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War on Waste: Perspectives on Supporting and Formalising Informal Solid Waste Pickers in Johannesburg, South Africa

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Research report submitted to the Faculty of Science, University of the Witwatersrand,

By

Anele Thandeka Treasure Mvuyane

Supervisor: Prof. Mulala Danny Simatele

in partial fulfilment of the requirements for the degree of Master of Science.

School of Animal, Plant and Environmental Sciences

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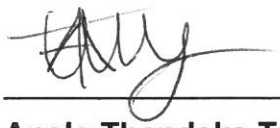
DECLARATION

I, Anele Thandeka Treasure Mvuyane, declare that this Research Report is my own work except as indicated in the references and acknowledgements. It is submitted for the degree of Master of Science at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination at this or any other university.



Anele Thandeka Treasure Mvuyane

Signed at Victory Park

On the 05 **day of** 09 **2018**

ABSTRACT

The informal solid waste management sector has become an income generation platform for a number of unemployed residents of South Africa. The recycling of waste has increased in many South African cities and more specifically in Johannesburg where the unemployment rate continues to rise. As such, the streets of Johannesburg are decorated with waste pickers, pushing and pulling trollies filled with recyclable materials, with the end goal of making an income. Evidence in literature has revealed that waste picking has both economic as well as environmental benefits. However, despite the contribution that waste pickers have towards waste management and environmental landscape protection within the city, local legislation and policy has failed to recognize their role within the formal solid waste management sector. Although scholars have investigated the possibility of integrating waste pickers into the formal municipal waste management sector, little has been done on findings methods and strategies that may not necessarily require integration but rather the provision of support to organise and formalise waste pickers. This research explored institutional strategies within which waste pickers can be formalised and organised. It investigated the barriers and challenges that exist towards the formalisation and supporting of waste pickers. The findings of the research revealed that, there is a need to support waste pickers, there is a need to formalise and organise waste pickers to give them a greater voice in society and to protect them from exploitation. More attention is needed in the formalisation of waste pickers and organising them into cooperatives which have a better prospect in bringing sustainable livelihoods and social acceptance of waste pickers. It is also vital to note that, formalising through cooperatives is not a ‘one-size’ fits all approach, all cities and municipalities should develop a fit for purpose method suitably structured for their local context.

Key words: Solid waste management, informal solid waste management, formal solid waste management, waste pickers, recycling, organisation, formalisation, support.

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LIST OF ACROYMS

Acronym	**Definition**
CSIR	Council for Scientific and Industrial Research
DEA	Department of Environmental Affairs
GDRAD	Gauteng Department of Agriculture and Rural Development
IDP	Integrated Development Plan
JMPD	Johannesburg Metro Police Department
kg	kilogram
NGO	Non-government Organisation
NWMS	National Waste Management Strategy
PPE	personal protective equipment
SAIRR	South African Institute of Race Relations
SAWPA	South African Waste Pickers Association
SMMEs	Small, Medium and Micro-Sized Enterprises
WIEGO	Women in informal employment: Globalising and Organising

CHAPTER ONE

FRAMES OF REFERENCE

1.1 Introduction

Informal solid waste recycling has emerged as an important livelihood strategy for low income urban residents that have been side-lined in the provision of socio-economic services. Informal solid waste pickers are individuals who make a living from waste collection, sorting and recycling, but are not formally tasked to provide these services by the responsible municipality (Gupta, 2012). The failure of urban authorities to adequately meet the needs and desires of residents has forced them to adapt to the pressures of the entrepreneurial systems thus, the emergence of this informal trade. Simatele and Etambakonga (2015) are of the view that the disadvantaged and marginalized groups resort to other forms of livelihood in order to survive. Amongst which include informal solid waste collection and recycling which is gaining momentum. This informal trade allows for economic empowerment of individuals involved in the trade, it makes provision for job creation and consistent income generation which contributes to decreased unemployment rates.

Almost two-thirds of the South African population lives in urban areas (South African Institute of Race Relations (SAIRR), 2013). Kubanza and Simatele (2015) are of the view that rapid urbanisation and stagnant economic empowerment have created pressure on local municipalities who in turn fail to provide satisfactory and equitable solid waste management services to a number of urban dwellers. The ripple of uneven supply of service provision impacts the vulnerable and poor the most, and as a result of this deprivation, the urban poor are forced to diversify their income. Informal solid waste collection and recycling has thus become a major source of income generation in South Africa more particularly in Johannesburg where an estimated 42% of

urban residents in the city are actively engaged in informal solid waste management (Department of Environmental Affairs (DEA), 2012a). Waste pickers have become part of Johannesburg's urban lifestyle. We see numerous people pulling trolleys and shopping carts down the street. Trolleys filled with recyclable material such as cardboard, plastic, scrap metal and glass, picked up from the side of the streets, extracted from waste landfill sites and harvested from household dustbins across the suburbs of Johannesburg. These waste pickers all share one ultimate goal, selling these recyclables at buy back centres and thereby making a living.

A number of studies in solid waste management have focused on the challenges of waste management, however little or no attention has been placed in understanding how informal solid waste management activities and recycling can be supported by the "mainstream" formal waste management system. Furthermore, there has been a lack of investigation when it comes to the possibility of creating a formally organised, and efficient informal solid waste system which may not necessarily require integration. A study by Colombijn and Morbidini (2017) and Medina (2008) argues that the formalisation of "scavenger" organizations can result in grassroot development, environmental protection and poverty alleviation. Informal waste management has been in existence for some time, it has grown into a fully functioning sector that is self-reliant and has instant financial gains for participants. Formalising the sector can contribute to an increased social stature and acceptance of its participants.

Tukahirwa and Lukooya (2015) state that adequate socio-economic facilities and services in African cities are essential to improve the lives of the underprivileged and urban productivity. The deterioration of these services makes it difficult for local authorities to manage urban processes and thus negatively impacts the management of solid waste. This failure in service provision triggers the need for a review of existing policies and frameworks to incorporate informal solid waste collection. Informal waste pickers need to be

recognised and supported effectively, as they are major contributors in the battle against solid waste management.

This research will investigate whether it is possible for the formal waste management sector to effectively support waste pickers, as well as the prospect of better formalising the informal trade, to allow it to serve its purpose of promoting economic empowerment whilst protecting the environment within Johannesburg. The lack of support and formalisation of informal solid waste pickers in urban areas has not only resulted in the misrepresentation of waste pickers in the sector but has also exposed them to poor working conditions and has deprived them of their basic human rights.

1.2 Thematic Consideration

Informal waste recycling and collection in Johannesburg is largely influenced by a demand for income generation, job creation and economic empowerment (Simatele and Dlamini, 2017). Many individuals have adopted multiple means of seeking livelihood stability turning to the informal sector to cope with poverty and food insecurity (Simatele and Etamakonga, 2015). The waste collection and recycling industry makes a meaningful contribution towards job creation (Savage, 2009). Muzenda et al. (2015) further emphasis that the implementation of operative strategies to manage waste will assist in developing an economically feasible sector with a projected total expenditure of approximately R10 billion per annum.

Literature on solid waste management conducted in Johannesburg has attempted to identify the important roles portrayed by informal waste pickers in the management of solid waste outside of the socio-economic spectrum, however more needs to be done to have a better appreciation of this profession. Waste pickers contribute to the protection of the environment and sustainability in urban spaces through the collection of waste, through the sorting of different waste streams and recycling of material. This in turn saves the municipality money and resources and releases the pressure of urban solid waste

management service delivery backlog. Waste pickers contribute to the management of municipal solid waste, through their intervention, the amount of waste reaching landfills or left lying in the streets unattended is recovered (Colombijn and Morbidini, 2017).

The informal solid waste management sectors structure resembles that of a pyramid (Gupta, 2012). At the base of the pyramid sit the waste pickers who are actively engaged in the collection of recyclable solid waste, above them sit the buy-back centres that purchase these recyclables from them (Gupta, 2012). On the top of the pyramid sit big corporate re-processors that gain profit from the hard labour of the forgotten “grass rooter” (the waste picker). Gupta (2012) is of the view that between the waste pickers and re-processors numerous levels of traders exist, most unregistered dealers. These informalities then give rise to the mismanagement and misrepresentation of waste pickers, also playing a role on the biasness of income generated throughout the trade.

It must be noted that a majority of cities in sub-Saharan African countries lack policies and legislation that would support investments in informal waste recycling. In cases where policies and legislative tools exist, their application has proven to be inconsistent which calls for research that can establish the barriers and challenges that exist in the potential organisation or formalisation of the informal sector (Sentime, 2014).

Many scholars have indicated that the informal solid waste management sector is the most active player in the promotion and implementation of the solid waste management hierarchy, surpassing the formal sector (DEA, 2012a). The reason for this stem from the fact that; the informal sector is focused on the recovery and recycling of material, whereas the formal sector is mandated by the legislation to promote environmental protection placing emphasis on the collection and disposal of waste at approved landfill sites (Gupta, 2012). According to Simatele at al. (2017) informal waste pickers currently operate in

the setting where there is no official framework that exists within which their activities can be supported. Which makes it hard to understand how South Africa will be able to climb up the waste hierarchy of modern waste management if the legislative framework deliberately disregards the efficient and existing recycling system.

Most of the analysis and studies of informal solid waste collection, recycling and management have been centred on the integration of formal waste management systems and waste pickers. However, little has been done on how these two systems can exist simultaneously. In manner in which the informal sector may be organised and structured not require integrated. There is a need to examine methods that can enable the formalisation (decriminalisation the act of waste picking) of the informal solid waste management system in Johannesburg. If adequate waste management policies and strategies are not employed, Johannesburg will continue to face serious waste management challenges. The study will seek to understand how the formalisation of street waste picking, or lack thereof, would impact on the effectiveness of waste collection, waste picker income and their social status.

1.3 Research questions

The key arguments in this research respond to the following research questions:

1. To what extent do street waste pickers contribute to solid waste management in Johannesburg?
2. What institutional frameworks and strategies exist within which informal solid waste collection can be supported effectively?
3. What barriers exist that hinder the effective support of waste pickers by local authorities in Johannesburg?
4. Would it be possible to organised and formalised waste pickers in manner that may not require integration?

5. What are the implications of the findings of the study in a wider context, particularly in Sub-Saharan Africa?

1.4 Research aims and objectives

The aim of this study was twofold in nature; the study aimed to investigate strategies within which waste pickers can effectively be supported by the formal waste management system in Johannesburg. The study was also aimed at investigating whether there are possible alternatives to organising and formalising the informal solid waste management system which may not necessarily require integration. Despite the role that waste pickers contribute to waste management and socio-economic development as well as environmental protection, society, municipalities and government urban development and planning policy has not integrated these informal systems into its policy framework (Simatele et al., 2016).

The specific objectives of this study were as follows:

a. To better comprehend the contribution of informal waste pickers to solid waste recycling in Johannesburg.
b. Create and identify an inventory of contemporary barriers towards the effective support of informal solid waste management by urban solid waste management strategies in Johannesburg.
c. To explore the challenges that confront waste pickers in the process of recycling and waste management.
d. To investigate the possibilities of organising and formalising the informal solid waste management system in a manner that does not require enforced integration.

1.5 Scope of the study

This study explicitly focused on informal waste recycling, mainly “street” waste pickers. It is important to note that there are various sources of waste. A study by Wilson (2014) distinguishes the three primary sources as domestic, industrial and agricultural waste. This research focused on municipal solid waste, therefore agricultural and industrial waste were not considered. The study was also limited to Johannesburg as this is one of South Africa’s biggest city and has a high number of individuals who make a living by selling recyclable waste.

1.6 Ethical Consideration

Several ethical issues were addressed in the development of this research which included; informed consent, acceptance and access, confidentiality and anonymity. Ethical clearance (reference number: **GAES2017-02)** was obtained from the university for the protection of participants prior to the collection of data. With regard to consent, Robson’s (1993) has advised that “whenever possible, the investigator should inform all participants of the objectives of the investigation and all aspects of the research or intervention that might reasonably be expected to influence willingness to participate”.

1.6.1 Confidentiality or Anonymity

Participants were advised on the confidentiality and anonymity of their participation in the research. No names, nor form of identification was recorded during the study. Participants were advised on the freedom of choice to participate and were advised not to disclose sensitive information. A number of waste pickers did not want to disclose their income as well as their educational level.

1.7 Structure of study

This research report is made up of six (6) chapters. The first chapter reviews existing literature pertaining to informal waste recycling and how it has emerged at different scales, from global to local domains, principally in the context of municipal waste management. The second chapter focuses on the different themes and the conceptual framework around municipal solid waste management, at all levels. The third chapter details the methodology employed in the study, it discusses how participants were selected for this study and the techniques used to for data analysis. The fourth chapter is a presentation of the findings and results from both empirical and secondary data collected during the study. The fifth chapter deliberates the findings presented from the various chapters listed above, and finally the last chapter concludes the discussions and provides some recommendations.

CHAPTER TWO

THEORETICAL CONSIDERATION AND LITERATURE REVIEW

2.1 Introduction

The management of municipal solid waste is a global issue. The handling, separation as well as the processing of municipal waste differ from country to country; region to region (Simatele et al., 2016). Waste has undesirable impacts on the health of humans and the natural environment at large. Waste also contributes to the global crisis of climate change, as it produces greenhouse gasses such as carbon dioxide and methane, which are responsible for climate change. Therefore, the recovery of waste may crucially reduce the emission of greenhouse gases into the atmosphere, contribute to the protection of the environment as well as the protection of natural resources through recycling.

The Constitution of the Republic of South Africa (1996) has five objectives and from those, two are pertinent to the scope of the study. The first being the advancement of socio-economic development whilst the second pertains to the safety and health of the natural environment. It is therefore our constitutional right as citizens, whether born or residing in South Africa, to live within an environment that promotes health and wellbeing through legislative and any other reasonable measure that prevent ecological degradation, pollution, whilst promoting conservation and sustainable just economic and social growth.

2.2 Municipal solid waste management: The global context

The world is faced by the issue of municipal solid waste management and, the volumes of waste generated as a result of human lifestyles. The change in quantity and quality of waste has made it more complex to manage (Pamnani et al., 2015). To date, population growth, higher economic development and improvement of human lifestyles contributes to the increasing generation of

waste every day (Minghua et al., 2009). Garnder (2012) states that's approximately 1.3 billion tonnes of municipal solid waste is produced per annum globally. Currently, the World Count organisation estimated global municipal waste generation at approximately 2.2 billion tonnes per year, this is expected to triple to by year 2025. This is also a reflection of growth in per capita waste generation from 1.2 kg to 1.42 kg per individual per day in the next fifteen years (The World Bank, 2012). This rise can be attributed to increased consumption patterns which are directly related to changes in lifestyle and economic standing. The more economically capable people become, the more goods are consumed, and waste generated. However, these global averages are broad estimations as rates vary significantly by region, country, city and even within cities. As such, the huge amounts of waste generation are becoming a growing concern due to the environmental impact associated with the mismanagement of waste and continuous release of toxic emission (Karak et al., 2012).

As standards of living improve and disposable income increases, the consumption of goods and services similarly escalates, and this results in an increase in the amount of waste produced (Chen, 2006 and Khjuria et al., 2010). Despite the challenges faced regarding municipal solid waste management globally, first world countries are still leading in the management of waste, they have made waste management a priority, regulated sustainable measures concerning the use of solid waste such as the waste to energy generation paradigm. Nzeadible (2009) further states that first world countries have in place mechanisms that allow the promotion and support of municipal solid waste management agendas, something we as the third world still fall short on. The physical characteristics of waste generated varies from region to region. More often than not, people who dwell in developed countries tend to buy readymade foods and packaged products, whilst on the other hand people in developing countries depend more on raw materials, imported goods which increase the fraction of organic waste (Metin et al., 2003). Solid waste cannot be managed on a one size fits all approach, therefore, various waste management practices exist in different parts of the world, which also means these practises may be more

suitable in particular environmental and social settings than others. Guerrero et al. (2013) is of the view that, amongst the best practices of solid waste management, the following exist; appropriate composting, recycling, waste-to-energy innovations and clean landfilling for ultimate disposal.

Cities without adequate means and methods to manage solid waste suffer from continuous mismanagement of solid waste such as illegal dumping and unsafe disposal of waste. In countries of the developing south, tons of municipal solid waste are left unattended on the side of the streets daily, creating breeding ground for pests that spread illnesses, clogging drains, causing pollution to water, the contamination of land, degradation of the environment and creating countless health and infrastructural dilemmas (Pamnani et al., 2015). Rapid growth in municipal solid waste generation coupled with poor municipal solid waste management practices pose serious environmental and sustainability issues. Accordingly, countries that have well developed waste management practices and well taken care of infrastructure face the least challenges in this war against solid waste. It is therefore fair to say that one of the operative solutions to this dilemma is adapting efficient municipal solid waste management strategies, that are suitable for each region's blueprint. More often than not, developing countries do not prioritise research in solid waste, which leads to the use of technology from developed countries. This is also echoed by Pamnani et al. (2015) who is of the view that, in developing countries low priority is placed to solid waste management budgeting, therefore, affording enough budget for collecting and transporting waste leaving technical knowledge and research undiscovered.

The rates of solid waste generation are influenced by economic development, the degree of industrialisation and urbanisation, habits and customs of the public, as well as the local climate (The World Bank, 2012). Generally, the greater the economic development and rate of urbanisation, the higher the amount of solid waste generated. A study by Medina (2011) revealed that the amounts of waste generated in developed countries was much greater than that of developing countries. Which does not come as a surprise, as income level and urbanisation

are connected. As one increases their disposable income and improves living standards, consumption patterns of goods and services similarly increases, and ultimately the amount of waste generated also increases.

2.3 Municipal solid waste management: A sub-Saharan African context

Waste generation in sub-Saharan Africa has been estimated at around 62 million tonnes per year (The World Bank, 2012). However, per capita generation is usually low in this region, although it extents a wide range, from 0.09 kg to 3.0 kg per person per day, with an average of 0.65 kg per capita per day (The World Bank, 2012). It is worth noting that, countries with the greatest per capita rates are islands, and this is probably waste generated by the tourism industry and more comprehensive accounting of all waste produced, where on the other hand, you find areas where waste generation is not accounted for. Simelane and Mohee (2015) are of the view that a number of cities in sub-Saharan African countries experience high rates of growth in population due to increased processes of migration, industrialisation, urbanisation and modernisation. A study by The World Bank (2012) reported on the current waste generation per capita based on income levels. The study found that the average kg/capita/day for higher income level was 2.1 kg whereas that of lower income level was at 0.60 kg. Proving that urbanisation and economic development has not only increased the number of urban residents but has also directly increased the generation of solid waste (Simatele et al., 2016). These changes have however, taken place in an era were unjust economic growth and liberation coupled with weak institutional and policy frameworks and implementation still exists. Kubanza and Simatele (2015) are of the view that available local authority resources have not been able to meet or provide services to the growing population such as the maintenance of roads, sewerage and water systems, infrastructure for waste management as well as the running and supply of socioeconomic services.

Municipalities of many developing countries fail to deliver operative management of municipal waste, this is due to inadequate services and limited financial budgets. In developing countries, municipalities are frequently unable to progress

at the same rate with the rates and changes in the pattern of the municipal solid waste problems (Furedy, 1990, Jin et al., 2006). Municipal solid waste management as stated by Ahsan et al. (2014) is becoming a risk for city residents, planners, other concerned stakeholders and particularly the urban poor. In most African cities, provision of regular collection and disposal of household waste is highly inadequate, especially in low income areas and “poor” neighbourhoods (Gumbo and Simelane, 2015). Waste generation is an inevitable phase in human’s consumption cycle and therefore it is dumped on any available open piece of space within and around the city (Simatele and Simatele, 2014).

While African cities continue to expand; a decline in economic situation has led to an intense decline in the supply of basic urban services and infrastructure (Simatele and Simatele, 2015) supported by Okot-Okumu (2015). Therefore, illegal open dumping and uncontrolled incineration practices are employed to reduce the mountains of stinking refuse that accumulates unattended to (Mohee and Bundhoo, 2015). Henry et al. (2006) observe that the main reasons for these poor practices include, among other things the lack of education and awareness of the community, poverty, lack of appropriate infrastructure and regulations, and very little or no government willingness to implement a proper waste management strategy in these areas. A study by Kubanza and Simatele (2015) reported that in the year 2014 in Lusaka, only 15% of solid waste was collected, 17% in Dar es Salaam and 13% in Kinshasa due to the lack of appropriate solid waste management infrastructure. Consequently, low income areas in sub-Saharan African cities characterised by poor road infrastructure have accumulated heaps of foul-smelling refuse, since refuse collection trucks cannot access those areas (El-khattam et al., 2011).

Gupta (2012) is of the view that waste management systems in cities of the developing world cannot manage its waste efficiently without the contribution of the informal sector, waste pickers, traders and collectors. Furthermore, Gupta (2012) along with other scholars emphasise that the informal waste management sector reduces the overall cost for municipalities. Material through the informal

sector is recovered from the source through door-to-door collection by waste pickers, this material no longer requires to be collected by the municipality thus saving them transportation cost for collection as well as extends the life span of landfill sites as the waste does not even reach the disposal phase (Gupta, 2016). Above all, the informal sector has a very low ecological footprint and uses far less fossil fuel than the formal trade, this is due to the fact that informal waste management relies more on manual human power in comparison to the motorised formal system (Gupta, 2016).

It must also be noted that most cities in sub-Saharan African countries lack suitable policies and legislation that would support investments in waste recycling. Where such policies and legislative tools exist the capacity and application has proven to be inconsistent (Sentime, 2014). In the case of the eThekwini municipality, were they adopted a technology for waste management (waste-to-energy) which was electricity intensive and proved to be costly to run. The lack of aligned comprehensive policies has resulted in the destruction of policies which, if properly established would contribute towards the reduction of costs and bring out effective and sustainable resource waste management and socio-economic service delivery (Sentime, 2014). In light of the observations made, it can be argued that the absence of inclusive policies and technical skills have in part contributed to the failure in developing appropriate strategies, approaches and technologies that would result in effective solid waste management in urban development in sub-Saharan Africa (Mudhoo, Mohee and Simelane, 2015).

Simatele and Etambakonga (2015) and Samson (2008), argue that in order to understand and appreciate the current challenges faced by urban authorities, it is important to examine the entire urban municipal solid waste management system in sub-Saharan cities. They further argue that the cross-region implementation of colonial and outdated urban development and planning policies by city authorities have limited the scope in which a future for African cities and a local scope can be captured. Moreover, poor urban governance, tied

with corruption and marginalisation of the poor have not only ignored the actions of the poor but has harmed the growth and everyday lives of the poor (Sentime, 2014). Simelane and Mohee (2015) argue that the development of effective municipal solid waste systems in the sub-Saharan African cities, will depend on looking for African urban management strategies and this will ultimately depend on the theoretical sharpness and practical abilities of both state and local authorities to adapt formal institutions to new and changing urban realities (also Samson, 2008 and Sentime, 2014).

2.3.1 Waste collection and transportation

African cities continue to grow, Simatele (2015) supported by Okot-Okump (2015) argues that there has been a deterioration on the provision of basic services and needs of urban dwellers due to economic downfalls. These include the provision of appropriate infrastructure to ensure effective waste management. Chimuka and Ogola (2015) are of the view that the solid waste collection and transportation continues to be a costly exercise.

For instance, the failure in the provision of public transport services and road maintenance, have negatively impacted refuse collection and recycling (Simatele et al., 2017). The weakening of national and local economies has resulted in increased informalisation of both employment and settlement patterns, a combination that has led to the horizontal growth of urban areas (Mbuligwe and Kassenga, 2004; Henry et al., 2006). This is not the case for developed countries such as Sweden, where more often than not household waste is separated at source and placed at nearby centres (Simelane and Mohee, 2015). Ahmed and Ali (2004) reported that approximately 95% of waste generated in African cities is nether collected nor recycled. Inadequate socio-economic facilities and amenities in African cities thrive, leaving the poor in need, local authorities are finding it difficult to manage (Tukahirwa and Lukooya, 2015). Kubanza and Simatele (2015) supported by Mohee and Bundhoo (2015) as well as Kubanza and Simatele (2015) state that the growth in population sizes and density, size of

area, municipal solid waste generated, social (in)justice, the design of streets, placement of low income houses as well as high traffic congestion influence the cost of transportation and collection of municipal solid waste.

South Africa is no different to other developing countries, as it faces similar challenges related to municipal solid waste transportation and collection (Simatele et al., 2017). Simelane and Mohee (2015) along with Koushk et al. (2004) agree that source separation may be the starting point in improving the system of municipal solid waste management and further recommend that separation starts at household level and bring about transfer centres or community recycling centres. Transfer stations have the potential to decrease the cost and frequency of trucks collecting waste from households. However, concern arises and has been noted by Chimuka and Ogola (2015) that the possible introduction of transfer centres may cause more issues due to vandalism by informal waste pickers and dogs, perpetuating environmental and human health hazards. Regardless of the above-mentioned possibility, municipalities can provide a platform for transfer centre security, which also calls for the organisation of waste pickers for better managed solid waste. Ultimately, the transportation of municipal solid waste to landfill can be reduced.

2.3.2 Solid waste disposal practises on a Municipal level

An analysis of current literature states that developed countries have detailed plans and procedures for the proper disposal of municipal solid waste, these come in the form of effective legislation and regulations (Mohee and Bundhoo, 2015). In many developing cities in Africa, appropriate treatment and disposal practices are nothing but a dream. Kehila and Gourine (2010) report that in Algeria, approximately 80% of municipal solid waste generated is dumped, whilst in Egypt, it has been reported that 83.5% of municipal solid waste is dumped.
It is critical to note that, in poor and marginalised areas municipal solid waste remains a challenge, a challenge exacerbated by illegal dumping and neglect which is problematic to human health and results in environmental degradation

(Simelane and Mohee, 2015). A study by Medina (2011) reports that in developing countries approximately 90% of municipal solid waste ends up being dumped in open spaces. Regardless of the waste that is being collected, only a minor portion receives appropriate disposal and treatment while the other remains disposed inappropriately, thus resulting in extreme ecological and health effects (Mohee and Bundhoo, 2015). Bringing it closer to home, in Lesotho the situation is worse, only 7% of municipal solid waste is collected, the rest is illegally dumped (Simatele et al., 2017). Simatele et al. (2017) also report that in Gaborone and Mozambique, municipal solid waste is disposed in open spaces instead of official landfill sites. Afon (2005) and Afon (2012) further describe the scene in Lagos as one that is adorned by heaps of waste stacked up across every street corner. Lack of education and political instability amongst these cities has been reported as one of the contributors to the current challenge of municipal solid waste.

A study by Zaki and Khayal (2010) reports that aside from dumping, landfilling is commonly practised in developing African countries such as Madagascar and Mauritius, where 97% and 91% respectively of municipal solid waste is landfilled. Hoornweg and Bhada-Tata (2012) further report that Tunisia, Mauritania and Morocco landfill 65%, 37.3% and 28% of municipal solid waste respectively. These figures clearly indicate the need for more encouragement of households to recycle and composting waste to reduce landfilling by entities adjudicated to provide municipal solid waste management (Sharholy et al., 2008). However, Mahar et al. (2007) argue that technologies for the disposal and treatment of municipal solid waste are being introduced in African countries, and that the issue of waste is decreasing with the inception of proper regulations and infrastructure. Regardless of what is stated above, everyday life in a developing country translates to waste piled up on the streets. In the view of the above statements, Simatele et al. (2017) along with Gumbo and Simelane (2015) are of the view that it can be assumed that a proper waste management system is dependent on various factors, these include, government incentives, proper infrastructure,

applicable laws and regulations coupled with public awareness, motivation and willingness.

2.4 Contextualising municipal solid waste management locally: South Africa

In the face of the strides that Johannesburg has made towards the management of municipal solid waste, challenges on how to integrate the ever-growing number of informal solid waste pickers remains unaddressed. Simatele et al. (2017) are of the view that part of the reason for the current state of affairs is the lack of knowledge on how to align and integrate informality with formality into the urban development and planning policy, this has also left the possibility of formalising informal waste pickers in a manner that may not require integration unattended. In many cases the lack of skilled labour forces, as well as indifferences at managerial level, corruption coupled with the mismanagement of municipal resources, work against the possibility of creating a sustainable initiative to municipal solid waste management (Chimuka and Ogola, 2015).

Some of the major challenges are already known by critically observing the current urban municipal solid waste management system and equating it with that of other sub-Saharan African countries (Simatele et al., 2017). At the end of the day, South Africa might have some of the best environmental legislation and be in the forefront of innovative technology and methods of solid waste management, the fact remains that other important factors such as carefully planned strategies to support waste pickers can be a plausible solution and have been overlooked. However, non-integration which means formalisation and organisation of informal waste pickers could play a major role in a waste management strategy. The success of these strategies does not lie on the municipality and informal waste pickers only, but also the community on which these stakeholders operate in (Simatele et al., 2017). Waste pickers encounter numerous challenges on a daily basis; whether they are working on landfill sites, picking waste from the streets or moving from house to house, suburb to suburb going through municipal bins. The informal sector is demographically diverse; the

role players do not only differ by the types of waste they collect. Waste pickers are also divided by gender, ethnicity and language as well as nationality. These factors play a huge role in the collaboration and synergy between the different role players.

Literature on informal waste management in a sub-Saharan city context simulates interest in the subject, and aids to contextualise the South African informal waste recycling system (Simatele et al., 2017). With this being said, a large and dynamic indigenous waste management system exists in South Africa and has been around for ages (Simelane and Mohee, 2015 and Samson, 2008). This phenomenon has largely been driven by the informal waste sector (Simelane and Mohee, 2015 and Samson, 2008). In many cities in South Africa, thousands of individuals secure their income through informal solid waste management. These individuals are usually categorised as poor and are sidelined by society (Dias, 2012 and Medina, 2007). DEA in 2016 estimated that the number of active waste pickers in South Africa ranges between 18 000 and 100 000. Even though a great number of participants not being identified or recorded to date. Globally, South African waste pickers form part of an industry with over 15 million waste pickers in developing countries (DEA, 2016). The most effective municipal waste management strategy and system is built by the hands of the informal sector. Scheinerg et al. (2010) states that there is a need for the acknowledgement of the informal sector in order to minimise and better manage waste.

In the light of the above mentioned, scholars insist that informal waste recycling can be prompted successfully in African cities (Simatele et al., 2017). Researchers further state that the informal sector has broader implications for urban livelihoods and environmental stability in a poverty-stricken Africa (Adamo, 2012). International organisation, Women in informal employment: Globalising and Organising (WIEGO) strongly argued in favour of informal waste pickers and their integration in municipal solid waste management. WIEGO also appreciates the fact that waste picking can be formalised, and benefits realised by potentially organising the sector which may not necessarily translate to integration.

Solid waste management has become and continues to be a major issue in the urban landscape in sub-Saharan African countries. It is argued by Ogutonyinbo (2012) and Henry et al. (2006) that the issue is a result of failing institutions, civil conflicts, corruption and social injustice. The informal system has not been fully acknowledged in urban development strategies and policy planning in South Africa. Possible formalisation of waste pickers and provision of support within urban development and planning policy should form the foundation that could enable change in the promotion of “green” jobs and the sustainability of the environment. Yet, work that has been done in South Africa has continued to focus on legislative frameworks governing waste management (Sentime, 2014), failing to harness the different informal structure into formalities so that we can have an operative and efficient solid waste management system.

2.5 Gap in Literature and Knowledge

The development of effective solid waste management systems depends on looking for fit for purpose ‘African’ urban management strategies, that will depend on technical sharpness, and practical abilities of both the government and local authorities (Sentime, 2014). Researchers have looked at the potential integration of waste pickers into the formal system. However, little has been done on the potential of formalizing waste pickers in a manner that may not necessarily require integration in a South African context. Various scholars globally have documented the contribution that waste pickers have towards the management of municipal solid waste. A study by Gunsilius (2012) suggests that, the success of integration is largely dependent on the ability of the informal sector to manage and efficiently organize their business, and their ability to gain political and public buy-in. Gunsilius (2012) further states that, political will for the incorporation of the informal sector and potential collaboration with other role players and particularly the private sector is crucial.

Despite the challenges faced in municipal solid waste management in sub-Saharan African cities, ambitious targets and goals that seek to improve waste management techniques have been implemented by the municipality. Cities in

the sub-Saharan region need to recognise waste pickers as a strategy that they can use to manage and minimise waste in their cities. Cities can build on readily available system rather than to implement costly technologies that come at a huge cost to tax payers. Waste collection, transportation and disposal systems in municipalities are still weak and poor because of low funding, lack of technical skills and technical difficulties and shortcomings. The challenge of solid waste management therefore needs to be addressed collectively by looking at new approaches that are not necessarily common but include both the traditional centralised municipal council-based approach and new decentralised-community based approaches, to create a mix that best fits the particular municipal council and its inhabitants.

2.6 Conclusion

Little has been done to investigate the potential provision of support to waste pickers in order to allow their trade to be organised or formalised. We also have limited understanding of the barriers and challenges that exist that hinder the support of waste pickers in society. As much as the world has realised that organising waste pickers can fortify their bargaining position with government and industry and overcome unemployment and poverty through grassroot development, not much research and literature has been developed in a South African context. In light of the above mentioned, this research seeks to fill the gap in knowledge and provide literature that is relevant to an African context, within a developing region and for South Africa on the potential organisation of waste pickers within Johannesburg.

CHAPTER THREE

METHODOLOGICAL CONSIDERATION

3.1 Introduction

This chapter outlines the methodology employed in the studying presented in this research report. Methodology describes activities undertaken to investigate a research problem and the motivation for the application of specific techniques or procedures used to identify, select, process, and analyse information applied to understanding the problem, thus, permitting the reader to critically assess a study's overall reliability and validity. The methodology employed in a study is essential to its success. A good methodology guides the readers through the process of data collection, analyses and interpretation. An unreliable methodology may yield untrustworthy results and, as a result, undermines the value of your interpretations of the findings. This chapter will present the positionality of this research, the design employed in this research, the methods adapted in analysing the data collected as well as reflections from the date collection and analysis exercise.

3.2 Research Positionality

Research paradigms are structurally embedded sets of beliefs which often inform the researchers thinking at a particular space and time (Lincoln and Guba, 2011; Creswell, 2013) and these are critical for the positioning of a researcher. These paradigms have the ability to influence the researchers reasoning and layering of interpretation and their position in a research. Lincoln and Guba (2011) further state that these paradigms play a part in defining the world views of the researcher and their preceding beliefs or assumptions. They further incorporate terms like ethics i.e. the state of being moral in the world; ontology which seeks to understand what knowledge or reality is; epistemology, which seeks to decipher how we know knowledge or reality; theoretical perspective which defines the approaches that can be utilised to get this knowledge (Lincoln and

Guba, 2011). Lincoln and Guba further state that, these paradigms also define the methodology adopted to acquire this knowledge, which includes methods or tools used to acquire this knowledge and the sources which inform the type of data we collect (Lincoln and Guba, 2011).

This research leans towards the interpretive approach and it is underpinned by a subjective epistemology and ontology. An interpretive approach is utilised to understand societies lived experiences from their perspective (Hennink et al., 2011 and Longhurst, 2010). The research approach views social reality as mutually created between people in the real world, it acknowledges the fact that people are people and tries to discover the meanings people attach to their natural social, economic and environmental settings. This is aligned with the researcher's beliefs that knowledge can be gained from social interactions and behaviours. This was demonstrated through interaction with the people on the base of municipal solid waste management, the waste pickers. The researcher also recognises people's experiences and culture and that they don't potentially see the world differently from us but experience it differently and interactions with them increases knowledge. Hussey and Hussey (1997, p.1) states that research has three common principles, these include the processes of inquiry and investigation, it's methodological and systematic and it's pillared by the increase of knowledge.

The research was conducted with a subjective mindset, meaning there was no rigid right or wrong answer but gave waste pickers the opportunity to express their personal feelings, opinions and unfiltered experiences within municipal solid waste management. Instead of adopting the traditional scientific approach of proving a hypothesis and reducing people to subjects and statistical figures, the humanity factor of participants was embraced. Unlike the positivism research paradigm which is led by the principle that there's a single reality and single truth, this research is constructive or interpretive in nature, it embraces people's perceptions and supports subjectivity (Hennink et al., 2011). The researcher realised that there was a gap in knowledge when it came to strategies and

methods that can be put in place to support and formalise the informal waste management sector particularly in Johannesburg, were a number of people have resorted to this industry due to a number of social and economic pressures and also realised the level of subjectivity attached to the notion. The questions that were used whilst engaging with waste pickers and other informants engaged with how individuals understood the world in which they live and work in. The qualitative nature of the research allowed for a fuller narrative of waste pickers perceptions and experiences in waste management and studied the subjective meanings waste pickers attach to informal municipal waste management. This is supported by Stake (1995) and Hennink et al. (2011) who define qualitative research as one that seeks to understand the complexities of experiences of individuals rather than to argue for control and explanations.

The design of the research was therefore influenced by the nature of the research. Similar to Creswell's (2013) observations, this research considered specifics and real-life experiences from in depth data collected from multiple sources and audiences involved in waste management. The description above quantified the reasoning behind the use of an interpretive and subjective approach in data collection. It was crucial for the researcher to not only study the general phenomenon but to examine specifics of each of the participants in the research. Therefore, the positionality of the research and methods adopted were found suitable in the quest to understand real-life experiences, challenges and issues that waste pickers encounter in the process of informal waste recycling and management within the City of Johannesburg.

3.3 Research design

The following section will give a detailed description of the study area, procedures used for sampling and various other data collection methods.

3.3.1 Description of research site

The challenge of municipal solid waste management is common in Southern African urban areas, the data used in this research analysis was collected in

Johannesburg, Gauteng province, South Africa. Johannesburg is the largest city in South Africa, distinctive from other South African cities by an extensive history of local and international migration, with a current population of 4.4 million inhabitants, accounting for approximately 36% of Gauteng population and 8% nationally (City of Johannesburg IDP, 2013). The population in the city has been increasing faster than that of the entire Gauteng region and this is a result of the city's continued attraction of individuals from other provinces and internationally who are seeking for improved economic opportunities and quality of life (City of Johannesburg IDP, 2013). Johannesburg is categorised by wealthy individuals with a high standard of living compared to their counterparts in smaller cities (City of Johannesburg, 2016). This has directly translated into a growth in personal income as well as consumption patterns within the urban areas. The high standards of living have translated into an increase in waste generation and need for disposal, whilst the culture of re-use and recycling is slowly gaining momentum it has not reached a point where it has meaningfully contributed to the management of solid waste. With the continuous rise of immigrants seeking employment and refuge in the city, municipal solid waste generation is also increasing. Ineffective solid waste management services coupled with the ever-rising unemployment rate and the failure of formal institution's provision of basic services makes it imperative to formulate an effective system, which is formalised and efficient in the management of municipal solid waste in Johannesburg. Waste pickers have entrenched themselves in Johannesburg streets, which made it ideal to conduct a study of this nature in Johannesburg. Their unavoidable existence made it easy to pin point the spatial location of waste pickers as well as buy back centres around and within the city (shown on **Figure 3-1**).

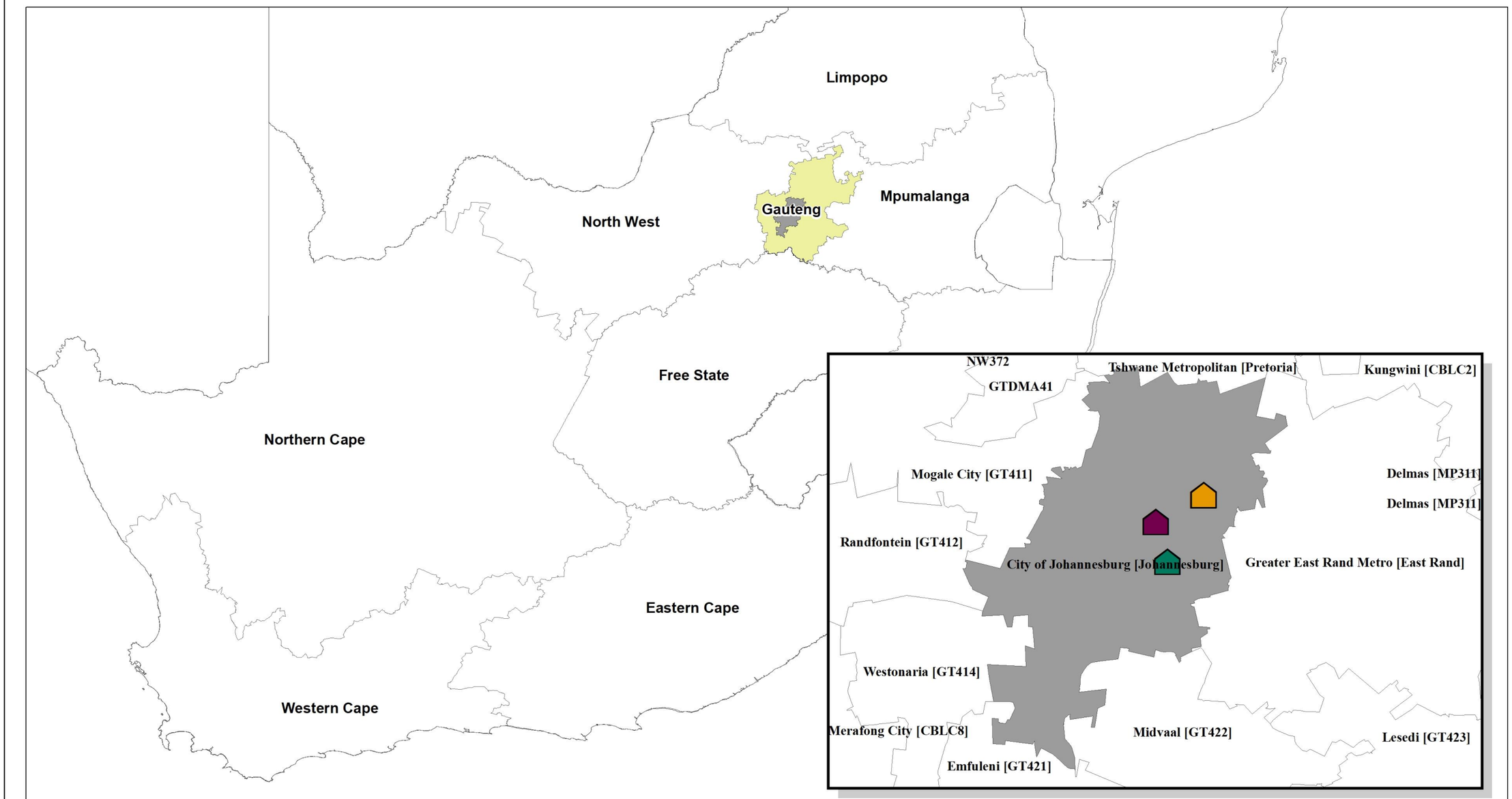


Figure 3-1: Locality map of the study area

3.3.2 Study population and Sampling procedure

The study sought to better understand the informal industry and to tap into the major role players day to day running of the formal as well as informal municipal solid waste management space in Johannesburg. Due to the nature of this research, multiple sampling methods were used in collaboration in order to identify and select participants; these were purposive and snowball sampling. Purposive sampling also known as judgment is a practice in which a researcher trusts his or her own judgment when selecting members of population to partake in the study (Palys, 2008). The study involved the participation of a total of thirty-five (35) research participants drawn within Johannesburg's informal and formal solid waste management system. The sample included twenty-eight (28) street waste pickers (two waste pickers were not willing to partake in the research), three (3) managers from buy back centers (namely; the Victory Park Community buy back center, Maningi scrap metals and Remade recycling in Newtown), three (3) key informants which comprised of two (2) representatives from Pikitup and one (1) from the City of Johannesburg, as well as one (1) participant from waste associations/ non-government organisation (NGOs) called groundWorks[1]. The selection of participants was solely based on their participation in solid waste management practices within Johannesburg. The research was driven by the desire to seek valuable content and variation amongst street waste pickers and was not fixated on the sample size of participants. Therefore, the findings of the study are not a reflection of the broader population but rather the reflection of the views and experience shared by the participant.

No pilot study was undertaken however as the interviews were carried out a few questions were identified as not suitable for the intellectual caliber of waste pickers thus modification and interpretation of pertinent terms was employed. Data was collected between June 2017 – August 2017 and additional data was collected in May - June 2018. The presence of waste pickers within the streets of

[1] groundWorks is a Non-government organisation that promotes environmental justice and protection and also supports developing waste associations

Johannesburg is not a foreign citing, their presence is undeniably overwhelming. With that being said, the researcher targeted waste pickers at their selling points (buy back centers), places of residence and locations where waste separation takes place, which were open spaces and parks as well as randomly whilst commuting around the city. Permission to interact with waste pickers at buy back centers was sought from managers and permission to speak to waste pickers at their separation location and places of residence was sought from the older individual waste pickers (elders) who oversee the parks. In order to extract the most valuable information and to avoid the loss of context, waste pickers were interviewed in vernacular as most waste pickers used their mother tongues to communicate. Clarification and translation of particular terms was done during interviews which allowed for more information to be extracted by the researcher from the participants.

The study was qualitative in nature thus a purposive and snowball sampling method was adopted and only waste pickers who were willing to participate were interviewed. It is crucial to note that all participation was on a voluntary basis and not a single participant was forced to partake in the research. A study by Creswell (2013) states that it is the researcher's purpose and the sample choice that yields detailed and relevant information. All the participants in the study embodied features that could better inform the purpose of the study. Waste pickers being the back bone of the solid waste management system provided quality insight and information that helped to answer the research questions.

The snowballing sampling method was then introduced in the study, and an exponential non-discriminative snowball sampling pattern was followed. The snowballing method was specifically utilised to find waste pickers and buy back center managers. Snowball sampling is a unique non-probability technique for developing a research sample where existing study participants recruit future participants from among their associates (Katz, 2006). This sampling method is often used in hidden populations which are not easily accessible by researchers or in other cases where a sampling frame is hard to create, and it is assumed that

cases are associated through links that can be used to locate other participants based on existing ones (Katz, 2006). Although the presence of waste pickers across the City of Johannesburg is abundant, the location of waste pickers aided in the identification of buy back center managers. With this being said, the first respondents in the study were waste pickers, and through interactions with waste picker, the researcher followed that trail of waste pickers which lead to their place of bargaining i.e. buy back centre. The journey with waste pickers, led to buy back centre managers who were able to share details of waste picker association members. This method proved to be a success as it made it easier to locate key individuals who work closely with waste picker in the management of solid waste. Appointments officials were made via email and telephonic communication and due to the location of some participants telephonic interviews were undertaken.

The rights of waste pickers and other informants were protected throughout the data collection process. In order to achieve this the aim and objectives of the study were clearly stated to the participants, this was done verbally with waste pickers. In the case of buy back centre managers, municipality representatives and association members this was done in writing followed by a telephonic communication in cases were the informant requested more information. Information on the nature of the study, expectations from participants, the use of data anonymously, the length of the interview and voluntary status of the research was provided in detail. All participants were asked to sign consent forms which stated the voluntary nature of the study, the ability to withdraw at any stage of the interview as well as the non-monetary factor of participating in the study. A number of waste pickers were not comfortable to sign these forms as they were sceptical to have their signatures documented. Different question-themes were used for waste pickers, buy back centres and key informants as each group varied from the other. Questions that were asked sought to understand the current working conditions of waste pickers, barriers that exist in the establishment of an institutional support structure for waste pickers as well as possible strategies and systems that may be put in place in order to bring formality into waste picking that may not require integration. Relationships

between department officials, associations and waste pickers in the management of municipal solid waste management were investigated. Apart from these questions, the interview questions also looked at the challenges encountered by buy back centre managers and the relations or lack of coordination between these key role players in solid waste management (waste pickers, municipality officials, associations as well as residents).

Each interview session lasted for approximately 30 minutes, the processes and procedures were explained verbally to waste pickers and interview questions were in English and translated to isiZulu and Sesotho. Research participants were constantly reminded of their right to pull out of the study at any stage of the research process. The interviews were undertaken by the researcher alone, detailed notes were captured. Non-verbal cues and “stakeholder fatigue”, sensitivity and feelings were monitored throughout, the researcher ensured that participants answered questions they were comfortable answering.

3.4 Data collection tools

Primary and secondary data were used in the compilation of this research, providing practical and theoretical information aiding to extend the debate around the methods that may be employed to formalise informal waste pickers. A thorough review of literature was undertaken to generate refined theoretical context vital to municipal solid waste management. Primary data was predominantly gathered through interviews with key informants, representatives working within the municipality mandated to safe guard municipal solid waste management, and other relevant organisations and associations. Personal observations and photography also formed part of primary data collection methods, which were utilised to gather “new” data from the ground, revealing and documenting day to day work experiences of waste pickers.

3.4.1 Semi-structured interviews

The interview process was led in a semi-structured manner thus enabling the identification and unpacking of themes. This manner brought about municipal solid waste management concepts that were new to the researcher. Furthermore, the utilisation of semi-structured interviews allowed the researcher to recognize the broad themes that are entwined in the informal sector of waste recycling. Much emphasis was placed in the possible formalisation of waste pickers that may not necessarily require integration in the process of data collection. Interviews were conducted in a manner that built trust between the researcher and waste pickers which brought a level of ease to the participants increasing their willingness to share their stories. Interviews were predominantly conducted in English, isiZulu and Sesotho.

Blandford (2013) defines semi-structured interviews as a combination of structured interviews which come in the form of questionnaire were all questions are predetermined and unstructured interviews which take the form of a conversation between the researcher and informants. This is the case as many questions and themes, were planned ahead of time, but terms of investigation were followed within the interview, in order to follow up on thought-provoking and unexpected discussions that emerge (Blandford, 2013). With this being said, given the nature of the informal waste management industry, semi-structured interviews were most suitable and thus employed in the study.

3.4.2 Key Informants

The term key informant refers to any person or persons with whom an interview about a particular organization, issue, or interest group is conducted. Interviews with key informants are usually in-depth and consist of individuals who can be considered as experts who are knowledgeable about an organisation's operations. For the purpose of this research key informants were figures in leadership positions within the authority space who are responsible to ensure effective municipal solid waste management in Johannesburg. Given the nature

of the study, the most suitable key informants were individuals from Pikitup, representatives from the City of Johannesburg municipality as well as a participant from waste association/NGO, groundWorks. The perks of key informant interviews were that one could interact with role players in decision making and implementation thus bringing forth intellectual strategies and provision of insight into complex questions.

3.4.3 Personal observation

Personal observations are one of the most useful methods for detecting patterns, practices, habits as well as differences amongst persons of interest. Observations allow the researcher to gain first hand interactions and enables a better appreciation and understanding of research participants. This method was adopted in order to better understand the dynamics of waste picking. In order to validate the responses received during interviews with waste pickers, observations were done and documented by the researcher. From these observations, it was possible to verify the legitimacy of responses received from interviewing waste pickers. This method allowed for the researcher to capture data that was not influenced by the pressures that come with being interviewed and allowed the researcher to capture the pure form of waste pickers' social structures and operations. These observations were critical to supplement the information gathered during semi-structured interviews. A variety of observational analysis was engaged by the researcher as the observer namely; notes were taken during and after interviews with waste pickers, researcher had informal conversations with waste pickers, at any given point the researcher also observed waste pickers from a distance whilst they did their daily business.

3.5 Data Analysis

According to Hesse-Biber and Leavy (2011) data analysis is a process of making sense and meaning to data. Data analysis is not a phase in research, however it is a process that runs throughout the research (Stake, 1995). Due to the nature of the study being qualitative, the collection and analysis of data is crucially

important (Creswell, 2013 and Miles and Huberman, 1994). Miles and Huberman (1994) further state that categorisation is the most vital element of qualitative data analysis and involves the classification of things, events, persons. In light of this, the researcher is then required to adopt the process of coding, which involves the identification of meaningful pieces of textual data (derived from interviews, photographs captured and observations) during the data collection process (Creswell, 2013). Coding is an analysis strategy used in qualitative data analysis that assists in the identification of themes, patterns and concepts that exist in the data and aids in better understanding the perspective of each participant (Hesse-Biber and Leavy, 2011 and Miles and Huberman, 1994). The aim of coding is to make sense of the data collected and to create meaningful themes, themes can be defined as broad units of information consisting of various codes combined to form a shared idea (Creswell, 2013).

Consequently, Tesch's method of analysis taken from Creswell (2009) was adopted as an analysis tool for this study. Due to the relatively small sample size, data was analysed manually on Microsoft excel and no qualitative data analysis software was utilised. The following steps were followed as per Tesch's method:

a. All data obtained during the data collection stage was transcribed;
b. The researcher went through the transcripts repeatedly;
c. Notes, comparison, contrast, ideas and thoughts coming out of the data were written in separate cells and colour coded;
d. Research questions were also written out, and each piece of information answering the specific research question was clustered into themes and categories;
e. All data was grouped and coded and the most common occurring themes and categories were noted.

This process was done multiple times to ensure that all the relevant data was understood, and any data which was collected and did not necessarily aid in answering the main research question were eliminated from the study.

Validity and reliability is an important feature in any research, in essence anyone who wishes to use your methodology to conduct a study similar to you in nature needs to be able to be guided by your research. Thus, in order to ensure reliability, four techniques taken from Creswell, 2013) were utilised:

a. *Applicability*: The researcher provided the context from which data collection focused on.
b. *Truth value*: Three methods of data collection i.e. semi-structed interviews, key informants and observation were used as well as voice recordings to ensure that all the data collected can be cross checked and can be deemed valid.
c. *Consistency*: Coding was adopted for accuracy and methods used to collect and analyse the data were clearly stated.
d. *Neutrality*: Pertinent statements made by participants were quoted to retain authenticity and true meaning.

It is important to note that, although data collection and analysis strategies may be comparable in the space of qualitative research, the findings of each researcher are unique and are influenced by the paradigm on which the researcher identifies themselves and because this study is qualitative in nature, data will be presented in a narrative and descriptive manner rather than the binary scientific reporting style.

3.6 Methodological reflections

3.6.1 Interviewee effect and challenges

A number of challenges were faced during the collection and analysis of data for this study. The majority of waste pickers approached warmed up to participating in the study, whilst others were hostile. They felt as if they were being used as pawns by the researcher in a scheme to gain donor funding or sponsorships and as a result refused to participate. It was apparent that there has been a breach in trust between waste pickers and inquisitive persons and this made interactions

complex. This misrepresentation and mistrust of researchers presented itself as a challenge when conducting interviews with waste picker. The researcher assured participants that the research was for academic purposes only, and that no financial benefits are anticipated for the researcher. This called for a revised method of engagement to be undertaken by the researcher in light of this challenge.

A number of waste pickers requested financial incentives to be a part of the study and for payments for images captured during the research; while other waste pickers refused to be part of the study. The voluntary nature of participation in the study was relayed to the participants prior to the interview. The researcher had to continuously advise waste pickers that there are no financial gains or exchanges anticipated from participation. The researcher is employed as a full-time environmental consultant and this research was undertaken part time. Time proved to be a constrain with regards to the collection of data. There were difficulties faced by the researcher in attempt to secure appointments with officials, whose scheduled were tight. There were also challenges with regards to getting time off work to undertake data collection. The researcher worked timelessly to track down participants and key informants. This called for the researcher to walk around the streets and observe and learn the culture of waste picking during the weekends and take some weekdays off at work to carry of the research. This also required that the researcher puts in a great effort to balance being a student whilst employed in the demanding world of consultancy. Another challenge that was related to time constraints was getting waste pickers to ‘stop’ working and partake in interviews. Waste picking is a fast-paced business, there is little to no time to relax. At times the researcher had to assist the respondents with sorting their material whilst conducting informal interviews. This could be viewed as a challenge in one light, but in the other, this allowed the researcher to entrench themselves in the study and fully participate in the dynamic world of recycling, whilst gaining trust from waste pickers.

The research was conducted during the spurge of women abuse and femicide in the country. The majority of waste pickers were male therefore presenting a safety risk for the researcher. The researcher havening being brought up in a dynamic environment met with the waste pickers in public areas and left all valuables locked and hidden in the car as a safety measure. This reduced the potential risk of theft or intimidation.

3.7 Conclusion

This chapter outlined the methodology adopted in the research. A qualitative approach was used in this research in order to uncover lived experiences, behaviours, thoughts and feelings of waste pickers, buy-back centres and officials. Sampling methods employed in this research included purposive and snowball sampling.

Key informants, personal observation and semi-structured interviews were the data collection techniques utilised. Details included interviews with waste pickers, managers of recycling buy-back centres and key informants in formal waste management sector and NGOs. Themes and codes were used to assess qualitative data, where which Tesch's method of qualitative data analysis was used.

CHAPTER FOUR

EMPIRICAL EVIDENCE

4.1 Introduction

This chapter presents empirical evidence collected through interviews, observations and informal discussions with research participants. The investigation was guided by these following themes and facets: reasons for participating in waste management particularly waste picking; socio-economic and demographics of the roles players (the waste picker); challenges and barriers faced by waste pickers; opportunities, support and formalisation of waste picking; barriers towards supporting and formalisation of waste pickers in the solid waste management sector in Johannesburg. In light of the above, the results are additionally divided into sub-themes, verbatim quotations as well as categories. It should be noted that all verbatim quotes are presented in English.

4.2 Empirical Findings

It is imperative to first identify the demographics of the waste pickers, this is depicted on **Table 4-1** and **Figure 4-1** below:

Table 4-1: Waste Pickers demographic make-up

Variable	**Category**	**No of Respondents**	**Percentages**
Gender	Female	7	25
	Male	21	75
Total		**28**	**100**
Age Range	15-25	15	54
	26-35	11	39
	36-40	2	7
Total		**28**	**100**

Source: Based on field material, 2017.

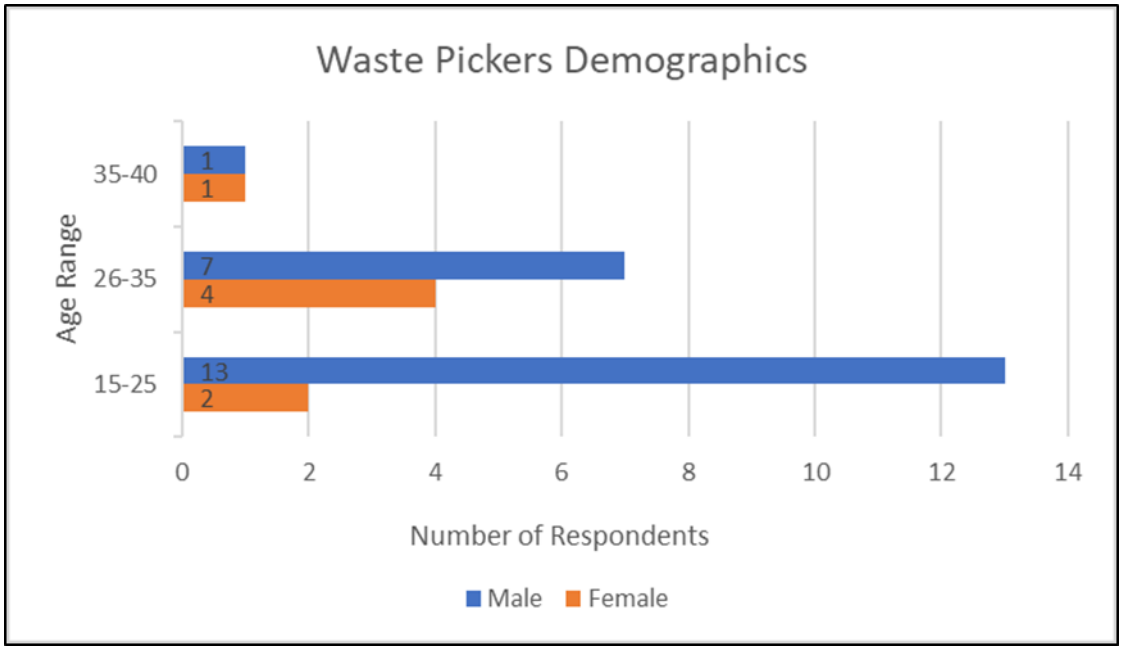


Figure 4-1 Study Respondents demographic make-up

Source: Based on **Table 4-1** above.

Figure 4-1 suggests that the majority of waste pickers were male with a representation of 75% of the sampled group, while only 25% of the respondent were female. Further analysis of the information represented above suggests that the majority of waste pickers are of the age of 15-25 and 26-35 with both age groups representing 54% and 39% of the sample respectively, and only 7% of the participants categorised as adults. This information is vital as it depicts that a large number of youth in Johannesburg are actively participating in waste picking. This can be coupled with the high rate of youth unemployment in South Africa which has been estimated at 26.7% as of Quarter 1 of 2018 (Stats, 2018). The lack of formal employment and opportunities has led to a great number of individuals seeking alternative methods of making an income, such as waste picking and recycling. People move from rural areas to urban areas in hope of employment and an increased standard of living, but the reality is not as such. This is true in the case of Johannesburg were Sentime (2014) and Samson (2008) note the rapid urbanisation in Johannesburg is attributed to rural-urban migration, population growth and industrialisation. With the urbanisation rate in

South Africa increasing, in the near future more youth will find themselves unemployed resulting in the participation of informal economies such as waste picking.

Figure 4-2 depicts a photograph taken at the Victory Park community buy back centre, through this image one can clearly ascertain that the people involved in waste picking are largely the unemployed youth (14-35).

Figure 4-2: Waste picker sorting waste at the Victory Park community buy back centre

Source: Photo by Anele Mvuyane, 2017.

Having established the demographic distribution of waste pickers, it is worth nothing their nationally. Waste pickers were asked whether they were citizens of South Africa and **Figure 4-3** below depicts the responses that were obtained. Approximately 71% of the waste pickers interviewed during the research

indicated that they are South African citizens and only 29% indicated that they were not South African citizens. This information is important as one of the barriers that have been suggested by the local authority in the supporting and formalisation of informal waste pickers was the issue of nationality and illegal residence in the country. The data collected during the research indicates that there may be a misconception on the nationality of waste pickers and this can be attributed to a number of reason which will be discussed in detail in Chapter Five.

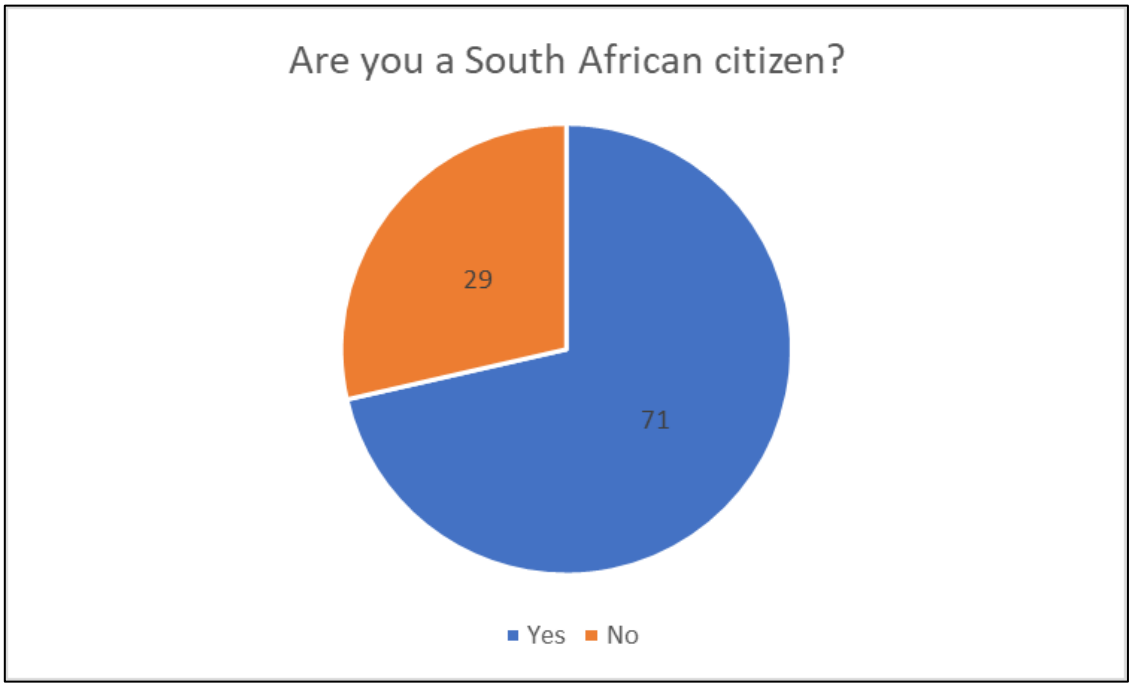


Figure 4-3 Nationality of research participants (waste pickers)

Source: Based on Table 1 see Appendix A.

In view of the above, it is worth identifying the factors that have contributed to the increase of waste pickers in Johannesburg, with unemployment being the leading influencer in the informal sector. In order to shed light on this, the level of education of waste pickers who participated in the study was noted. It was important to learn about the level of education of waste pickers. **Table 4-2** illustrates the various educational levels of the waste pickers interviewed during the research.

Table 4-2 Research participants (waste pickers) level of education

Level of Education	Number of respondents	Percentage
Never went to school	2	7%
Attended/ Completed Primary School	9	32%
Attended / Completed High School	15	54%
FET/ TVET/Technicon	0	0
Attended/ Completed University Qualification	0	0
Undertaken/Completed Post Graduate Qualification (Hons, MSc., PhD, etc.)	0	0
No response	2	7%
Total	**28**	**100**

Source: Based on field material, 2017.

More than half (54%) of the respondents attended/completed high school with only 7% of the respondents having never attended school at all.

Simatele and Simatele (2014) have observed that in large parts of Sub-Saharan African countries, a phenomenon known as urban explosion has tended to be correlated with the lack of economic opportunities to cater for the creation of jobs as well as the provision of urban services to the growing population. In a South African context more specifically in a city like Johannesburg, the job market is very tough. Skilled and qualified individuals find themselves competing for employment opportunities. Which leaves the rest of the unskilled and unqualified population, similar to the waste picker participants missing out on formal employment due to their lack of formal education and training. In view of this observation, it was important to provide evidence that can support the

analysis, therefore it is imperative to note what influenced waste pickers into participating in the informal management of municipal solid waste. The views from the participants are reflected in the **Figure 4-4** below.

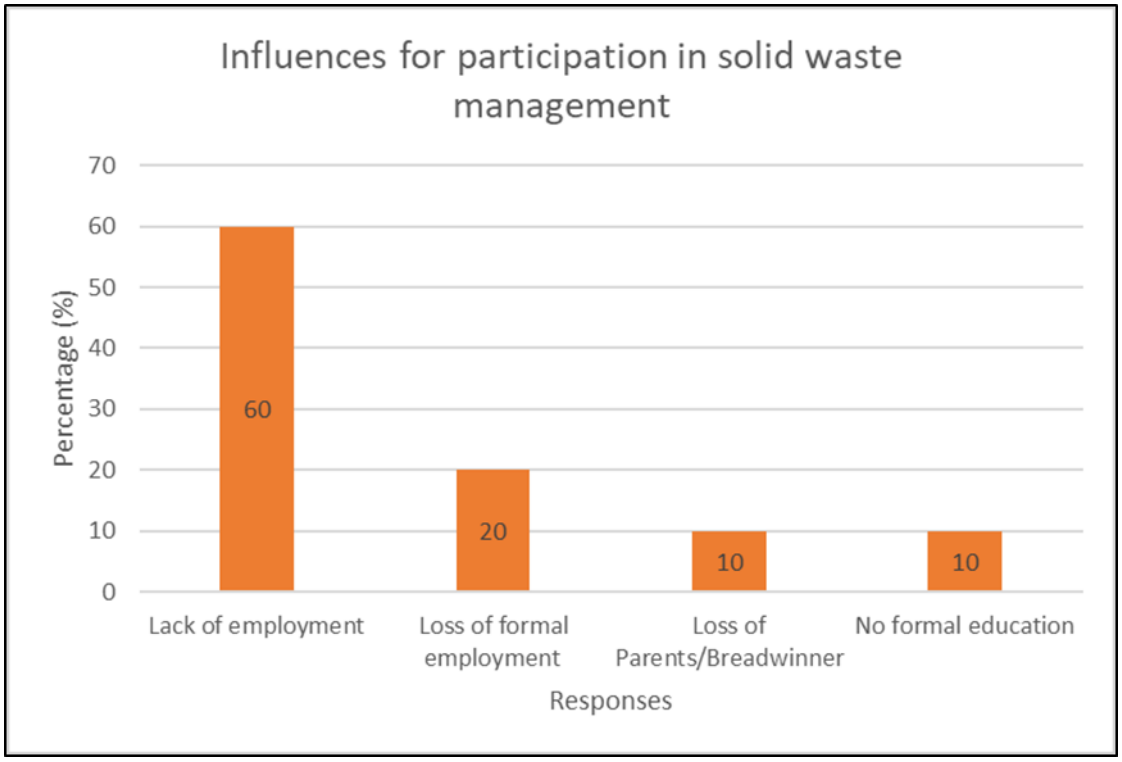


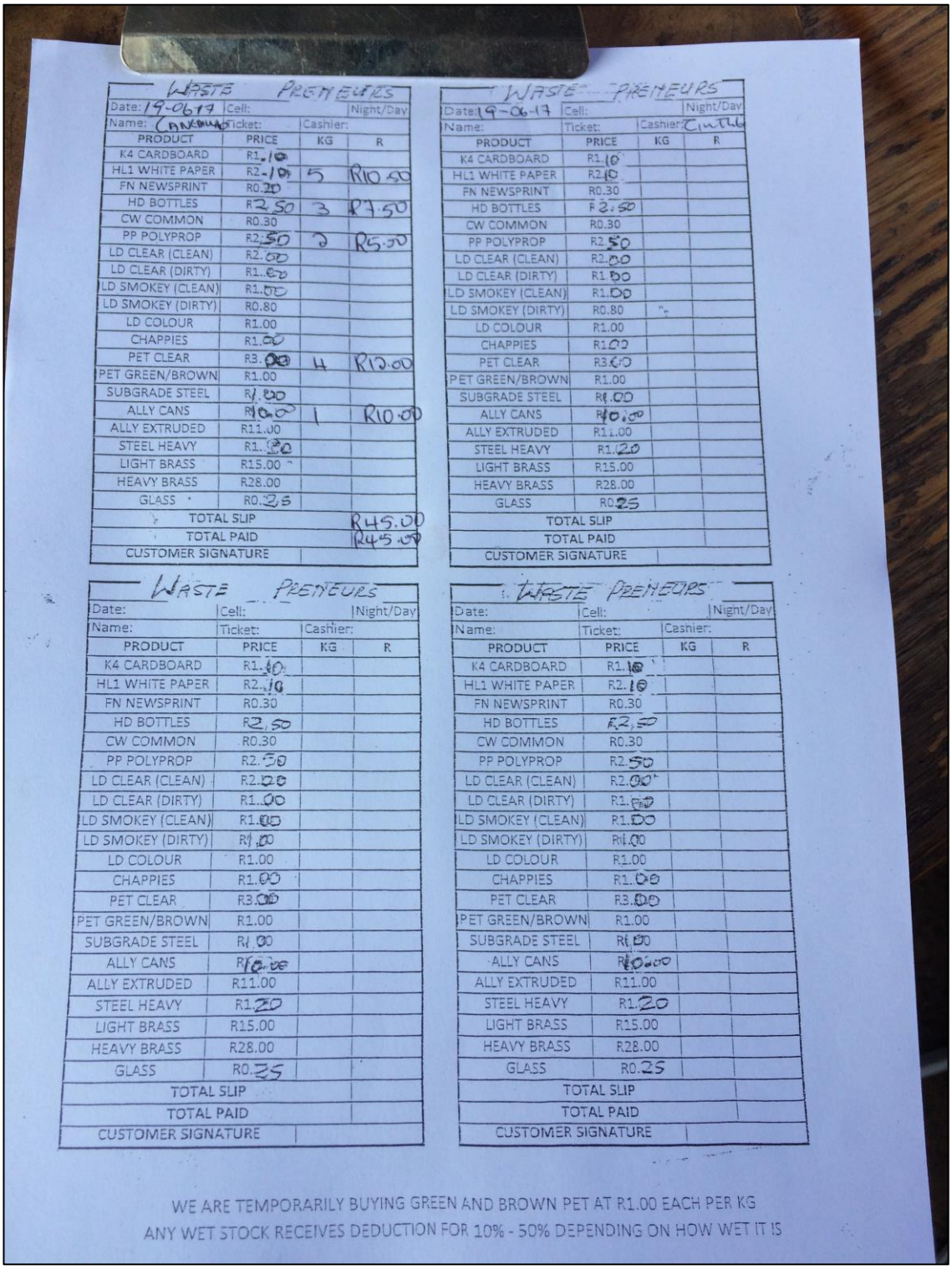
Figure 4-4: Influences for participation in solid waste management

Source: Based on Table 2 see Appendix A.

Figure 4-4 represents the percentage distribution of causes that influenced the respondents to partake in informal solid waste management. The results support the statements made above, 60% of the responded of the respondents have indicated that a lack of employment (which in this case means any form of employment) has influenced them in participation, whilst 20% indicated that they had lost their formal employment and 10% of the responded stated that they either lost their parents who were breadwinners, or they had no formal education to enable them to be employed formally. The sector of recycling is an instant cash generation market, where its players are driven by economic reasons and pressures to partake in the industry. Engagements between buy back centres

and waste pickers are increasingly becoming a major form of employment and a source of livelihood for the unemployed population.

In view of the observation above, it is vital to comprehend the monetary value of recyclable materials, this is presented in **Figure 4-5** below. Wilson et al. (2006) supported by Medina (2001) are of the view that the prices of recyclable material is largely dependent on a number of factors, which include, the price of raw materials, supply and demand, the presence of a local market, accessibility and convenience of transporting these materials.



WASTE PREMEURS

Date: 19-06-17	Cell:		Night/Day
Name: CANDIDATE	Ticket:	Cashier:	

PRODUCT	PRICE	KG	R
K4 CARDBOARD	R1.10		
HL1 WHITE PAPER	R2.10	5	R10.50
FN NEWSPRINT	R0.20		
HD BOTTLES	R2.50	3	R7.50
CW COMMON	R0.30		
PP POLYPROP	R2.50	2	R5.00
LD CLEAR (CLEAN)	R2.00		
LD CLEAR (DIRTY)	R1.50		
LD SMOKEY (CLEAN)	R1.00		
LD SMOKEY (DIRTY)	R0.80		
LD COLOUR	R1.00		
CHAPPIES	R1.00		
PET CLEAR	R3.00	4	R12.00
PET GREEN/BROWN	R1.00		
SUBGRADE STEEL	R1.00		
ALLY CANS	R10.00	1	R10.00
ALLY EXTRUDED	R11.00		
STEEL HEAVY	R1.20		
LIGHT BRASS	R15.00		
HEAVY BRASS	R28.00		
GLASS	R0.25		
TOTAL SLIP			R45.00
TOTAL PAID			R45.00
CUSTOMER SIGNATURE			

WASTE PREMEURS

Date: 19-06-17	Cell:		Night/Day
Name:	Ticket:	Cashier: CINTHIA	

PRODUCT	PRICE	KG	R
K4 CARDBOARD	R1.10		
HL1 WHITE PAPER	R2.10		
FN NEWSPRINT	R0.30		
HD BOTTLES	R2.50		
CW COMMON	R0.30		
PP POLYPROP	R2.50		
LD CLEAR (CLEAN)	R2.00		
LD CLEAR (DIRTY)	R1.50		
LD SMOKEY (CLEAN)	R1.00		
LD SMOKEY (DIRTY)	R0.80		
LD COLOUR	R1.00		
CHAPPIES	R1.00		
PET CLEAR	R3.00		
PET GREEN/BROWN	R1.00		
SUBGRADE STEEL	R1.00		
ALLY CANS	R10.00		
ALLY EXTRUDED	R11.00		
STEEL HEAVY	R1.20		
LIGHT BRASS	R15.00		
HEAVY BRASS	R28.00		
GLASS	R0.25		
TOTAL SLIP			
TOTAL PAID			
CUSTOMER SIGNATURE			

WASTE PREMEURS

Date:	Cell:		Night/Day
Name:	Ticket:	Cashier:	

PRODUCT	PRICE	KG	R
K4 CARDBOARD	R1.10		
HL1 WHITE PAPER	R2.10		
FN NEWSPRINT	R0.30		
HD BOTTLES	R2.50		
CW COMMON	R0.30		
PP POLYPROP	R2.50		
LD CLEAR (CLEAN)	R2.00		
LD CLEAR (DIRTY)	R1.00		
LD SMOKEY (CLEAN)	R1.00		
LD SMOKEY (DIRTY)	R1.00		
LD COLOUR	R1.00		
CHAPPIES	R1.00		
PET CLEAR	R3.00		
PET GREEN/BROWN	R1.00		
SUBGRADE STEEL	R1.00		
ALLY CANS	R10.00		
ALLY EXTRUDED	R11.00		
STEEL HEAVY	R1.20		
LIGHT BRASS	R15.00		
HEAVY BRASS	R28.00		
GLASS	R0.25		
TOTAL SLIP			
TOTAL PAID			
CUSTOMER SIGNATURE			

WASTE PREMEURS

Date:	Cell:		Night/Day
Name:	Ticket:	Cashier:	

PRODUCT	PRICE	KG	R
K4 CARDBOARD	R1.10		
HL1 WHITE PAPER	R2.10		
FN NEWSPRINT	R0.30		
HD BOTTLES	R2.50		
CW COMMON	R0.30		
PP POLYPROP	R2.50		
LD CLEAR (CLEAN)	R2.00		
LD CLEAR (DIRTY)	R1.50		
LD SMOKEY (CLEAN)	R1.00		
LD SMOKEY (DIRTY)	R1.00		
LD COLOUR	R1.00		
CHAPPIES	R1.00		
PET CLEAR	R3.00		
PET GREEN/BROWN	R1.00		
SUBGRADE STEEL	R1.00		
ALLY CANS	R10.00		
ALLY EXTRUDED	R11.00		
STEEL HEAVY	R1.20		
LIGHT BRASS	R15.00		
HEAVY BRASS	R28.00		
GLASS	R0.25		
TOTAL SLIP			
TOTAL PAID			
CUSTOMER SIGNATURE			

WE ARE TEMPORARILY BUYING GREEN AND BROWN PET AT R1.00 EACH PER KG
ANY WET STOCK RECEIVES DEDUCTION FOR 10% - 50% DEPENDING ON HOW WET IT IS

Figure 4-5: Cash value of recyclables and receipts issued to waste pickers by the Victory Park community buy back centre

Source: Photo by Anele Mvuyane, 2017.

Figure 4-5 above shows the various recyclable products being sold at the Victory Park community buy back centre along with the prices of each product per kilogram. It is worth noting that in Johannesburg, waste pickers are paid depending on the quantity/mass of recyclables collected. During the study when waste pickers were asked whether the amount they make in selling recyclables is consistent enough to provide for a sustainable livelihood the respondents stated that:

> "Income depends on the mass of the recyclables you have collected, and the type of recyclables collected" (Pers.com,2017d).

At the time of data collection, it was established that waste pickers were left without a choice than to accept the money being offered to them by the buy-back centres, they have no formal support and representative body they belong to in order for the prices to be collectively negotiated.

The recovery and contribution of waste pickers into the management of municipal solid waste is still considered a grey area, which may also attribute to the lack of recognition by the formal system and municipality. Dialogue with waste pickers and officials have revealed that while the primary motive behind the collecting and recycling of waste is economic empowerment, at a greater scale these actions are promoting the waste hierarchy by ensuring that waste is being recycled and reuse rather than being sent to landfill sites.

Figure 4-6 and **Figure 4-7** depicts the different types of recyclable solid waste that is collected by waste pickers and sold at the Newtown Remade buy-back centre. The general impression in these figures suggest that informal waste pickers significantly contribute to the management and recycling of solid waste in Johannesburg. Waste pickers have also become skilled individuals in the sector of recyclable material, as they can identify various types of solid waste with latent values and locating buy back centres that can offer them the most within

Johannesburg. The majority of the waste pickers choose their buy back centres depending on the price of recyclables per kilogram (kg) offered by the centre as well as the proximity of the centre which allows them to make numerous trips. One of the waste pickers interviewed during the research stated:

> "The income I make depends on the type of waste I collect, the total mass I am able to transport, and some recyclables are worth more than others" (Pers.com, 2017c).

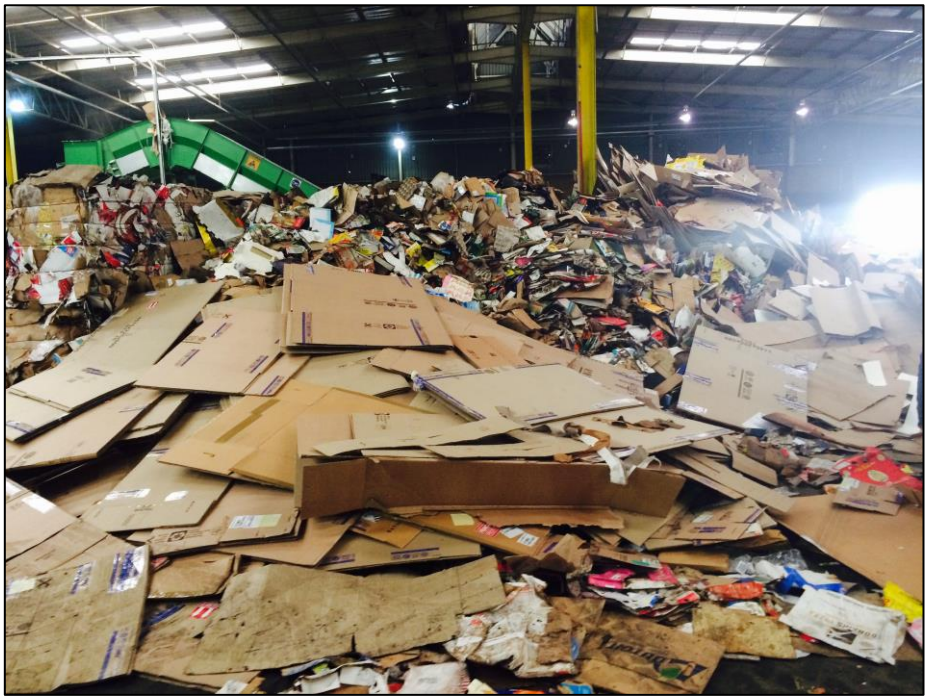


Figure 4-6: Recyclable material at the Newtown Remade buy back centre

Source: Photo by Anele Mvuyane, 2017

Figure 4-7: Recyclable material at the Newtown Remade buy back centre

Source: Photo by Anele Mvuyane, 2017

Figure 4-8 depicts the type of waste being collected by waste pickers and recycled at the three buy back centres, and the table also presents the price of each recyclable per kg according to each buy back centre.

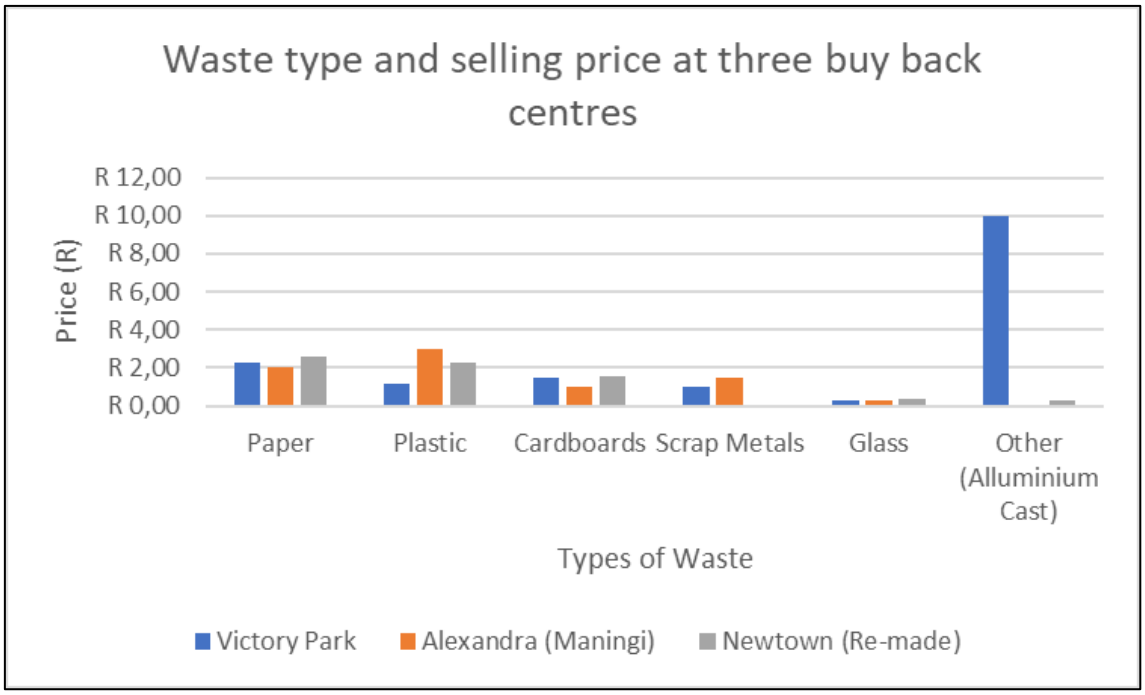


Figure 4-8: Waste type and selling prices at three buy back centres

Source: Based on Table 3 see Appendix A.

From **Figure 4-8** above, it can be argued that the pricing of recyclable goods amongst buy back centres varies thus influencing the location that waste pickers choose to sell their recyclables at and types of waste they are more likely to collect. Based on the figure above it can also be argued that the inconsistency in pricing may expose waste pickers to exploitation by buy back centres, which agrees with the statement made prior that the lack of representative bodies for waste pickers marginalises their right to negotiate fair prices.

4.3 Contribution of waste pickers to solid waste management in Johannesburg

Empirical evidence has suggested that waste pickers play a momentous role in the management of municipal solid waste, however they remain informal and unregulated in their trade. Apart from partaking in the sector for economic benefits, their contribution to the cleaning of cities, the protection of the environment as well as the minimisation of waste to landfill, eases the

management role of solid waste in Johannesburg. Participants in the research revealed major contributions that waste pickers have in the management of municipal solid waste. These contributions were grouped into sub-themes namely *(a)* waste minimisation and minimisation to landfill, *(b)* cleaning up the city whilst reducing municipal expenses and *(c)* source of livelihood and employment.

a. Waste minimisation and minimisation to landfill

Waste pickers collect recyclable materials from a mixture of solid waste which they extract from dustbins, the streets, parks, shopping centres and residential complexes within the urban setting. Discussions with Pikitup officials from Johannesburg revealed that waste pickers indeed contribute to the minimisation of waste that reaches landfill site, thus extending the life of these landfill sites. However, what was echoed by officials was the lack of data indicating the exact contribution that waste pickers have in the management of solid waste. She stated:

> "Waste pickers are part of an independent economy, they are self-employed. They have no knowledge of how big scale their contribution is towards waste management. Waste pickers play an important role in solid waste management. Their work is in line with Pikitup's mandate which is to reduce, recycle and reuse waste. However, Pikitup cannot determine the exact amount of tonnages that is being recycled by waste pickers, it is hard to quantify their contributions" (Pers.com, 2017a).

Solid waste collection estimates provided by the buy back centres provides useful information on the involvement of waste pickers in the management of solid waste. **Figure 4-9** and **Figure 4-10** below presents the amount of waste being recycled and sold by waste pickers at the Remade buy back centre in Newtown in an average week during the winter month of July. It is worth noting that the type and quantity of recyclable material collected and sold by waste pickers in also depend on the season and availability. Therefore, these results may be influenced by the fact that the data was collected during the winter season were,

more cardboard and cartons are utilised for tea and coffee as opposed to the summer were more plastic may be collected due to hotter temperatures increasing people's consuming of cooldrinks. It is worth noting that only two of the three buy back centre managers were willing to share this information.

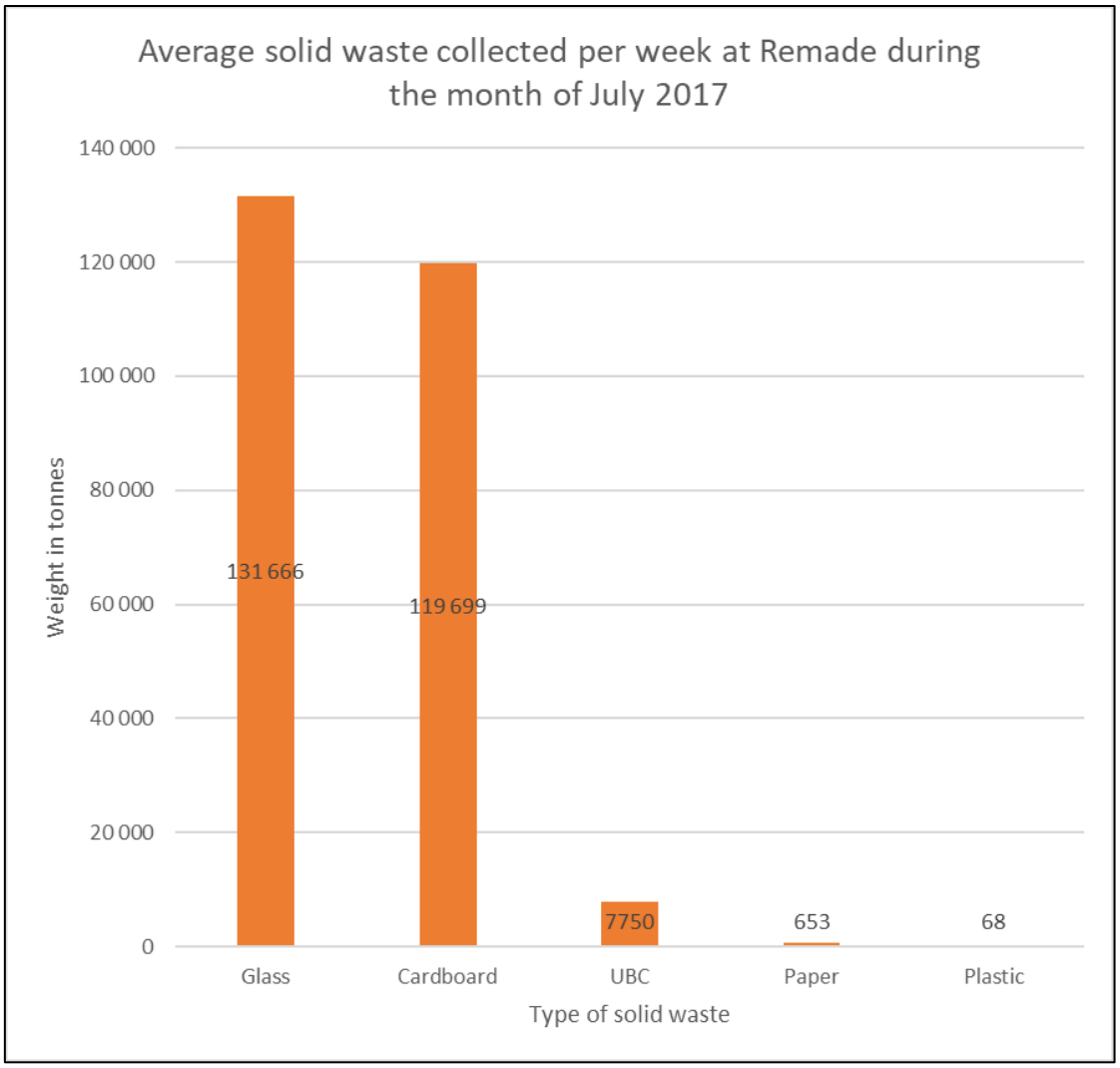


Figure 4-9: Average solid waste collected per week at Remade during the month of July 2017.

Source: Based on Table 4 see Appendix A.

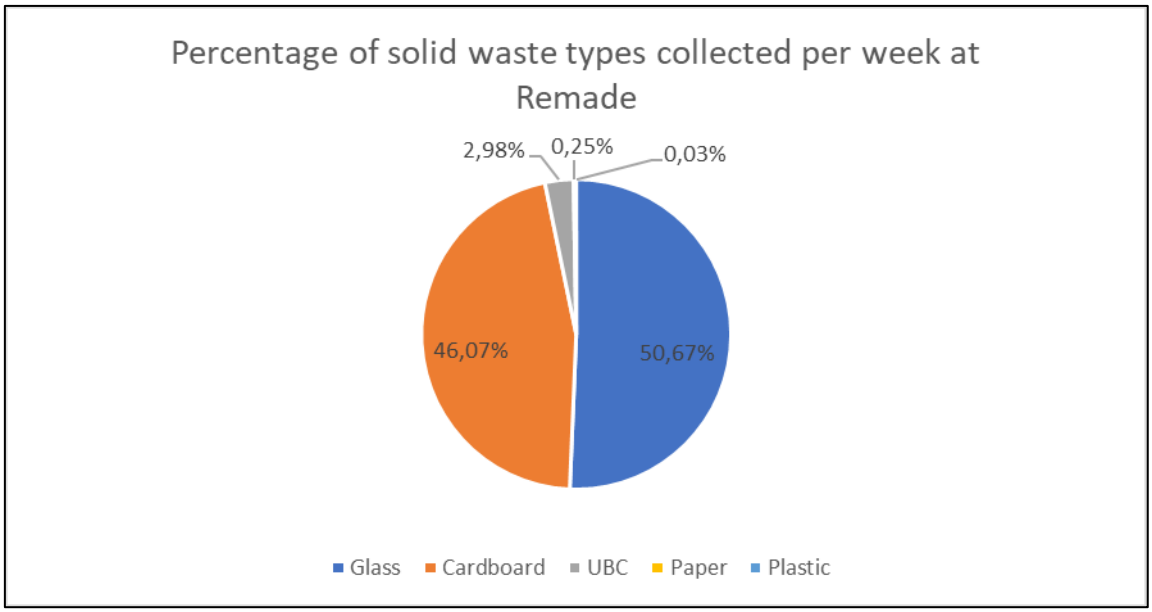


Figure 4-10: Percentage of solid waste types collected per week at Remade

Source: Based on Table 5 see Appendix A.

Approximately 131 666 kilograms of glass are collected at the Remade buy back centre per week, that amounts to 50,67% of the total waste recycled at the centre. Cardboard is the second highest waste type collected, amounting to 119 699 kilograms per week, 46% of the total recyclable waste collected. Plastic on the other hand is the least collected and recycled waste, approximately 68 kilograms are collected per week. The Victory Park community buy back centres provided an estimated figure of approximately 80 – 100 kilograms of combined waste types collected per week. Waste pickers, officials and waste association felt that the presence of waste pickers in the management of municipal waste has contributed to the minimisation of waste that goes to landfill sites. The overall impression in **Figure 4-9** and **Figure 4-10** above is that waste pickers do indeed contribute to the management of solid waste and indeed, waste that goes to landfill site is reduced significantly. This is echoed by a member of groundWork, a non-profit organisation which aims at promoting environmental justice and also part of the South African Waste Pickers Association (SAWPA). He stated:

"Waste pickers play a huge role in waste management, without them landfills will be full beyond capacity. The life span of landfill sites has been extended with their participation in recycling. They are the back bone of the waste management system of the country" (Pers.com, 2017b).

b. Cleaning up the city whilst reducing municipal expenses

It is evident that waste pickers play a major role in the cleaning up of cities, this is also true in Johannesburg. Waste pickers have officially become a trade mark of the urban landscape, whether they are gliding down the streets riding on their man-made trolleys or pulling a heavy load up the steep hills of Johannesburg, they are part of our culture and they deserve the recognition for their role in cleaning the city. Waste pickers spend the whole day collecting waste from various areas; parks, sidewalks, streets and open spaces within and around the city. Although they are largely marginalised and viewed by most as a nuisance in society, waste pickers contribute to the reduction of solid waste in urban areas. In light of the above observation, discussions with officials at Pikitup revealed that waste pickers intervention in waste management has indeed saved the municipality money, more so in the transportation/collection of waste. An official at Pikitup stated:

"Waste pickers have no knowledge of how big scale their contribution is towards waste management. Some residents are not happy about the presence of waste pickers, more so the digging in their bins. However, waste pickers reduce municipality's expenses in light of collection and disposal of waste at landfill sites which are usually far from the cities peripheries" (Pers.com, 2017a).

c. Source of livelihood and employment

The unemployment rate in South Africa as per quarter three of 2017 at the time of data collection was sitting at 27.1% according to Stats SA (2017), and the

majority of the unemployed are of the working-class age (youth). Discussions with waste pickers indicated that the recycling of waste was their main source of income, this is depicted in percentages in **Figure 4-11** below.

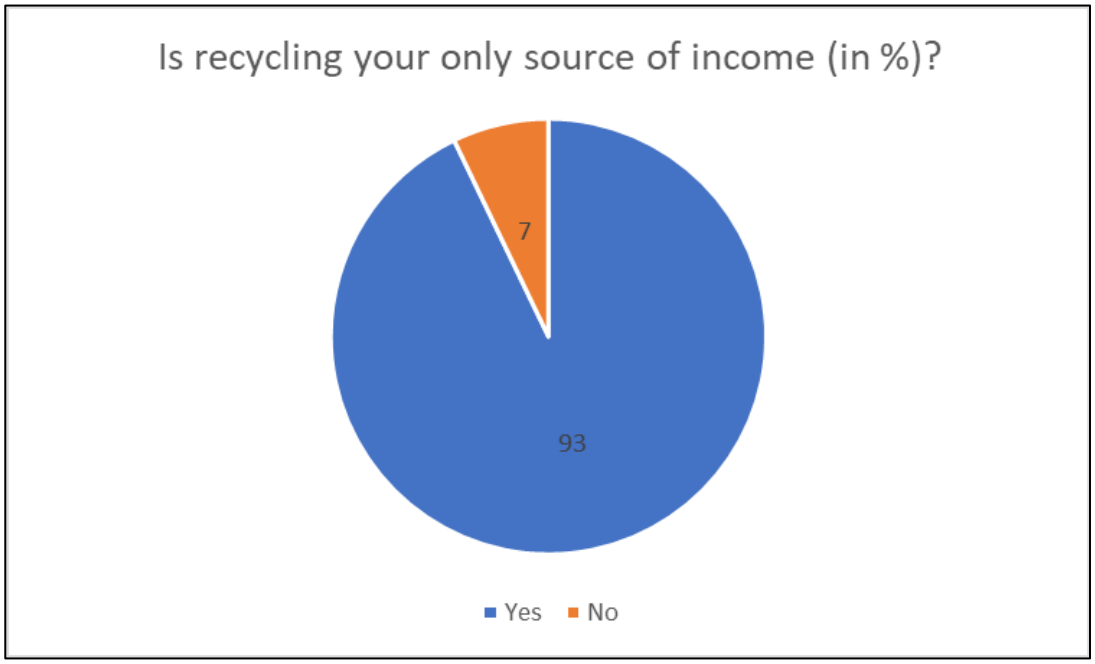


Figure 4-11: Percentage of waste pickers whose income is only recycling waste

Source: Based on Table 6 see Appendix A.

Approximately 93% of the waste pickers interviewed indicated that recycling waste was their only source of income and livelihood, with only 7% of the sampled population having alternative income. It is worth noting that waste pickers have different roles in their respective households and the majority of waste pickers interviewed indicated that they were breadwinners at home. Table 4-3 indicates the number of dependants each of the interviewed waste pickers have, whom depend on their income to survive. 29% of the respondents have 0 – 4 dependants whilst 71% had 5 – 10 dependants who survive from their income generated through waste picking and recycling. It should be noted that dependants extend further than the waste pickers children but also accounts for other family members and relatives that depend on waste pickers for survival.

Table 4-3: Number of dependants supported by waste pickers through recycling

Number of Dependant	Number of respondents	Percentage (%)
0 – 4	8	29%
5 – 10	20	71
Total	28	100

Source: Field-based material, 2017

One of the waste pickers stated:

> "I send money back home to help pay for my sisters' university tuition, they (family) don't know what I do to get the money, but they appreciate it when I am able to provide for them. If they knew that I was picking waste from bins I don't think they would understand" (Pers.com 2017e).

Some waste pickers indicated that, each Rand they make helps them secure a meal for the day and helps them avoid partaking in criminal activities in order to get money. This view consequently indicates that informal waste recycling contributes to the well-being and welfare of waste pickers and their dependents.

4.4 Institutional frameworks and strategies for waste management

The Department of Environmental Affairs (DEA) estimated that South Africa's recycling industry provided approximately 90 000 jobs in the year of 2010 (DEA, 2010). A large majority of these jobs were in the sorting and collection stages of recycling, and informal recycling activities such as 'waste-picking' (Madubula and Makinta, 2013). Madubula and Makinta (2013) further state that the government is willing to expand and endorse the participation of Small, Medium and Micro-Sized Enterprises (SMMEs), cooperatives and Expanded Public Works

Programme projects, through the employment of separation at source and establishing buy-back centres as well as facilities for materials recovery.

With that being stated, discussions held with local officials and a member of groundWork revealed contradicting suggestions in relation to the availability of strategies which can support informal waste collection in Johannesburg. The local authority indicated its willingness to support the informal sector, however, they were of the view that the municipality does not have enough capacity to absorb waste pickers into the formal system. She stated: “The issue of informal solid waste management support is not a city issue but a global issue that requires a number of stakeholders to come together and implement an interdisciplinary approach” (Pers.com, 2017a). However, groundWork stated: “Municipalities have capacity. All municipalities have capacity, but they lack political justice and will” (Pers.com, 2017b). He further stated that there were a number of landfill sites that still have no waste management licenses, and if the Minister would initiate material recovery, recycling and treatment facilities ran by waste pickers near landfill site, jobs can be created, and waste can be better managed. The views from groundWorks were echoed through discussions with an official from the City of Johannesburg who was of the view that municipalities and its structures do have the capacity to support waste pickers. She further suggested that the current issue with provision of support lies with the lack of know-how and research on waste activities, coupled with the lack of political will and a top down approach (Pers.com, 2018a).

a. Cooperatives

Principles of a cooperative are aligned with those of waste pickers. Waste pickers may be involved in an independent economy; however, it can be argued that waste pickers share common economic, cultural and social aspirations just short of “unity”. The development of cooperative has been revealed as a potential strategy to support the informal solid waste management sector. The local authority calls for waste pickers to unite themselves into cooperatives as the

municipality cannot undertake business with individuals. A member from groundWork stated: “Cooperatives is the right way to go, all members of a cooperative are equal” (Pers.com, 2017b). The local municipality cannot operate with individuals, this then results in waste pickers being excluded from government tenders that can empower them and ultimately expose them to a sustainable income and attain a sustainable livelihood. Discussions with groundWork also suggested that buy back centres and recycling centres should be built close to landfill sites and these facilities should be ran by waste pickers with the support, training and guidance from local municipality.

A workshop ran by WIEGO in August 2017 echoed the sentiments of collaboration through trade unions and cooperative movements. The proceedings of the workshop emphasised that, it is critical for waste pickers to be organised in a democratic organisation as to allow them to be included and represented regardless of age, sex, nationality, ethnicity or race. An official from the City of Johannesburg was of the view that there is a need for policy development, a policy which deals with formalisation of waste picking, she was of the view that policy planning and development strategies that introduce a framework for the registration of waste pickers may facilitate the formation of cooperatives thus promoting waste picker authorisation and operationalisation (Pers.com, 2018a). Based on the discussions had with groundWork and the officials, cooperatives are currently the best and most promising strategy in the formalisation of waste pickers and the informal sector.

b. Small, Medium and Micro-Sized Enterprises (SMMEs)

SMMEs also have the potential to support the formalisation of waste picking and informal solid waste management in Johannesburg, however, the principles SMMEs were highly criticised by groundWork. A member of groundWork stated:

> “We don't believe that the solution to integration and formalisation lies on SMME's, they have an element of

> exploitation imbedded in them. SMME's are not usually ran in a fair manner, they use the normal business model "work hard for less". The history of SMME's reveals that there is unfair treatment and unfair dismissal" (Pers.com, 2017b).

4.5 Identified barriers and challenges in waste management

A number of barriers and challenges exist within the informal waste management sector and these have seemed to be a major barrier in the effective support of waste pickers by the formal solid waste management system across South Africa and specifically in Johannesburg. These barriers and challenges have been divided into the following sub-theme (a) Illegal immigrants and lack of formal citizenship documentation (b) Lack of organisation in a form of cooperatives and SMMEs (c) Flooded market of buy back centres (d) Lack of collaboration between waste pickers and the municipality (e) Lack of society acceptance and buy in.

a. Illegal immigrants and lack of formal citizenship documentation

Data collected in the field from the waste pickers indicated that the majority of waste pickers were South African citizens. However, discussions with officials brought to light that one of the major barriers in the successful support of waste pickers by the municipality is the factor of illegal immigrants and lack of citizenship documentation (Pers.com, 2018a). These contradicting ideas may be a result of the make-up of waste pickers, which may be influenced by the different areas in which they operate in. Sentime (2011) supported these claims when he found that more than half of waste pickers are South African, and the rest are originally from Zimbabwe, Lesotho and Mozambique. An official from Pikitup stated:

> "90% of the waste pickers I have interacted with have no formal identification and are residing in South Africa illegally, therefore the municipality cannot work nor support illegal immigrants" (Pers.com, 2017a)

One of the managers at the Remade buy back centre stated:

> "It is difficult to integrate waste pickers because some waste pickers have no IDs. We would have liked to formalise the sector by even paying the waste pickers at banks/electronically, however there is no formal documents. We need to look into the identification issues for formalisation" (Pers.com, 2017f)

b. Lack of organisational strategies and frameworks to represent the waste pickers (Cooperatives and SMMEs)

Discussions with officials and a member of groundWork pointed out that one of the barriers that prevents supporting waste pickers was their lack of organisation and unity. The official stated that "there needs to be improved governance through increased interaction networks through the formation of cooperatives, small enterprises, forums and workshops" (Pers.com, 2018a). Waste pickers currently work under an independent economy, where they are their own bosses and money made goes directly to the waste picker. An official at Pikitup stated: "Waste pickers need to group themselves into cooperatives, the municipality cannot work with individuals" (Pers.com, 2017a). She further mentioned that "as a collective, one body can administer tenders for Pikitup and other government departments." The above statement holds true as the African Proverb states that "umuntu umuntu ngabantu" which translate to "A person is what he is because of other people". A member of groundWork states that "One of the biggest challenges facing waste pickers, is that they are voiceless in society" (Pers.com, 2017b). He further states: "Waste pickers need to form cooperates to have a greater voice".

c. Lack of collaboration between waste pickers and the municipality

Discussion with waste pickers, member of groundWork, and officials indicated that there was little to no collaboration between the waste pickers and the municipality of Johannesburg. The absence of these collaborations has led to the mistreatment of waste pickers in a number of instances. One of the waste pickers that were interviewed stated that: "Government is not on the ground cleaning the

streets, we are but they are only concerned with the buy back canters not waste pickers" (Pers.com, 2017f). The above statement is supported by **Figure 4-12** below which depicts responses from waste pickers regarding whether they have received any support from the municipality as waste pickers.

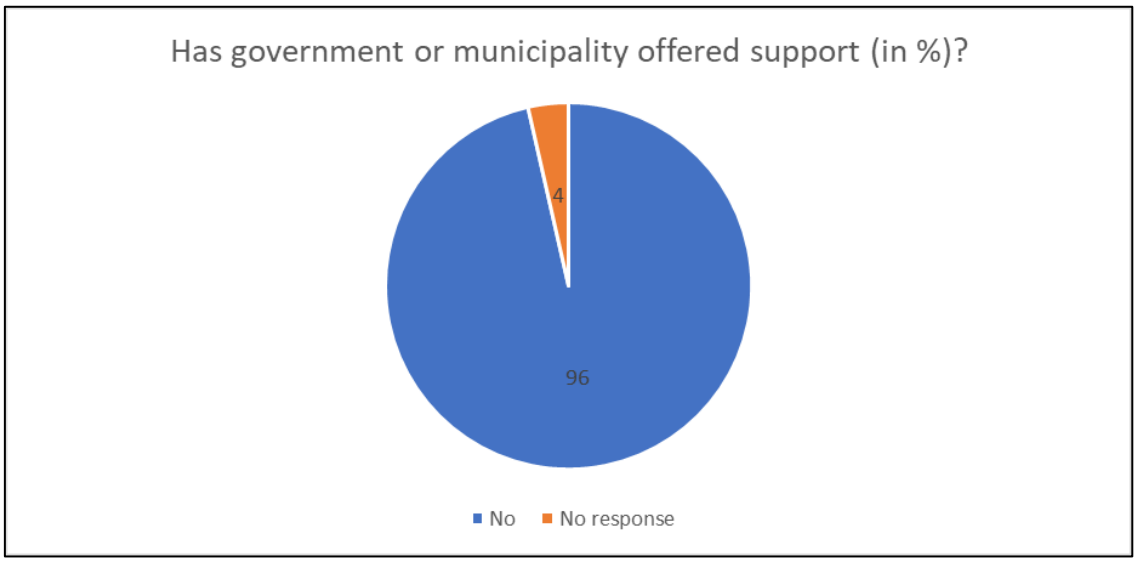


Figure 4-12: Percentage of waste pickers that receive or have received support from the government or municipality.

Source: Based on Table 7 see Appendix A.

It is evident in this figure that 96% of the waste pickers that were interviewed stated that they do not receive any support from the municipality or government proving that there is currently no collaboration between these different players in solid waste management. Member of groundWork stated: "groundWork is an NGO so we have little to no collaborations with municipality/government" He further stated: "Sometimes we need to work alongside with them especially when we are disagreeing on their initiative such as incineration, which they believe is the solution to the current issues with waste management" (Pers.com, 2017b). An official of the City of Johannesburg stated that "the formulation or adoption of existing legislation and legal structures that will contribute effectively to the protection of the activities of waste pickers may address some of the current barriers and challenges faced by waste picker" (Pers.com, 2018a). Discussions

with officials from Pikitup indicated a willingness to collaborate however the issue of identification was still a great barrier. An official stated that “Johannesburg has tried to register waste pickers; however, they do not have the necessary documentation” (Pers.com, 2017a).

d. Lack of society acceptance and harassment

In spite of the visible contribution that waste pickers have in the management of municipal solid waste within Johannesburg, they are still unrepresented, disregarded by society and face numerous counts of harassment from society and officials such as the Johannesburg Metro Police Department (JMPD). Discussions with waste pickers revealed that they did not feel safe whilst doing their daily jobs due to harassment. One waste picker stated: “Being a female in this industry is not easy” (Pers.com, 2017g). She further stated: “We travel at night and in the early mornings to pick up the waste” she herself has been victim to harassment. Another waste picker stated: “Police burn our recyclables and "homes" in Riverside, we lose money and our stock” he further stated: “Residents chase us away from their suburbs while some give us food and clothes.” A number of waste pickers are homeless, they live in parks, in the bushes and under bridges. These areas are what they call home, and, in most instances, this is where their waste is sorted before being trolleyed and sold to buy back centres. This has resulted in the lack of acceptance by society as their work is deemed dirty and some have been labelled as criminals and drug addicts thus degrading their social standing further. Another waste pickers stated: “Some of the residents don't want us in their neighbourhood and sometimes the police take our trolleys away” (Pers.com, 2018b).

Discussion with one of the managers of a buy back centre has revealed that society has judged and misrepresented waste pickers and their job. He works with waste pickers on a daily basis and has made friends with most and regards them as his clients rather than waste pickers. He stated: “Waste pickers are nice people who are earning a living for their families, some are even renting flats in

the city". Residents and society are of the view that waste pickers are a nuisance, criminals and drug addicts and should be removed from the business of recycling. However, this negativity towards waste pickers may be attributed to the lack of understanding of the role of waste pickers in space environmental protection at large and the cleaning up of the city.

4.6 Organisation and formalisation of waste pickers in Johannesburg

This study presents a case that seeks to acknowledge the role that the informal sector has on the management of municipal solid waste in Johannesburg. It does this by drawing the attention to readers in light of the capability and organisation displayed by waste pickers, arguing that the informal solid waste management sector has embedded possibilities and strategies that exist that can enable formalisation of the sector that may not necessarily require integration with the formal system (i.e. municipality). Empirical evidence suggests that waste pickers have in their own right formalised their sector. However, the levels of formalisation may not be in line with other players in the industry and may not even be known to officials. Discussion with waste pickers have revealed that they have grouped themselves into regions across the city based on their location and distance from the nearest buy back centre. Waste pickers from certain regions are not allowed to trade their waste in certain regions; this demarcation can be compared to that of the taxi industry. Further discussions with waste pickers revealed that waste pickers have timetables that they follow, which are largely aligned with Pikitup's schedule. This allows them the opportunity to harvest bins in residential areas for recyclable goods before Pikitup fetches the waste. One of the waste pickers stated: "I have created my own timetable that aligns with Pikitups' waste collections, we go to the suburbs depending on the day of the week" (Pers.com, 2018c).

With that being said, this research argues that it is feasible to have a formalised solid waste management sector and it is possible to effectively support waste pickers, see **Table 4-4** below.

Table 4-4: Formalisation of waste pickers within Johannesburg

Model:	Formalisation
Driven by:	Waste picker associations and local government and municipality.
Regulation:	Manage and monitor
Financial support:	Provide support
Legal Framework:	Amendment of municipal bylaws, development of guidelines or norms and standards
Institutional arrangements:	Establishment of a body or union for waste pickers
Location	Source separation and Access to Landfill sites

Source: Field-based material, 2017

4.7 Legal Framework

The reception and attitude of municipal authorities regarding the informal sector and waste pickers differs from area with area. A discussion with a member of groundWork revealed that, formalisation discussions are being held at national level DEA and that the local municipalities where waste pickers operate are being side-lined. This disconnection makes it difficult to start conversations, because currently the key role players in the management of municipal solid waste are being overpowered. As depicted on **Table 4-4** above, Johannesburg with the aid of the DEA need to develop municipal bylaws and guidelines that ensures that waste pickers are recognised, and provision is made for them to formally conduct their business within the municipality. These guidelines should include the following aspects.

a. Identification and registration of waste pickers

Discussions with a member of ground Works revealed that SAWPA was in the process of registering waste pickers under their association. He stated that there were approximately 1000 waste pickers who have been registered to date. With that being mentioned, Johannesburg in collaboration with buy back centres and waste pickers need to develop a waste pickers database. The information contained in the database would facilitate information sharing and growth as well as manage engagement issues between waste pickers, the community and the municipality. The municipality can then track the movement of waste pickers and demarcate the regions within which they operate, thus enabling them to comprehend the contribution that waste pickers have in waste management in this city. Information obtained in the database can also be utilised by the various departments such as the Department of Science and Technology and the Department of Economic Development NGOs to aid waste pickers in forming cooperatives as form of formalisation. It should be noted that currently, waste pickers at Remade in Newtown are registered and have access cards that allow them to sell their recyclables at the centre. Initiatives like these can be rolled out to other buy back centres and at a municipal level.

Furthermore, a member of groundWork stated: “I believe cooperative run by waste pickers have a high chance to succeed because they are already part of the system, they know how the industry works, they are on the ground daily and understand dynamics that we as "professionals" are not aware of.” (Pers.com, 2017b). Gupta (2012) states that the mobilisation of waste pickers and the informal sector, depends on the establishment of direct contractual relationships between the waste pickers and municipalities. In order to realise this, the informal sector needs to organise themselves into cooperatives or any other structured organisation. We have seen that waste picking and recycling is an independent economy, where waste pickers work individually. Cooperatives are run jointly by people who share the same interest and they have a much louder voice in society as well as at municipal level.

Figure 4-13 below presents a model that can aid in facilitating the formalisation of waste pickers within the urban waste management system. The model facilitates the registration of waste pickers within the local authority through waste associations, which in turns grant local authorities access to on the ground information and a status quo for the development of bylaws and guidelines. This model also calls for training and facilitation of waste pickers in order to ensure that waste picking becomes a sustainable income generation option for people who cannot be absorbed by the formal system due to the lack of skills and training. It also calls for infrastructure development, which will ensure that waste pickers perform their activities in a manner that does not harm them or the environment.

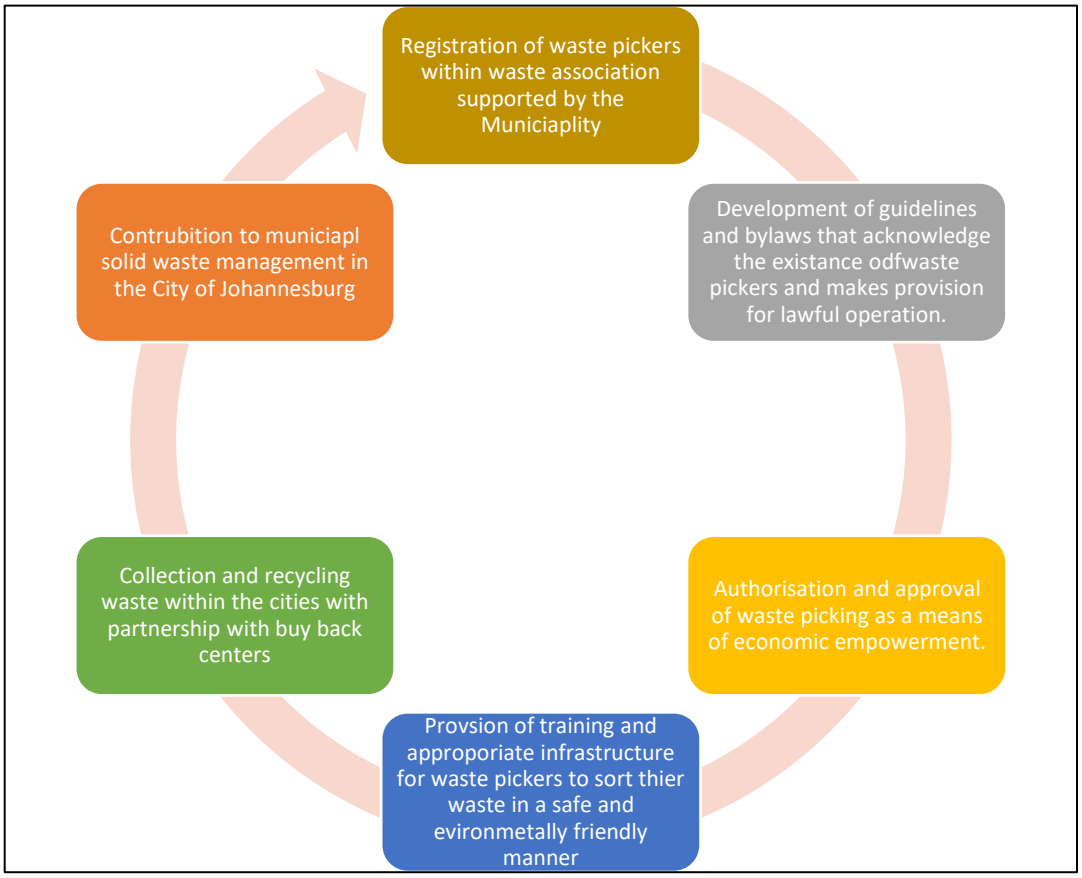


Figure 4-13: Formalisation of waste pickers within Johannesburg Model

Source: Field-based material, 2017.

b. Procurement of PPE and User-friendly trolleys

Various waste pickers raised concerns relating to safety and health risks they are faced with whilst recycling waste. The health and safety of waste pickers is jeopardised on a daily basis, with their visibility to motorists being a major issue. Thus, the need for the provision of personal protective equipment (PPE) will assist in reducing this risk. PPE required may include, reflector vests, gloves and dusk masks. Private companies such as AdReach have hosted initiatives in the past that provided waste pickers with reflective vest as well as bright green trolleys that are highly visible for transportation of recyclables.

At the time of data collection, the trolleys drawn around the city by waste pickers were self-made with dimensions that are not safe for use on the busy streets of Johannesburg. One of the waste pickers that had been provided with a trolley through the AdReach initiative revealed that he chooses not to use the trolley due to its size and design. He could not maximise profit from his trips because he could not overload; which brought to light the idea of consultative designing of trolleys. Fit for purpose design for trolleys which meet the needs of waste pickers while avoiding nuisance to motorist and civil society should be considered. These trolleys can be developed and put on trial by waste pickers, comments and suggestions can be submitted to the association or buy back centre managers. Procurement of these items can be a collaborative effort between the local municipality, private businesses such as AdReach and waste picker associations.

c. Training of waste pickers

Discussions with a member of groundWork revealed that a study had been conducted by the Council for Scientific and Industrial Research (CSIR) on the success rate of cooperatives and the results of the research found that cooperatives had a high failure rate. One of the reasons that were attributed to the failure was the lack of provision of business training for cooperatives. The research found that the government had provided funding to cooperatives but

fail to provide them support and skills training. Waste pickers have “mastered” the industry in the light of making money and the identification of recyclable material of highest value, however their lack of business training and knowledge results in the unsustainability of the industry. The training of waste pickers should also include environmental and legislative training, this will ensure that waste pickers are aware of the various laws and regulations that they need to abide to within Johannesburg. The training of waste pickers can be a collaborative effort between various government departments such as the Gauteng Department of Agriculture and Rural Development (GDRAD), Pikitup and NGO’s.

d. Development of a guideline for the operation of waste pickers in Johannesburg

A guideline needs to be developed for waste pickers, this guideline should be a collaborative effort between private industries, national and provincial government as well as the local municipality. A pilot project can be selected where the guideline can be tested, results from the pilot project can then be assessed and corrective measures implemented where shortfalls are experienced.

4.8 Implications of this study in Sub-Saharan Africa

Empirical evidence suggests that there has been a misrepresentation of waste pickers in society. It has also revealed that these preconceived misconceptions and ideologies have impacted the way this sector is understood. Field based material indicated that 71% of the waste pickers were indeed South African citizens, this is in contrary to officials’ beliefs and impression that waste pickers are largely foreigners. This belief has been paraded as the biggest barrier in the collaboration of the informal and formal sector within the sector of solid waste management in Johannesburg. The findings thus reveal that officials have ignored and avoided the informal sector in fear of the stigma of its illegality which has been wrongfully attached to it.

The findings of the study also revealed that more females are participating in waste picking which before was thought of as a sector fit only for males. Although being female in an informal sector may expose you to more danger than your male counterpart, the operational challenges and harassment by society is felt by both sexes. Empirical evidence also suggests that the majority of individuals involved in waste picking are between the ages of 16 – 35 which is categorised as youth in South Africa. This may be a response to the high unemployment rates in the country as well as the lack of formal education which leaves the uneducated and unskilled side-lined. Empirical findings suggest that it is possible to formalise waste pickers, in order to afford them the opportunity to earn a sustainable income, support their families and not fall prey to the exploitation by defining a market price for the work they are doing towards environmental protection and the cleaning of the City.

4.9 Conclusion

This chapter has presented the research results, and specifically focused on the empirical evidence that was found. A total of five themes were unpacked namely, demographics of the participants; the contribution of waste pickers in the management of solid waste; the barriers and challenges faced by waste pickers and a potential approach on create a sustainable, integrated and economically viable solution to formalise waste pickers in the City of Johannesburg. A number of waste pickers expressed their desire to get a sustainable income, and recognition from government for the work they do for the cities waste management. However, the empirical evidence presents a scenario that is not unique to Johannesburg, but the reality in South Africa as a whole (Simatele and Dlamini, 2017). Waste pickers are breadwinners, children, fathers and mothers, and they deserve to reap the benefits of being citizens of South Africa, the stigma of the illegality of the sector needs to be addressed in order for waste picking to be recognised as an occupation. It is possible to support waste pickers and to give them the protection, infrastructure and social credibility they need for the work they undertake on a daily basis.

CHAPTER FIVE

ANALYSIS AND DISCUSSION

5.1 Introduction

The aim of this study was twofold in nature; the study aimed to investigate strategies within which informal solid waste management can effectively be supported by the formal waste management system in Johannesburg. The study was also aimed at investigating whether there are possible alternatives to organising and formalising the informal solid waste management system which may not necessarily require integration. Based on empirical data informing this study, it is apparent that waste pickers have a significant role to play in the management of municipal solid waste in Johannesburg. Empirical evidence has also revealed that waste pickers have an informally organised system in place and they have shown the ability to be able to function outside of necessarily being integrated with the formal local municipality waste management system. This then calls for the formalisation of waste picking within Johannesburg. It is therefore imperative that appropriate policy entry points be identified in order to make provision for the support of waste pickers. Supporting waste pickers will enable them to earn a sustainable income and improve their livelihood whilst promoting environmental protection. Waste pickers are also in the forefront of promoting the waste hierarchy through their recycling and reuse of waste therefore minimising the cost of waste management for the municipality at large.

5.2 Refined Urban Governance System

Governance as defined by the UN-Habitat (2012) relates to an enabling environment which requires adequate legal frameworks, well-organized political and administrative processes to allow the local government to respond to the needs of their people. The study revealed that there has been a surge in the number of individuals involved in the informal sector of waste management. This increase in waste pickers can be attributed to the rise of waste generation as a

result of urbanisation (Onibokun and Kumuyi, 1999). These findings are aligned with the study conducted by Stats SA (2015) which revealed that during quarter one of 2014 approximately 2.4 million people in South Africa were trying to make a living within the informal economic sector. Onibokun, and Kumuyi (1999) are of the view that the actual volumes of waste generated is not the issue, it is the failure of government and municipalities to keep up with it.

Moreover, the various and multifaceted challenges faced in African cities, especially in the light of urban waste, insufficient infrastructure and social services, questions the capacity for governance in countries in Africa (Onibokun, and Kumuyi, 1999). With that being said, a refined urban governance system needs to be initiated within Johannesburg. Governance embraces the role of the government in society; the management of socioeconomic actions and the participation of civil society in the management of society at large (Onibokun, and Kumuyi, 1999). Improved governance in Johannesburg will facilitate and bring together views and perceptive from all key stakeholders within the waste management sector.

One of the most interesting findings of the study was that 96% of the respondents stated that they do not get support from the government or local municipality. Local government has failed to protect the rights of waste pickers and continues to ignore their presence in the system. Mohee and Simelane (2015) state that numerous cities across the globe have implemented solutions to persistent social challenges through what is termed “social innovation”. The study found that the lack of recognition and support of waste pickers by local municipalities has led to the failure to meet the needs of the people. The issue of recognition is also supported by Schenck et al. (2016) who is of the view that the recognition of waste pickers in the waste system is most the empowering factor for them to operate. The study revealed that some of the officials were not aware of the existence of waste picker associations, such misrepresentation of stakeholders can be avoided with an improved governance system. Schenck

et al. (2016) suggests that recognition of waste pickers can assist them become more visible, they can have a voice and be validated. Information and knowledge holds much power in society, the current breakdown in communication between the different role players in waste management has created challenges in the potential provision of support to waste pickers by local municipalities.

Therefore, the findings of this study suggest that all the key role players in the formal and informal solid waste management sector should collaborate. Medina (2008) agrees with the findings, as he states that various studies have suggested that when waste pickers are organised and supported, the sector of waste picking can bring about grassroot investments by the underprivileged people, create employment, reduce poverty, conserve natural resources, promote cost saving for municipalities and encourage environmental protection.

5.3 Refined Legislation and Legal structures

Secondly, South Africa has been hailed by many for having high quality environmental legislation, however, the implementation has continuously been lacking. This disconnect in implementation has hindered the success of many sectors in the light of environmental protection. This can be attributed to inefficiencies within the country's governance system. The draft National Waste Management Strategy (NWMS) acknowledges that waste picking can be a sustainable job creating sector promoting the recovery, reuse and recycling of waste. NWMS further emphasises that there is a great need to look into the formulation of health and safety standards for waste picking (DEA, 2012a). This is all good on paper, however the political will remains absent. Wilson and Velis (2014) agree that enhanced legislation allows for the empowerment of waste pickers to be realised and creates a network for waste pickers to compete with other economies within Johannesburg.

Empirical evidence revealed that the majority of waste pickers are South African citizens, discrediting the notion that the sector is dominated by foreigners and illegal immigrants. These findings are supported by Sentime (2011) who states that more than 50% of waste pickers are South African and the rest mostly come from neighbouring countries such as Lesotho, Mozambique and Zimbabwe. This then opens up a new dialogue that needs to be facilitated by local and national governmental bodies. We can no longer hide behind the fact that waste pickers are illegal immigrants therefore criminalizing the trade and promoting a more isolated and unsupported industry.

Improved legislation in this case will allow for waste pickers to be empowered therefore creating a network for growth and sustainability of economic ventures with Johannesburg. A transformation in thinking is therefore a necessity in order for legislative interventions and development to play their role in assuring the success of recognising and supporting waste pickers.

a. Institutional failures within the sector of municipal solid waste management

In view of the above, political intervention is needed to address these issues. If all key stakeholder work together in formulating guidelines and legislation that is informed by all participants and people who have on the ground knowledge, the industry of waste picking can ensure that it is recognised, 'legalised' and accepted in society. There is some evidence that suggests that a change in power relationships among waste pickers and the government, buy back centres, industry and the broad society has led to an improvement in the waste management sector. In Brazil and Colombia for instance, waste picking activities are now supported by government; these countries have recognised waste picking as an occupation and organised; waste pickers are seen as authentic stakeholders who can voice their concerns at a local, state and national level (Medina, 2008). Furthermore, municipalities in these countries have recognised the benefits of waste pickers in the system, saving them money

through the reduction of waste that needs to be collected, transported and disposed of (Medina, 2008). However, in an ever-growing city like Johannesburg, where waste is being generated at an exponential rate and the municipality is infamous for failing to deliver services, waste pickers remain unheard.

The challenges of solid waste management in South Africa, particularly in Johannesburg have resulted from the lack of buy in from government. There is a lack of political frameworks and strategies that can facilitate this change and great political instability and corruption within the system. Although, the collaboration of the formal waste management sector and informal may be viewed as an acceptance of waste pickers activities, which may be contradictory to current environmental and traffic rules and regulations, collaborative governance, still remains a much-needed tool in Johannesburg, more so if we are looking for effective solid waste management methods (Scheinberg, 2012).

5.4 Shift from individual waste picker to cooperatives

Thirdly, the role that waste pickers play in the management of municipal solid waste is substantial, however they still remain voiceless and side-lined. Waste pickers are still not recognised as the back bone of waste management by the local municipality, industry as well as society. The commercial value of waste picking has not been appropriately recognised. Waste pickers play a vital role in the supply chain of waste recycling, as they are direct suppliers to businesses that commercialise solid waste (Onibokun, and Kumuyi, 1999). According to Medina (2008), three models have been utilised in order to organise waste pickers, these are; microenterprises, cooperative as well as public-private partnerships. Empirical evidence in the study agrees with Medina in such that, both the local officials and groundWork suggested that waste pickers organise themselves into cooperatives in order to have a bigger voice. It is worth noting that government and industry operate at a large scale, therefore they demand large volumes of material to be processed, sorted and crushed and do not buy

nor operate with individuals waste pickers (Medina, 2008). There is thus a need for local authorities and groundWork to come forth and support waste pickers into organising themselves into cooperatives.

Wilson et al. (2006) agrees with the findings of the study and further states that, organising waste pickers into cooperatives should enable capacity building and training programmes, while making provision for opportunities for effective health and safety standards. The formation of cooperatives can also ensure that waste pickers are not exploited and exposed to price fixing by buy back centres. Currently the price of recyclable material is driven by on the ground deals and there is no agreed upon rate for recyclables amongst buy back centres. Additionally, buy back centres purchase their recyclables directly from waste pickers which in most cases is already sorted. This material is then cleaned and processed, and thereafter sold to industry. Under these circumstances the middle man 'buy back centre' often makes a large profit while waste pickers are left with little to reduce poverty (Medina, 2008). Colombijn and Morbidini (2017) further state that the current waste pickers model operates under an exploitative market which is made up of one buyer and multiple sellers leaving waste pickers with no choice but to accept whatever money is being offered to them. On the other hand, Colombijn and Morbidini (2017) also express the fact that there are drawbacks which come with cooperation's such as, sterner governmental control and reduced flexibility as well as tax which in the current model is not an issue to waste pickers.

Cooperates have been hailed as one of the most culturally acceptable and appropriate methods to organise social capital which underpins the development of the African informal economy (see Meagher, 2005, Porter and Lynon 2006, and Rigg, 2007) this model has also been adopted by communist regions such as Asia to aid in their economic production. Another benefit to the formalisation of waste pickers is the possibility of waste pickers entering into service agreements and contracts with the municipality for the promotion of separation from source. Empirical evidence revealed that all parties are willing

to find a common ground and work together. Material recovery from a source that has already separated the waste increases productivity and the income for waste picker, this frees them from the hassles of having to walk around great distances daily in search of specific materials (Medina, 2008). This initiative also promotes a safer and healthier environment for waste pickers, as they do not have to physically dig into bins and dumpsites in order to retrieve recyclables. Separation from source goes beyond being an initiative to promote economic empowerment to waste pickers, as it extends to culture change in society in light of waste management, be it in schools, in offices or in residential areas. A paradigm shift is needed amongst society, we need to realise that waste management particularly recycling is a not a crime infested business, but one that is dominated by regular citizens who are seeking an income.

It should be noted that, cooperatives may play an uncertain role in urban governance systems however, it should not be overlooked that they may be a very important vehicle in organising waste pickers (Colombijn and Morbidini, 2017). Cooperatives made provision for greater volumes of waste to be collected making the trade more profitable to those who take part in it. For instance, in Colombia a very dynamic waste picker cooperative movement exists. Over a hundred waste pickers cooperatives have united and are now able to provide benefits such as loans, improved working conditions, legal aid and business assistance to waste pickers (Colombijn and Morbidini, 2017). Colombijn and Morbidini (2017) are of the view that cooperatives can also boost social statuses of waste pickers, for instance in countries like India, members of a cooperative of waste pickers have a uniform and are referred to as ‘street beautifiers’. However, some scholars still remain sceptical on the success of cooperatives, this is noted by Colombijn and Morbidini (2017) who observed that cooperatives also carry consequences such as the exclusion of outsiders as well as the exploitation of the poor. The informal sector remains marginalised and unregulated (Simatele et al., 2017), therefore it is imperative to seek to maintain this semi-formal structure that exists in waste picking whilst concurrently providing increased monitoring, support and regulation towards a

more inclusive municipal waste management system thus reducing tensions between the formal and informal sector participants.

5.5 Development of adequate infrastructure and equipment

Lastly, empirical evidence gathered from the study revealed that there is a lack of appropriate infrastructure within Johannesburg which can enable waste pickers to conduct their daily duties in a safe and dignified manner. The challenge of the lack of infrastructure forces waste pickers to sort their waste at 'source', 'source' being the side of the road, in open spaces and parks within the city. Such activities further contribute to society alienating themselves from supporting waste pickers. Medina (2008) agrees with the findings in that, he is of the view that waste pickers endure hostile social environments, working on the streets and in open dumps, exposing them to various health and safety risks, and sometimes rejection by society. This is echoed by Simatele et al. (2017) who are of the view that the provision of appropriate solid waste infrastructure and protective equipment, may trigger a cultural revolution bringing forth a sense of acceptance of waste pickers in Johannesburg.

60% of the respondents suggested that the lack of formal employment was their motivation to join the waste management and recycling business. Therefore, there is a need for government intervention in supporting and providing appropriate waste management facilities and associated infrastructure to enable the poor and unemployed/unemployable the ability to generate an income and sustain their livelihoods. The following are some of the major challenges that were raised by waste pickers in the process of recycling and managing waste in the informal sector.

a. Lack of appropriate infrastructure

In light of the above, the formalisation of waste pickers does not necessarily call for the integration of waste pickers into the municipal waste management

system. Formalisation means inclusivity, support and provision. For instance, waste is currently not separated at source or household level in Johannesburg; the practise of ‘separation at source’ is still voluntary and a few members of society partake in it. The promotion of source separation can avoid the scavenging of bins as waste pickers will already find the waste sorted into specific materials. A similar situation is seen in Brazil, were Colombijn and Morbidini (2017) observed that ‘proto-separation’ or separation from source in households is highly dependent of the willingness and goodwill of the citizens. The research revealed that due to the lack of appropriate infrastructure, waste pickers sort their waste in parks, which also double up as their place of residence. In these situations, waste pickers expressed their concerns relating to harassment by metro officials who confiscate their trolleys and burn their recyclables when they do raids in these parks. Separation from source is also supported by Gukhool (2015) who stated that the separation of waste from source is more common in the developed western countries, this is however not the case in South Africa and more specifically Johannesburg. Should the municipality promote separation at source, waste pickers would not be compelled to sort waste on the side of the street, in parks and leave unwanted waste scattered at the side of the bins. Therefore, bringing a sense of dignity and formality with the sector.

Empirical evidence revealed that waste pickers face numerous health and safety risk, whilst conducting their daily recycling business. Waste pickers are at the risk of being hit by motorists whilst in transit, and this can be attributed to their lack of visibility on the streets. They are usually dressed in dark clothing to accommodate their job. Waste pickers are also faced with various health risks as they lack appropriate protective clothing and equipment to enable them to do their jobs in a safe manner. Currently waste pickers use self-made trolleys to transport their recyclables to buy back centres. These trollies can occupy a full lane on the roads of Johannesburg, this then exposes waste pickers to more traffic risks and also places motorists at risk of colliding with other motorists as well waste pickers. These findings suggest that, there is a need for an

intervention from the municipality and private business to support waste pickers by providing them with protective equipment and adequate physical infrastructure. The support can be in the form of reflective vests to increase their visibility on the streets as well as gloves to protect them whilst they savage bins. Therefore, it is suggested that waste pickers in collaboration with the local municipality and private business should join forces to address these infrastructure issues in order to ensure a more effective and safe solid waste management system for Johannesburg.

b. Lack of public participation, awareness and education

Data collected during the study revealed that there is a correlation amongst education levels and waste picking. These findings are supported by Viljoen et al. (2012) who states that, no skills of formal education are needed in waste picking, and people can partake in recycling to earn a living and income. Empirical evidence suggested that a majority of individuals involved in waste picking have little to no formal educational training. Although improved literacy and skills do not necessarily mean waste pickers income will be more, it can make them more employable and less vulnerable to exploitation (Schenck et al. 2015). The age distribution of waste pickers also revealed that the informal sector is controlled by youth who are forced into the informal sector due to the lack of employment opportunities and the lack of skills required to be absorbed into the formal system. It is evident that the government's failure to provide services to its citizens has forced the marginalised to diversify their income generation methods. In various countries of the developing Southern Africa, the formalisation and organisation of waste pickers does not only support waste pickers; but it also creates significant economic benefits for society as a whole (Medina, 2008).

The culture of waste reduction, reusing and recycling in Johannesburg is very poor, and calls for a shift in mindset of all citizens. We have dissociated ourselves from the waste we generate, and we have built landfill sites on the

periphery of the city in an attempt to avoid living in proximity to the detritus of our own consumption. Society has failed to recognise the value of solid waste management and the benefits both economic and environmental. Simatele et al. (2017) suggest that there needs to be an improvement in public awareness and education in the dynamics of waste management, this can be in the form of educational programmes that extend beyond lecture rooms.

Environmental awareness programmes need to reach the masses in order to raise awareness on environmental protection and wealth creation opportunities through recycling. In this way, society may comprehend the contribution that waste pickers have on maintaining the city clean and pleasant to live in. The majority of waste pickers are in this industry to generate an income and more often than not while they are harvesting for valuable material, they tend to dispose unwanted material in an unsanitary manner. This calls for a collaborative effort by the local municipality and business owner as well as civil society to provide environmental awareness training to waste pickers so to ensure that they do more good than harm whilst partaking in recycling.

Waste management practises should also be implemented on a household level, parents should encourage their children to reuse and recycle waste. The education system needs to support these initiatives by promoting recycling in schools, this can be in the form of providing colour coded bins for different types of waste and offering an incentive for students who have recycled the most. This can help grow the culture of waste reduction in society. If more people get involved in waste recycling, waste picking may be more acceptable to the general society and may be seen as a dignified profession.

c. Social acceptance and issues

In light of the above, informal waste picking has been highly stigmatised, sitting on the edge of illegality. Waste picking has also been viewed as an undesirable

industry and those who participate in it, are looked down upon by society. While discussions with waste pickers revealed that they were proud of their contribution to environmental protection and the overall management of solid waste in Johannesburg, they hoped to secure more formal employment in future and that their siblings and children find more respected jobs. Waste pickers should be seen as the environmental agents they are, however in a society blinded by social expectations and standards and were one's occupation determines a person's level of respectability, waste pickers are still seen as criminals, unpleasant and a nuisance in the community. Inclusion and recognition of waste pickers by the local municipality and national government policies and strategies will encourage socio-economical inclusion of waste pickers which will ultimately encourage waste pickers to take pride in the work they do (see Colombijn and Morbidini, 2017). Simelane and Mohee (2015) is of the view that social acceptance of waste picking as an authorised economic activity in South Africa is vital in achieving the objective of an 'Inclusive City'.

With that being said, it is worth noting that as much as waste picking activities contribute to the protection of the environment, some of the activities have undesirable impacts on the environment. Kubanza and Simatele (2015) agree with the statement, as they observed that some waste pickers lack the knowledge of environmental standards as their interest lies in the economics behind waste recycling rather than the environmental protection aspect. This echoes the statement that environmental awareness programmes are needed in order to ensure that all the stakeholders in solid waste management do better than harm.

5.6 Conclusion

Good governance embraces the role of society and has the potential to lead to the development of appropriate programs, policies and strategies for the management of urban areas. This can help ease the current challenges posed by urbanisation in the light of waste management in the city. South Africa may

have one of the world's leading environmental legislation and laws, however, the continued failure to implement laws has led to the continual failure to protect the environment. Corruption coupled with the lack of political will has hindered progression towards an inclusive and sustainable waste management sector.

The study revealed that the majority of waste pickers are South African citizens, this then calls for a shift in thinking and planning towards organising and supporting waste pickers. The constitution of the Republic states that all citizens whether by birth or resident should enjoy basic human rights. With this being said, waste pickers should also enjoy the fruits of democratic and human rights. Legislation needs to facilitate the inclusive and support of waste pickers within society. Good governance and inclusive waste management legislation should be given priority to realise the commercial and social value of waste picking in Johannesburg.

Collaboration of role players in waste management is crucial for the success of the sector. The study found that there has been a growing disconnection between the key roles players causing great misrepresentation and fuels conflicts as waste pickers remain unheard. Waste pickers need to organise themselves into cooperatives and similar bodies in order to increase their footprint in the waste management system and to reduce exploitation and price fixing. Currently the informal waste management industry is exposed to unfair discrimination and treatment and this calls for rapid interventions from government.

The lack of appropriate infrastructure, participation from the public, awareness and education has also influenced the social unacceptance of waste pickers. There needs to be a change in thinking in society and government at large. Waste pickers are stewards of environmental protection; hence they deserve

to be effectively supported by officials in order to undertake their jobs in an environmentally safe and economically sustainable manner.

CHAPTER SIX

CONCLUSION AND RECOMMENDATIONS

6.1 Introduction

This research explored the dynamics which influence the formalisation of informal solid waste management systems in Johannesburg. Challenges and barriers that hinder the progression towards an inclusive municipal solid waste management system were also investigated. The research proposed a potential solution to the lack of formalisation and support of waste pickers by the formal waste management system within Johannesburg. The research also exhibited the contribution that waste pickers have towards the management of municipal solid waste. However, regardless of the noticeable impact that waste pickers have on the management of municipal solid waste, evidence suggests that there has been no progress towards the realisation and recognition of this industry and provision of support to better organise and formalise waste picking in Johannesburg. It has been revealed that waste picking is still perceived by many as an undesirable occupation and a 'nuisance' to the community at large. Waste picking has been criminalised, frown upon and has been associated with illegality. This perception has affected the recognition of waste pickers by municipalities, as well as policy makers.

The findings of this research also revealed that waste picking is largely dominated by the urban youth who are forced into this sector due to the lack of formal employment opportunities. No formal education, training or skills are needed to partake in solid waste recycling, therefore the number of youth involvement in waste picking is increasing. Waste picking is an easy way of making a living, waste pickers only work when they want to or when they need money, they have flexible working hours and enjoy the element of being their own bosses.

6.2 Key Findings and Summary

The demographics of waste pickers have diversified, and continues to change, and this calls for an intervention. This research has revealed that a vast majority of waste pickers are South African citizens, which opens up a new dialog. The findings are contradicting the stereotypical ideology that waste pickers are illegal immigrants and the urban poor. This then leaves local municipalities and government bare, with no easy way to dismiss waste picking. South Africans are quick to frown upon foreigners and the misconception that waste pickers are largely foreigners proved to be a form of solace and safety net for the local municipality and government to keep shunning away from collaborating with waste pickers and offering them support. It is often easier to hide behind the law, but when research reveals that a majority of waste pickers are indeed South African citizens, this then provides a platform for waste pickers to get access to aid and support from officials.

Waste picking may not be formalised in the manner that is anticipated by the municipality and officials, but the findings of the research have revealed that with the informality of the trade, waste pickers have managed to organise themselves through regions, waste type and areas of operation. The research found that integration may not be the only solution to better position waste pickers recognition in the municipality, support and organisation was found to be best suited for the current reality of waste pickers in Johannesburg. The research then calls for the provision of support by the urban governance system, local municipality and officials in facilitating the formalisation, decriminalisation and organisation of waste pickers within Johannesburg.

The research revealed that there is a lack of policy, strategy and regulatory support to facilitate the formalisation of waste picking in Johannesburg. These conditions have widened the gap in progression towards a formalised waste management system that recognises waste pickers as the pillar of waste

recycling and waste management. Despite the challenges faced by waste pickers on a daily basis, waste pickers still participate in recycling, they still contribute to the protection of the environment and extension of life of landfill sites which are currently stretched. Their participation continues to be a livelihood strategy for them and a means of earning an income.

Based on the findings of this research and other scholars that have investigated the role played by waste pickers in the management of municipal solid waste, it is evident that local municipalities, government and policy makers need to intervene in assuring that municipal solid waste is managed in a manner that promotes the waste hierarchy. Government interventions can aid waste pickers in organising themselves into cooperatives which will result in the strengthening of the supply chain and contribute towards a sustainable income generating sector. Pending government intervention, waste pickers will remain misrepresented, neglected and unrecognised as the environmental champions that they are. The following section details the recommendations and suggestions for future research.

6.3 Recommendations

The findings of the study have revealed that there are many misconceptions that are embedded in society and throughout the government system, these have led to waste pickers not being recognised as members of municipal solid waste management system. In light of this, the following recommendations are made:

a. There needs to be a change in mind set and culture towards the illegality and criminalisation of waste picking. Waste pickers are citizens of South Africa and deserve to reap the rewards and benefits that are entitled to us as per the Constitution of South Africa. It is recommended that local municipality initiates a program that calls for the registration of waste pickers and development of a database to enable them to be able to offer support and services to waste pickers.

b. It is recommended that waste pickers are trained on the rules and regulations of waste management and environmental protection as well as business skills, in order for them to get the opportunity to establish sustainable cooperatives. Waste pickers should move away from working in silos and come together in order for them to have a louder voice and greater footprint in the formal waste management system. This initiative should be led by the municipalities with the support of waste pickers associations to identify waste pickers, map their distribution and consolidate them into a sustainable and recognised livelihood strategy

c. It is recommended that decision makers and policy developers recognise the value that waste pickers hold in the management of solid waste in the municipality. They should include waste pickers in policy and clearly define their presence in the system.

d. It is recommended that separation from source be promoted and re-ignited to society, as this will effectivity support waste pickers by making their work easier and safer, as they won't need to harvest bins anymore and this will also reduce the potential pollution from unsafe disposal of unwanted goods.

e. Due to time and budget constraints, the sample size for the project was limited to a few participants. Therefore, it is recommended that in order to fully comprehend the nationality and contribution of waste pickers towards solid waste management in Johannesburg, this assessment should be widened, and a more substantial sample size should be assessed

6.4 Suggestions for future research

A number of gaps in knowledge still exist, there is a lack of reliable data on the volume of waste being collected and recycled by waste pickers in Johannesburg and South Africa as a whole. This then leaves a grey area in comprehending the extent that waste pickers are contributing to waste management and municipal cost savings. There is also a gap in understanding the existing capabilities of waste pickers in terms of formulation of cooperatives. More research is needed in Johannesburg and South Africa at large in order to

facilitate the organisation and formalisation of waste pickers, which will lead to the recognition, protection and support of waste pickers by the government.

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APPENDIX A: FIELD DATA 2017 AND 2018

Table 1: Citizenship

Are you a South African citizen?	Responses	Percentage (%)
Yes	20	71
No	8	29
Total	10	100

Table 2: Influences of waste picking

Influences for participation in solid waste management	Percentage (%)
Lack of employment	60
Loss of formal employment	20
Loss of Parents/Breadwinner	10
No formal education	10
Total	100

Table 3: Market cost for recyclables

Type of Recyclable	Recycling centres		
	Victory Park	Alexandra (Maningi)	Newtown (Re-made)
Paper	R2,30	R2,00	R2,60
Plastic	R1,20	R3,00	R2,30
Cardboards	R1,50	R1,00	R1,60
Scrap Metals	R1,00	R1,50	R0,00
Glass	R0,30	R0,30	R0,40
Other (Aluminium Cast)	R10,00	R0,00	R0,30

Table 4: Amount of solid waste collected at Remade Newtown in tonnes

Type of Solid waste	Amount in Tonnes
Glass	131 666
Cardboard	119 699
UBC	7750
Paper	653
Plastic	68

Table 5: Amount of solid waste collected at Remade Newtown in tonnes in percentage

Type of Solid waste	Amount in Tonnes	Percentage (%)
Glass	131 666	50,67
Cardboard	119 699	46,07
UBC	7750	2,98
Paper	653	0,25
Plastic	68	0,03
Total	259 836	100

Table 6: Sources of income

Is recycling your only source of income?	Responses	Percentage (%)
Yes	26	93
No	2	7
Total	28	100

Table 7: Government support

Has government or municipality offered support?	Percentage (%)
Yes	96
No	4
Total	100

APPENDIX B: PLAGARISM DECLARATION FORM