communal portable containers were preferred by 12.5% of the respondents. With this method, the residents suggested that dustbins could be emptied into such a container before the service providers collect it for final disposal. There was a general view among those that preferred the two former methods that having a curb side collection would result in high service charges because of the high frequency of collection.

The frequency of collection largely depends on the quantity of waste generated, the size of container and the method of collection.

Table 5.12 Summary of frequency of preferred solid waste collection methods

Frequency	Total	Percentage (%)
Weekly	15	37.5
Fortnightly	22	55.0
Monthly	3	7.5
Total	40	100.0

Fortnight collection was the most favored frequency with 55% of the respondents preferring it. Those who chose this frequency assumed that it takes two weeks to fill up the dumpsite, or the containers. Weekly collection was second with 37.5% selecting it and 7.5% chose monthly collection. When the respondents were looking at frequency of collection their focus was on the cost of the service and the benefit of the duration. This is why they came up with the frequency of fortnight.

5.3 Community Participation

Questions 18 to 21 focused on finding out if residents were willing to participate in the solid waste collection project and the ways they would support it.

Willingness to support any activity largely depends on the understanding of the benefits one would obtain and the attitude of an individual concerned towards solid waste management. The table below shows the proportion of respondents willing and the proportion not willing to participate in solid waste management programs in Avondale.

Table 5.13 Summary of respondent’s willingness to participate in solid waste management

Willingness	Total	Percentage (%)
Willing	32	80.0
Not willing	8	20.0
Total	40	100.0

Eighty percent of the respondents were willing to participate should a service provider provide a service at a cost. This was regardless of the arguments that it was the duty of the City Council to collect garbage. Those not willing claimed they had no extra income to spend on solid waste collection, and argued that it was the responsibility of the City Council. They claimed they do not generate sufficient amount of waste to warrant involvement of private companies. The researcher however observed that those not willing were being irresponsible citizens because they also indicated not to like the effects of garbage on their immediate environment.

Most of the willing respondents are the ones, who acknowledge that there is poor solid waste collection or interested in a collection service and had tertiary level of education.

The table below shows the amounts of money residents are willing to pay to support solid waste collection service in Avondale.

Table 5.14 Summary of money residents are willing to pay per month for solid waste collection

Range (Kwacha/month)	Total	Percentage (%)
10,000-20,000	14	35.0
20,000-30,000	10	25.0
30,000-40,000	7	17.5
50,000 or more	5	12.5
Nothing	4	10.0
Total	40	100.0

Those willing to pay between K10, 000 and K40, 000 were 77.5% of the respondents. This amounts to an average of K25, 000 per month per household. An organization that wants to provide a service to the community has to work within the average figure.

Those that were not willing to pay for the service gave excuses that have already been highlighted above.

Apart from monetary contributions, some respondents were willing to buy their own plastic bins for the curbside collection method and hand tools for the communal dumpsite. They were also promising not to default payments to the service provider should the project commence.

## CHAPTER SIX

### 6.0 DISCUSSION

This chapter discusses the research findings that have been recorded in the previous chapter.

The majority of respondents have families of 6 to 10 members. According to LCC and ECZ (1997), it is estimated that residents of low-density areas generate solid waste of about 0.41kg per person/day.

Using the majority family size of 6 to 10 members, the lower limit of 6 members generate about 2.46kg/day that is equal to 73.8kg/month. For a family of 10 members, 4.1kg is generated per day or 123kg/month. This analysis shows clearly that the larger the family size, the greater the quantity of solid waste generated. The absence of the solid waste collection service has resulted in accumulation of uncollected waste observed.

How much waste is produced

An official from Lusaka City Council attributed poor waste collection to poor funding by the government. Land rates are a major source of revenue for the council. The revenue collected is not all channeled to waste collection but it is also shared between other departments. Rentals and water supply used to be other sources of income for the council. However, this major source of income was lost after the sale of the houses to the sitting tenants and the privatisation of water supply. It is for this reason that the Council is unable to effectively collect waste in the capital city.

Residents have realised that the city council current position and have shown willingness to support waste management initiatives. The sentiments of the council official were also echoed by 25% and 20% of the respondents who agreed that lack of transport and poor funding respectively, affected waste collection. However, another group of 20% of the respondents argued that no amount of funding or waste collection trucks would improve the situation if there was poor planning.

✓

The majority (75.5%) of residents disposed off waste in rubbish pits. in long run this could result in the contamination of the soil. However, this method was preferred because there was no existing waste collection service in the area and the only cost incurred is that of hiring an individual to dig a rubbish pit. When waste accumulates, it is burnt or the rubbish pit is buried. Use of dustbins did not seem beneficial to most residents because when it fills up, the waste is either thrown along the roadway or in the rubbish pit. A waste collection service seems to be the only option that will make Avondale a clean area.

Curbside collection by from liftable containers was preferred by 70% of the respondents. The researcher observed that there were few centrally located plots were a central dumping place or a portable container could be put. Curbside collection was preferred because residents do not need to walk long distances to dispose off waste. This method would also be advantageous to service providers because all roads in Avondale are paved.

This research has revealed that 80% of respondents are willing to take part in community efforts to eliminate waste from their surroundings. This kind of response would encourage potential service providers to take up the challenge of collecting waste in Avondale.

Almost all (96%) respondents want to participate in solid waste management through money contribution. The contributions range from K10, 000 to K50, 000 per month for a biweekly collection service. An average of K30, 000 per household would be a suitable charge for residents of Avondale.

The respondents have a positive attitude towards solid collection from their area. This assertion has been strengthened by the fact that 97.5% of the residents are literate, 85% are engaged in income generating activities and 80% are willing to take part in solid waste management in their area.

## **CHAPTER SEVEN**

### **7.0 CONCLUSION AND RECOMMENDATIONS**

#### **7.1 Conclusion**

This chapter sums up the whole report and gives suggestion that can help solve some problems related to solid waste management.

The overall objective of the study was to identify a solid waste collection system that will be supported by the residents of Avondale. Indicators such as preferred solid waste collection methods; income levels of respondents and the manner in which respondents are willing to participate were assessed.

This study shows that residents of Avondale are literate and the majority (57%) has a family size of 6 to 10 members. It was also found that 85% of the respondents are involved in economic activities that generate income to sustain their families. This was either in the formal sector or informal sector. The residents earned an average of K2, 920,000 per month per person.

In terms of solid waste disposal and collection situation, it was discovered that Lusaka City Council collects no waste in Avondale. The major reason for this situation was attributed to poor funding from the government. Involvement of the private company in the collection of solid waste was favored by 92.2% of the respondents. However, it was observed that some residents did not favor the idea they pay land rates which the council is supposed to use to carryout this service.

The study also revealed that most of the waste is disposed off in rubbish pits and the pits are buried when full. On a few occasions, residents practiced burning and dumping of waste on empty plots.

The most preferred solid waste collection method was the curbside liftable container system to be done fortnightly at an average cost of K30, 000 per month per household. This was preferred by 70% of the respondents. The study also revealed that 80% of the

respondents were willing to participate in solid waste management using the selected method. Apart from monetary contributions, respondents showed willingness to buy their own dustbin to support the selected method.

The hypothesis that the residents of Avondale want to have a solid waste collection that they will support is true. This conclusion has been reached after considering that 70% want curbside collection system, 80% are interested in taking part in solid waste management and 90% were willing to pay for the service to be provided using the preferred solid waste collection method.

## **7.2 Recommendations**

Based on the findings of this study, the following are the recommendations to improve the situation:

- i. The government should involve members of the community and stakeholders to come up with solid waste collection systems for different communities,
- ii. There is need fro Lusaka City Council to educate members of the public on environmentally friendly ways of disposing off domestic solid waste,
- iii. The government should adequately fund the City Council to enable it acquire or repair broken down refuse collection trucks,
- iv. The City council should enforce the rules and regulations that deter poor waste disposal and
- v. Governments should give incentives to organizations and companies involved in management of solid waste so that it can attract a lot of investment in this sector.



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# COMMUNITY PARTICIPATION IN SOLID WASTE MANAGEMENT IN AVONDALE, LUSAKA, ZAMBIA

## Personal Details

1. What is your family size? Five (5)
2. What is your level of education?  
☐ None    ☐ Primary    ☐ Secondary    ☒ Tertiary
3. Are you employed? ☒ Yes    ☐ No
4. What is your expected income per month? K 500,000

formal  
informal

## Solid Waste Collection

5. Does the city council collect garbage in Avondale? Yes ☐ No ☒
6. If yes to question 5, how often do they collect solid waste? N/A  
☐ Once per month    ☐ Fortnightly    ☐ Once per week  
☐ Other (specify) \_\_\_\_\_
7. If no to question 5, what do you think could be the reason(s)?  
Lack of public funds.
8. Is there any other organization that collects waste in Avondale?  
☐ Yes    ☒ No
9. If yes to question 8, name the organization(s). N/A.
10. If no ~~solid~~ to question 8, would you like to have a garbage collection service?  
☒ Yes    ☐ No
11. How do you dispose off solid waste generated from/by your household?  
☐ Dust bin    ☒ Rubbish pit    ☐ Other (specify) \_\_\_\_\_
12. What is the **final** destination of the solid waste disposed using the above method? RUBBISH PIT
13. What solid waste collection method is used in your area?  
☒ None    ☐ Collection from roadside in liftable containers  
☐ Collection from communal portable container system  
☐ Other (Specify) \_\_\_\_\_  
☐ Collection from central dumping place

3\*?

14. Give reason(s) to the answer selected in question 13.-----  
There is no waste collection system

15. Whom would you like to provide solid waste collection service to you?  
☒ Private Company      ☐ City Council      ☐ Local Community  
☐ Other (Specify) -----

16. What method of solid waste collection would you like the service providers in question 13 to use?  
☒ Collection from roadside in liftable containers  
☐ Collection from central dumping place  
☐ Collection from communal portable containers

17. How often would you like solid waste to be collected from Avondale using the method(s) in question 13?  
☐ Weekly      ☒ Fortnightly      ☐ Monthly  
☐ Others (specify) -----

### Community Support

18. Are you willing to participate in efforts to collect solid waste from Avondale?  
Yes ☒ No ☐

19. If No, give reason(s) -----

20. How much money contribution are you willing to pay to support solid waste collection in your area?

☐ ≤ K15,000      ☐ K20,000 to K30,000  
☒ K30,000 to K40,000      ☐ ≥ K50,000  
☐ Others (Specify) -----

21. How else would you support solid waste collection in Avondale?

Co-operation and commitment

## **Appendix ii**

### **Non structured interview schedule for Lusaka City Council and Cleanfast Limited**

Lusaka City Council

1. What are the reasons for the current poor solid waste collection in Avondale?

Cleanfast Limited

2. What terms and conditions do you offer to your clients for solid waste collection?