

UNIVERSITY OF KWAZULU-NATAL

**Exploring the role of the Informal Sector in
Municipal Solid Waste Recycling: A case Study
of eThekweni Municipality**

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DECLARATION

I Zamokuhle Lucas Mavimbela declare that:

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ABSTRACT

Informal solid waste recycling is the measure of the metropolitan setting in many South African municipalities. The eThekweni metropolitan's waste pickers are performing a significant part in the waste management recycling. The suggestion in the data collected recommends the unlike operations with mutual environmental and economic gains, which contribute in the direction of employment and the ecological stability. In spite of the role that the informal sector plays to the waste management and social economic improvement, along with the environmental conservation, the metropolitan development policy in South Africa has failed to incorporate and include the informal sector within the municipality formal waste management system in its strategic framework. Illustration on the findings of the research study led by particular fragments of the eThekweni Municipality, and by means of different approaches stimulated by the out-dated participatory researches, the study further explored the official policies found in the informal sector that are implicit. The sample was comprised of 40 informal waste pickers who are involved in the informal solid waste recycling, 6 municipal officials, and 3 waste buy-back centres. The major solutions of this problematic matter might be the inclusion of the informal sector within the formal municipal waste management systems, through waste recycling. This can be achieved through the informal sector integration, the research further classifies the obstructions that impede the integration of the informal sector into a comprehensive municipal formal waste management system: exploitive policies, social acceptance, and absence of substantial evidence to back informal activities, illegal immigrant, and non-existence of lawful nationality documents. It is highly significant to notify that the integration of the waste pickers ought not to be grounded on a 'universal' exemplary, but as an alternative it should take into consideration the confined setting and circumstances.

TABLE OF CONTENTS

Contents

DECLARATION	i
ACKNOWLEDGEMENTS	ii
ABSTRACT	iii
TABLE OF CONTENTS	iv
TABLE OF FIGURES	viii
LIST OF TABLES	ix
ABBREVIATIONS AND ACRONYMS	x
CHAPTER ONE	1
Introduction and Frames of References	1
1.1 Introduction	1
1.2 Motivation for the Study	4
1.3 Focus of the study	4
1.4 Problem Statement	5
1.5 Research Questions	7
1.6 Objectives	8
1.7 Methodology	8
1.8 Chapter Outline	9
1.9 Summary	9
CHAPTER TWO	11
Conceptual Framework and Literature Review	11
2.1 Introduction	11
2.2 Solid waste management in a global context	12
2.3 Contextualizing the waste management amongst the SADC African cities	

2.3.1	Waste collection and transportation	18
2.3.2	The municipal solid waste practices	19
2.4	Contextualizing the South African municipal waste management	20
2.5	Summary	22
CHAPTER THREE		24
Research Methodology		24
3.1	Introduction	24
3.2	Aim of the study	24
3.3	Research Design	24
3.3.1.	Study setting	25
3.3.2.	Population and sample of the study	25
3.3.3.	Data collection tools	27
3.3.4.	Semi-structured interviews	29
3.3.5.	Focus group discussion.....	30
3.3.6.	Key informants	31
3.3.7.	Personal observations	31
3.4	Data Analysis	32
3.4.1	Data validity	33
3.4.2	Data reliability	33
3.5	Ethical considerations	34
3.5.1	Informed consent.....	34
3.5.2	Publication of the results	34
3.5.3	Management of information.....	34
3.6	Methodological reflections.....	35
3.6.1	Language barrier	35

3.6.2	Member domination	35
3.6.3	Confidentiality or anonymity	35
3.6.4	Interviewee effect	35
3.7	Summary.....	36
CHAPTER FOUR		37
Presentation of the results		37
4.1	Introduction.....	37
4.2	The contribution of the waste pickers in the municipal solid waste management and recycling.....	43
4.3	Problems that the waste pickers faced with in eThekweni area.....	48
4.3.1	Occupational problems.....	48
4.3.2	Operational problems	50
4.4	Barriers to a formal inclusive eThekweni Municipality waste management system	56
4.5	A strategic approach for a sustainable solution to the integration of the informal waste pickers in eThekweni.	60
4.5.1	Legal working framework	61
4.6	Summary.....	65
CHAPTER FIVE		66
Discussion		66
5.1	Introduction.....	66
5.2	The effect of the urban governance system.....	66
5.3	The equipment, protective clothing and infrastructure	67
5.4	Improvement in legal structure and legislations	71
5.5	Community Based Organizations (CBOs) and Non-Governmental Organizations (NGOs)	72

5.6 Summary.....	74
CHAPTER SIX.....	75
Conclusion and Recommendation.....	75
6.1. Introduction.....	75
6.2. Conclusion.....	75
6.3. Implications of this research.....	76
6.4. Limitations of the study.....	77
6.5. Recommendations to solve the research problem.....	79
6.6. Recommendations for the Future Studies.....	80
6.7. Summary.....	80
REFERENCES.....	82
APPENDIX 1: Letter of Introduction.....	89
APPENDIX 2: Letter of Informed Consent.....	90
APPENDIX 3: Ethical Clearance Approval.....	91
APPENDIX 4: Questionnaire for Waste Pickers.....	92
APPENDIX 5: Questionnaire for Key Informants.....	96
APPENDIX 6: Turn-it-in Report Summary.....	99

TABLE OF FIGURES

Figure 1-1 KZN Province and Durban Metropolitan map.....	3
Figure 2-1 Waste Treatment Technologies.....	13
Figure 2-2 The location of the waste pickers in the recycling Industry.....	15
Figure 3-1 The map of eThekweni Metropolitan.....	26

LIST OF TABLES

Table 4-1: The Participants Demographic Characteristics	38
Table 4-2: The participants' causes for contributing in an informal waste recycling.	39
Table 4-3: Average waste collected per week in research recycling plants	43
Table 4-4: Social problems encountered by the waste pickers in eThekwini area .	48
Table 4-5: Operational problems faced by the solid waste pickers in eThekwini ...	51
Table 4-6: The informal sector integration system with the eThekwini municipality waste management and recycling	61

ABBREVIATIONS AND ACRONYMS

GDP	Gross Domestic Product
SW	Solid Waste
SWM	Solid Waste Management
NGOs	Non-Government Organisations
CBOs	Community Based Organisations
MDGs	Millennium Development Goals
PPE	Personal Protective Equipment
EM	Ethekwini Municipality
IRS	Informal Recycling Sectors
DSW	Durban Solid Waste
SADC	Southern African Development Community

CHAPTER ONE

Introduction and Frames of References

1.1 Introduction

The cities are growing vastly since there are many developments taking place. Rapid urbanisation is one of the core factors which accompany this growth, with an estimated 66% of the world's population living in the urban areas by 2025 (UNEP, 2015). The population increase and the cities growth causes a high proportion from rural areas to tip towards urban areas, shifting the socio economic equilibrium and the state of the global environment. More than 50% of the world's population lives in the developed areas than in rural areas (UN-Habitat, 2008). Urbanisation is not a problem but the unplanned population growth results in many environmental glitches such as air, noise, water pollution, and the municipal solid waste formation, this is due to the changes in lifestyle and high depletion rate (Troschinertz & Mihelcic, 2009).

Population growth, migration, and industrialisation has frequently contributing to urbanisation (Wilson & Velis, 2014). UNDESA estimated about a third of the world's population found in the cities in 1950, 54% in 2014, and a projected 66% in 2015. Africa, its urbanisation growth is faster than in the late 1990s, and it is expected to be the fastest between 2020 and 2050. Johannesburg (South Africa) as an example, is expected to surpass the 10 million mark projection in 2030 (UNDESA, 2014). African cities are experiencing rapid growth of different types of waste generation which is resulting from modernisation and urbanisation processes (Nzeadibe, 2009).

The developing continents like Africa, Asia, and Latin America, are highly pretentious by the solid waste management problem. This has been a case since the 19th century, and it is instigating exceptional demand on the services provided by the municipalities, such as the collection of waste, shipping, handling and discarding (Simelane & Mohee, 2012). The new developments have positioned

a large number of the local authorities underneath the huge burden to deliver an effective and competent waste gathering services in their cities (Mutang et al., 2013).

Municipalities face different daily challenges in managing the solid waste, at the same time they need to deliver basic levels of affordable and equitable services for waste collection, transportation and disposal (Wilson & Velis, 2014). In addition to spending 20% to 50% of the municipal expenses on the solid waste management practices, with a collection of 50% to 80% of waste generated by the cities to landfill sites (Medina & Dows, 2000). The local authorities found in sub-Saharan cities that are customarily at the centre of handling the solid waste, demonstrated a privation of the capability to effectively match the demand of the competent and appropriate waste management practices (Okut-Okumu, 2012). Therefore, the lack of effective solid waste management practices in an informal sector, has turn out to be of significance value towards the municipal waste management, as it is gradually playing a vital role in the recycling and management of the municipal solid waste (Chimuka & Ogola, 2015). Theoretically, the informal sector has closed the gap created by the inefficiency of municipal practices, and the institutions in the municipal solid waste management (Gumbo & Simelane, 2015).

In line with the above, South Africa is not an exception in terms of inefficient and ineffective waste management. The informal sector waste recycling has been increasingly becoming the evident and part of the urban landscape. This scenario resulted from the exodus of the rural people's drive to the urban areas looking for work prospects and better life. However the deterioration and stagnation of the urban economy with high urbanisation, have created enormous pressure on local municipal authorities who are overwhelmed and also incapable to provide the reasonable waste management services to different segments of the urban development (Kubanza & Simatele, 2015).

The KZN province is amongst the top Five Big Provinces in South Africa. From **Figure 1-1** below, it shows that the KZN Province covers the total catchment area

of approximately 94 000km², with a perimeter of 1620km, located easterly part of South Africa.

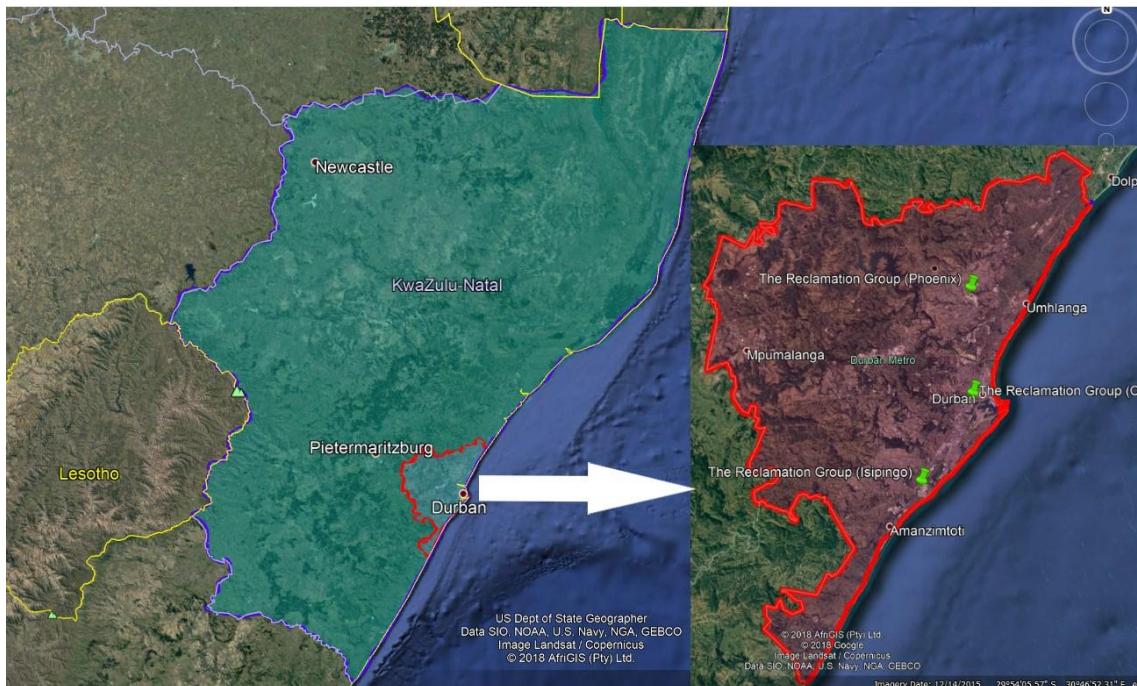


Figure 1-1 KZN Province and Durban Metropolitan map

Picture taken from Google Earth, showing the KZN Province with the catchment area of about 94000km², with the perimeter of 1620km easterly part of the South African map. eThekweni as part of the KZN Province have got the catchment area of approximately 2 300km² with the perimeter of 343km. This makes eThekweni metropolitan to be only 2.45% of the KZN Province Catchment area, but eThekweni have a population of about 3.5million people.

However, due to the KZN large catchment and being regarded as the rural area, it looks underpopulated with a total population of 11.1 million, and with 31.53% of the KZN population living in eThekweni metropolitan, that makes a high population density in KZN to be found in eThekweni metropolitan area (StatsSA, 2011). eThekweni metropolitan is in the third place in high populated metropolitans after Johannesburg and Cape Town with a population of 4.5 million and 3.8 million respectively. The eThekweni metropolitan weekly refuse removal of 86.1% in 2011, which is 0.4% higher than that in 2001 is recorded, meaning that there is still 13.9% which is unidentifiable, and cannot be traced (StatsSA, 2011).

The eThekweni is one of the largest Metros in South Africa, with the high economic activities happening on it, Durban Harbor and Dube Trade Port. Contrary to this status, eThekweni also exhibits high levels of poverty and unequal society in its distribution of socio economic service delivery. Similar to the city of Johannesburg where a large number of people in the urban area are poor, Johannesburg is subjected to different vulnerability markers ranging from food insecurity to poor health (Karani & Jewasikiewitz, 2007). This results to the state where the urban poor in South Africa become none passive actors, and are actively engaged in weaving their own future by adopting the various strategies in order to adapt with the daily challenges of the urban poverty and deprivation (Samson, 2009). As a result the informal solid waste recycling had thus become a major source of income generation, and it contribute significantly to the urban food basket (Sentime, 2011).

1.2 Motivation for the Study

The researcher was motivated by viewing the above observations, since the research will explore the modern procedures and different mechanisms, which contribute to the marginalization that results to the lack of incorporation of the informal sector systems, waste management processes, and how it can be matched with the formal structures and mechanisms of municipal waste management in an urban context. This study will be used for the generation of local informal sector waste recycling information, and activities relating to waste management within eThekweni. This will help in identifying the appropriate methods by which the informal sector can be integrated with the municipal waste management in South Africa.

1.3 Focus of the study

The research specifically focused on informal sector waste recycling, street waste pickers, and the recyclable municipal solid waste materials. It is of very importance to understand that there are different sources of waste, and the main

sources are domestic, agricultural, and industrial waste (Wilson & Velis, 2014). The research focused on the municipal solid waste while dealing with the informal sector waste recycling. The industrial and agricultural waste were not considered for this research. The study was limited to the eThekweni area, since it portrays different individuals who only make the living by reclaiming recyclable waste.

1.4 Problem Statement

According to Sentime (2014), the high urbanisation rate has caused the high tonnes of the solid waste throughout Latin America, Africa, and Asia. This attracts the informal waste activities in different industrial, commercial, residential areas, and the landfill sites (Rockson et al., 2013). As a result, the solid waste presents both the opportunities and threats. Some be certain of the solid waste as a subject issue; while to some, waste is the hazard, and it poses some environmental risk, whilst it is of valuable benefit to others (Sembiring & Nitivattananon, 2010). According to Sembiring and Nitivattananon (2010), the informal waste pickers understood waste as a resource. Informal waste recycling is seen as an opportunity to livelihood, looking at the urban growth in African cities, considering a high rate of unemployment amongst the African cities (Matter et al., 2013).

In the environmental management context, solid waste must be recycled in order to reduce landfill exhaustion and new landfill construction (Wilson et al., 2009) & (Nzeadibe, 2009). Informal waste recycling activities reduce the environmental damage, it is an effective way of saving energy, and also save municipal waste collection and disposal costs (Williams et al., 2005). When there is no formal recognised recycling infrastructure, the informal sector provided value for the sustainable and effective solution in removing recyclable materials from solid waste generation zones to the value chain (Rockson et al., 2013).

The most crucial environmental concern which makes this research more feasible throughout South Africa, is the fact that the largest route for waste disposal is through the landfill (Sentime, 2014); (Samson, 2010) & (Ezeah et al., 2013). Between 60 000 and 90 000 waste pickers found in the informal sector in South Africa, they are earning a living from recovering the recyclables from the

municipal waste (DEA, 2016). This helps to reduce the volume of waste that goes to the landfill sites by diverting it away from the landfill sites. This can work only if the South African government can acknowledge and formalise the informal waste sector, in order to ensure sustainable waste management and the environmental protection. Another area of concern on the emissions of landfill, is the issue of greenhouse gases from the municipal solid waste, which is composed of mainly methane and carbon dioxide contributing to the global warming (Williams et al., 2005). Another areas of concern that make this research significance are the landfill leachate and the shortage of development of landfill sites (DEA, 2011). As a result, to reduce the impacts of leachate on the environment, water bodies, and people; South Africa will need to reduce the recyclable solid waste away from the landfill sites. There is only one simple way to reduce leachate production from the landfill sites, which is to recognise and integrate the informal sector into the municipal waste management system through recovery and recycling.

Existing literature on informal solid waste recycling suggests that, beside South Africa, other countries must also deal with the informal sector. In South Africa however, the state is the main player and the legislative framework governing waste management, and it does not recognize the informal waste sector (Sentime, 2014). The state tends to disallow and marginalise the informal waste pickers, instead of promoting and recommending the informal waste pickers into the municipal solid waste management system (Sentime, 2014). According to the waste Act 59 of 2008, there is no regard of the informal sector in the national waste management strategy, even though Act 59 of 2008 emphasizes the formation of the countrywide waste management strategy through 'reduction, re-use, recycling and recovery of waste'. The local municipal authorities have acknowledge the fact that the informal sector is not integrated with the municipalities, due to the number of different political and socio-economic factors found in the formal municipal solid waste management system (Sentime, 2014).

The role of the informal sector in the municipal waste management system is only restricted to policy boardroom debates. There is no exertion made to mainstream the operations of the informal sector into the formal waste management plans

and policies. The lack of the integration and recognition policies of the informal sector in waste management, displays the poor working conditions that the informal sector is faced with daily, that include the contact with the harmful biochemical waste. These observations argue that the informal sector found in eThekweni metropolitan only supply their recyclables to the buy-back centres, this shows a positive connection between the informal sector and the buy-back centre managers. Even though the formal waste management officials are claiming that the informal waste recycling is illegal.

From the above findings, this research argues that the practice on ground regarding the informal recycling within the municipal waste management, does not conform to the municipal framework. The reality is that the informal waste recycling is mostly operated by the informal sector. The informal sector is continuously becoming part of the municipal waste management and recycling in eThekweni metropolitan (Sentime, 2014). Even though the informal recycling is managed by the informal sector, which does not make the informal sector to be part of the policy and institutional framework of municipal waste management in South Africa. As a result, the informal sector are currently functioning in the context where there is no existing institutional framework to support their activities. It is very difficult to imagine how South Africa can be able to top the waste hierarchy of modern waste management if the legislative framework deliberately exclude the efficient existing recycling system. The study argues that it is very important to recognize the local clarifications that can match the local requirements and options, to explore the alternatives, ecological, and operative systems in municipal solid waste management. This is being done by identifying ideas through which the informal sector can be supported, and also be integrated with the formal system.

1.5 Research Questions

The following questions guided the research process:

1. How can the informal sector contribute to the formal waste management systems in eThekweni?

2. What barriers do exist into the integration of informal waste pickers in eThekwini?
3. In what way can the informal recycling sector be integrated with the eThekwini formal waste management systems?

1.6 Objectives

This research investigate the barriers that do exist in the integration of informal sector to the formal eThekwini municipality waste management sector. It also explore the extent at which the informal waste pickers (i.e. focusing on the recyclable materials) on how they contribute to waste minimisation and management in eThekwini. This was done to bring an awareness and the knowledge of the informal sector's role in the eThekwini metropolitan waste management and recycling. The results of this study could be used by the authorities to develop a programme that would bring an ecological explanation to waste management and recycling in eThekwini metropolitan. The eThekwini municipality will manage to do the proper planning, development, and to implement the government policies in a way to promote the sustainable development.

Specific objectives:

1. To explore the role that the informal sector play in municipal waste management and recycling in eThekwini.
2. To determine challenges that the waste pickers experience in the process of waste management recycling.
3. To understand the barriers that prevail the setting up of the system that include recognition of the informal sector.

1.7 Methodology

The main interest of the study was to search different life experiences, behaviours, thoughts, and feelings of the informal waste pickers, the buy-back centres, and the municipal officials; as a result the qualitative approach was used. Purposive and snowball sampling methods were used in this research.

The data collection techniques used were focus group, key persons, observations, and semi-structured questions. Details included the interviews with the waste pickers, directors of recycling buy-back centres, and the key informants within municipal formal waste management sector with the focus groups. Tesch's method of qualitative data analysis was used which involves coding and identification of different themes. This method was used to ensure the trustworthiness of the research findings, truth value, applicability, consistency, and neutrality criteria. The third chapter of the study also outlined in detail the methodological considerations of the research design.

1.8 Chapter Outline

This research paper is made up of six chapters. The first chapter reviews the existing literature on how can the informal recycling sector has emerged at the different range of scales, from the global to the local spheres, particularly in the context of municipal waste management. The second chapter focuses on the different themes and conceptual framework around the municipal waste management at different levels. The third chapter outlines methods used to recruit participants for this study, and the different techniques used to analyse data. The fourth chapter is the presentation, analysis, and discussion of the results from both primary and secondary data. The fifth chapter synthesises the discussion and findings that are presented from the different chapters listed above. The sixth chapter conclude the discussion, research limitations, and it also provides some recommendations for the future researches.

1.9 Summary

This chapter covers the information that relates to the waste management and the informal sector, the responsibilities of municipalities particularly in waste management. The different issues were highlighted with informal sector and the waste management. Problem statement, the research objectives, focus of the study, methodology, and the research questions were discussed. The motivation for undertaking the research was outlined together with the nature of informal

recycling in the context of waste management in South Africa and Globally. The informal waste pickers' state was discussed in accordance with the lack of policy and municipal framework on waste management with regards to waste pickers. It was noted that, in eThekweni metropolitan the informal waste pickers operate in an unregulated manner, and the municipalities at a national level do not acknowledge the informal waste pickers within their formal waste management system.

CHAPTER TWO

Conceptual Framework and Literature Review

2.1 Introduction

The challenge on the waste management is globally. The solid waste recycling infrastructure and the processing of the solid waste is depending on the individual country. The waste affect the environment in a negative way, and it also poses health hazard if not controlled punctiliously. The United Nations developed eight Millennium Development Goals (MDGs), and two of them are applicable towards this study. The first goal concerns the extermination of poverty and starvation; the second one is about the advancement of ecological sustainability (Griggs et al., 2013). At the moment, the globe is facing the issues of climate change, and the solid waste management problems. The greenhouse gases (i.e. methane and Carbon dioxide) that the waste is producing, have an impact on the global climate change. That is due to the effect that greenhouse gases contribute to the climate change, as a result the waste recycling is the favourable environmental choice for the waste management globally.

According to the Constitution of the Republic of South Africa (1996), there are five objectives for the local authorities to achieve, and two of them are relevant to this research topic. The first objective have the main focuses on the social and economic development, and the second objective relates to the safe and healthy environmental promotion. Section A and B of the Constitution further mention that, every person has the right to the liveable environment, and it promotes ecological protection for the benefits of the present-day to the upcoming generations, over the processes that inhibit pollution and environmental humiliation; that endorse preservation; and protected bearable ecological improvement and proper usage of natural resources; and encouraging the permissible social development and economic growth.

2.2 Solid waste management in a global context

There is a huge amount of waste generated due to the changes in human lifestyle, and as a result the issue of the municipal waste management is the major problem facing the world. There is a higher population density, fiscal development, and the daily refining human regimes, these are some of the issues that contribute to the increasing day to day waste generation (Song et al., 2015). Approximately 2.6 billion loads of solid waste are being produced, and by 2025 this digit is projected to double (Zaman, 2014). The large extent of solid waste produced has been of concern due to the negative effect on the environment, which is supplementary with the improper solid waste management, and this results in waste degradation and the proclamation of deleterious by-products (Ripa et al., 2017).

Beside the municipal waste management challenges that are experienced by developed and developing countries, management of the municipal waste in the first-world countries are leading in the way that they have priorities through the solid waste management by employing the principles, and ecological measures regarding the use of solid waste, for example by converting waste to electric-energy generation. In the first world countries there are monitoring mechanism put in place that seek to promote and support municipal solid waste developing in different cities (Ma & Hipel, 2016). According to **Figure 2-1** below it can be seen that the Waste treatment technologies use natural aquatic and terrestrial systems Composition and generation.

Modern Waste Management Chain

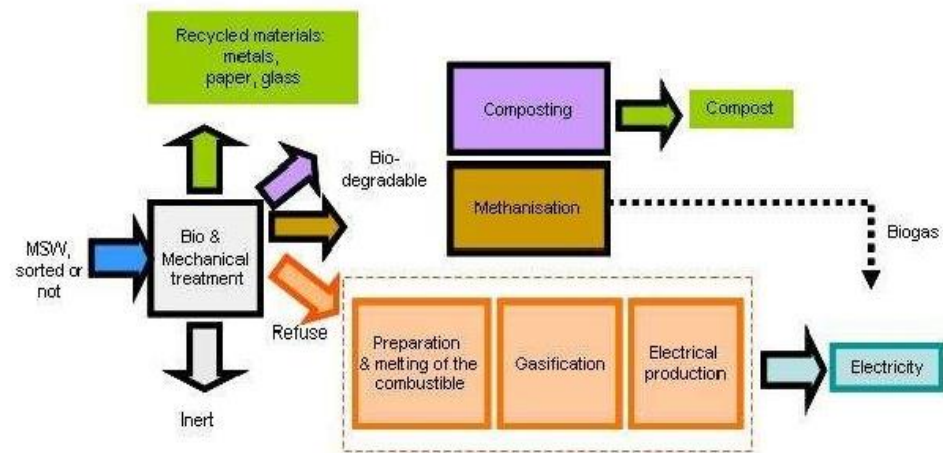


Figure 2-1 Waste Treatment Technologies

Adapted from upcoming Euroscicon Ltd **6th Edition of European Conference on Waste Management**, which will be held at Stockholm, Sweden on May 13-14, 2019.

According to the upcoming 2019 Waste Management Conference, which will be held in Stockholm Sweden, the developing countries are encouraged to use the different waste management technologies for the dumping, reprocessing, stowage, or energy reclamation from the different types of solid waste. The tremendous amounts of municipal solid wastes are handled differently, and according to the physical characteristic and the type of waste generated. The main reason for doing this, is to classify the waste generated according to its physical characteristic. The developed countries for example, have the waste composition which tends out to be more of recyclable materials (Bouzon et al., 2016). This is due to the fact that most individuals in the advanced countries have a habit of buying packaged and convenient products, while the evolving countries are highly dependent on sustenance farming, with less post-harvest processing of food. The developing countries have a habit of buying raw materials, and also depend on imported new and used products, and that results in an increase on the fraction of organic waste (Tozlu et al., 2016). In various countries across the world, there exist different waste management practices, and **Figure 2-1** shows

that the best practice amongst them include: recycling, composting, waste to energy technologies, and sanitary landfilling for the proper and ultimate way of the disposal of waste (Turcott Cervantes et al., 2018).

However, the cities that do not have the adequate means of waste management practices, they are continuously suffering from the indiscriminate dumping of solid waste, and this becomes worsen by the deleterious attitudes they possess about the innocuous and protected dumping (Mukhtar et al., 2018). There are different number of factors which affect the approach towards the positive contribution in the waste management system, and these comprise insufficient recycling and improper waste disposal facilities; the lack of collection access, waste sorting and separation facilities; the lack of the government policies, the lack of enforcement, and the lack of incentive measures; the residents' general mistrust of local government authorities in the most developed nations such as the United States of America, Canada, Japan, Australia, and Ireland (Gusmerotti et al., 2018). The countries with the improved solid waste management system practices and infrastructure are still facing different challenges that include, the insufficient waste sorting, and the recycling of products that are not recyclable (Kumar et al., 2017).

According to Aparcana (2017), amongst the different working classes, the amount of solid waste produced in advanced countries is greater than that in the evolving countries. According to Ikhlal (2018), the average municipal solid waste that is generated for the developing countries is lower than that of the developed countries. The main reason for these differences is the fact that the individuals in developed countries are dominated by the higher income working class, and the higher living standards with the high GDP per capita compared to developing countries (Simelane & Mohee, 2015). The depletion of goods and services escalate with an increase in income and living standards, and this results to an increase in the amount of solid waste generated (He et al., 2018). It was also noted that in island such as Mauritius and Fiji, large extent of municipal waste are being produced. These huge quantities of municipal waste are associated with tourism industry (Zaman, 2016).

2.3 Contextualizing the waste management amongst the SADC African cities

There is a high rate of population growth in cities found in the SADC African countries, and that is due to an increase in the migration process, industrialization, urbanization, and modernization (Dlamini, 2017). As a result these processes have resulted in large number of urban populations, and also an increase in the generation of the municipal solid waste. Unfortunately these changes have resulted in the rapid economic stagnation and deterioration, and leading to the weak policy and institutional frameworks. According to Frediani *et al.* (2013), the lack of financial resources has not only made the solid waste management difficult for local authorities, but it also prevented the residents from solving urban based problems with it challenges. According to Simatele *et al.* (2017), the local authority's resources have failed to provide services to the demands of the high growing urban population, such as the maintenance of the sewer and water systems, roads, waste management infrastructure, and the supply and running of the socio-economic facilities.

The waste pickers are found at the lowest level of the metropolitan informal sector (Hayami *et al.*, 2006). According to Schenck and Blaauw (2011), The simple **Figure 2-2** below was created to demonstrate the location where the waste pickers are comprehensively found in the solid waste management system.

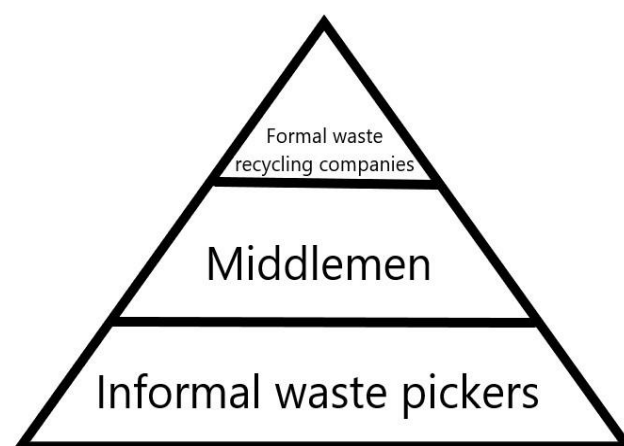


Figure 2-2: The location of the waste pickers in the recycling Industry

Taken from the article by Schenck and Blaauw (2011), **Figure 2-2** above illustrate the position of the waste pickers in the recycling industry.

The above **Figure 2-2** shows that in South Africa, the waste management system do not seem to be ready to provide lodgings of the waste pickers. The harmful economy is partaking the prominent effects on all sectors of metropolitan economy, in particular to those residents who are poor. In the most African cities, the services provided for the ordered collection and disposal of the domestic waste refuse is extremely poor, which is the evident in most poor neighbourhoods (Gumbo & Simelane, 2015). The solid waste generated is hardly collected, and it is therefore dumped on any available space within the city (Dlamini, 2017).

From the above observations, it shows that waste removal still remains as an unsolved problem in most African cities (Kubanza & Simatele, 2016). Insufficient skilled labour, economic deterioration, and weak institutional frameworks has resulted to the poor solid waste management (Dlamini, 2017). The above facts show that there is a challenge with the management of the solid waste and the environmental problems it possess in different African countries. The waste collection is unnoticed in many sub-Saharan African cities, with the municipal solid waste collection rates extending from 20% to 80% (Dlamini, 2017).

Illegal dumping and the uncontrolled incineration used by the public members to reduce the mountains of solid waste refuse (Dlamini, 2017). The main reasons for these poor practices among other things are due to lack of education, poverty, lack of regulations and infrastructure, and no government willingness in the implementation of a proper waste management strategy (Morissey, 2013). According to Kubanza & Simatele (2015), only 13% of solid waste was collected in Kinshasa, 15% in Lusaka, and 17% in Dar es Salaam, and this was due to the lack of refuse trucks and poor infrastructure. This was also due to the fact that the low class areas in the African cities that lack service through the accessible roads, tend to sink in the sewage and piles of solid waste, and that is due to the fact that the refuse trucks cannot access these areas (Simatele et al., 2017).

Most cities in the African countries lack the proper waste rules and regulation that have the potential to support the investments in the solid waste recycling. According to Sentime (2014), in the instance where the rules and regulating instruments are present, their use are being inconsistent. The eThekweni municipality has adopted the electricity technology for waste to energy conversion which is demanding and expensive to manage. This state of affairs has resulted to the consequence whereby the local municipality is dependent on the supporters for monetary assistance directly to operate and run this technology continuously (Dlamini, 2017). There are no inclusive guidelines that are well associated with the alteration of the strategies, which if it is accurately established would have contributed to the reduction of expenses, and convey out the sustainable and effective supply management and mutual economic service delivery (Sentime, 2014).

The absence of inclusive guidelines and technical skills have resulted somehow to catastrophe in planning the suitable approaches, stratagems, and technologies that would result in operative waste management practices, and further contribute to sustainable municipal waste management development in Africa (Dlamini, 2017). The above facts have remain compromising the capability of the local authorities to manage effectually the processes and daily urban changes.

To appreciate and understand the current challenges that the local authorities are faced with, it is significant to examine the whole municipal waste management systems in SADC countries (Simatele et al., 2017). The obstinate application of the foreign and old-fashioned urban development plan strategies by the municipalities, partake inadequate scope of imagining the future of African cities, and the aptitudes of all city residents to be apprehended (Simatele et al., 2017). The corruption, poor urban government, official persecution of the low class, the nonexistence of the stabilities, have not solitary overlooked the actions of the low class, nonetheless it has maltreated their daily lives (Sentime, 2014).

African urban management strategies would help in the improvement of the operational municipal waste systems in the SADC African cities, this determination sooner or later will rest on the practical abilities and the theoretical

sharpness of both the State and the local authorities' adaptation of the formal organizations to the innovative and the mutable urban certainties (Dlamini, 2017).

2.3.1 Waste collection and transportation

According to Simatele *et al.* (2017), continuous evolution in the African cities causes theatrical deterioration on the provision of the basic infrastructure and municipal services as a result of the present fiscal settings. That is why solid waste collection and transportation motionless remains a costly practice in municipal solid waste management system for developing countries (Chimuka & Ogola, 2015). The failure in the delivery of the municipal transportation and proper road infrastructure maintenance services for an instance, have resulted in a negative impact when it comes to the refuse collection and recycling. A high deterioration factor from the national to local markets has lead to an increase of casual occupation and settlement arrays, which results to the horizontal growth of urban areas (Fathi *et al.*, 2014). The modern development pattern in most African cities has expanded and stretched the current services and infrastructure (Simatele *et al.*, 2017). In developed countries such as Sweden, in most cases, the households place their waste at the closest waste centres that are source separated (Mbah & Nzeadibe, 2017). About 95% of generated waste is neither collected nor recycled across the African cities (Babaei *et al.*, 2015). The previous studies have suggested that the population growth, density, generated solid waste, social justice, and the level of traffic jamming have continuously impacted negatively on the budget, gathering, and transportation of the municipal solid waste (Kubanza & Simatele, 2016).

Like many developing countries, South Africa is in front of the similar challenges regarding the gathering of the municipal waste. According to Simelane and Mohee (2015), the starting point to improve solid waste management system is source separation at the domestic level, and the introduction of the waste transfer stations. They further find that the transfer stations have the potential to lower the cost, as the collection trucks can not be passing each household. According to Chimuka & Ogola (2015), the transfer stations could be subjected to vandalism by the waste pickers and even stray dogs, which may result to human and

environmental health hazard. The important argument on this research study is that, the source separation must be the part of the municipal management system and the waste pickers must be organized to the system, and municipalities to provide security for the transfer stations. As a result, the transfer stations can decrease the volumes of solid waste that goes to the landfills.

2.3.2 The municipal solid waste practices

From different reviews of existing literature, they state that the advanced countries have their own measures for the proper dumping of the municipal solid waste. For example, working regulations, guidelines, and accomplishment plans (Dlamini, 2017). Most cities in Africa do not have the proper working waste management and disposal practices. According to Mohee and Bundhoo (2010), Algeria dumps 80% of their generated waste while Egypt dumps 83.5%. Nigeria collects up to 2400 metric mountains of waste per day at Olisosun landfill with an area of approximately 42 hectares (Mudhoo et al., 2012).

It is noticeable that in poor and marginalised areas within the cities, the municipal solid waste is still a challenge, that is due to the lack of solid waste collection and the illegal dump sites, and this poses a disaster to human health and the environment degradation (Mohee & Bundhoo, 2010). According to Velis *et al.* (2012), the problem of waste in the evolving countries is highly estimated, about 90% of the municipal solid waste that is collected end up in open dump sites. A small fraction obtain a suitable disposal, although the other residual solid waste is inappropriately disposed, resulting in ecological imbalance and negative health effects on the environment and humans (Velis et al., 2012). In Lesotho only 7% of urban domestic waste is collected, the remainder is discarded in open places; In Gaborone “Botswana” and Maputo “Mozambique”, there is evident that they also using an open space disposal rather than in a regulated landfill sites. Lagos “Nigeria” is decorated by piles of garbage in every street corner, and this is due to the absence of training and radical instability amongst the cities (Nzeadibe, 2013).

Beside the use of the dump site, the landfilling is mostly practiced in some African countries. In Madagascar and Mauritius, the landfills accounts to 97% and 91% respectively of their municipal solid waste (Mohee & Bundhoo, 2010). In Tunisia, about 65% of municipal solid waste goes to the Landfill, while the Mauritania and Morocco use 37.3% and 28% of landfilling respectively (Dlamini, 2017). This shows that there is much more needed to be done, in order to encourage the use of other waste disposal options, such as composting and recycling, in order to minimize waste that goes to the landfill sites (Chimuka & Ogola, 2015). According to Pakpour *et al.* (2014), different disposal and treatment technologies, such as composting and incineration, engineered sanitary landfill are now emerging in the developing countries. The waste management problem is decreasing with the introduction of the proper infrastructures, policies, and regulations (Pakpour *et al.*, 2014). However, the waste-to-energy and incineration, are the technical options that do not encourage the integration of the informal sector, since these are the systems that need waste to be produced for them to be profitable, as a result they do not encourage waste separation at source and recycling (Aparcana, 2017). According to Leonard (2015), the waste-to-energy brings the trepidations of the informal waste sector integration into the eThekweni metropolitan. These innovations have the negative implications on the integration of the informal sector with a formal eThekweni metropolitan system, they contribute to the collapse in devising integration strategies for the operational waste management practices and the sustainable municipal waste management (Leonard, 2015). Therefore, it can be deduced that the suitable waste management system be subject to the numeral elements, such as the government incentives, adequate infrastructure, appropriate laws and regulations, and public willingness and awareness (Gumbo & Simelane, 2015).

2.4 Contextualizing the South African municipal waste management

The eThekweni metropolitan has made efforts in the management of its municipal waste, but the problems on how to integrate a figure of waste pickers remains unspoken. The shortage of awareness on exactly how to integrate, align informality and formality of the municipal development goals and forecasting policies, is the core reason on this state of affairs (Leonard, 2015). According to

Dlamini (2017), the city of Johannesburg's absence of experienced labour and proper talents, along with the emotional intelligent in the management level, the exploitation and the proper management of the municipal funds, these are the major causes of failure in the establishment of a workable approach to the municipal waste management system. The big cities like Durban, Cape Town and Johannesburg, high population growth and urbanization has worsened the problem of the municipal solid waste management (Simelane & Mohee, 2015). Some of the solid waste challenges are being appreciated by exploring the current waste management systems, and relating it with the rest of SADC African countries (Zhu et al., 2007). This means that, it is not enough for South Africa to have good legislation and regulations, but there is a need to expend period discovering more suitable technologies and procedures to be used in order to manage the municipal solid waste. For the above strategies to be accurately executed successfully, the role of the publics also needs to be considered (Leonard, 2015).

The background information discovered on the role played by the informal waste recycling in the sub-Saharan African countries, stimulates the broader interest for this research. It acts as an introduction on the new solid waste collection strategy, as well as to contextualize the South African informal waste recycling system. Therefore, it should be noted that a large, dynamic, and indigenous solid waste management system exist in South Africa, which is largely driven by means of the informal sector (Samson, 2009). Thousands of waste pickers in South African cities earn their living through the informal waste recycling, and they are categorized as third class "poor and less-privileged" residents (Dias, 2012). According to the Department of Environmental Affairs (2016), a total estimated solid waste pickers in South Africa ranges from 18 000 to 100 000, and they form part of about 15 million solid waste pickers found in developing countries across the world. It is evidence from the leading municipalities in Colombia, Brazil, and Egypt, the highly operational waste management system is built on the informal systems, and they need to be acknowledged as part of the strategy for the sustainable waste management and minimization (Scheinberg, 2012).

Many researchers insisting that the informal waste recycling can be implemented successfully across the African cities. They further proclaim that the informal sector recycling has extensive implications for the urban livings, and the environmental sustainability across the African continent (Adama, 2012). According to Dlamini (2017), informal waste recycling can help in the reduction of the waste sent for disposal, environmental protection and clean cities, new ideas on entrepreneurship, and generation of employment and income, mitigates challenges of climate change, and green economy with the conservation of natural resources.

In view of the above discussion, solid waste management has tend to be a major problem in the municipal development in SADC African countries. These challenges are the results of the failing institutions, civil conflicts, and social injustice (Kubanza & Simatele, 2015). It gives the impression that most of the studies that have focused on the municipal waste management in the urban perspective, have hardly analyzed and examined the value of the incorporation of the informal sector with the municipal waste management systems. Informal waste system generally is further acknowledged as a system, which is not totally recognized in municipal development strategies and policy formation in SADC African countries, South Africa in particular. In order to facilitate variations in the advancement of green occupations and ecological sustainability, the informal solid waste recycling need to be integrated with the municipal development strategies and development policy (Sentime, 2014). However, the work that has been done in South Africa mainly focuses on the legislative framework that governed the waste management, solid waste collection processes, and the management of the municipal solid waste, with less understanding on how can they capture the different informal structures into the formal ones, so that there can be an operational waste management system (Oelofse & Nahman, 2012).

2.5 Summary

Beside the municipal waste management challenges being experienced by SADC African cities, goals and targets that seek the improvement in waste management strategies and techniques have been implemented by the different

municipal authorities. These improvements entail the waste recovery and recycling, incineration and composting, and waste-to-energy production, even though the incineration process is not recommended as the sustainable innovation due to its negative effects on the environment. The methods adopted and the advancement made in the municipal solid waste management thus far, are very encouraging. However the waste pickers' role in some parts is still not recognized as a strategy that can be used to minimize and manage waste by the formal system in SADC African cities. Due to the poor economy amongst the African countries and dependent on foreign monetary support, they need to build on the already available system rather than to implement advanced technologies that are costly and challenging to maintain. The waste collection, transportation, and the disposal systems in different municipalities are still poor due to the lack of funding, lack of technical skills, and the technical maintenance difficulties of the system. Insufficient funding on the supervision of the municipal waste results into environmental and human health problems. Unfortunately the financial support and the ability to effectively manage the municipal waste is the major challenge in most SADC African cities. The challenges of the municipal waste management can be addressed collectively by considering new approaches, which include the traditional centralized municipal council-based approach together with the new decentralized-community based approaches, to create a system that fits the municipal council and its residents.

CHAPTER THREE

Research Methodology

3.1 Introduction

The chapter displays the research framework method that was used for this study. The actual framework detailing what was in the point of fact done throughout the data collection process, outlining exactly on how the data was collected, and why the data was collected that way. In general, the method used for this chapter outlines in details on how this research was really piloted. The content of this research chapter include: a recap on the aims of the study and objectives, reliability and validity of the study, research design, data collection, data analysis, ethical considerations, and the methodological reflection of the study.

3.2 Aim of the study

It is of paramount important to remind the reader about the purpose of this research study. This research revolves around the understanding of the role of the informal sector in the municipal waste management in the eThekweni metropolitan area. The main aim of the research is to identify the systems and mechanisms that need to be used in order to integrate the informal sector with the formal municipal waste management system. It also identify the barriers that obstruct the integration of the informal sector into a comprehensive municipal waste management systems.

3.3 Research Design

The following section provides the complete narrative description of the research area, the sample selection procedures, and numerous techniques implemented in order to collect data.

3.3.1. Study setting

The functions that eThekweni metropolitan and its suburban perform had assisted the eThekweni to be the ideal research area. The eThekweni metropolitan is a base of local authorities with the residents of just about 3.5 million people living in it, and an average population density of 1600 people per km² (StatsSA, 2011). The eThekweni metropolitan covers a total area of 2 306 km², with the perimeter of 343 km, estimated using Google Earth application. There is a lot of economic activities in eThekweni metropolitan that contribute to the country's GDP. This results to a great increase of personal incomes and high consumption of individuals in the urban areas. Consequently there is more solid waste disposal, while there are less incentives to recover and to re-use the solid waste generated by the metropolitan. The eThekweni metropolitan also draws more immigrants because of the eThekweni's economic activities, and consequently it ends up generating more solid waste compared to the Nelson Mandela Bay and City of Tshwane. It is also important to note that although eThekweni metropolitan is amongst one of the most urbanized metropolises in South Africa, and the labour migration has been increasing in the post-apartheid.

3.3.2. Population and sample of the study

This study was fascinated by the formalities involved in the informal sector and the municipal waste management system in eThekweni metropolitan. The study used the purposive sampling to select a representative sample for the study. The sample comprised of the secondary data of 40 waste pickers who are involved in the processes found in the informal solid waste recycling, and primary data of 3 directors from buy-back centres (Congella, Isipingo, and Phoenix North Reclamation Group (Pty) Ltd) as with their locations shown in **Figure 3-1** below, 5 key informants from (Solid Waste and Cleansing Department; Human Settlement, Engineering, and Transport Department; and Environmental services Department) in senior and the executive management positions.



Figure 3-1: The map of eThekweni Metropolitan

Taken from Google Earth application, the eThekweni metropolitan map, with the three research sites, as shown from the map, the Isipingo, Congella, and Phoenix North Reclamation Group buy-back centres.

The participants were chosen in the basis in which they are involved in the waste practices and management in eThekweni Municipality. The number of participants that are recruited were led by the theoretical code known as saturation. According to Hennink *et al.* (2011), the saturation is the point where the data collected tend to be repetitive. As a result, this research was driven by the variation and context found amongst the waste pickers rather than the number of participants.

3.3.3. Data collection tools

a. Secondary data

The eThekweni Municipality Statistical Department, they did small preliminary study, which is done annually where they collect the demographics about the waste pickers and record it on their statistics. They do that in order to monitor the eThekweni people diverse lifestyle, and the availability of data for future researches which are conducted within the city. This is mainly done to distinguish whether the waste pickers will be capable to recognize the questionnaire questions, to examine the data collection instrument used, to classify questions that need revisions, and to understand if different questions examined were relevant for the respondent. This primary data is annually collected between August and October of each year.

The eThekweni Municipality waste pickers are of a communal site, and they are found in every corner of the streets. The waste pickers were also targeted at their trading points, the buy-back centres. The permission was obtained from the directors of the centres, which are working together with the eThekweni Municipality to interview waste pickers identified within the buy-back centre vicinity. The waste pickers were then interviewed purposely in eThekweni Municipality and the suburban buy-back centres. For the extraction of the undocumented information and activities, the interviews were conducted in their vernacular language. Since the majority of the waste pickers use their mother tongue as a medium of communication. The explanations and clarifications of different terms were used during the interviews, which allowed the extraction of more information.

The researcher then used the purposive sampling, which involves only the street waste pickers that voluntarily participated during the data collection, were then interviewed. According to Creswell (2013), it is the researcher who knows the research purpose, the sample that can give the required information, and the participants in most times, who can give more understanding of the research problem area on sites. The waste pickers possess those features, which can

enrich the purpose of this research, and they provide detailed quality information since they are the masters of waste management and recycling activities within the eThekweni metropolitan.

b. Primary data

For the primary data, a small trial exploration research was conducted a week before the data collection commence. This was done so that the participants will be familiar with the questionnaire, to examine the data collection instrument and to categorize questions that require modifications. The participants estimated response time from the research questions was adjusted where necessary. The data was then collected from April 2019 to the beginning of June 2019.

As the research frame grew, the snowball sampling was then applied to recruit the key informants from the eThekweni Municipality and other organizations. This was done to bring about the key information on the different perception, and the attitudes that the key informants have towards the waste pickers, as a result the snowball sampling was used to complement the purposive sampling procedure. According to Chaim Noy (2008), snowball sampling is a technique where one contact is used to recruit another contact, which can put in touch with someone else. This was a very important technique to employ in this research in order to be able to identify people who work close with the waste pickers, and those that are well known to the waste pickers. The snowball sampling method is advantageous, since the researcher can link trusted sources that are familiar with the study, thus enriching the information and the participation on the research. The directors were used to identify other buy-back centres, to visit other organizations, departments, and the Solid waste and Cleansing Department, where the key informants were used. The researcher communicated with the key informants verbally and through emails, and the questionnaires were circulated via emails, while others were delivered by hand to the key informants offices.

Both secondary and primary data were used to complement each other, thus providing the interfaces of theory, practice, and helping to expand the debate and discourse amongst the methods that can be employed to integrate the informal

sector to formal municipal waste management plan. The comprehensive and intense review of literature was done to generate the concentrated theoretical frameworks, which are essential in the formal municipal solid waste management. The primary data was collected largely from the answered questionnaires from the key persons, municipal officials working in the solid waste management department, and other relevant organizations. The use of observation of the phenomenon and the photographic surveys are also primary data collection methods, which were then used to generate fresh data from the field in order to reveal the informal waste pickers' operations and recycling sites.

3.3.4. Semi-structured interviews

The questions were piloted in a semi-structured manner so that the research can unpack different research themes. This method familiarized the researcher with the different conceptions and the new perspectives on the municipal waste management. The additional use of the semi-structured questions also permits the researcher to apprehend the broad themes in the informal waste recycling. A greater insight into how to integrate the informal waste pickers, and their operations into the formal municipal waste management, this was also discussed in the data collection process. In conducting the interviews, the researcher acted more like a facilitator rather than an interviewer, in order to dig deep into the informal waste pickers' stories. The questions were inscribed in English, and rendered to isiZulu. The recorded interviews were transcribed and then translated to English.

According to Hennink *et al.* (2011), the semi-structured interviews are not a platform for a two way discussion, somewhat it is a comprehensive or exceptional thoughtful facts, and significance conversation amongst the participant and the investigator. Consequently, it enabled the semi-structured questions to be engaged for this study, and it was done in four ways. Firstly, there was a questionnaire guide for the research procedure where the participants not only replied to questionnaire's questions, but also play a part during the answering process. Secondly, the non-verbal behavior and personal communications with the participants was regularly used. Thirdly, the method gave certainty on the

follow ups and explanations on the flow of the interview. Finally, it collected the comprehensive, multipart, and inclusive information (Hennink et al., 2011).

3.3.5. Focus group discussion

The next phase elaborate individual collaboration in focus groups, in order to collect different range in the data provided. The different thoughts were piloted in the buy-back centres vicinity, to facilitate the participants so they can interact in a fruitful, more willingly than dysfunctional way. Focus group considerations were steered throughout data collection process, and the informal waste pickers were able to relate their involvements, difficulties, and their approaches in the direction of the informal waste picker's integration. The more neutral location resulted from the collaboration with the informal waste pickers. The results gathered from the focus group deliberations, helped as a guides in the continuations of the study.

Focus group were used since they are different from the semi-structured questionnaires and interviews, which dependent only on the collaboration between the investigator and respondent. It displayed the various sights on the subject, as the result the focus groups and questionnaires can be joined together. Focus groups were around the interaction with seven to ten pre-selected participants, but in a manner that is orderly structured for data validity. Hence they able the researcher to access the participants' experiences.

The following strength facilitated the selection of the focus groups:

1. They enabled and promoted interaction between the research participants, cheap and uncover the unique perspectives on the research.
2. They also promoted self-disclosure, and yielded the detailed information on the research issue (Hennink et al., 2011).
3. The last strength is that it is rich in nature, in the way that the participants can build into each other's views (Hennink et al., 2011).

3.3.6. Key informants

The key informant interviews were used in this research, which is a technique that is used to utilize detailed and rich information source. The key sources were the national figures in leadership positions, which are in charge of the municipal waste management. Using the focus of the study, the appropriate informants were identified as those in the Environmental Department, Infrastructure Services Department, KZN officials, eThekwini metropolitan, and Batho Pele cooperative who have the adequate knowledge and information of the municipal waste management in eThekwini municipality. The advantage of key person's interviews is that it promises a positive interchange of ideas from end to end enquiring in a complex questions. It was very crucial for this research to record the information and transfer it to the questionnaire. This permitted the researcher to seal in trendy information fissures and to spontaneously participate in the discussion.

3.3.7. Personal observations

First hand understanding of the perspectives of the informal sector, was gained through the employment of personal observation. This was done to support the answers given from the interviews, the informal waste pickers' working conditions were also documented through observation. Through personal observation, it was possible to ascertain whether the response given by the informal waste pickers do match the reality tally. The researcher managed to capture data in a more natural circumstances. Through the personal observation, the study managed to capture the whole social setting in which the informal waste pickers function, which was done through the recording of the context in which they work and the influence of the physical environment. Semi-structured interviews only provided a piece of the whole informal waste pickers' scenario, which was then fitted into a "picture in the box" through the observation. Various types of observational analysis were employed by the researcher as an observer:

1. Researcher-participant: The researcher took notes; observes; and participated before, during, and after the interviews in some waste operations.

2. Total researcher: The researcher silently observed informal waste pickers interaction from a distance.

3.4 Data Analysis

Since this is a qualitative research, the data collection and analysis processes are the precise and critical phase in a study, and it is essential for these processes to be piloted simultaneous (Creswell, 2014). The categorization process is the frequently implemented process in qualitative data analysis and it involves the arrangement of effects, people, and happenings (Miles & Huberman, 1994). According to Creswell (2013), the case study researchers practice different types of classifications, hence the researchers require different data code. This means that the researchers must define different subjects, recognize patterns, and use the subjects and patterns to comprehend the perceptions of the participants (Miles & Huberman, 1994).

For that reason, the Tesch's method for the qualitative data analysis was used as an analysis tool (Creswell, 2009). The interviews from the focus groups and the semi-structured questionnaires were transliterated. Tesch's method acknowledged different steps that this study followed. The steps involved the following:

1. The researcher went through all the evidence confined in the transcriptions.
2. The researcher then nominated, and read once more the stimulating transcriptions.
3. Little proceedings, thoughts, judgments, and the developing evidence were transcribed in the margin using the different colored pencils.
4. The data received from replying to the questionnaires were gathered into subjects, sub-themes, and classifications.
5. Then all the transcriptions were coded.
6. The data was then grouped, and the most evolving expressive phrasing for the subjects, sub-themes, and classifications were noted.
7. To complete the procedure of analysis, re-coding was implemented where needed.

3.4.1 Data validity

To ensure external validity, a rich, thick, and detailed full description was employed in this research. This strategy was used so that anybody with an interest in transferability can do so based on a solid context (Creswell, 2014; Hennink et al., 2011; & Miles & Huberman, 1994).

3.4.2 Data reliability

To ensure data reliability, the following four methods were used:

1. **Applicable:** The framework used for the data collection as well as the comprehensive focus of this study was provided by the researcher (Creswell, 2014).
2. **Relevant to the study:** Key persons, researcher's own observation, focus group, and semi-structured questionnaires; interviews that strengthens consistency and internal validity (Sekaran & Bougie, 2016).
3. **Uniformity:** The data was coded for accuracy, data collection, and analysis approaches were drawn in particulars to provide a different perspective of the study procedures used.
4. **Non-bias:** The testimonials given during the study are shown in quotes.

Even though the data collection and analysis approaches are identical through most qualitative methods, but the approach in which the results are reported is different. According to Sekaran and Bougie (2016), the significance of generating a data presentation and the description text, has remained the supreme regular procedure of presentation for all qualitative data. This is the qualitative study, the findings are displayed in a expressive, description form instead of a statistical reporting. The thick narrative is therefore the means of information transportation used in this research, for communicating the holistic picture in the experiences found in the municipal solid waste management.

3.5 Ethical considerations

This research has abide strictly to expected ethical considerations. Earlier to the data collection phase, ethical clearance was obtained from the University of KwaZulu-Natal (see Appendix 3). Ethical issues were address during the course of the research, including soliciting informed consent, providing information, ensuring the participant's confidentiality and anonymity. This study addressed the ethical issues in the following manner:

3.5.1 Informed consent

The research participants had a right to withdraw from the participation of the study at any level of the research process, as it was stipulated in the participant's information sheet. Officials and key informants signed a letter of consent (see appendix 2). For the informal waste pickers, the researcher explained the study on the signed introduction letter (see appendix 1); and the agreement was taken as a consent agreement. At no point during data collection, participants were asked to record their names, or any personal information that could be used to identify them. All the data collected from the participants in the study was confidential, and participants remained anonymous.

3.5.2 Publication of the results

The researcher compiled an accurate research report, and never manipulated the report results. UKZN as the custodians of this research, this copy of the research will be published under the master's thesis section available in the University of KwaZulu-Natal library, as well as the UKZN Graduate School of Business and Leadership.

3.5.3 Management of information

The data from the semi-structured interviews, audio, and text transcript of the interviews are filed and kept under the protected computer password, which are accessible until the research is completed, and will then be discarded after the

completion of the interviews and the studies. The research report is a public research document, therefore the participants' information was concealed, and so were some sensitive areas. Policy makers, academics, and the interested parties can have access to this research, provided that their interest is for personal and academic exercises, otherwise permission is needed by the University for any other purposes.

3.6 Methodological reflections

3.6.1 Language barrier

For the duration of data collection, interviews were conducted in English and then interpreted to isiZulu, and the researcher was able to translate to isiZulu.

3.6.2 Member domination

In each of the focus groups, there was a 'spokesperson' who dominated the discussions. Some participants were unwilling to raise their views and issues because they were shy and scared. In order to make sure that all the participants made their contributions, equal chances were facilitated. Participants were asked to share their experiences, since their names were not recorded.

3.6.3 Confidentiality or anonymity

The anonymity cannot be guaranteed in focus groups as members discuss controversial issues (Sekaran & Bougie, 2016). The participants were advised to keep the sensitive issues confidential, but that was not promised as members divulge information. The informal waste pickers did not want to disclose their daily pay for the solid waste recyclable materials, even when asked to use estimates.

3.6.4 Interviewee effect

During the interviews, the informal waste pickers were asked to provide the information on the support that they receive from the municipal authorities, if any.

But the informal waste pickers did not disclose some of the crucial information, it was because they were afraid of losing their relationship with the directors of the buy-back centres.

3.7 Summary

This chapter outlined the research methodology that was used, the research questions, aims and objectives, as well as the research design was also discussed. The interest of this study was exploring the different life skills, behaviors, thoughts and feelings that the informal waste pickers, buy-back centres, and officials; therefore, a qualitative approach was used. The sampling methods employed in this research includes the purposive and snowball sampling. The focus groups, key persons, researcher's own observation, and semi-structured questionnaires are the data collection techniques used. Details included the interviews with the informal waste pickers, directors of the recycling buy-back centres, key informants in formal waste management sector, and focus groups. Tesch's technique of qualitative data analysis was used, and it involved coding and identification of themes. To ensure trustworthiness of the research findings, criteria's such as truth value, applicability, consistency, and neutrality was employed. The study further outlined the methodological considerations of the research design.

CHAPTER FOUR

Presentation of the results

4.1 Introduction

This chapter is based on the empirical evidence that was collected through the interviews and discussions with the participants involved in this research. The survey revolves around these important themes and aspects: the socio-economic characteristics of the research participants; the reasons of the involvement of the informal sector in the formal waste management systems; different daily problems encountered by the informal waste pickers; the involvement of the informal sector on the municipal waste management systems; the obstacles to an integrated waste management systems; and lastly, the method for the ecological solution to the informal waste recycling in eThekweni Municipality.

The results are distributed into sub-themes, classifications, and precise quotes as expected in the traditional writing of the qualitative research. The exact citations are all written in English. It is highly significant to first classify the demographic characteristics of the informal waste pickers, and these are shown in **Table 4-1** below.

Table 4-1: The Participants Demographic Characteristics

Variable	Category	Participants	Percentage
Gender	Male	38	95
	Female	2	5
Age Range	15-25	7	17.5
	26-35	24	60
	36-45	6	15
	46-55	2	5
	56-65	1	2.5
Total	Total	40	100

Information supplied gathered from the **eThekweni Municipality statistic Department** with 77.5% of the sample comprised of the youth and 95% male participants, from the data that was collected year **2015-2018**.

Table 4-1 shows clear that the 38 of the informal waste pickers were men, while 2 were women only. **Table 4-1** also shows that 60% of the entire population of the waste pickers ranges from 26 to 35 years of age; 7 participants of the sample population is between 15 and 25 of years, and 6 participants ranges between 36 and 45 years. The high representation of 31 participants of the age group range from 15 to 35 years, this is a symbolic reflection of the fact that the informal waste pickers are predominantly regarded as the youth, and this is a true replication of the high unemployment in South Africa with a percentage of 27.6% compared to 26.6% of 2015 in the country (SSA, 2019). According to the StatsSA Census (2011), the eThekweni metropolitan contributed approximately 43% on the national unemployment rate, which has dropped by 12.8% compared to 2001.

The most people who are distressed by this percentile growth are the youth, who are progressively not being captivated by the formal sector, as shown in **Table 4-1** above. As a result, the lack of formal employment opportunities due to prompt suburbanisation caused in engrossing the youth to pursuit for an alternate employment possibilities in order to attain their source of revenue, which are essential for the tracking down of other conveniences.

According to the Statistics South Africa (2019), the metropolitan population growth in South Africa is projected at 2.4% and with no awareness it will end

result in 71% of the metropolitan population by 2030, and 80% by 2050 respectively. An official from the eThekweni Municipality indicated in the questionnaire that:

“The current urbanisation in the eThekweni CBD has in a way led to economic, social and physical problems, and this will definitely continue to require the attention of both legislators and policy makers. If we leave it to spiral out of control, it will have a devastating impacts on the urban areas.”

It is highly significant to remember that the prompt suburbanisation in eThekweni metropolitan is escalating as the effect of a cumulative rural-urban migration, population growth, and industrialisation (Sentime, 2014). The growing urbanisation, as mentioned by the eThekweni metropolitan official, has conveyed many challenges that need to be mitigated by the government, for example, the deterioration of the municipal infrastructure, inefficient service provision capability, congestion, environmental degradation, and the generation of volumes of solid waste.

According to Simatele *et al.* (2017), in most SADC countries, high urbanisation rate has brought an inadequate fiscal base to accommodate for employment provisions, or establishment of municipal services to the residents. From this thought, it remained significant to classify features that contributed into inducing the waste pickers’ participation in municipal waste management recycling. These observations are shown in **Table 4-2** below.

Table 4-2: The participants’ causes for contributing in an informal waste recycling.

Reasons	Frequency of citations	Participants	Percentage
Self-employment		16	40
Source of livelihood		10	25
Respected in the community		6	15
Raise money for school		4	10
Other		4	10
Total		40	100

Information gathered from the supplied data by the **eThekweni Municipality Statistic Department** with 65% of waste pickers who rely in recycling as a form of employment and livelihood, from the data that was collected year **2015-2018**

Table 4-2 above clearly indicate the main purpose for the participation in an informal waste management by the waste pickers is for financial and fiscal advancement. The 65% of participants' population displayed that the necessity for occupation and revenue creation as the foundation of appealing to informal waste management recycling. The further 15% contended that the solid waste recycling gives them a prospect of recognition and respect in their particular societies. These discoveries tends to be similar to the former research studies which proposed that an increase in metropolitan poverty and redundancy have pooled in prompting the weighty dependence of several metropolitan poor families on the informal sector, some of which is solid waste recycling (Simatele et al., 2017).

The data composed from the three different study settings, along with the deliberations with the representatives from the solid waste recycling plants, which is marked as considerable as waste management and recycling plays a considerably part to the employments of the waste pickers, the waste pickers also contribute comprehensively to waste minimisation, resulting to proper waste management.

The practical indication recommends that the waste pickers perform a substantial part in the municipal waste management, yet they are informal and unregulated in nature. The waste pickers gather the recyclable materials found in the diversified solid waste in the streets, dustbins, shops, clubs, clinics, parks, factories, residential flats, and hotels in the urban fabric. Deliberations with the waste pickers as well as officials found in the waste recycling plants discovered that even though the purpose of gathering waste is virtuously economic motivated, a substantial quantity of recyclable constituents are frequently collected and recycled.

Waste pickers have become extremely expert at identifying solid waste through the prospective values, and discovering the buyback centres across the eThekweni metropolitan. The most frequently targeted municipal solid waste are plastic, paper, cardboard, metal scrap (mostly tins, cans, etc.) PET bottles. It is also significant to notify that these operations are essential and implicit within the framework of common uncertainties found in the informal systems of eThekweni municipality. During the dialogue with one of the waste pickers retailing at the Congella Reclamation group, responded:

“It works very well for me when DSW workers are on strike, it means that all the waste is not collected, and I can take my time and collect as much as I want. But when DSW workers are working, it becomes a problem, it’s a race against time, and they always beat us as they have vehicles that they use to collect waste. We walk long distances, and it is difficult to get there before them. So it is always good for us when they are on strike.”

Further discussion with the official from the Phoenix North Reclamation Group recycling plant, discovered that a substantial quantity of recyclable waste is frequently brought by waste pickers who ordinarily sell it at fee. They trade their recovered recyclable materials in the buy-back centres around eThekweni, namely Phoenix North Reclamation Group recycling plant, Congella Reclamation Group recycling plant, and Isipingo Reclamation Group recycling plant. Most waste pickers select their best buyers in terms of the prices they offered to them, and also in terms of the buy-back centres proximity. The buy-back centres are the middlemen in recycling of recovered waste especially because industries do not buy recyclable materials directly from an individual waste picker, instead they buy in bulk, in buy-back centres. One of the operators in the Phoenix Reclamation Group for example, stated:

“A lot of recyclable solid waste you see here was brought in by the waste pickers. We buy the recyclable materials from the waste pickers, and we also sell it to the manufacturing industry who then transform it into re-usable materials. Our baling machines compact and bale the sorted recyclable solid waste. The baled

recyclable materials are then delivered to paper and plastic mills, where the recyclable materials are used in the manufacturing process.”

The above quotation supports the evident that the informal sector through the recycling activities take essential part to the municipal solid waste minimisation and management. As a result, the engagement between the buy-back centres and the waste pickers seems to be increasingly to be the major form of employment and a source of livelihood.

Based on the information given from above, it is important to have an understanding of the monetary value of the recycled materials. According to Wilson *et al.* (2006), the buying price of recyclable materials from the waste pickers be subject to the price of virgin materials, the reality of narrow markets, the supply and demand for the secondary materials, the level of availability, and the suitability of conveying the materials. In comparison with an experience from other countries, the price paid in Nigeria depends on the quality and the quantity of the recyclable materials (Ogintoyinbo, 2012). In the context of eThekweni, the waste pickers are generally paid based on quantity (kilograms) of the recyclable materials collected.

According to the discussion with the waste picker from Isipingo Reclamation Group recycling plant, apart from the quantity of the recyclable materials, present thrilling variation in the prices paid in the buy-back centres. The waste picker further confirmed that:

“Many industries are closed towards December, so the demand is low during that time, and therefore the buying price decreases. We end up getting nothing.”

The views expressed by the waste picker suggests that the waste pickers are exploited mainly because they operate as individuals, and in this scenario they do not have a supporting management board. They end up accepting any offered price as they are not under a representative body that can represent them and negotiate the prices.

4.2 The contribution of the waste pickers in the municipal solid waste management and recycling.

Data shows that in as considerable as the solid waste recycling considerably contributes to the employments of the waste pickers. The waste pickers make extensively important contribution in the cleaning of the city, environmental protection, and waste management and minimisation. The participants listed the different important contributions of the waste pickers in waste management and recycling. These contributions are divided into four groups of sub-themes which are: (A) waste minimisation, (B) minimise waste to landfill, (C) reduces the municipal expenses by cleaning up the City, (D) source of employment and livelihood.

A. Solid waste management and minimization

The recovery and the recycling of the solid waste materials in the eThekweni Municipality is mostly run by the informal sector. **Table 4-3** below displays diverse solid waste materials that the waste pickers collects for the recycling in three different recycling Buy-back centres per week.

Table 4-3: Average waste collected per week in research recycling plants

Recycling Plant	Different solid waste with their estimated amount (in kg)							
	Glass/ Bottles	%	Plastics/ Bottles	%	Paper/ Boxes	%	Scrap metals/Cans/ Tins	%
Phoenix North Reclamation Group	124	27	106	32	41	23	29	15
Congella Reclamation Group	198	43	135	41	82	46	123	64
Isipingo Reclamation Group	138	30	89	27	55	31	40	21
Total	460	100	330	100	178	100	192	100

Information gathered from the supplied data by the **eThekwini Municipality Statistic Department** with the Congella recycling a large number of recyclables compared to Isipingo and Phoenix North Reclamation Group Buy-back centres, from the data that was collected year **2015-2018**

Table 4-3 also shows that the waste pickers make the substantial contribution to the municipal waste minimization and management in eThekwini. It is further suggested that 43% of the recyclable glass or glass bottles, and 64% of scrap metals is established on average at the Congella Reclamation Group recycling plant respectively, they are a result of the contribution made by an individual waste picker.

The one of the official from eThekwini Municipality discovered that the waste pickers are the imperative role players in the waste management recycling. They recycle on source from the street bins, industrial areas, household and commercial zones. The official further mentioned that in the setting of an augmented and elongated strike occurrences by DSW staffs from the formal institutions and organizations who were tendered to manage waste, the waste pickers proved to have the capability to be malleable to deal with the uncollected waste left in the streets. They use their makeshift trolleys to collect the recyclable waste and sell it to the buy-back centres, others also sell their recyclable materials on the weekends. The eThekwini Municipality official stated:

“The waste pickers have a valuable contribution as far as the solid waste recycling is concerned. The waste pickers populate the streets of eThekwini Municipality recovering recyclable waste at domestic level, industrial, and commercial levels. There are different activities of the waste pickers in eThekwini which are organically grown, these such activities are highly flexible and adaptable, and they are very responsive to the different waste challenges that the eThekwini Municipality faces. It can be argued that these different activities by the waste pickers in eThekwini Municipality are highly driven by the demands.”

Sometimes the waste pickers would spend the whole day in the city searching for the recyclable waste. The waste pickers mentioned the challenge of source

separation at domestic level, even though households produce most waste; papers, plastics, bottles, and the hazardous waste are common types of wastes. The residents are not aware of the practice, or they do not see the need to separate their waste on source, since the government have no initiations and implementations of the waste resource recovery programme at household level. The waste picker from Isipingo Reclamation Group recycling plant responded that:

"I understand how important my job is, but the residents are not aware of the recycling and source separation. They mixed all the waste in one refuse bag, as a result I am delayed since I have to search if there are any recyclable materials inside the refuse bags. Government need to put some majors in place, and educate people to separate their waste before disposing it."

The officials in the eThekweni Municipality need to educate and implement majors on the residents about the importance of recycling and source separation, so that this residents' behavior towards waste management and recycling can be controlled and monitored. The municipal authorities require the understanding that the most operative way to manage waste is the recycling through source separation.

B. Reducing the waste that goes to the landfill

All the participants' views display that the recycling can be the best solution to divert the solid waste that goes to landfill sites. They also point out that it is an economically viable method, and the recycling creates employment for the people living in the city. During the discussion with the eThekweni Municipality official, she revealed that waste pickers make a huge changes on the volumes of solid waste that end up in the landfill sites. She further mentioned that the strategy of landfill waste reduction is through integration of the informal sector with the formal municipal waste management systems, taking into consideration that eThekweni is running out of the development space. All the participants anonymously agreed that the role that the waste pickers play in eThekweni helps to reduce solid waste volumes that goes to landfill sites. One of the official from eThekweni stated that:

“At the moment, the eThekweni Municipality is running out of capacity in their landfill sites. The waste pickers help in reducing the solid waste that goes to the landfill sites, and at the same time increasing the lifespan of the landfill sites in the eThekweni region.”

Another official from the Environmental Department within eThekweni further stated that:

“The recycling process does not only reduce the waste that goes to the landfill sites, but it also helps in the lowering of the greenhouse gases and leachates emitted by landfills, and it saves energy used during the production and importing of products like plastics and cardboards.”

C. Reduction of the waste management expenses and cleaning up the city

Even though the waste pickers are marginalized and not recognized by the residents in their communities, but they do contribute to the urban economy by reducing the volume of solid waste produced in metropolitan areas. From the view of these observations and discussions with the officials, it was pointed out that the recycling does make the difference in the urban landscape. The recycling process is used to recover usable and recyclable solid waste materials from the environment, and thus create the sustainable and hazard free cities. The one of the senior officials from eThekweni Municipality stated that:

“Waste pickers play a vital role by reclaiming the recyclable waste found in the dustbins across the city. They help reduce the municipal transportation and disposal expenses by on source waste collection, thus saving the public funds. DSW trucks get less volumes of solid waste, and this help reducing the number of trips which result in the reduction of fuel costs. The waste pickers’ role in waste management and recycling for us is a huge cost saving measure.”

D. Source of livelihood and employment

It cannot be disputed that as much as the waste pickers contribute to waste management and minimization, the waste pickers also use this as an approach to alleviate urban poverty. The waste pickers mentioned that as much as the recycling process activity benefits the environment, it also helped them to feed their families through the informal recycling. One of the waste pickers aged between 26 and 35 of years believes that the informal waste recycling is a form of employment, he stated that:

“Waste recycling is my source of income. I have two children, and I managed to put one of my children in the tertiary educational institution through the recycling money.”

The further discussion with the waste picker revealed that the solid waste recycling activities is a source of livelihood, they can buy food, support themselves and their families. The views mentioned from above confirms that the informal solid waste recycling also contributes to the well-being and welfare of the solid waste pickers.

It can also be disputed from these observations that the waste pickers are not passive actors, but they are dynamically involved and engaged in adjusting their systems, ensuring that their livelihood and income are not negatively impacted. The most attention-grabbing part from the above opinions is that as much as the recycling events of the waste pickers as a source of the income, they also play a significant role contributing to the environmental sustainability (Simatele et al., 2017). The local authorities from eThekweni Municipality further discovered that the waste pickers are responsible for an estimated 82% recyclable waste recycling, since the recycling capability is intrinsically linked to their livelihood and as a source of income.

4.3 Problems that the waste pickers faced with in eThekwini area

The waste pickers highlighted different challenges they encounter during the waste recovery and management. These challenges were then divided into two sub-themes, occupational and operational problems, which were then sub-divided into different categories. In 4.3.1 Occupational problems: Social and Health issues, and in 4.3.2 Operational problems: Exploitation by the Buy-back centres, Competition, ill-treatment by motorists, and Distance, theft, and long working hours.

4.3.1 Occupational problems

A. The different social issues

The waste pickers work under different extreme weather conditions. Some of the challenges as shown in **Table 4-4** below indicate that harassment by the people and the nonexistence of the corporal infrastructure represent 35% and 30% correspondingly. Many of the informal waste pickers mentioned that the provocation at waste collection location is highly prevalent because residents are always suspicious and identify them as criminals who take out the waste from their source and scatter them arbitrarily.

Table 4-4: Social problems encountered by the waste pickers in eThekwini area

Challenges/Problems	Frequency of citations	Participants	Percentage
Harassment		14	35
Lack of Infrastructure		12	30
Heavy Traffic		10	25
Health issues and physical injury		4	10
Total		40	100

Information gathered from the supplied data by the **eThekwini Municipality Statistic Department** with 65% of the social challenges coming from the harassment and the lack of infrastructure from the data that was collected year **2015-2018**.

One of the waste pickers at the Phoenix North Reclamation Group stated that:

“People along the streets identify them as drug addicts and criminals. They do not recognize our role in the solid waste management and recycling. As a result I try by all means to focus on the waste that I am collecting so that I can make more money, rather than trying to be part of the community that does not appreciate my work.”

Another waste picker in Congella Reclamation Group confirms this, and stated that:

“The worst problem is the harassment from the Durban Metro police, they do not want to see us in the streets with our waste, but we do not have any other waste removing plan, we must continue pulling our trolleys.”

The residents who do not understand the waste pickers' role are constantly on the opinion that the waste pickers are of an annoyance and need to be prevailed from recycling solid waste. This residents' negative behavior possibly will be reasoned as being the result of privation of understanding on the contribution that the waste pickers have on the environmental sustainability and protection, and the way the waste pickers are harassed by the metro police, taxi drivers, and some people in the community.

B. Health issues

The further 10% from **Table 4-4** of the participants identified the ill-treatment as one of the major concerns. This is a result of the absence of the proper attire and equipment required for guaranteeing the protection of the waste pickers from the hazardous waste, and this often result to illnesses. The combination of these challenges compromised the waste pickers' capacity to successfully participate in solid waste recycling. When they manually manage waste, they have a direct contact with broken bottles and glasses, and animal and human waste. A waste picker from the Isipingo Reclamation Group stated that:

“It is hard to recover the recyclable waste in the rubbish dustbin without taking out what is inside it. In some cases, when I take out the recyclable material from the dustbin, I get cuts from the sharp objects and poisonous substances, since I used bare hands. It can be better if the government can provide us with hand gloves, facial mask, overall and boots so we can protect ourselves.”

The hospital waste found in public hospitals is not carefully separated and sorted, as a result the entire medical waste becomes infectious and leads to the transmission of infectious ailments like HIV. Another waste picker confirms his dissatisfaction on hospital waste carelessness, and stated that:

“I was diagnosed of HIV particularly after contacting the sharp object from the hospital solid waste.”

Most waste pickers complained about the smell of gases from the waste they come across during recyclable waste recovery found in dump sites and dustbins. According to Wilson *et al.* (2009), waste pickers are likely to inhale gaseous emissions during waste collection, this can cause bronchitis, skin and eye infections, health risk like flue, respiratory issues, abscesses, high blood pressures, physical harms (i.e. chronic soreness arms, back-ache, shoulders and legs). Many of the waste pickers confirmed that they become sick after being at the point of waste collection source. A female waste picker aged between 26 and 35 years of age who sells her waste at Congella Reclamation Group stated that:

“I am currently taking the Tuberculosis (TB) treatment, and this is a result of the dustbin smells. I do not have a choice, but I will continue to live and force myself to do the solid waste recycling daily, because this is the only source of livelihood for me.”

4.3.2 Operational problems

Despite the waste pickers' occupational problems experience, the waste pickers are also faced with the operational challenges. From **Table 4-5** below, it is shown

that there are also operational challenges that the waste pickers face in the eThekwini.

Table 4-5: Operational problems faced by the solid waste pickers in eThekwini

Challenges/Problems	Frequency of citations	Participants	Percentage
Exploitation by the middleman		15	37.5
Competition		13	32.5
Motorists' ill-treatment		9	22.5
Distance and Theft		3	11
Total		40	100

Information gathered from the supplied data by the **eThekwini Municipality Statistic Department** about 70% of operational challenges are due to unfair competition and exploitation by the middlemen (Buy-back centres, wholesalers, primary and secondary dealers, recycling Buy-back centres, and the intermediate processors), from the data that was collected year **2015-2018**

A. Exploitation by the middlemen

From **Table 4-5** above, about 37.5% of the major operational problems encountered by the waste pickers during waste management recycling are through over exploitation by the middlemen. A large number of the waste pickers feels like they are being used by the Middlemen. The middlemen is made up of brokers, wholesalers, primary and secondary dealers, buy-back centres, and intermediate processors (Wilson & Velis, 2014). These groups contribute a lot to the informal waste recycling sector since they purchase the recyclable materials directly from the waste pickers. One of the officials in the three buy-back centres stated that:

“It is difficult to work directly with the waste pickers since they are not employed by the middlemen (buy-back centres), worse there are no government regulations, they are actually self-employed. Therefore they operate at their own schedule, sometimes they come in large numbers, and sometimes they come in small number, and that affects the demand of quantities needed, as a result the price is also affected.”

The issue of the middlemen is becoming a challenge, since the waste pickers do not have control on the buying price, and the waste pickers feel that the buying price is low and unfair to their effort. The waste pickers who sell the recyclable solid waste at the Congella Reclamation Group stated that:

“This work is not paying us the fair price, and it is tiring, since I travel a very long distance collecting the recyclable waste. Since there is no stable price, I always go around looking for the better prices between different buy-back centres. I sometimes find the recyclables that yields only 50 cents per kg, but cannot leave it since I have covered long distances. When I got 10-30 kg then that is when I can sell them and it pays R10 to R15. With the good quantity of plastics and cardboard boxes I normally get R70 to R100.”

Another waste picker from the Congella Reclamation Group stated:

“I travel from Carto Manor to the city every Monday where I live under the bridge for the entire week. I only return to my family on Saturdays, they have no idea what type of job I am doing. I make very little money; on the good day I make about R100, but on average day I normally make between R50 to R70. The prices are very problematic since with that money I must buy food, pay rent, and support my family.”

According to Ezeah *et al.* (2013), the individual informal waste pickers do not have the regulated supportive network, therefore they are most subjected to exploitation. The above statement confirms the evident that the middlemen obviously takes the advantage of the waste pickers by paying them the unfair and low prices on their recyclable materials.

B. Unfair competition over recyclable materials

The informal waste pickers felt that there are different valuable recyclable materials which are found in different commercial areas, street dustbins, and residential areas that do not deserve to end up in the landfill sites, while there is

a large number of them who make a living through the solid waste recycling. **Table 4-5** shows that out of 40 participants 32.5% of them complained about the unfair competition among themselves, DSW services, and private companies. The waste pickers complained that it sometimes take them days to search for the recyclable materials. The waste picker from Isipingo Reclamation Group stated that:

“Many people has now discovered you can make money through the solid waste recycling. The main challenge now is that the waste collectors from the DSW services take the recyclable materials found in the dustbins and recycle it for themselves. So by the time we arrive, we find that there is already no recyclable materials available on site, and we then have to search the whole town of Isipingo for the recyclable materials, and that takes time, and also causes the unfair competition. Some companies will collect the cardboards and papers in their premises and send them for the recycling in the buy-back centres. To cut the story short, there is a large number of us with the limited number of the recyclable materials.”

The further discussion with some of the waste pickers confirmed that even the Metro police will compete with them. The one of the waste pickers stated that:

“They arrive where we sleep and impound our material, and then go and sell it by themselves.”

Worse than that, some of the waste pickers went as far as colonising the streets, so that no waste picker from outside can come and claim the recyclable solid waste from their territory. As a result, other waste pickers cannot just collect solid waste in every street, since the streets belong to the certain individuals. One of the waste pickers stated that:

“The competition has resulted into the ownership of the streets. There is a large number of us in the streets that is why we are now claiming streets. We end up fighting and killing each other over the recyclable materials.”

C. Ill-treatment by the motorists

Table 4-5 shows that 22.5% of the participants identified that the ill-treatment by the motorists is another concern, and is connected to the lack of the infrastructure, which shows that there is no working relationship between the motorist and the waste pickers. This is to the fact that the waste pickers do not have their gazetted routes, they pull their trolleys down the streets of eThekweni every day. As a result, the motorists do not tolerate the waste pickers. One of the waste pickers from the Congella Reclamation Group stated that:

“We want to earn a living while making the difference on the environment too, but the motorist are not patient with us, especially the taxi drivers. They beat us every day and call us names, saying that we are blocking the roads. They run over our trolleys, while others hit us. I do not entertain them, because at the end we are all trying to make a living. It is a fact that some of them understand our situation, but most of them insult us. It seems like most people do not understand the work we are doing.”

Regardless of the different problems encountered by the informal waste pickers, it is evident that they do not have the protective personal equipment (PPE) with the reflectors so that they can be identified by the motorists, especially early mornings and late evenings. The challenge mentioned above generally results to the motorists running over the waste pickers along the roads. It is also noted that the residents do not recognize the waste pickers' role, since they call them nuisance, and further say that they must be stopped from collecting the waste close to their properties. The common view amongst the waste pickers was that the lack of proper roads networks result in a number of fatal accidents. One man from Congella Reclamation Group between 26 and 35 of years stated that:

“All of us work in traffic, we create a third lane on the two lane road by using the sidewalks.”

D. Theft, distance, and long working hours

Distance and long working hours are other challenges encountered by the waste pickers. The waste pickers in eThekweni use their trolleys for collection and transportation of more than 60 kg of the recyclable solid waste over the average distance of 35km a day, even during the extreme weather condition. Their work is dangerous and physically demanding, but the waste pickers will continue pushing their trolleys through the streets of eThekweni searching for the recyclable solid waste materials. Above that the waste pickers have to find their way to the buy-back centres, so that they can sell their recyclable solid waste.

Apart from walking long distances searching for the recyclable solid waste from different waste streams, they fight and steal each other's solid waste recyclable materials. One of the waste pickers at the Phoenix Reclamation Group stated that:

"this trolley you see is heavy when it is full, pushing a trolley and negotiating the way in the streets to the buy-back centres is a very difficult thing to do, people are not considerate they just say whatever they like and I cannot answer them back, I just carry on with my work. If I answer them back, some of them become stressed and want to pick a fight with me over my recyclable materials."

Another waste picker added stating that:

"I make sure that I wake up at 3h00 in the morning and visits all my dustbins searching for the recyclable materials before others come and claim it."

An official from the Congella Reclamation Group stated that:

"We have a large number of waste pickers coming from Carto Manor, Durban central, Rosburgh, and Berea to name the few. They travel each and every day by feet searching for the solid waste recyclable materials around the eThekweni and sending their recyclables to the buy-back centres. There are fights every day

over the recyclable materials. It's their daily problem, and they can sometimes kill each other over their recyclable materials."

The insistent fights towards the recyclable materials could be due to being aggravated by the lack of storage facilities and sorting space for the waste pickers. The absence of these facilities contributes to the illegal dumping and littering, which is the least preferred practice in the solid waste management.

4.4 Barriers to a formal inclusive eThekweni Municipality waste management system

The eThekweni metropolitan officials and informal waste pickers expressed their different opinions and concerns on the reasons why the role and the contribution of the informal sector is not incorporated and recognized within the formal municipal waste management system. The study discusses five major barriers which are, non-existence of valid citizenship documents and domination of illegal migrants, no supporting evidence, social acceptance and oppressive policy, large numbers of middlemen, non-existence of cooperation amongst the municipal authorities and the informal waste pickers.

A. Lack of valid citizenship and domination of illegal migrants

The one of the officials from the eThekweni municipality revealed that the solid waste pickers' role is not recognised as important role in waste management recycling. He further mentioned that it is difficult for them to recognise the waste pickers since most of them are formerly not from South Africa. Even when they are from South Africa, most of them do not have the valid South African identity documents. More than 50% of the population of waste pickers come from South Africa, and some originate from neighbouring countries like Zimbabwe, Mozambique, and Lesotho (Sentime, 2014). The eThekweni municipality official stated that:

"We have approximately 34% of waste pickers who are not from South Africa. And again most of those who are South Africans do not have the citizenship

documents. These are some of the challenges, we cannot put them on the eThekwini municipal database.”

The interviews with the waste pickers showed that most of them are not in the position of the identity documents or passports. Officials made it clear that if the waste pickers were to be affiliated in the eThekwini municipality system, the preference will be given to the South African citizens, of which a majority of them also do not have the valid identity documents, and more than 34% are immigrants. A different official mentioned that some of the waste pickers are criminals, and therefore they do not have the proper identification documents. The official further stated that:

“Even if the South African government can try and help those people, it will make no difference helping them because the system will pick up the individuals who once committed crime.”

B. No supporting evidence

According to the official from the eThekwini municipality, the major challenge is that the waste pickers do not have the databases of their own. They only identify them in the roads of eThekwini metropolitan but they have no trace, since their activities are neither organized nor documented. An official from the DSW stated that:

“At the moment, there is nothing that the government can do about the individuals. It is not easy to help people that you are clueless about their role in the waste management and recycling. All in all, we do not know how many they are, we have no idea about their working networks, even worse we do not know about their working stations.”

With reference to the above statement, the waste picker from the Isipingo Reclamation Group remarked that he loved recycling, he also stated that:

“I am not looking for the government employment since they have their own ways of doing things, and I have my own way of doing things also. The major problem when working under the government system is that they have the dictatorship system, they will command me on how to operate as the waste picker while I am having a lot of experience operating under the informal system. I know how to do my job better than anyone else.”

According to the above waste pickers statement, the waste pickers have lost hope from the government, and they show no confidence in the government and municipal authorities.

According to Wilson and Velis (2014), the struggle in quantifying numerous significant features, and the non-existence of data on the waste operations makes it challenging to engage with particular main players in the waste management. This shows that the municipal authorities use the top-down approach that only supports the elite groups and ignores the significance of the waste pickers. It is with no doubt that the waste pickers are contributing a lot as far as the waste management and recycling is concern, there are some individuals who dedicate themselves to make the difference on the ground, but not on paper.

C. Social acceptance and oppressive policy

Most of the waste pickers lack the recognised social acceptance within their communities. The people and authorities perceive the waste pickers' operations as a public nuisance and the shameful activities that must be detached in the society. The main problem is the impounding of the trolleys with solid recyclables by the metro police. In worse cases the waste pickers are identified as criminals, as a result they are often being accused of theft, most resident do not feel safe around the waste pickers. The waste picker from the Congella Reclamation Group stated that:

“The society do not recognize our work as the resource recovery strategy, but they classify us as low class people.”

Since the waste pickers are not recognised, their role is not acknowledged as the effective players in the waste management and recycling.

D. Large numbers of middlemen around eThekweni

According to one of the waste pickers, there are a lot of buy-back centres in eThekweni municipality. As a result, it is not easy for the eThekweni municipality to convince the waste pickers to manage them and make them to operate in groups. This is due to the facts that many waste pickers have developed a trusted relationship with the officials in the buy-back centres. This makes the waste pickers to sell their recyclables at any buy-back centre of their choice, depending on the distance they will cover and the selling price of their recyclable materials. According to Medina (2000), industries in the developing countries encourage and support the integration of the waste pickers, and the formation of the middlemen in order to ensure the constant supply of the recyclable materials. For the eThekweni municipality, the authorities need to come up with a strategic plan to work with the private sector and regulate the buy-back centres around the eThekweni metropolitan region.

E. Non-existence of cooperation amongst municipal authorities and the waste pickers

According to the waste pickers in the three buy-back centres, there is no coordination between the eThekweni municipality and the waste pickers. This lack of cooperation resulted to the circumstances that are challenging on the waste pickers. The waste pickers stated that:

“It is not easy to get the funding, resources, or to break through the municipal channels. It is always not easy to deal with the eThekweni municipality officials. We are now trying to request the personal protective equipment from the municipality. The major problem is that we are not yet organised, and most companies want us to be registered with the eThekweni municipality first.”

According to the above statement, the municipal waste officers are unaware about the waste pickers needs. They do not understand the real issues and hazards that the waste pickers are exposed to across the ground. The eThekwini municipality can only improve understanding the challenges or factual concerns regarding the solid waste recycling through the direct involvement with the informal waste pickers.

With regards to the above observations, there is a need to reimagine the different avenues through which the waste pickers can be integrated into the formal municipal waste management systems in eThekwini metropolitan. According to Sentime (2014), the main focus of the municipal waste management system involves the solid waste collection, transportation and disposal. However, looking at the high unemployment rate of 30.2% in eThekwini, there is a need to apply new strategies that can facilitate the recyclable waste recovery and recycling in eThekwini municipality (StatsSA, 2011). This agenda will not solemnly contribute to the operational waste recycling systems, but it will create more jobs that can result to the improved economic growth (Simatele et al., 2017). It is important for the municipal authorities to implement different strategies that can help in the training and organisation of the waste pickers on waste management and recycling. This process will bring the awareness and acknowledgement of waste pickers' role in the municipal waste management system.

4.5 A strategic approach for a sustainable solution to the integration of the informal waste pickers in eThekwini.

Beside the buy-back centres and their agents, experienced waste pickers exists in the eThekwini. The main focus of this research study is acknowledging the main part that the informal sector can play by improving the waste recovery and the recycling in eThekwini. This can be done by drawing attention to the capabilities portrayed by the waste pickers that the informal sector represents future strategies and current possibilities to improve the waste recovery and recycling process in eThekwini. The waste pickers can then be successfully be organised as means of promoting the sustainable development. This research confirms that it is feasible to incorporate the waste pickers to the municipal waste

management systems using the following approach displayed on **Table 4-6** below.

Table 4-6: The informal sector integration system with the eThekweni municipality waste management and recycling

Model	Integration into the municipal formal system
Driven by	Local Government/ municipal authorities
Database creation	There must be a form of listing of names of waste pickers
Regulation	Policy to guide and regulate the system legally
Financial support	Give support where necessary to meet the PPE requirement and other support tools
Legal working Framework	Develop norms, standards, and guidelines
Institutional arrangement	Establish the proper structure, representative body, and union for waste pickers
Recognition	Collect all the operations of the waste pickers, and identify their role in the community
Location	Given the recyclable separation sites, for the managed source separation
Collection System	Open competition system

Information in **Table 4-6** is based on the field work, and the researcher's observations on some of the issues of concern, some matters can still be updated where necessary, but the main focus is on the working legal framework.

4.5.1 Legal working framework

The eThekweni municipality with the help of the National Development Plan and the Environmental Affairs can put some guidelines in place, to be used by the municipalities for the integration of the informal waste pickers into the municipal

waste management sector. The legal framework displayed from the above **Table 4-6** is divided into six sub-themes: Identification and registration of the eThekwini waste pickers; Conduct the needs analysis workshop; Proper protective clothing procurement; Investigate and design working schedule that is user friendly; Develop training needs for the waste pickers; and The proper guidelines to be developed for the eThekwini municipality waste pickers.

A. Identification and registration of the eThekwini waste pickers

The eThekwini municipality will need to develop a database for all the waste pickers in their region, and update it on regular basis. The registration can be done using the assistant of the buy-back centres and waste committees which are based in the community. Using the above process, the eThekwini municipality can accomplish gathering of the right evidence on the waste pickers who operate in the eThekwini metropolitan area. The evidence gathered from the above can give the line department a suggestion of where the solid waste recovery operation flood is at, and the major role that the waste pickers perform in the value of the waste management sequence. The above procedure can also help in developing the communication platform amongst the ward committees, association, and the waste pickers where the eThekwini metropolitan can employ different issues of waste management. The Environmental Department can also work with Solid Waste and Cleansing Department with other Non-Governmental Organisations (NGO's), to help the waste pickers to form associations and alliance.

B. Conduct the needs analysis workshop

To assess the integration model, the eThekwini Solid Waste and Cleansing Unit can then facilitate a required analysis workshop, which can be utilized as the norm to analyse the disputes that the waste pickers are faced with so that the eThekwini can prioritize on the waste pickers needs. The Solid Waste and Cleansing Department can engage with the relevant stakeholders to identify the additional means of empowering the waste pickers. Then the Departments can have the waste pickers' profile, so that they can understand the daily challenges that waste pickers are facing, so that the informed intervention can be

implemented by DSW and the Environmental Department. The workshop will be used as part of the waste picker activity profiling strategy for the relevant stakeholders for empowerment. The workshop can also be used by the applicable stakeholders to recognize the main role they can perform on the empowering of the waste pickers. The stakeholders comprise of residents; manufacturing; local, regional, and national Departments; and the eThekweni municipality Departments.

C. Proper protective clothing procurement

Waste pickers' Personal Protective Equipment (PPEs) can be procured by the Department of Environment, DSW, and Human Settlement and Infrastructure within the eThekweni municipality. The protective clothing must have the reflectors, to make the waste pickers to be visibly to the motorists throughout the daytime and at night-time, since the waste pickers utilize the streets to move the recyclables from the streets to the buy-back centres. They will need also the comfortable ergonomic boots to cover their everyday walking distances. The protective clothing may also include face mask and hand gloves so they can be protected during the reclamation not to inhale hazardous and dangerous substances that are common in the reclaimed solid waste. The protective clothing can be made available from the ward committees and may also be issued to the waste pickers on the launching day.

D. Investigate and design working schedule that is user friendly

The waste pickers will need the user friendly and efficient trolleys that they can pull along the streets of eThekweni. The municipal departments with the help of the waste pickers can try and undertake in a practice of designing trolleys that are suitable and user friendly to carry out waste pickers' activities. The waste pickers will specify what type of trolley they need, working together with the municipality, and identify and develop the industry that can help in the manufacturing of the trolleys. The industry will then use the specifications developed by the waste pickers committee working together with the municipality department in order to make the trolley prototyped. The prototype trolley will then

be taken to the buy-back centres for the evaluations and comments together with the eThekwini municipality. The comments from the buy-back centres will then be factored to the design of the sample trolley that can be accepted by the waste pickers.

E. Develop training needs for the waste pickers

The appropriate training will be conducted by DSW, KZN Department of Agriculture and Rural Development, Environmental Department, and Human Settlement & Infrastructure services. The training provided will cover business skills, the recycling processes, and the eThekwini municipality's by-laws compliance and requirements. The training will give the waste pickers an opportunity to understand different applications of the legislation. The training will also bring clarity on issues that the waste pickers are not clear with, and to also learn about the recycling industry. When the training project is completed, the eThekwini municipality can supplementary retrain the waste pickers, appropriately give those (waste pickers) more skills when there are new developments within the recycling industry. The experimental project can be implemented in the Durban central first, and subsequently it can be rolled out at other fragments of the eThekwini municipality.

F. The proper guidelines to be developed for the eThekwini municipality waste pickers

The guidelines for the waste pickers can be developed by the industries involved in recycling, provincial or national government, and eThekwini municipality. The guidelines will be developed as a learning curve during the duration of the pilot project. The eThekwini municipality will be conducting a comprehensive study and record the lessons learned during the pilot project. The study will then be used as a guideline for the operations of the waste pickers in eThekwini.

4.6 Summary

The chapter has presented the finding results of the research that are specifically concentrated on the empirical discoveries. Five different subjects were discussed: The demographic features of the study participants; the different challenges that the street waste pickers are faced with; the involvement of the waste pickers on the municipal waste management; Different barriers found in an integrated waste management system; and lastly Different approach for the sustainable solution to integration of the waste pickers in eThekwini metropolitan. The most waste pickers suggested the need for the employment in a form of a revenue generation as the foundation of appealing in the solid waste recycling. According to the study, the waste pickers are more vulnerable specifically to the harassment by the metro police, motorists, and the residents. However, the government must recognise and acknowledge the waste pickers operations in the eThekwini policy improvement and planning approaches. These are some of the core reasons to the obstruction of a comprehensive waste management: The non-existence of collaboration; the public recognition of the waste pickers in communities; There is no valid citizenship documents; and There is no supporting evidence about the waste pickers' activities. In the view of the observations from above, the eThekwini municipality can empower the waste pickers through organization and legal framework on the informal sector addition, and the acknowledgement in the metropolitan waste management development and development policy. For the integration to be successful, the urban authorities will need to conduct workshops to train, register, discuss different issues, and to provide the waste pickers with the protective equipment. The integration of the waste pickers will then ensure an increase towards the community participation and commitment, both in terms of the waste management and recycling.

CHAPTER FIVE

Discussion

5.1 Introduction

The imperative study was used to identify, capture, and cultivate the full potential and contribution of the waste pickers in the metropolitan waste management in the eThekweni municipality, and it was highly significant to apply a distinct attention that gave more emphasis on the integration of the informal sector with the municipal waste management strategic programmes. According to the empirical data outcome from this study, the waste pickers in the eThekweni region and the informal sector that they operate in, have been demonstrating the ability to work efficiently in the local municipality's solid waste management. They have the capacity to collect and recover the considerably huge amount of waste recyclables. To support the activities of the informal waste pickers, it is highly important that the appropriate policy is being identified and implemented at an entry level in order to maintain the different activities of the waste pickers. This policy will enable the waste pickers to gain employments, and to add value to the ecological municipal waste management systems. For the above intermediations to occur, there must be some improvements in the government systems.

5.2 The effect of the urban governance system

The improved governance may result to a creation of trust and self-confidence amongst the waste pickers, the government authorities, NGOs, and the private sector. Urban developments have the potential to help facilitate and trigger the establishment of the forum where the common interest on the waste recycling can be able to be uttered, this may result to a reinforced partnership among diverse sectors. The relations between these sectors show that there is a sophisticated possibility that the association, cooperatives, small businesses, and systems can be used conventional as the core opportunity where the informal

waste operations can gain support and be integrated in the formal municipal waste management system (Dlamini, 2017).

There are different approaches or sustainable solutions for the informal waste sector in eThekweni municipality, and the recommendations on different developments that can be derived from different issues raised by the informal waste pickers during the workshops. According to the findings of this study, the organised workshops can be used as the platform whereby the process of mapping the waste pickers groups can be implemented. According to Mohee and Simelane (2015), the large number of cities in the world have managed to implement solutions to manage social challenges through innovation. In Nigeria, Brazil, India, and Egypt, the informal sector is integrated with the municipal waste management, and it is known to be highly innovative and resilient, rather than difficult circumstances (Nzeadibe, 2013).

5.3 The equipment, protective clothing and infrastructure

There must be an improved governance in terms of the provision of the proper solid waste infrastructure, adequate equipment for the waste pickers to conduct their activities, and the protective clothing. This may initiate transformation in the culture that may involve an augmented recognition of waste picker's operations by the community. According to Dlamini (2015), the waste pickers normally originate from the underprivileged backgrounds with unrecognised public social position in their communities. As a result, the formalisation of the waste pickers could improve their livelihood, and better their standard of living. The interesting finding in this study confirms that 65% of the participants uses the solid waste recycling as a basis of employment and livelihood. The provision of the solid waste management infrastructure would hypothetically cause consequential integration of the waste pickers' operations to eThekweni metropolitan legal framework. The non-integration of the waste pickers has affected their activities negatively in the following challenges:

A. Community social issues.

It is very important to understand that in eThekweni metropolitan as it is the case with other metropolitans of the developing countries across the SADC cities, the integration of the informal sector have a tendency to suffer from the administrative procedures, and is subject to the municipal views (Simelane & Mohee, 2012). Informal waste pickers are classified by the community as the criminal and low class people who are continuously regarded as the risk to the public (Simatele et al., 2017). The evidence from this research suggest that 35% of the waste pickers found themselves threatened and harassed, mostly by the metro police officials. From the findings, it appears that harassment is the core challenge experienced by the informal waste pickers. According to Simatele and Etambakonga (2015), the undesirable behavior toward the informal waste pickers might be driven by the public absence of information on the contribution made by the waste pickers in the municipal waste recycling. According to Samson (2010), the positive acknowledgement of the waste pickers is the important step to bring upon the changes in communal opinion, with the intention of facilitating the conditions where the waste pickers can be seen and implicated and contained by the framework of their role in the environmental protection as the common goal of the waste minimisation and sustainability. Social recognition and acceptance, bring the improved governance, along with the integration of the informal sector with the municipal waste management system.

B. Lack of the solid waste physical infrastructure

About the source separation, the participants do not only experience the challenge with non-segregation of solid waste, but they also lack the internal infrastructure and the appropriate waste collection system. The findings show that 30% of the participants indicated that there is a challenge of the lack of proper physical infrastructure at point of solid waste separation. According to the findings, source separation at household level is not encourage or emphasized, some of the waste pickers complained that they have to look for the recyclables from the household refuse, which is mixed with biodegradable materials. As the result, the waste pickers operations are being delayed, and this affects the rate

of recycling, since the residents fail to separate their waste at domestic level. According to the findings from this study, the eThekweni municipality at source waste separation is not practiced.

The eThekweni metropolitan residents need to be encouraged to embrace the source separation at the household level. The eThekweni municipality need to supply households with two types' coloured bins and refuse bags for separation at household level, one for the recyclables materials and the one for the organic materials. The organic material such as food and yard waste are very useful for composting, this is the strategy that the eThekweni must adopt. The proper physical infrastructure can encourage the residents to cooperate with the authorities, to establish and maintain a sustainable waste management system. In the case where the statutory requirements for waste segregation at source are absent, the informal sector will become useful at identifying the recyclable materials, since they have been active in the waste separation process. Public awareness and participation work together in order to increase waste management and recycling activities. As a result, it is crucially important to bring awareness and educate the residents about being environmentally conscious.

C. Lack of facilitation workshops, public participation, and the awareness programmes

The data collected in the three different study settings, and the representatives from the solid waste recycling buy-back centres, has shown that the operative waste management is strongly dependant on the educational level of the residents, the government obligations, the economic inducements, and the adequate infrastructure. The proper education of the citizens can modify their perception towards the waste pickers' role in solid waste recycling, and this may result to a new perspective of waste-to-resource idea. In order to improve the public awareness, the educational programme should go outside the passive lectures, into the formation of the small pilot projects, which can create the empirical data, proving and supporting how can the solid waste recyclables can be transferred into wealth. According to Matter *et al.* (2013), the domestic waste is part of the core components of municipal solid waste, as a result the

educational awareness at the household level must be encouraged. This will result to the household families viewing waste as the resource, therefore initiating source separation schemes at household level. The South African education system should also include the waste pickers role and education at the school level, especially at the primary schools, where the General Science textbooks would feature different aspects of the environmental management education. The waste management authorities should display and teach about their success in waste management forums, so that they may educate the public about the importance of solid waste recycling at household level. The bottom-up inclusive models for instance conferences, yearly public assemblies, seminars, workshops, radio talks, TV programmes, and the responsiveness movements should be used to disseminate the information that would increase the involvement of different segments of the population.

D. Social acceptance in communities

Although the informal solid waste recycling is an old practice that promotes the resource recovery and the recycling of waste. The research findings shows that the waste pickers are still stigmatised and socially relegated. In eThekweni municipality, the informal sector is still not included into the formal municipal waste management systems, which results to a major limitations to social acceptance. According to Simelane and Mohee (2015), in order to achieve the objective on an inclusive system, the social acceptance of the waste pickers is an important legitimate activity in South Africa. Before the integration of the waste pickers into an improved waste recycling programme, motivation and desires of waste pickers' perception need to be in consideration.

Beside many challenges encountered by the waste pickers, the results show that the waste pickers contribute to the environmental sustainability and local economy. The waste pickers' influence is generally felt highly in waste collection, recovery, and recycling (Sentime, 2014). Even though the waste pickers' activities contribute to the protection of the environment, the waste pickers' activities also have a negative impact on the environment. According to Simatele and Etambakonga (2015), frequently there is a high possibility that the waste

pickers may scatter the organic waste through source separation, which may have a negative impact on the environment. In most circumstances, the waste pickers have a tendency to lack awareness on the conservational ethics, since the waste pickers' interest lie in the selling of the recyclable materials, not on the environmental protection.

5.4 Improvement in legal structure and legislations

The improvement on the governance systems will convey the invention, implementation of the present legislature, and the legitimate structure that will effectively bring the protection of the waste pickers' operations. According to Wilson and Velis (2014), the improved legislation may enable the empowerment of the informal waste pickers, and this may result to the vibrant network that will allow the waste pickers to compete with other economic ventures. Transformation and political power are the prerequisite for the above developments to take place. Creativity of the municipal authorities and the decision makers are the major source of the implementation of the integration strategy of any phenomena. According to the empirical results of this research study, in order to integrate the waste pickers, the possible legal framework need to be in place. The eThekwini municipality failed to incorporate the informal sector through direct involvement, engagement, and empowerment with the already existing waste pickers.

A. The eThekwini metropolitan deficiencies in waste management

According to Simatele and Etambakonga (2015), the failure of the integration of any occurrences with the existing municipality development planning system, has been worsened by an increase levels of the institutional deficiencies. This situation has been observed in the eThekwini metropolitan, where the absence of transparency and responsibility in the whole municipal waste management supply chain proved to be of dominant. The lack of transparency among the municipalities has resulted into a low management preparedness to apply the appropriate waste management policies, regulations, and infrastructure, which will then result into the failure of the municipalities to provide the proper waste management services (Mohee & Bundhoo, 2010). As a result, the waste

management challenges in South Africa particularly in eThekweni metropolitan, has resulted from the corruption not “political instability”, and lack of an institutional framework policy.

5.5 Community Based Organizations (CBOs) and Non-Governmental Organizations (NGOs)

It is important to include the participation of the CBOs and NGOs in the integration process of informal sector within formal municipal waste management. Since CBOs play a vital role in the community mobilisation, even though their effectiveness is limited by the political roles and the policy statements. Therefore, the utilisation of the CBOs in the policy implementation is a challenge for the local authorities (Chimuka & Ogola, 2015). The local government authorities need to understand and recognised that their roles ought to involve the facilitation of public initiative by delivering the facilities and service needed by their communities (Mohee & Bundhoo, 2010). From the above interpretations, it is significant for the eThekweni municipality to evaluate its existing governing framework policy to make certain that there is an effective communication and cooperative alliance with the societies and other interested parties. The local authorities should be in a place whereby they can provide the waste pickers with the appropriate training and funding, so that the waste pickers activities will be in line with the sustainable waste management standards, and implement more appropriate recycling activities. Then the cooperatives can deliver the effective skills, where the waste pickers are provided with support and advocacy. These interactions can also provide the platform for the proper integration into the formal system.

A. The waste pickers’ cooperatives

The role that is played by the solid waste pickers is not recognised. The local authorities should give support, and amplify the waste pickers by organising them into the cooperatives (Mvuyane, 2018). The cooperatives are the powerful tool for the promotion of the basic development of the informal sector. When the waste pickers are organised into cooperatives, this will build the capacity needed to

facilitate and implement the necessary training programmes, which will provide the opportunity for the effective enforcement of health and safety, and the environmental quality standards (Wilson et al., 2009). The NGOs and the CBOs are the right platforms for the municipalities to identify the jobs related to the waste management recycling. The waste management and recycling may provide the technical innovations, which may lead to the development of small, medium, and micro enterprises.

The NGOs and the CBOs may provide the waste pickers with an opportunity where they can receive assistance to advance their operational circumstances, and to equip the waste pickers with the managerial skills so that they can improve on their negotiating power, information sharing and exchanging ideas, and also provide them with source separation methods (Nzeadibe, 2013). According to the UN-Habitat (2008), in countries like Brazil and Bangladesh, the waste pickers are provided with skills necessary to reduce the occupational risks, resulting to an increase in the quantity and quality of the recyclable waste materials.

The waste pickers are well familiar with the local living conditions, this means that the waste pickers can effectively establish their goals, setup and define the waste strategies, adopt targets, and create working structures (Mbah & Nzeadibe, 2017). The local authorities or qualified personnel can facilitate the process, supervise, enforce the rule of laws; and can help by setting up of the committee that must provide the management, accounting, consultancy, and technical methodological assistance (Chimuka & Ogola, 2015). The qualified personnel may also help in accessing subsidies to improve the infrastructure (i.e. ecological awareness programs, services necessary for advancement, waste separation and storage area, societal facilities), and the acquisition of the suitable equipment (i.e. safety equipment, tools, and branded uniforms).

The eThekweni municipality is in short of the landfill space. Through the eThekweni Integrated Waste Management Policy and Plan in 2015, the eThekweni had set a target to divert 22% of the municipal solid waste, creating an estimated 2000 sustainable jobs in the waste industry, which was not successful since they only managed to divert approximately 16% so far. To implement such an idea

successfully, the eThekweni metropolitan will need the identification, prioritisation, and empowerment of the waste pickers with their organizations. Given that there is nothing of substance with regard to the implementation of the integration of the waste pickers, it is important that the municipal authorities adopt the strategy that is tailored towards job creation, and the sustainable recycling practices. According to the findings, the informal sector is still marginalised and unregulated. It is thus imperious to retain this complex structure, while at the same time trying to offer some level of monitoring, regulation, support to access some recyclable materials through source separation programmes, and working with the buy-back centres trying to quantify the tonnage collected. The addition of the informal sector into the formal municipal waste management systems can also reduce the likelihood of conflict that normally occurs between the participants of both sectors.

5.6 Summary

The relationship between the informal and formal sector may be understood as the acceptance of the waste pickers' activities, which contradict the existing environmental regulation standards and traffic regulations. From the discussions above, for the collaborative governance to be successful, cooperation still remains a necessity. The strategies for the improvement of the waste pickers' conditions, lies on the establishment of the resource-based management approach to waste management that requires the waste management authorities to rise above dependence on government funds to a more sustainable, and economically independent status. This will require a paradigm alteration from providing the hygiene and sanitation services, to become an environmental resource management agency. Considering the income from the government funding, waste disposal fees, marketing of the recovered waste, and energy that will allow the municipalities to become the major economic players, which offer the excellent working conditions for all their waste pickers. This agenda will not simply contribute to an operative waste recycling systems, it will create jobs as well as the improved economic growth. As a result, it is important for the eThekweni metropolitan to adopt the new strategies that will help in the facilitation, acknowledgement, and the integration of the waste pickers in the municipal waste management systems.

CHAPTER SIX

Conclusion and Recommendation

6.1. Introduction

The different barriers that do exist in the creation of an inclusive municipal solid waste system, were further investigated in this research, which will then be used to bring an understanding to the involvement and acknowledgement of the contributions that the informal sector plays in the municipal waste management. The research also support an idea towards the ecological solution in informal waste management found in eThekweni metropolitan. There is some evidence validated in this study, which suggests that the waste pickers do play a substantial role in the waste management and minimization process. Beside these contributions, there is no significance progress that has been completed to address the matters on the ways in which the informal sector can be aligned and be integrated with formal municipal solid waste management systems. The cause of why this municipal matters still exist, is because the awareness of the waste pickers' role is of views that they are regarded as "a nuisance" to the urban residents. Many of the eThekweni municipality officials still consider the informal waste sector as an activity that is highly contributing to the littering, it also has the possibility of initiating the conservational deprivation.

6.2. Conclusion

The conclusions of this research has presented that the informal sector is not just for the metropolitan underprivileged only, it is convolutedly connected from end-to-end casualization of the formal firms, which stretches nationally and uniformly beyond the embedded structures. The selling of the recyclable waste materials by the waste pickers, has managed to facilitate the process that links the informal sector to the formal system. It is highly significant that the metropolitan authority system and organisations in the eThekweni metropolitan need to be more flexible in such a way that the local authorities express their concern in seconding the

links, in cooperation with the structural exchanges for the finest performances, to convey the operational and ecological solid waste collection and recycling system.

6.3. Implications of this research

There are different barriers that hinder the recognition of waste pickers with the municipal solid waste management system, which include following: the illegal immigrants, lack of regulations, lack of supporting evidence, repressive policy, and lack of social acceptance. These conditions tend to exclude rather than include the waste pickers operations in the legal framework. In spite of these challenges, the waste pickers perform a major part in the waste management system, by diverting 14.9% of eThekweni recyclable solid waste to the landfill sites, reducing the municipal expenses by cleaning up the city, provision of the secondary raw materials, enhancing the environmental sustainability, and the minimisation and control of waste in general. The informal waste sector's activities are a source of income, and also provide the livelihood with the considerable economic benefits.

Knowing the consistent environment of the informal sector to the municipal system, the metropolitan authorities will need to move far from the intently absorbed sector perceptions, turning toward the more comprehensive diverse approach of the waste management recycling. This involve creating and encouraging the desirable demand for the public and private collaboration, which will produce an increase in improvement and investment in the municipal waste management recycling industry. The participation of the NGOs and CBOs in an expanded governance may play a main important part in the organisation of waste pickers into cooperatives, which will then strengthening the whole solid waste industry supply chain. The governance collaboration and networking with the NGOs and CBOs can enhance reliability while opening channels for the proper communications with government, formal stakeholders, municipal authorities, decision makers, recycling industry, and the whole community. Until the point where the waste pickers are truly empowered and integrated with formal

municipal waste management, the informal sector contribution will still remain unrecognised.

6.4. Limitations of the study

A. Sampling Technique

The participants were chosen on the basis that they are involved in the waste practices and management in eThekweni Municipality. The participants employed were led by the theoretical code known as saturation. Not all recruited participants gave their feedback answers on the questionnaires provided. A total of 10 key informants were invited to participate, but only 6 managed to provide their feedbacks. Five of them were considered using the relevancy of information provided, since the other one was not familiar with the field of research. All the invited buy-back centres directors were willing to share their experience and knowledge about informal waste management in eThekweni metropolitan. The sample on the secondary data given by the eThekweni stats department was filtered and reduced to fit the study. Instead of 60 informal waste pickers, only 40 were used as participants in relation to the research.

B. Communication Barrier

Throughout the data collection, questionnaires were piloted in English and interpreted to isiZulu, and the researcher was able to translate to isiZulu.

C. Member domination

In each of the focus groups, there was a 'spokesperson' who dominated the discussions. Some participants were unwilling to raise their views and issues because they were shy and reserved. In order to make sure that all the participants made their contributions, equal chances were facilitated. Participants were asked to share their experiences, since their names were not recorded.

D. Confidentiality

The anonymity cannot be guaranteed in focus groups as members discuss controversial issues (Sekaran & Bougie, 2016). The participants were advised to keep the sensitive issues confidential, but that was not promised as members divulge information. The informal waste pickers did not want to disclose their daily pay for the solid waste recyclable materials, even when asked to use estimates.

E. Interviewee effect

During the interviews, the informal waste pickers were asked to provide the information on the support that they receive from the municipal authorities, if any. But the informal waste pickers did not disclose some of the crucial information, it was because they were afraid of losing their relationship with the directors of the buy-back centres.

F. Issues with the Participants

There were transparency issues, which resulted to the researcher to validate the response “answers” given by the participants. With regard to the key informants, some of them did not provide answers to the questionnaire at the first time. As a result, the researcher had to facilitate the study by making several follow up meetings requesting answers to the questionnaires. The other participants had transferability issues, where the participants could not transfer their knowledge properly onto the questionnaire. The participants ended up being interviewed by the researcher for clarity in relation to the questionnaire, trying to understand the feedback gaps from the answers they provided on the answered questionnaire. There were also some issues with the recycling sites, the directors had some restrictions with interfering on the operations and no photography were permitted to be taken, the waste pickers also were not pleased with their photos being taken. As a result, this research was mainly driven by the variation and context found amongst the waste pickers rather than the number of participants.

G. Time Limitations

Most of the participants are the senior officials, they have limited time to answer the questionnaire. Some of them have a stressful working life, with the executive meetings and dealing with extended structures in their departments. Given the fact that the researcher's ethical clearance certificate was delayed due to unforeseen conditions, the distribution of the questionnaires was also delayed. Some of the senior officials were willing to participate, but due to time constraints with the financial year ending in June, they could not finish all the questions answered. Many of them managed to give the final response during May to the beginning of June. As a result, this puts more pressure on the researcher to try and understand the participants' response while analyzing the outcome of the research.

6.5. Recommendations to solve the research problem

For the local authorities to recognise the role that the waste pickers play in solid waste management, it is important to implement the integration of the waste pickers with the formal waste management system. To achieve that, research recommends that:

1. The government authorities should implement a shift toward recycling of the recoverable solid waste recyclable materials, in order to empower the individuals economically; implementing the green entrepreneurial initiatives, and give support to the waste pickers.
2. The government authorities must acknowledge and integrate the informal sector with its formal waste management systems; instead of replacing the waste pickers, the measures essential to be taken to advance efficiency, and protect livelihood of waste pickers.
3. The barriers at household source separation should be addressed; legal framework, economic incentives, institutional arrangement, and operational matters could be used to overcome these issues; however in some cases, the social aspects are the problem to achieving efficient recycling target.

4. The cooperatives need to be established and be evaluated, where the outcomes will be used to incorporate the development stage of other programmes and projects; this can be used to help and reinforce the organisation by creating a supplementary resourceful collection and disposal systems.

6.6. Recommendations for the Future Studies

There are lot of research gaps in the waste management recycling in South Africa, which need to be studied. The areas of concerns include: The planning majors that the municipality need to take in order to integrate the informal solid waste sector; the formalisation of the informal waste recycling industry as the option towards the economic goals; the majors that the informal waste pickers took in order to organise themselves into cooperatives; and did the majors taken managed to increase the governance and improve the performance. The research that quantify the contribution of the waste pickers towards the sustainable environment and economic growth, from the national to regional scale. The waste pickers' integration into the waste management systems will guarantee benefits and recognition of the waste pickers' operations, protection, and the government support.

6.7. Summary

The research findings show that there are no policy, strategy, and regulations to facilitate the formalisation of the waste pickers in eThekweni municipality. These issues have expanded the conditions towards a formalised solid waste management system that can recognise the waste pickers as the pillar of the solid waste recycling. Despite different challenges that the waste pickers faced with, the waste pickers still contribute to the protection of the environment, and the extension of the landfill site life span. The waste pickers' participation to the informal system is a livelihood and income generation to them. The other scholars who have done the similar study, have investigated the role that the waste pickers play in the management of the municipal waste. The local authorities, government, and policy makers need to intervene in assuring that the municipal

solid waste is properly managed in a manner that promotes the waste hierarchy. The government intervention can also aid the waste pickers in organizing themselves, which will contribute toward the sustainable income generation. Without the government intervention, the waste pickers will remain misrepresented and unrecognised.

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APPENDIX 1: Letter of Introduction

Informed Consent Letter 3C

UNIVERSITY OF KWAZULU-NATAL GRADUATE SCHOOL OF BUSINESS AND LEADERSHIP

Dear Participant,

MBA Research Project

Researcher: Zamokuhle Lucas Mavimbela

Supervisor: Doctor Pfano Mashau 031-260 7021

Research Office: Ms. P Ximba 031-2603587

I, **Zamokuhle Lucas Mavimbela** an MBA student, at the Graduate School of Business and Leadership, of the University of KwaZulu Natal. You are invited to participate in a research project entitled **Exploring the role of the Informal Sector in municipal solid waste recycling in eThekweni**. The aim of this study is to: **investigate the barriers that do exist in the integration of the informal waste sector into the formal eThekweni municipality waste management sector. It will also explore the extent at which the informal waste pickers focusing on the recyclable materials on how they can contribute to the waste minimization and management in eThekweni. This will be done to bring the awareness and knowledge of the role that the informal sector is playing in the eThekweni's waste management and recycling. The results of this study could be used by the authorities to develop a programme that would bring a sustainable solution to waste management and recycling in eThekweni. The eThekweni municipality will then manage to do the proper planning, development, and to implement the government policies in a way to promote the sustainable development.**

Through your participation I hope to understand [**The ways in which the waste pickers contribute to municipal waste management systems and the recycling in eThekweni; The barriers that do exist into the integration of informal waste pickers in eThekweni; the ways in which the informal waste recycling sector can be integrated into the formal waste management systems in eThekweni**]. The results of the focus group are intended to contribute to [**Displaying the incentives and the safety margin, so that the Municipality will know the outcomes of all the majors being taken in advance; It will also allow the eThekweni Municipality to predict and to prepare the proper budget to invest in its assets, service and infrastructure delivery to its residents**]

Your participation in this project is voluntary. You may refuse to participate or withdraw from the project at any time with no negative consequence. There will be no monetary gain from participating in this survey/focus group. Confidentiality and anonymity of records identifying you as a participant will be maintained by the Graduate School of Business and Leadership, UKZN.

If you have any questions or concerns about completing the questionnaire or about participating in this study, you may contact me or my supervisor at the numbers listed above.

The survey should take you about **30** minutes to complete. I hope you will take the time to complete this survey.

Sincerely

Investigator's signature _____ Date _____

This page is to be retained by participant

APPENDIX 2: Letter of Informed Consent

UNIVERSITY OF KWAZULU-NATAL
GRADUATE SCHOOL OF BUSINESS AND LEADERSHIP

MBA Research Project
Researcher: Zamokuhle Lucas Mavimbela [REDACTED]
Supervisor: Dr. Pfano Mashau 031-260 7021
Research Office: Ms P Ximba 031-2603587

CONSENT

I (Full names of participant) hereby confirm that I understand the contents of this document and the nature of the research project, and I consent to participating in the research project.

I understand that I am at liberty to withdraw from the project at any time, should I so desire.

SIGNATURE OF PARTICIPANT

DATE

.....

.....

This page is to be retained by researcher

APPENDIX 3: Ethical Clearance Approval



13 May 2019

Mr Zamokuhle Lucas Mavimbela (203502489)
Graduate School of Business & Leadership
Westville Campus

Dear Mr Mavimbela,

Protocol reference number: HSS/0217/019M

Project title: Exploring the role of the Informal Sector in Municipal Solid Waste Recycling: A case study of eThekweni Municipality

Approval Notification – Expedited Application

In response to your application received on 02 April 2019, the Humanities & Social Sciences Research Ethics Committee has considered the abovementioned application and the protocol has been granted **FULL APPROVAL**.

Any alteration/s to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through the amendment/modification prior to its implementation. In case you have further queries, please quote the above reference number. **PLEASE NOTE:** Research data should be securely stored in the discipline/department for a period of 5 years.

The ethical clearance certificate is only valid for a period of 1 year from the date of issue. Thereafter Recertification must be applied for on an annual basis.

I take pleasure in wishing you everything of the best with your study.

You

.....
Dr Rosemary Sibanda (Chair)

/ms

Cc Supervisor: Dr Pfano Mashau
cc Acting Academic Leader Research: Professor Ana Martins
cc School Administrator: Ms Zarina Bullyraj

Humanities & Social Sciences Research Ethics Committee

Dr Rosemary Sibanda (Chair)

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Website: www.ukzn.ac.za

APPENDIX 4: Questionnaire for Waste Pickers

Questionnaire on waste pickers involved in waste management and recycling:

1. Gender (please tick)

Male	<input type="checkbox"/>
Female	<input type="checkbox"/>

2. Age of the respondent being interviewed

Age range	<input checked="" type="checkbox"/>
15-25	<input type="checkbox"/>
26-35	<input type="checkbox"/>
36-45	<input type="checkbox"/>
46-55	<input type="checkbox"/>
56-65	<input type="checkbox"/>
>65	<input type="checkbox"/>

3. Are you able to share what made you to work in the city of Durban as a solid waste collector?

.....

.....

.....

4. How long have you been collecting the recyclable solid waste?

.....

5. Which materials do you recycle?

.....

6. Where do you get the recyclable materials?

.....

7. To whom do you sell your recyclable materials? Name as many as possible.

.....

8. How does your buyer get the recyclable materials from you?

They collect from us	
We deliver to them	

9. In your sort of the recyclable materials, how much do you earn?

Earning per day (in Rands)	
Earning per month (in Rands)	

10. Have you ever experience any major problems or challenges in your work?

	Physical injury	Sickness	Harassment	Heavy Traffic	Other specify...
Always					
Sometimes					
Never					

11. Does the city of Durban help you as an informal solid waste collector?

Yes	
No	

If no, state the reason why.

.....
.....
.....

12. In what ways could you improve the collection method of the recyclable materials?

.....
.....
.....

13. What must the Durban Municipality do for you to be recognized in their formal waste management system?

.....
.....
.....

14. Are you aware of any legislation or laws concerning the informal solid waste collectors?

Yes	
No	

15. What are your comments on the following principles?

Supply	High	Low
Demand	High	Low
Prices	High	Low
Competition	High	Low

16. What is your comment on safety and health of your job?

Unsafe		How?	
Unhealthy		How?	
Safe		How?	
Healthy		How?	

17. From your own understanding, what challenges you from obtaining more recyclable materials?

.....

.....

.....

.....

.....

18. How can the challenges be resolved?

.....

.....

.....

.....

APPENDIX 5: Questionnaire for Key Informants

Questionnaire on informal solid waste recycling in the city of Durban

Questions for local authorities and partners involved in waste management.
Information related to solid waste management and the informal waste recycling:

1. Are you in a position to share the role of your organization with regard to the waste municipal waste management?

.....
.....
.....

2. Are you in partnership with any organization involved in the waste management process?

.....
.....
.....

3. In what ways does your department work with the informal solid waste recyclers that are found in the city of Durban?

If so, how?

.....
.....
.....

If not, why?

.....
.....
.....

4. Do you realize any role that is being played by the informal waste collectors in the city's solid waste recycling?

.....
.....
.....

5. How do you think the informal waste collectors can do to help in addressing solid waste recycling in the city of Durban?

.....
.....
.....

6. What is your opinion on the integration of the informal solid waste sector into the existing Durban municipality's formal waste management system?

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7. How will the integration of the informal solid waste sector contribute to solid waste recycling and the well-being of the waste pickers?

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8. According to your own understanding, what are the problems or barriers that exist in setting up the system that will recognize the informal solid waste sector?

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9. What can be done in order for the informal waste sector to be recognized by the formal Durban municipality's solid waste management system?

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APPENDIX 6: Turn-it-in Report Summary

Exploring the role of the Informal Sector in municipal solid waste recycling A Case Study of eThekweni Municipality

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