Integrating informal waste reclaiming practices into the formal waste management sector: Madibeng Local Municipality

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PREFACE AND ACKNOWLEDGMENTS

In South Africa, the integration of waste pickers into the formal waste management system has emerged as a priority in recent years, reflecting the country's commitment to sustainable waste management practices. This research investigates the integration of waste pickers as part of the formal waste management system. This is an area of emerging research interest in South Africa.

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ABSTRACT

Waste pickers, crucial for waste management, often face poor conditions and legal hurdles. Integrating them requires clear policies, infrastructure, and overcoming challenges like safety risks and resistance to change. Municipalities provide varying levels of support, but effective integration demands collaboration, policies, and infrastructure. Waste picker integration is an area of emerging interest in South Africa.

The research focuses on integrating informal waste pickers into South Africa's formal municipal waste management systems, using the Madibeng Local Municipality as a case study. The study employs a mixed-method design, involving 217 participants from different waste picker groups and municipal officials. It sheds light on waste pickers' demographics, working conditions, challenges, and the inconsistent support they receive from municipalities.

In Madibeng Local Municipality, the waste picker population is predominantly female, contrasting with other studies on reclaimer groups that reveal diverse gender compositions. The gender distribution of labour within these communities may lead to potential income disparities and highlights the need for targeted interventions to promote gender equity in waste management sectors. The average age of waste pickers is 42 years, with the majority falling within the youth age range. Marital status varies among waste pickers, with a significant percentage being never married or single. Many waste pickers in South Africa are illegally in the country, which hinders their integration into municipal structures. Language proficiency and education levels among waste pickers are generally low, making it difficult for them to secure formal employment. However, some waste pickers have acquired skills through formal and informal training. Understanding the demographic profile of waste pickers is crucial for addressing their specific needs and improving their overall well-being.

Waste pickers, who collect and reclaim reusable and recyclable materials from discarded waste, play a valuable role in waste management by reducing landfill waste and recovering valuable materials for recycling. They often face poor working conditions, health and safety risks, low social status, and extreme poverty. Waste pickers primarily collect recyclable waste from shops, businesses, households, schools, and industrial areas. The most frequently collected waste types are cans, plastic, glass, paper, and cardboard. Waste pickers typically work long hours, starting early in the morning and finishing in the afternoon, and work an average of 8 hours and 33 minutes per day. They work different days per week, with the majority working seven days. Waste pickers rely on various means of transportation, such as trolleys, to transport recyclable waste. They store their collected recyclables in bags, crates, drums, containers, or rented spaces before selling

them. The majority of waste pickers sell their recyclable waste to private individuals, while some sell to buy-back centres or waste depots.

Waste pickers in Madibeng travel long distances, often on foot, to sell their recyclable waste at buy-back centres. They are willing to travel longer distances for better prices. The income of waste pickers varies based on factors such as location, type of work, quantity and value of waste, buy-back centre, and gender. Women tend to earn less than male waste pickers. Access to shelter is crucial for waste pickers' well-being, and their living conditions vary. Food shortages can occur, particularly on rainy days. Waste pickers often work independently but form supportive networks. The waste picker population is growing, and they are often unaware of waste management regulations.

To date, waste pickers have been ignored and excluded from the municipal waste management system. Integration is, however, an area of interest in South Africa. Integrating waste pickers into formal waste management systems requires clear policies, infrastructure, and educational initiatives. The support provided by municipalities for waste pickers is varied, with some receiving limited support while others receive none. Challenges in integration include resistance to change, lack of legal recognition, safety risks, and resistance from formal waste management actors. Equitable distribution of benefits and overcoming social stigma are important considerations. Municipal workers have expressed concerns about integrating waste pickers, including issues with "illegal migrants, unwillingness to work with the municipality, unrealistic expectations, and liability. Lack of funding, training, and support for waste officials also pose challenges. Some waste pickers are not interested in integration due to various reasons. Waste pickers in Madibeng prioritise access to medical aid, pension funds, safety, security, electricity, tools, machinery, water, sanitation, and storage facilities. They face challenges such as safety concerns and harassment by authorities. The illegal status of waste pickers in South Africa presents a significant obstacle to their integration. Waste pickers struggle for recognition and rights, facing persecution and competition from privatisation and businesses. Stakeholder participation and waste pickers associations are crucial for successful integration.

Keywords: *informal waste sector, waste pickers, waste reclamation, integration*

ABBREVIATIONS AND ACRONYMS

AI	Artificial Intelligence
ANC	African National Congress
BBC	Buy Back Centre
BBCs	Buy Back Centres
CID	Criminal Investigation Department
CIWP	Community Informal Waste Pickers
DEA	Department of Environmental Affairs
DEFF	Department of Environment Forestry and Fisheries
DSI	Department of Science and Innovation
EPR	Extended Producer Responsibility
FNAS	Faculty of Natural and Agricultural Sciences
IDP	Integrated Development Plan
ILO	International Labour Organisation
IoT	Internet of Things
IWMP	Integrated Waste Management Plan
KKPKP	Kagat Kach Patra Kashtakiri Panchayat, A trade union of waste pickers
LIWP	Landfill Informal waste Pickers
MRF	Material Recycling Facilities
NDP	National Development Plan
NGO’s	Non-Governmental Organisations
NWMS	National Waste Management Strategy
NWU	North West University
OECD	Organization for Economic Co-operation and Development
PPE	Personal Protective Equipment
QCA	Qualitative Comparative Analysis
QDA	Qualitative Data Analysis
S@S	Separation at Source

SAWPA	South African Waste Pickers' Association
SDF	Spatial Development Framework
SIWP	Street Informal Waste Pickers
SME	Small Medium Enterprise
STATS SA	Statistics South Africa
UNEP	UN Environment Programme
UNICEF	United Nations Children's Fund
WIEGO	Women in Informal Employment: Globalizing and Organizing

KEY DEFINITIONS

Buy-back centres: Buy-back centres, as defined in the context of the National Environmental Management Waste Act (NEMWA) or similar waste management regulations, refer to a facility or establishment to which individuals or businesses can bring their recyclable materials, such as paper, cardboard, plastics, glass and metals, and exchange them for monetary compensation or other incentives (Sohan, 2021).

Circular economy: an economy that is restorative and regenerative by design and aims to keep products, components and materials at their highest utility and value at all times, distinguishing between technical and biological cycles (Sohan, 2021).

Collaboration and partnerships: A sustainable economy requires collaboration among governments, businesses, civil society and communities to drive change at various levels.

Community engagement: The zero-waste movement often involves community-based initiatives, education and awareness campaigns to promote waste reduction practices at the local level.

Community informal waste pickers (CIWP) are those who harvest their recyclables on a daily basis from their local communities, including taverns, local liquor stores, shops and dumping areas where the local municipality does not conduct refuse collection. They normally store their recyclables in their backyards and garages. In most cases they trade their recyclables only after a lengthy period due to the limited harvest from their communities. CIWPs include elderly persons who supplement their pensions and Government grants.

Consumer awareness - Consumer Protection Act (Act 68 of 2008): to protect a fair, accessible and sustainable market for consumer products and services.

Economic diversification: A sustainable economy promotes diversification of industries and sectors to reduce dependence on a single resource or sector, enhancing resilience to economic shocks.

Formal recycling: The formal recycling process involves the local municipality's collecting waste from residential and business areas and taking it to landfill sites to be sorted. Barnes, Blaauw, Schenck and Pretorius (2021:2053) state that "recycling companies add value through processes of beneficiation to render the recyclables into a usable form for the manufacturing or end-use market."

Formal sector: The formal sector is everything modern and industrialised, and consists of both private and public enterprises, all operating within the legal boundaries of the specific country. This sector is backed by the government and often funded by recognised commercial financial service providers (Ezeah, Fazakerley & Roberts, 2013). Barnes *et al*. (2021) the formal sector is defined as "employment originating from a business or firm that is registered with the state." Barnes *et al*. (2021) point out that formal sector activities include municipalities' waste management activities, NCOs and appointed private waste management companies.

Formal waste services refer to waste management activities that are organised, regulated and provided by authorised entities, typically under the purview of local governments or other relevant governmental bodies. These services are structured, monitored and operated according to established rules, regulations and standards.

Informal economies refer to economic activities that occur outside the formal labour market.

Informal recycling: Informal recycling refers to waste pickers' recovering specific waste, such as metals, paper, glass and building material, which is taken to informal sorting sites. The waste pickers then salvage anything of value, which they sell to buyers for cash (DEFF & DSI, 2020).

Informal sector: The informal sector operates outside the control and regulations of Government. This sector is characterised by "small-scale, labour-intensive, adapted technology, low-paid, unorganised/unplanned, and unregistered/unregulated work" (Ezeah *et al*., 2013:1250). This sector excels in developing countries and is seen as a front-line service, or input service, to large sections. Kay (2011:1) defines the informal sector as "economic activity that occurs outside the purview of state regulation and informal employment defined as employment originating from a business or firm that is not registered with the state."

Informal waste pickers: Workers in the waste informal economy, known as waste pickers, scavengers or waste collectors, are typically part of the informal labour force. They engage in waste collection, sorting and recycling as a means of earning an income to support themselves and their families.

Informal waste sector: In the context of the National Environmental Management Waste Act (NEMWA) or similar waste management regulations, informal waste services refer to waste management activities that are not regulated, authorised or organised by official governmental entities

Infrastructure development: This encompasses investing in waste collection systems, transfer stations, recycling facilities, composting sites and waste-to-energy plants to improve waste management capabilities.

Integrated Waste Management Plan: a comprehensive and strategic document that outlines a municipality's or region's approach to managing waste in a sustainable and environmentally responsible manner.

Integration and formalisation efforts: Numerous waste management systems and governments acknowledge the significance of the informal waste economy and attempt to incorporate informal waste workers into formal waste management systems. This involves training, access to protective gear and legal recognition.

Landfill informal waste pickers (LIWP) are those harvesting their recyclables on a daily basis at a landfill site. They have to be registered in the municipal data base and clock in at the landfill gate. They trade their recyclables to middle men, who sell to bigger companies, such as Remade and Consol (Pholoto, 2018; Mudavanhu, 2019).

Municipal waste management process: This procedure involves waste collection, transportation, treatment, evaluation and disposal. It must be checked to ensure compliance with stringent standards and norms.

National Waste Management Strategy: The National Waste Management Strategy (NWMS) is mandated by the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008), also referred to as the "Waste Act." The NWMS serves to meet the objectives of the Waste Act. State agencies and impacted individuals are required to implement the NWMS.

Public-Private partnerships: efforts by Government agencies and private businesses to invest in and run waste management facilities and services in collaboration.

Recyclable waste: According to the Waste Framework Directive, recyclable waste consists of items, such as cardboard, white paper, cans and plastics which, via a particular process, can be reprocessed into goods, commodities, or substances for their original or other intended functions.

Recycling initiatives: establishing or upgrading recycling facilities and programmes to enhance the recovery and recycling of valuable materials from the waste stream

Recovery, in the present context, means the controlled extraction of a material or the retrieval of energy from waste to produce a product (NEWMA: No. 59: Waste Act, 2008).

Recycling: the process of reclaiming waste for further use, which involves the separation of waste from a waste stream and then processing the separated waste into a new product or material (NEWMA: NO. 59: Waste Act, 2008).

Regulations and policies: Governments can implement policies that promote waste reduction, such as banning or taxing single-use plastics and encouraging producers to take responsibility for their products' end-of-life.

Re-use is the re-use of waste materials for similar or different purposes without altering the form or quality of the waste materials (NEWMA: No. 59: Waste Act, 2008).

Separation at source refers to the practice of separating post-consumer and domestic garbage at the site of generation in order to prevent it from entering the waste stream destined for landfilling.

Street informal waste pickers (SIWP) are those who collect their recyclables from streets and businesses (Pholoto, 2018). They know the refuse collection schedule of the municipality and on which day residents take out their refuse for collection (Mokobane, 2017). These groups share areas of harvest as they know who works at a certain spot in town. SIWPs are able to sell their collected waste daily as buy-back centres exist in various parts of towns (Mokobane, 2017). SIWPs also include street kids known as ‘hobos’ (homeless youths who recycle to buy drugs).

Waste is any substance, regardless of whether it can be reduced, re-used, recycled or recovered, that is surplus, undesired, rejected, discarded, abandoned or disposed of; or for which the generator has no more need for production reasons and which must be processed or disposed of (NEWMA: NO. 59: Waste Act, 2008).

Waste picker: a person who collects recyclable and reusable materials from household and business waste bins, landfill sites and open spaces in order to resell them for profit (DEFF & DSI, 2020:vii).

Waste picker integration: This refers to “the development of a formalised recycling system that recognises and enhances the current role of waste pickers, builds on the strengths of their existing system for collecting and revaluing materials, and includes waste pickers as key partners in its design, implementation, evaluation and revision. Integration of waste collectors includes the integration of their reclaiming activities in addition to their political, economic, social, legal and environmental integration (DEFF & DSI, 2020:vii).

Waste reduction programmes: Promoting re-usable products, decreasing packaging waste and discouraging single-use items are examples of activities that support waste reduction at the source.

Zero waste: The conservation of all resources through responsible production, use, re-use and recovery of products, packaging and materials, without burning them and without land, water or air discharges that are hazardous to the environment or human health.

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CHAPTER 1: INTRODUCTION

1.1 Background

The increase in urban populations has overwhelmed the capacity of municipalities to provide adequate and equitable waste management services (Samson, 2010; Sentime, 2014; Ezeah *et al*., 2013). To create an operative and sustainable municipal solid waste management system, there is need to rethink the current model of municipal waste management (Jerie & Tereza, 2014). Historically, waste management primarily focused on centralised, municipality-managed systems of collection, transportation and disposal, often ignoring the valuable role of informal waste pickers and recyclers. Globally, the management of waste has undergone significant transformations over time, with notable shifts towards recognising and incorporating informal waste management practices. As environmental concerns have grown and the economic potential of recycling has become evident, there has been a gradual shift towards integrating informal role players into the formal waste management framework (Sentime, 2014). This is particularly true in the Global South and developing economies (Porras Bulla *et al*., 2021).

This shift towards inclusive waste management not only benefits the environment, but also addresses social and economic issues, highlighting the evolving nature of waste management practices worldwide. Governments and organisations have increasingly acknowledged the importance of providing these workers with better working conditions, social protection and opportunities for skills development (Coletto & Bisschop, 2017). In many developing countries, informal waste pickers have played a crucial role in diverting recyclable materials from landfills, reducing waste volume and contributing to the circular economy.

The generation of waste is a problem of global concern with approximately 2.01 billion tonnes of waste generated globally and only 33% of it disposed of or treated in an environmentally sustainable manner. Medina (2008) emphasises that waste picking is an example of sustainable development, an activity that enhances environmental protection by increasing the amount of waste collected, re-used or recycled, resulting in high indicators for energy saving, pollution prevention and pollution reduction. The informal recycling sector can play a decisive role in curbing the negative impacts of a linear economy (Valencia, 2019). Informal recyclers are attracted to heterogeneous infrastructure configurations which emerge ‘naturally’ from discarded materials with potential usefulness or monetary value under unique circumstances and socio-technological mechanism (Lawhon *et al*., 2018).

South Africa is experiencing severe constraints in terms of the availability of landfill space, as well as challenges in operating and decommissioning landfills in a manner that is compliant with

licensing conditions (Sohan, 2021). Informal waste pickers in South Africa diverted around 51% of paper and packaging waste in 2017 by reclaiming recyclables from landfills at about 16-24 tonnes per waste picker per annum. This was estimated to have saved municipalities between R309.2 and R748.8 million in landfill airspace (Sohan, 2021). As many as 90 000 people depend on waste picking to earn a living in South Africa (Schenck *et al.,* 2019a:81). The work of waste pickers saves municipalities costs associated with collection, sorting, cleaning and transportation of waste (Samson, 2020a:2), and, according to Godfrey and Oelofse (2017:5), South Africa's recycling rates have improved due to the contribution of the informal economy and has put the country on par with many European countries.

Until recently, waste picking in Africa existed as a largely informal practice, operating outside the realms of formal waste management systems. The informal nature of waste picking poses challenges for systematic waste control and resource recovery, as it operates independently from the organised processes of the formal waste management system in the country (Coletto & Bisschop, 2017). This disparity highlights the need for greater recognition and integration of waste pickers into the overall waste management framework to enhance efficiency, sustainability and social inclusion with regard to handling waste-related activities.

In South Africa, the integration of waste pickers into the formal waste management system has emerged as a priority in recent years, reflecting the country's commitment to sustainable waste management practices. This shift is in alignment with the *National Waste Management Strategy* (NWMS) (DEFF & DSI, 2020), which emphasises the importance of inclusivity and recognises the significant role that waste pickers play in reducing waste and promoting recycling. The NWMS specifically highlights the importance of "strengthening and expanding the role of waste pickers e.g., through integrated separation at source, in the waste management system and recycling economy, and supporting markets for source separated recyclables*"* in the country (DEFF & DSI, 2020:31). Pillar 2 of the NWMS, which focuses on effective and sustainable waste services, explicitly mentions that innovative models and tools need to be developed and implemented to "engage the informal sector (waste pickers) in the delivery of separation at source" (DEFF & DSI, 2020:41), while the implementation plan to achieve Pillar 2 targets the "integration of waste pickers into the waste management system" (DEFF & DSI, 2020:50).

The *Waste Picker Integration Guideline for South Africa: Building the Recycling Economy and Improving Livelihoods through Integration of the Informal Sector*, a key document derived from the NWMS, serves as a comprehensive framework for the integration of waste pickers (DEFF & DSI, 2020). It outlines strategies to improve the working conditions and livelihoods of waste pickers, while ensuring that they remain an integral part of the recycling and waste management ecosystem. South Africa's dedication to waste picker integration not only supports environmental

sustainability by increasing recycling rates but also addresses social and economic development by providing better opportunities for and recognition of these essential workers, ultimately contributing to a more inclusive and resilient waste management system. According to this guideline, waste picker integration is the creation of an official recycling system that values and improves the present role of waste pickers, builds on the strengths of their informal system to collect and revalue materials, and includes waste pickers as key partners in its design, implementation, evaluation and revision (DEFF & DSI, 2020).

Integrating waste pickers into formal waste management systems, however, presents a multifaceted challenge. Resistance to change can be significant, as waste pickers may be hesitant to abandon their informal practices and fear a loss of autonomy (Hartmann, 2018). The lack of legal recognition for their work adds complexity, necessitating changes in laws and regulations to establish their rights and protection (Porras Bulla *et al*., 2021). Moreover, waste pickers often lack access to crucial resources, such as healthcare and education, which integrating them into formal systems may demand at the expense of strained municipal budgets (Yousafzai *et al.*, 2020). Safety risks inherent in informal waste picking, including exposure to toxins and unsafe working conditions, must be addressed. Resistance from formal waste management actors, who may see waste pickers as competitors, poses additional obstacles (Ghisolfi *et al*., 2017).

Ensuring equitable distribution of benefits among waste picker communities is a challenge (Schenck & Blaauw, 2011), as is tracking progress and sustainability in the long term. Infrastructure development and training are resource-intensive prerequisites for integration, as are overcoming social stigma associated with waste picking (Bonsu & Nartey, 2023). Despite these challenges, waste picker integration remains vital for sustainable waste management and improved livelihoods, requiring a collaborative and adaptable approach which involves multiple stakeholders to navigate this intricate landscape. The *Waste Picker Integration Guideline for South Africa* is primarily intended to educate and guide organisations other than waste pickers' organisations whose work affects waste pickers and who should promote waste picker integration. Waste picker integration, therefore, also promotes political transformation and the deepening of democracy by including people who have been stigmatised and marginalised in policy-making processes (DEFF & DSI, 2020). The developments around waste management in South Africa that produce a shift towards re-use and recycling have always attracted regulatory interest from the Government (Samson, 2015). The Minister of Environmental Affairs stated, "The waste sector is currently valued at about ZAR 50 billion a year" (DEFF & DSI, 2020). Waste has both social and economic values. "Reducing, recovering, and minimising waste provides opportunities for socio-economic development, new jobs, and business by maximising resource recovery for downstream manufacturing growth." (DEFF & DSI, 2020).

Municipal waste management systems were designed to collect and dispose of waste in what Scheinberg calls the “service chain,” and waste pickers play a critical role in linking the “service chain” to the recycling “value chain” (Scheinberg & Simpson, 2015:976; OECD, 2016).

1.2 Problem statement and rationale for the study

Hoornweg and Bhada-Tata (2012) paint a gloomy picture of how waste is increasing around the globe. They project that greater capital injection would be required to remove waste from the cities and argue that urbanisation and human consumption produce more waste than local municipalities can contend with.

In South Africa, waste management programmes continue to take up a large portion of the municipal budget (DEA, 2016), making the situation undesirable. As an intervention, informal waste pickers could be engaged to improve recycling rates in municipalities. Integration of waste pickers would assist in defining the roles of both municipal officials and informal waste pickers. It becomes ever more important to engage with this process in depth because no two municipalities are the same.

Recognition of informal waste pickers is essential for social welfare and would ease tensions between waste pickers and local municipalities. The International Labour Organisation argues that there is a need to create ‘decent work’ for informal waste pickers (Van Daele, 2008). The ILO (Van Daele, 2008) defines decent work as productive work for women and men in conditions of freedom, equity, security and human dignity. Furthermore, decent work results in a fair income and offer prospects for personal development by encouraging social integration.

The broad agreement is that informal waste pickers need to be integrated into the formal waste management system in order to participate proactively in waste management and the recycling economy, thereby improving their own livelihoods (Samson, 2012; Dias, 2016). This integration would require absolute buy-in on the part of municipalities because they are at the forefront of waste management (Mkhize *et al.,* 2014). How local municipalities conduct and manage integration would go a long way in meeting the requirements for diverting waste away from landfill sites, while also meeting the requirements for decent employment.

The Department of Environment, Forestry and Fisheries and the Department of Science and Innovation developed a *Waste Picker Integration Guideline for South Africa: Building the Recycling Economy and Improving Livelihoods through Integration of the Informal Sector* in 2020 (DEFF & DSI, 2020). These guidelines on the integration of waste pickers into municipalities provide an enabling opportunity to seek ways of placing informal waste pickers at the core of the collection of waste from the mainstream. The guidelines and the process they are broad and need

to be refined to suit conditions prevalent in a specific municipality, as well as being well received by those implementing such guidelines, namely, informal waste pickers and municipalities. While it is a victory for informal waste pickers to be recognised, municipalities still have to undergo a paradigm shift (Dias, 2016).

Waste picker integration, or formalisation, efforts often evoke mixed views and emotions within communities, governments and environmental organisations. On the one hand, proponents argue that integrating waste pickers into formal waste management systems provides them with better working conditions, social protection and access to essential services (Chikarmane, 2012). This perspective sees waste picker integration as a means of recognising their valuable contribution to recycling, waste reduction and environmental sustainability. On the other hand, some stakeholders may express concerns about the potential challenges of integrating waste pickers, such as increased operational costs, resistance to change, and potential displacement of informal workers from their livelihoods (Moreno-Sánchez & Maldonado, 2006). Additionally, there may be fears that formalisation could lead to bureaucracy and reduced autonomy for waste pickers (Hartmann, 2018). Balancing these perspectives requires careful planning, collaboration and policy implementation to ensure that waste picker integration benefits not only the environment and formal waste management systems, but also addresses the socio-economic needs and aspirations of waste picker communities. It remains a complex and evolving issue with varied opinions, reflecting the nuanced nature of sustainable waste management practices.

The concept of integration of informal waste pickers is fairly new in South Africa. Although ample research has been conducted on understanding waste pickers and their socio-economic and socio-demographic contexts, as well as their needs, research on waste integration in the South African context is scant. The present research is aimed at understanding the perspectives of waste pickers and municipal role players regarding the integration of informal waste reclaiming practices into the formal waste management sector. The Madibeng Local Municipality is used as a case study for this research. The researcher is not naïve to the fact that waste pickers are individuals with their own minds and choices. The same applies to municipal officials, who might have their own perceptions and ideas about waste picker integration.

1.3 Research aim and objectives

The aim of the research is to explore perceptions on how informal waste reclaiming practices may be integrated into or supported by the formal municipal waste management systems in South Africa, following a case study approach, in which the Madibeng Local Municipality is used as a case study example.

The research provides the views of both waste pickers and the municipality. Municipalities' perspectives on how informal waste reclaiming practices might be included in the formal waste management sector - specifically focusing on how municipalities view opportunities for and barriers to integration, and the specific role that they might need to play in terms of the formalisation of informal waste practices - are areas which have not been extensively researched in South Africa.

1.3.1 Research questions

How can informal waste reclaiming practices be effectively integrated into the formal waste management system in South African municipalities, using the Madibeng Local Municipality as a case study?

The research sub-questions are as follows:

- Research Sub-question 1: What is the current socio-economic profile of waste pickers in the Madibeng Local Municipality?
- Research Sub-question 2: What is the status of informal waste reclaiming practices in the Madibeng Local Municipality?
- Research Sub-question 3: What is the current status of waste management services and infrastructure in Madibeng Local Municipality?
- Research Sub-question 4: What is the current enabling environment within the Madibeng Local Municipality to allow for integration of informal waste reclaiming practices (e.g., the legal framework, such as guidelines, policies, by-laws; views of decision-makers within the municipality)?

1.3.2 Research objectives

The following research objectives were defined for this study:

- Research Objective 1: To determine the socio-economic profile of the waste pickers in the Madibeng Local Municipality.
- Research Objective 2: To determine the status of informal waste reclaiming practices in the Madibeng Local Municipality.
- Research Objective 3: To determine the current status of waste management services and infrastructure in the Madibeng Local Municipality.
- Research Objective 4: To determine the current enabling environment within the Madibeng Local Municipality to allow for the integration of informal waste reclaiming

practices (e.g., the legal framework, such as guidelines, policies, by-laws; views of decision-makers within the municipality).

1.4 Conceptual framework for the research

In relation to the research aim and objectives, provided in Section 1.3, Figure 1-1 illustrates the conceptual framework for the research, with RO1 and RO2 aimed at understanding informal waste reclaiming practices, whilst RO3 and RO4 reflect on the formal waste reclaiming practices in the Madibeng Local Municipality. The ultimate aim of the research is to explore the perceptions regarding the integration of the informal sector into the formal waste management sector in the Madibeng Local Municipality with the aim of highlighting opportunities for integration.

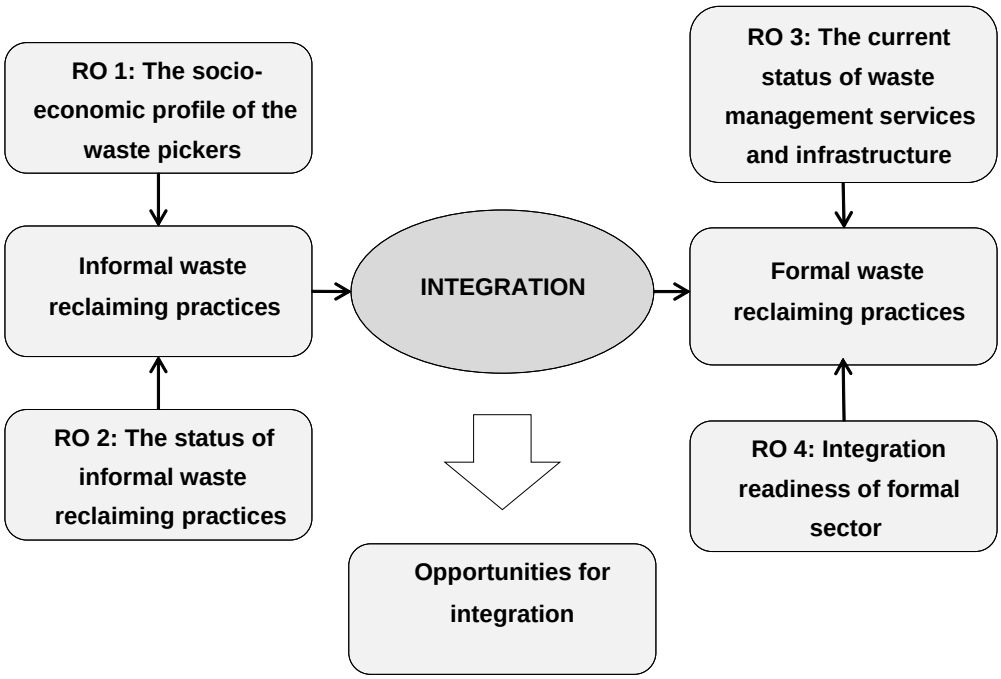

Figure 1-1: The conceptual framework for this research (Source: Researcher)

1.5 Delineation of the research scope

This study aims to contribute to research which focuses on waste picker integration into the formal waste sector. The present research was conducted by adopting a case study approach, in which the Madibeng Local Municipality, in South Africa, was used. The study focused only on *perceptions* of how the municipality could incorporate informal waste pickers. No actual integration efforts were attempted or formed part of this research.

Apart from the Madibeng municipality, no other local municipalities were included in the research scope. It is, however, believed that the results of this research may be generalisable and, therefore, useful to other South African municipalities.

Research participants included *three categories of informal waste pickers*, namely, landfill informal waste pickers (those operating on landfill sites), street informal waste pickers (those operating in the streets of towns and cities) and community or rural waste pickers (they are rarely observed in towns and operate within townships, in communities and rural areas). The research also included municipal role players in the Madibeng Local Municipality: the Director of Community Services (Waste and Environment included here), the Chief Environmental Officer responsible for environmental auditing, the Coordinator of Waste Management in charge of waste operation, and the Municipal Administrator (as the Accounting Officer for overseeing the municipal performance).

All participants included in the research were capacitated adults. Minors (under the age of eighteen years) and incapacitated adults were excluded, since they were considered to be vulnerable groups.

Importantly, the research focused strictly on recyclable municipal general waste streams, such as plastic, glass, paper and cans, because they are mostly the kind or waste easily available for informal waste pickers in Madibeng. No industrial or hazardous waste streams were included in this research.

The research is limited to the period 2019 to 2022. It should be noted that this period included restrictions imposed upon the public because of the COVID-19 pandemic. The Minister of the Department of Environment, Forestry and Fisheries issued a Government Notice No. 539 on 14 May 2020, which gave directions regarding measures to address, prevent and combat the spread of Covid-19 in relation to the recycling of waste. Purpose 2(c) of this Notice provided directions in respect of the protection of health, well-being and the environment when carrying out activities in the recycling sector in terms of the National Environmental Management Waste Act. The directions stipulated reasonable measures for re-using, recycling and the recovery of waste within the parameter of services permitted under Alert Level 4 of the Covid-19 restrictions.

Purpose 2(d) of the Notice enabled separation of waste at source by encouraging households and other establishments that generate municipal solid waste to separate recyclables from residential waste before disposal. A municipality was allowed to issue permits under Regulations 16(2)(b) and 28(4) of the regulations relating to informal recyclers and waste pickers, and had to

maintain a list of persons to whom permits were issued, including their names, gender and identification or passport number.

1.6 Limitations based on the research scope

The delineated scope (Section 1.5) and the limitations thus placed on the research scope need to be taken into consideration when reading this thesis.

Since a case study approach was followed, the research findings are limited to what was found in the Madibeng Local Municipality. Furthermore, the research is limited by the data collected. It may not reflect the overall situation of Madibeng, since the locations included in the research were selected to represent the three waste picker categories as indicated in Section 1.5 above. Each location provided a peculiar challenge in terms of economic activity in that specific area. Moreover, literature on integrating waste pickers within the South African context is limited, which did not provide a sufficiently comparative context for discussions. Where possible, literature from the Global South and developing countries was included to provide for comparative discussions. Lastly, the research is based on the *perceptions* of waste pickers and municipal officials, sought through interviews and surveys. This method relies on self-reported data, which may not be an accurate reflection of the phenomenon being studied, but are rather based on the perceptions and experiences of individuals within their specific contextual backgrounds.

1.7 Significance of the study and potential contribution to research

Previous research has predominantly concentrated on recognising the significance of integrating waste pickers into the formal sector, delving into their specific needs, and elucidating their pivotal role in the broader waste management system (Dias, 2016; Sekhwela, 2017; Samson, 2020a). The research landscape has been shaped by studies like Mudavanhu's (2019), which conducted a thorough analysis of the livelihoods of landfill waste pickers in South Africa through the lens of the sustainable livelihood framework. Despite this, there has been a noticeable gap in the literature regarding the practicalities of the integration process, its nuanced implications, and the reception it garners from key stakeholders, as highlighted by the Department of Environment, Forestry and Fisheries (DEFF, 2020:2).

The current research follows a trajectory similar to the Masters study by Seabi (2022), which focused on *Perspectives of role players on waste picker integration in the formal waste management sector.* The particular focus on understanding the integration process and its reception by stakeholders is underscored by the government call for attention to waste picker integration, as evidenced in the National Waste Management Strategy (DEFF, 2020) and the Waste Picker Integration Guideline for South Africa (DEFF & DSI, 2020).

The significance of this study is underscored by its potential to bridge the existing knowledge gap and guide practical implementation. The research is not only relevant to local municipalities contemplating waste picker integration but also serves as a beacon for those striving to apply the Waste Picker Integration Guidelines for South Africa. The outcomes and insights gleaned from this study can serve as invaluable lessons and guidance for South African municipalities, offering a detailed process for local municipal departments to navigate the intricacies of waste picker integration. Furthermore, the study's focus on a semi-rural municipality adds a unique dimension, providing insights into how integration strategies can be tailored to suit diverse regional contexts.

In terms of contributions to the broader research landscape, this study addresses a critical juncture where policy directives prioritise waste picker integration without the availability of concrete data to inform the process. As stipulated in the National Waste Management Strategy (DEFF, 2020), the lack of existing data makes the findings of this research especially pertinent, as they have the potential to fill this void and offer actionable insights into how semi-rural municipalities can effectively address the integration of waste pickers into formal waste management systems.

1.8 Research approach

The concept of waste picker integration is a fairly new idea in South Africa (DEA, 2019). It requires an approach that may lead to an exploration of this phenomenon using a variety of data sources so that the results may be inclusive enough to be credible. Therefore, this research employs an exploratory case study design, as this design allows for multiple research tools to be used to explore fully the nature of the phenomenon being studied. Case studies have one critical purpose, namely, to understand the studied subject in greater detail (Ridder, 2017:288).

Exploratory research designs are based on explanatory design theory, which is diverse and powerful, making them highly valuable. By emphasising the fundamental elements of design theory, we may understand its constructive nature as a prescriptive theory, while also recognising its availability as an explanatory theory, which is descriptive in nature (Berge *et al.,* 2006).

Gustafsson (2017) defines a case study as a form of qualitative research that can inform professional practice or evidence-informed decision-making in policy-making realms. The author further argues that, when implemented correctly, case study affords researchers an opportunity to describe a phenomenon in context using a variety of data sources; these sources could be individuals or organisations and their relationships, or communities. Consequently, a case study approach can assist our work of interrogating the nature of informal recycling, and the relationships between informal waste pickers and the local municipalities. Yin (2009) also

supports the use of a case study design when the focus of the study is to answer the questions of “how” and “when”, or when researchers want to cover contextual conditions which they believe to be relevant to the phenomenon being researched. A case study approach would assist the present researcher in collecting data through face-to-face interviews, in order to understand how integration could be modelled and why it has not been undertaken as yet. It would also allow the researcher to understand the context which influences how municipalities make decisions about solid waste management and how contextual factors affect the integration of informal waste pickers.

The research employed a mixture of qualitative and quantitative data collection methods, as elaborated on in Chapter 4 of this thesis.

1.9 Ethical considerations

Ethical considerations play a pivotal role in ensuring the well-being and dignity of the individuals involved. Informed consent emerges as a paramount principle, necessitating clear and comprehensible communication with waste pickers about the research purpose, methods and potential implications. Given the likelihood of encountering vulnerable groups, particularly minors, special care must be taken to exclude them from the study, prioritising their protection and respecting their rights. Confidentiality becomes a critical ethical facet, demanding the safeguarding of participants' identities and personal information to prevent stigmatisation or harm (Salerno *et al*., 2020). The research took into consideration the power dynamics inherent in the waste picker context, striving to maintain a respectful and equitable relationship with participants. Balancing the pursuit of knowledge with the ethical imperative of preserving the rights and well-being of waste pickers is fundamental to conducting research that is both informative and ethically sound (Baumgartner, 2018).

The ethical considerations and processes followed during this research are outlined in Chapter 4 of this thesis.

1.10 Structure and outline of the thesis

This thesis consists of six chapters and a reference list, and is supported by annexures.

Chapter 1 - Introduction: This first chapter provides the background of and reason for the necessity of incorporating waste pickers into solid waste management. Furthermore, it provides the problem statement, research aims, and objectives; it deals with the scope of the research, research limitations, the potential contribution of the research, and the relevant ethical considerations.

Chapter 2 - Literature Review: Chapter 2 details the current global initiatives and programmes to divert waste from landfills, with specific mention of the role of the informal waste picker. The working conditions of waste pickers are explored and discussed. The chapter delves at length into how municipalities treat waste pickers and what milestones are registered in the formalisation of their status. It traces the emergence of integration of informal waste pickers from developed through to developing countries. Several lessons learnt are reported in Chapter 2, including the scale of integration at global level. In conclusion, the study narrows down the concept of integration through Africa to South Africa in particular.

Chapter 3 - Contextualising the case study area - Madibeng Local Municipality: Chapter 3 introduces the reader to the case study area. The Madibeng Local Municipality is an area of mining, agriculture and tourism adventures. Its opportunities for growing the informal economy are fully discussed, as well as how, if effectively tapped into, the area would develop potential growth and employment.

Chapter 4 - Methodology: Chapter 4 details the research design and methodology employed in the study. It provides a bird's eye view of the research design, methods of data collection and data analysis, as well as the methodological limitations and ethical considerations.

Chapter 5 - Results and discussion: Chapter 5 presents the overall findings and interpretation derived from the quantitative and qualitative data collected from the respondents.

Chapter 6 - Conclusions and Recommendations: Chapter 6 provides the conclusions drawn and recommendations suggested related to the subject of the study.

1.11 Chapter conclusion

In this chapter, the study was introduced by outlining its background and the problem which prompted this study. The research problem pertains to the integration of informal waste pickers in the Madibeng Local Municipality into the formal waste management system. The research questions and objectives were formulated. The research approach, scope and limitations were presented, as well as the rationale for the study. This chapter also provided an outline of the study to indicate the content covered in specific chapters. Chapter 2 provides the literature review.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

Recycling of municipal solid waste in developing countries relies largely on the informal recovery of materials by waste pickers. Waste pickers recover materials to sell for reuse or recycling, as well as for their own consumption. They are often perceived to be a nuisance, a symbol of backwardness, and even as criminal. They survive in a physically and socially hostile environment (Medina, 2008).

Waste pickers' low income is often the result of the low prices paid by middlemen - and middlemen grossly exploit waste pickers (Medina, 2008). Opportunities exist for the improvement of the latter's living and working conditions by circumventing the middlemen (Medina, 2008). Nevertheless, many waste pickers enjoy their occupation because of the money they earn, not being accountable to an employer, and having a higher degree of flexibility in their working hours (Medina, 2008). The formation of waste pickers cooperatives attempts to circumvent middlemen and thus pay higher prices to its members, which would break the "vicious cycle of poverty" (Medina, 2008). Moreover, important waste collection and recycling rates ensured by the formalised involvement of informal waste pickers could help achieve many of the sustainable development goals, especially those related to health, the environment and cities (Wilson *et al.,* 2006).

A population estimated at three billion worldwide lack municipal solid waste management services (Navarrete-Hernandez & Navarrete-Hernandez, 2018). Limited waste collection and treatment have contributed to air, water and land pollution, and unmanaged waste is responsible for harbouring and spreading communicable diseases, such as cholera and malaria, which have claimed the lives of millions (Grant, 2019).

2.2 Legislative influence on informal waste pickers integration

The legislative landscape governing waste management in South Africa is diverse, encompassing various laws and regulations aimed at ensuring environmental sustainability. The Constitution of the Republic of South Africa establishes a constitutional right to an environment conducive to health and sustainable development (RSA Constitution, 1998). The National Waste Management Strategy of 2011 emerged as a legislative mandate, outlining objectives to minimize, reduce, reuse, and recycle waste, with a specific focus on integrating waste pickers into the formal waste management system (DEA, 2011).

The Polokwane Declaration of 2001 demonstrates the government's commitment to waste management practices, emphasizing a cradle-to-cradle approach towards zero waste. Although the Declaration sets ambitious targets, its efficacy is questioned as South Africa has yet to fully implement separation at source programs, a key element in waste minimization (Godfrey & Oelofse., 2017).

2.2.1 Legal Policy and Strategic Framework for Waste Management and Picker Integration in South Africa

The legal policy and strategic framework pertaining to waste reduction, recycling, and the integration of waste pickers in South Africa are primarily governed by the National Environmental Management Act: Waste Act 59 of 2008. This legislation was enacted with the overarching goal of safeguarding public health and the environment through the implementation of measures to prevent pollution and ecological degradation. The act emphasizes the necessity for reasonable measures to ensure ecologically sustainable development and establishes institutional arrangements for effective waste management, including planning matters (National Environmental Management Act: Waste Act 59 of 2008).

One key focus area of this legal framework is outlined in the National Environment Waste Management Act 107 of 1998, which underscores the importance of sustainable development in waste management practices. It specifically advocates for waste avoidance and reduction, as well as the promotion of reuse and recycling as viable alternatives. It is noteworthy that the legislation places a greater emphasis on waste reduction compared to recycling (National Environment Waste Management Act 107 of 1998). Moreover, South Africa is actively implementing Extended Producer Responsibility (EPR) waste streams. This mandates producers to take responsibility for the end-of-life disposal of the products they manufacture. The focus on EPR aligns with the government's commitment to shifting away from the use of dumping sites and promoting value recovery in waste management processes (DEA, 2011).

However, a critical examination of the legislation reveals both strengths and limitations. The National Environmental Management Waste Act of 2008 recognizes waste as a resource and introduces conditions for salvaging waste in waste management licenses (RSA, 2008). While this acknowledges the economic potential of waste pickers, the lack of specific guidelines on how salvaging should be conducted leaves room for ambiguity and inconsistent implementation (Samson, 2010b). The NWMS of 2011 acknowledges the vital role of waste pickers in the recycling sector, committing to improving their working conditions and creating decent work through formalization (DEA, 2011). Despite these commitments, there has been limited progress in the actual integration of waste pickers into municipal waste management systems, raising

concerns about the implementation and enforcement of these policies (Schoeman & Rampedi, 2022).

The National Environmental Management Waste Bill of 2007 marked a pivotal moment by recognizing informal reclaimers in legislation for the first time, allowing salvaging under specified conditions (RSA, 2007). However, the absence of clear guidelines on salvaging processes and timing has led to challenges in effectively incorporating waste pickers into formal waste management practices (Samson, 2010). In conclusion, South Africa's legal policy and strategic framework for waste management reflect a multifaceted approach that addresses key dimensions, including waste reduction, recycling, and the integration of waste pickers. Enshrined in national legislation, these initiatives are guided by a commitment to sustainable development, the implementation of Extended Producer Responsibility (EPR), and the empowerment of local municipalities. Aligned with the objectives outlined in the National Development Plan 2030, these efforts seek to establish a comprehensive and inclusive waste management strategy across the nation (NWMS, 2020).

The legislative emphasis in South Africa is notably placed on waste avoidance and reduction, with a discernible shift towards the adoption of ERP for various waste streams. Despite this alignment with global trends, the effectiveness of these measures in directly supporting the integration of waste pickers remains a topic of ongoing debate, as highlighted in the National Waste Management Strategy of 2020 (NWMS, 2020). This underscores the need for continued evaluation and potential adjustments to ensure that the policies not only align with global best practices but also effectively address the challenges and opportunities associated with the involvement of waste pickers in the waste management system.

2.2.2 Challenges in Waste Picker Integration: Legislative Measures and Strategic Efforts in South Africa

In South Africa, the Waste Act of 2008 serves as a foundational legislative framework for waste management. Section 10(1) of this act mandates provincial municipalities to develop integrated development plans (Fiehn & Ball, 2005), emphasizing a structured approach to waste management. Additionally, Section 10(3) requires all services to appoint a Waste Management Officer (RSA, 2008), highlighting the government's commitment to organized waste control. Despite these regulatory measures, the integration of informal waste pickers into formal municipal structures faces significant challenges (Samson, 2015).

Efforts in Johannesburg to address this issue have involved public and private partnerships in community recycling programmes. However, Sekhwela (2017) points out a critical issue: the

mismatch of understanding between informal waste pickers and municipalities regarding the concept of integration. This disconnect has led to strained relationships and a breakdown of trust among various stakeholders involved in waste management. Recognizing the need for clarity, the Department of Environmental Affairs (DEA) took a significant step in 2019 by issuing guidelines for waste picker integration (DEA, 2019). Although these guidelines are not legally binding, they provide a foundational framework for engaging with informal waste pickers. The document acknowledges the socially constructed and contested nature of waste picker integration, aiming to create a common understanding among different groups and officials.

Support for these guidelines is deemed crucial by Komane (2014), as they recognize the vital role played by informal waste pickers in the recycling economy. Financial support is emphasized to ensure the success of the guidelines, improving working conditions, incomes, and the overall position of informal waste pickers in the expanding recycling economy (Times Live, 2019). Despite these initiatives, challenges persist in the implementation and enforcement of policies related to waste picker integration. Clearer guidelines, uniform enforcement, and proactive measures to address the socio-economic challenges faced by waste pickers are crucial for the success of these legislative initiatives.

The National Waste Management Strategy (NWMS) complements these legislative efforts by promoting separation at source and raising public awareness. The strategy views waste pickers as playing a necessary and important role in the recycling industry (Sohan, 2021). An estimated 62,000 people are involved in the collection of recyclables on an informal basis, indicating the significant contribution of the informal sector to waste management. The National Development Plan recognizes the waste management sector's contribution to reducing unemployment, poverty, and income inequality. Waste pickers, part of the informal sector, have emerged as significant contributors to the collection of recyclables (Sohan, 2021). The government is considering measures to assist waste pickers in minimizing health risks and ensuring inclusivity, particularly for women, youth, and persons with disabilities.

In conclusion, while South Africa demonstrates a legislative commitment to environmental sustainability and waste management, challenges persist in integrating waste pickers effectively. Clearer guidelines, financial support, and efforts to address socio-economic issues are vital for fostering a more inclusive and coordinated approach to waste picker integration. Ongoing government support, public awareness campaigns, and recognition of waste pickers' entrepreneurial potential are crucial components in building sustainable waste management practices.

2.2.3 Local Municipalities' Role and Empowerment in Waste Management

The regulatory landscape in South Africa emphasizes the pivotal role of local municipalities in waste management, as outlined in the Municipal Structures Act No. 117 of 1998. These municipalities are granted specific powers and functions related to solid waste disposal, including the determination of waste disposal strategies, regulation of waste disposal, and the establishment, operation, and control of waste disposal sites within their jurisdictions (DEA, 2019). The Municipal Systems Act 32 of 2000 further empowers local governments by regulating key municipal systems, promoting organizational efficiency, planning, participatory governance, and service delivery. This legislation underscores the importance of municipalities developing a culture of governance that complements formal representative government with a system of participatory governance (Makhubele *et al*., 2019).

Aligned with national goals, the Chemicals and Waste Phakisa (Odeku, 2020) sets a target for metropolitan municipalities to have a minimum of 50% of households separate waste at source by 2023. Achieving this goal involves the review, amendment, and alignment of waste management bylaws at the local level with national and provincial policies and regulations. Moreover, it calls for the integration of waste pickers into the municipal waste system, emphasizing the critical role of municipalities in driving this integration process.

However, concerns about the enforceability and uniform application of guidelines for waste picker integration have been raised (DEA, 2019). The flexibility of these guidelines raises questions about their consistent implementation across municipalities. Despite these challenges, municipalities remain the closest sphere of government to the people, with a direct impact on local development and the daily lives of residents. Therefore, municipalities must play a crucial role in creating the necessary conditions and encouraging local communities to actively participate in waste management initiatives, contributing to the broader objectives of the National Development Plan 2030 (National Planning Commission, 2012; Guidelines on Waste Picker Integration, 2020).

2.2.4 Exploring Incentives for the Integration of Informal Waste Pickers

The current legislation provides for the incorporation of informal waste pickers into the municipal streams of waste collection, and, since 2019, the DEA (2019) has introduced guidelines that could fast-track the process of recognising waste pickers. In the context of high and increasing unemployment, people are taking the initiative to sustain themselves by reclaiming materials from the municipal waste stream. Reclaimers consume salvaged materials in their own homes, vend some for re-use in the informal economy, and sell recyclable materials to middlemen who supply

them as inputs to producers in the formal economy. This mode of survival represents a diverse livelihood strategy for people with few prospects of securing wage labour (WIEGO, 2014).

Currently, municipalities do not recognise or acknowledge waste pickers at their landfill sites, with the result that reclaimers often work there without permission (Schenck & Blaauw, 2011). In order to understand the role of informal waste pickers better, one has to look at the National Waste Management Strategy:

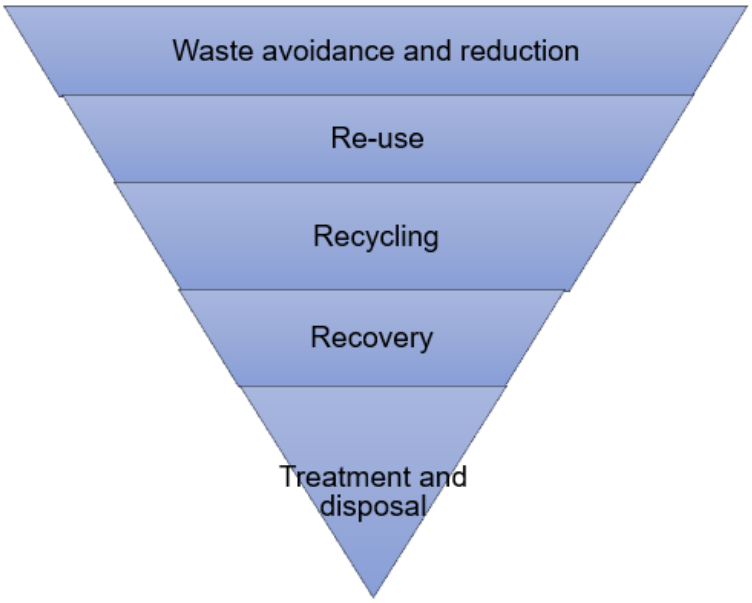

Figure 2-1: The waste management hierarchy (adapted from DEA, 2011)

Figure 2-1 above implies that, until alternative structures are created for recycling, informal waste pickers are the second target of the strategy for waste management and should be included in the formal management structure of waste collection. National Environment Waste Management: Waste Act 59 of 2008 defines waste management activity as including the “reduction, re-use, recycling, and recovery” of waste. This is a function currently undertaken by informal waste pickers and is consistent with Section 24 of the Constitution of the Republic of South Africa, which requires the state, through its organs, to enforce the right to “an environment that is not harmful to the health and well-being" of all citizens.

Section 24 obliges the State, and all who are involved in aspects of waste management, constitutionally to prevent pollution and ecological degradation. In upholding this right, the Government would achieve the constitutional goal of creating communities based on human dignity, equality and freedom while providing an income opportunity for large numbers of poor people.

In its National Waste Management Strategy (Sohan, 2021), with the goal of growing the contribution of the waste sector to the green economy, the government commits to:

> "[s]timulate job creation and broaden participation by SMEs and marginalised communities in the waste sector. These objectives include the creation of decent work through formalising the role of waste pickers and expanding the role of SMEs and cooperatives in waste management practices."

This commitment extends to expanding and formalising jobs through policy manipulation in various stages of the recycling value chain. With the announcement by the DEA (2016) that waste pickers need to be incorporated into municipalities, the government is already appreciating the role of waste reclaimers in the recycling sector of the informal economy and is moving towards creating decent job opportunities. However, the guidelines on the integration of waste pickers into municipalities are not cast in stone. They provide an array of opportunities for each municipality to design its own processes for integration. The aim of the present study was to explore the use of incentives as a measure of integrating informal waste pickers and to test the benefits of any such incentives in the lives of waste pickers.

Globally, it has been noted that it takes longer to fill up landfills because waste pickers keep withdrawing recyclable material from the waste disposed of there (Samson, 2015). In doing so, they save local municipalities millions of rands (Godfrey *et al*., 2016). Their service to cities and the environment requires being acknowledged financially. It is not enough to pat them on the shoulder; they require an income to feed their families.

2.3 Formal versus informal waste management economies

The sections below sketch the background of formal and informal waste management in developing countries, and provide the African and South African perspectives.

2.3.1 Developing countries

Informal employment has increased in many parts of the world and remains an important source of income in developing countries (Schneider *et al*., 2010; OECD, 2016). The increasing volume of waste generated globally is one of the most prominent environmental issues which the world faces. Globally, municipal waste generation is currently at an estimated 1.3 billion tonnes per year and is expected to increase to 2.2 billion by 2025 and to 13 .1 billion tonnes by 2050 (Kaza *et al*., 2018).

Informal waste workers are economically and socially excluded from the formal labour market, but they are, at the same time, integral to the implementation process of the recent and important

environmental policy of urban waste management (Coletto & Bisschop, 2017). The informal economy has been an object of study since the beginning of the 1970s, when economic anthropologist Keith Hart (1973) published the first ethnographic study to the informal economy in Accra, Ghana.

2.3.2 African perspective

Godfrey *et al.* (2019) estimate that 125 million tonnes of waste were generated in Africa in 2012, with 81 million tonnes (65%) coming from sub-Saharan Africa. The expected increase by 2025 is 244 million tonnes per year. Solid waste management is a serious challenge faced by African cities today (Guererro *et al*., 2013). For example, with a population of about 1.6 million, urban waste management is a serious challenge for the Ghanaian capital of Accra (Godfrey *et al.,* 2019). The problems related to solid waste in the city of Accra were subsequently reduced; more waste was collected and the city became cleaner (Guererro *et al*., 2013). The fact that the informal sector can contribute in significant ways to the improvement of local government service delivery is supported by a growing number of empirical studies, as well as by experiences in other countries (Godfrey *et al.,* 2019).

The choice to work in the informal economy might actually be an empowered choice rather than the result of sheer necessity to work informally, due to a lack of formal employment opportunities, as has been demonstrated in other parts of the informal economy (Rouse, 2008). Mohmand (2016) argues that the inclusion of informal institutions in formal governance can make a difference in service delivery by encouraging greater citizen participation in decision-making around service, as well as ensuring that public service delivery meets the specific needs of different populations. Rouse (2004, 2008) argues that informal enterprises are vital parts of urban service provision, and there is a need for a paradigm shift in the way informal service providers are viewed.

The environmental, economic and social aspects of waste management present a serious challenge for national and local authorities in many less economically developed countries (Harsh, 2001). Waste remains a threat to environmental and public health - as well as an economic and environmental opportunity (Thieme, 2013).

2.3.3 The South African perspective

Embarking on a national awareness campaign around recycling, the NWMS 2020 promotes separation at source through a concerted effort to raise public awareness and private sector investment in the delivery of infrastructure and services, such as kerb-side collection, drop-off centres and buy-back centres. The National Development Plan 2030 envisions South Africa as

follows: “transition to an environmentally sustainable, climate change resilient, low carbon economy and just society will be well under way.” Included proposed actions to achieve this vision are investing in consumer awareness, green product design, recycling, waste to energy technologies and other such initiatives that can result in a zero–waste society while building a greener and more environmentally sustainable economy (DEFF & DSI, 2020). Waste picker integration is promoted by various organisations, such as waste picker organisations and the World Bank. However, there is no commonly shared understanding of waste picker integration (Samson, 2020a:3).

According to the DEA, recycling should be prioritised where waste avoidance and reduction cannot be achieved (DEA, 2016). South Africa, through its waste management hierarchy, emphasises this stance, namely, that disposal of waste should be the last resort.

Waste pickers are one of the groups of people throughout the developing world, including South Africa, who make a living in the informal economy by picking waste from streets and landfill sites (Samson, 2010). Waste pickers in particular interact with the formal waste system, but it seems that the structural gap between the formal and informal waste economy remains in place (Viljoen *et al*., 2012). In 2003, the then President of South Africa, Thabo Mbeki, mentioned the fact that the informal economy was structurally disconnected from the formal economy and that ways should be found to link formal and informal sectors (Dias, 2011). Several studies were conducted to understand why informal waste pickers were determined to continue with their unsafe and poorly paid practices (Dias, 2011). According to the work done by the WIEGO (2014), Samson (2012) and Schenck *et al*. (2016), the little that informal waste pickers collected was enough to sustain their daily livelihood and that of their families (as also verified by Viljoen *et al*., 2012).

The Government has also recognised the potential of improving the lives of its citizens by committing to further research on the work of informal waste pickers (DEA, 2012; Samson, 2019). The results showed a significant opportunity for Government to assist in creating value in that informal economy. Schenck *et al*. (2016a), who conducted research on waste pickers on landfill sites in the Free State, as well as Viljoen *et al*. (2012), who researched the circumstances of day labourers in South Africa, also referred to the fact that the informal economy remains trapped at the hand-to-mouth subsistence level, with low-point enterprises that are disconnected from the formal economy. The interventions of Government need to be clearly understood to ease the fears of informal waste pickers, especially as tensions already exist between them and municipalities (Komane, 2014; Dias & Ogando, 2019).

Originally, authorities focused on and asked for integration as a form of supporting waste pickers - even trying to remove them from the value chain (Scheinberg, 2012). This approach caused a

pattern of withdrawal on the part of informal waste pickers who did not trust the intentions of municipalities (Dias, 2011:6; Nzeadibe & Anyadike, 2012). Any form of integration should involve consultation with the waste pickers themselves so that they can participate actively in the process of policy formulation. Integration should be done in the interest of all stakeholders and should assist the financial situation in which informal waste pickers find themselves (Samson, 2010; Nzeadibe, 2015; Scheinberg, 2012). For it to be perceived as successful, it has to result in the improvement of the lives of informal waste pickers because they are its focus. Moreover, such integration would have far-reaching implications beyond just employing them for a salary. It would correctly imply that they are self-employed (Viljoen *et al*., 2016), do not require new masters (Dias, 2016), and are recognised for the work they do. They are actually asking for more waste to recycle so that they can improve their lives (Masood & Barlow, 2013).

2.4 Importance of waste picker integration

There are different views with regard to waste picker integration. The sections below elaborate on these views to provide context to this research.

2.4.1 Global observations regarding of waste picker integration

Dias (2012) notes that, while some countries and their municipalities or local governments have integrated waste pickers into the municipal solid waste system, there have been cases, such as in Dar es Salam (Tanzania) and Bangkok (Thailand) where local governments have refused to integrate waste pickers into the solid waste management system. In Pune (India), the integration of waste pickers was a process that resulted in a shift in perceptions held with regard to waste pickers: following municipal recognition, waste pickers were legitimised because their work was granted occupational status (Ferreira *et al*., 2017). New Zealand views integrated waste management as a systems approach that focuses on achieving environmental sustainability (Seadon, 2010). This approach to waste management takes into account the value of recycled materials in the context of declining resources; thus, sustainability drives the need to recover solid waste. Zeng *et al.* (2016), who did their research in China, found that most of their respondents were aware of the significance of rural solid waste separation and that over half of rural households were prepared to take part in the separation programme.

The public, both in rural and urban areas, seems not to be informed about illegal disposal methods that may harm the environment. In recognition of this challenge, some municipalities in Brazil have embarked on door-to-door environmental education with regard to recycling. This indicates that there is a need to continue educating the public about the importance of waste management and how to protect the environment.

Informal waste sector integration is particularly difficult work, because there are many variables to account for and many interests to balance. Integration involves the work done by municipal officials to support waste picker integration programmes and initiatives (Dangi *et al*., 2015). If integration is to be facilitated by municipalities or local governments, they have to be well aware of the various actors and the different levels of involvement that each has to consider within the system (Masood & Barlow, 2013; Gunsilius, 2010).

Integration is a concept that is not new to waste management. It can be traced back to the 1970s when it was used in the context of solid waste management. However, its use has fluctuated over the years. Waste sector integration addresses all levels of the waste hierarchy, from prevention through recycling to disposal (Wilson *et al.*, 2013).

Samson (2018) provides a categorisation of how integration has been conceptualised by various academics globally. Samson (2018:1) argues that "all concept of integration performs important political work." The management of solid waste continues to be a major challenge in urban areas throughout the world, but particularly in the rapidly growing cities and towns in developing countries (Foo,1997). A typical solid waste management system in developing countries displays an array of problems, including low collection services, crude open dumping and burning without air and water pollution control, and the improper handling and control of informal waste picking (Wilson *et al.*, 2013).

Separation of waste for recycling and re-use carries the potential to reduce the improper disposal of waste, save energy, conserve resources, save costs, as well as environmental damage (Viljoen *et al*., 2021). Developing countries do not yet have sufficiently adequate systems and recycling industries compared to their developed counterparts which have implemented efficient recycling processes. Scheinberg and Simpson (2015), Nwosu *et al*. (2015), and Komane (2014) identify the following as characteristics that define the waste sector in developing countries:

- Low labour costs and shortage of capital, which usually drive the adoption of more low-tech solutions.
- Waste streams that are usually dominated by organic waste, making incineration difficult.
- A complex informal sector involved in collection, separation and recycling of waste.
- Low levels of education and awareness about recycling.
- Inadequate physical infrastructure in urban areas that forms a barrier to the collection of waste.

2.4.2 African view on waste picker integration

The African perspective on waste picker integration emphasises the crucial role these informal workers play in sustainable waste management systems. In many African countries, waste pickers contribute significantly to recycling efforts by salvaging valuable materials from waste streams. The integration of waste pickers into formal waste management systems aligns with the principles of inclusivity and environmental justice. Studies in South Africa have shown that integrating waste pickers into municipal solid waste management can enhance recycling rates and reduce the burden on landfills (Wilson *et al*., 2015). Additionally, research in Ghana highlights the economic benefits of integrating waste pickers, as they contribute to job creation and poverty alleviation (Amoyaw-Osei *et al*., 2016). Recognizing and supporting the efforts of waste pickers is essential for fostering sustainable and equitable waste management practices across the African continent.

The current status of waste picker integration at the Madibeng Local Municipality in South Africa reveals a complex landscape marked by a lack of clarity and understanding between informal waste pickers and municipal authorities (Samson, 2015; Sekhwela, 2017). Despite the South African government's recognition of the crucial role played by waste pickers in recyclable recovery since 1999 (DEA, 1998), the municipal waste management systems at Madibeng do not seem adequately prepared to accommodate these informal workers. The municipality has implemented pollution control, separation, and segregation measures, including landfill permits, air quality by-laws, waste management by-laws, and an integrated waste management plan. However, the practical integration of waste pickers into these formal structures is challenging due to a mismatch in understanding and inconsistent perceptions between the informal workers and municipal officials (Sekhwela, 2017). The working practices of some informal waste pickers at the landfill site, such as smoking on the job, pose hazards to the municipality, reflecting a disconnect in implementing the right procedures (Samson, 2015). Despite efforts to control the situation through site notices, access control, and an incident register, the Madibeng Local Municipality faces difficulties in managing and regulating the activities of informal waste pickers on the ground.

2.4.3 Solid Waste Management Challenges in Africa

The unhealthy disposal of solid waste is one of the greatest challenges facing developing countries (Guerrero *et al*., 2013). The challenge of implementing effective solid waste management has to do with poor social service delivery. Broken-down machinery, non-maintenance of dumpsters, poorly maintained urban streets and roads, as well as irregularities in the designation of sanitary landfill sites, cause unnecessary delays in solid waste clearance (Egunjobi, 1996).

For example, the poor state of solid waste management in Port-Harcourt (Nigeria) is caused by inadequate facilities, poor funding and poor implementation of policies, as well as unfavourable lifestyle (Momoh & Oladebeye, 2010). Any decision regarding the management of waste in a rural and remote town needs public participation of all stakeholders who will be affected in order to make a positive difference (Guerrero *et al*., 2013). The geographic location of households in Nigeria also impacts the way individuals feel about participating in separation activities; households in the rural areas indicated a greater willingness to participate than those in residential areas (Momoh & Oladebeye, 2010).

2.5 Waste pickers and their role in waste management

In the literature, waste pickers are variously referred to as reclaimers, waste pickers, garbage pickers, recyclers, scavengers and waste salvagers (Schenck & Blaauw, 2010; Chvatal, 2010; Samson 2010). Waste pickers are small- scale, self-employed agents, characteristically encountered in the urban informal sector (Hayami *et al*., 2006:42). Medina (2008) indicates that, in developing countries, collecting recyclables is the consequence of poverty and hardship and that roughly 2% of the world's population makes a living by collecting, sorting, using and/or selling salvageable material extracted from refuse. In both developing and developed countries, they earn a living by recovering recyclables for income or personal use (Rushton, 2003). They sell recyclable plastics, metal, paper, electronics and glass retrieved from rubbish bins or landfill sites (Schenck *et al*., 2019a).

The South African government has been recognising the role which waste pickers play in recovering recyclables from the environment in order to support their livelihoods since 1999 (DEA, 1998). Yet, municipal waste management systems do not appear to be ready to accommodate waste pickers. This is despite the realisation that official waste management systems in many cities, such as Cairo, could not be managed without the myriad of waste pickers and scrap collectors, who often form the basis of waste collection services at no cost to local authorities, central government and residents (Gerdes & Gunsilius, 2010). In the process 36 000 formal employment opportunities were created and an estimated 80 000 informal jobs and livelihoods were sustained (DEA, 2017).

The employment that is created in the recycling sector of the waste economy is distributed along the value chains of the recycling industry. Recyclable material passes through many hands before eventually arriving at the doors of the formal-sector recycling companies (Ralfe, 2007). The Department of Science and Innovation (DSI) and the Department of Environment, Fisheries and Forestry (DEFF) published a guideline for the integration of informal waste reclaimers into the formal waste management system in South Africa (DEFF & DSI, 2020).

The Waste Picker Integration Guideline focuses on the following:

- how municipalities are positioned to integrate waste pickers;
- how waste pickers can be integrated into municipalities; and
- the role that municipalities can play in the formalisation of informal practices as undertaken by informal waste pickers.

This approach is necessary because municipalities are at the coal-face of solid waste management and, at grassroots level, represent and implement the Government's stance on recycling. The present research will contribute to the available body of knowledge on the integration of informal waste pickers and provide insight into municipalities' responses to the daily presence of informal waste pickers in their territory.

2.6 Separation at source towards reuse, recycling and recovery of waste

Separation at source towards reuse, recycling and recovery is an integral part of waste management in South Africa. It reintroduces resources into the economy and reduces the need to exploit more virgin resources. It contributes to economic growth and creates green jobs. It also reduces social and environmental costs by managing recyclable materials efficiently at waste collection level (Moh, 2017).

2.6.1 Diversion of waste from landfill

Informal waste pickers make up one group of the key role players in the service chain that encompasses municipal activities involving generation, collection and disposal. They are the link between disposed and/or discarded recyclable waste and buy-back centres (BBCs), which move the material up the recycling chain to eventual export opportunities for resultant products (Godfrey *et al*., 2017).

Waste pickers function exclusively in the informal recycling value chain, where they obtain, buy or lease a trolley to collect waste from households, waste containers, businesses and the streets. This waste is then taken to informal waste sorting sites where recyclable materials, such as paper, plastic, glass, wood, clothes and food are separated from the waste that cannot be recycled or that does not have a resale value. The waste that has been salvaged is then grouped and taken to buyers and junk yards, for which the waste picker is then paid (Moh, 2017).

2.6.2 Roles and stakeholders

There are many players and stakeholders in the waste management process, both formal and informal. The main stakeholders, as presented in Figure 2-2 below, and the waste management

hierarchy (Figure 2-2), all have a stake in the integration of waste pickers, as well as the service and value chain. Figure 2-1 below illustrates the role of informal waste pickers in the service and value chains in South Africa.

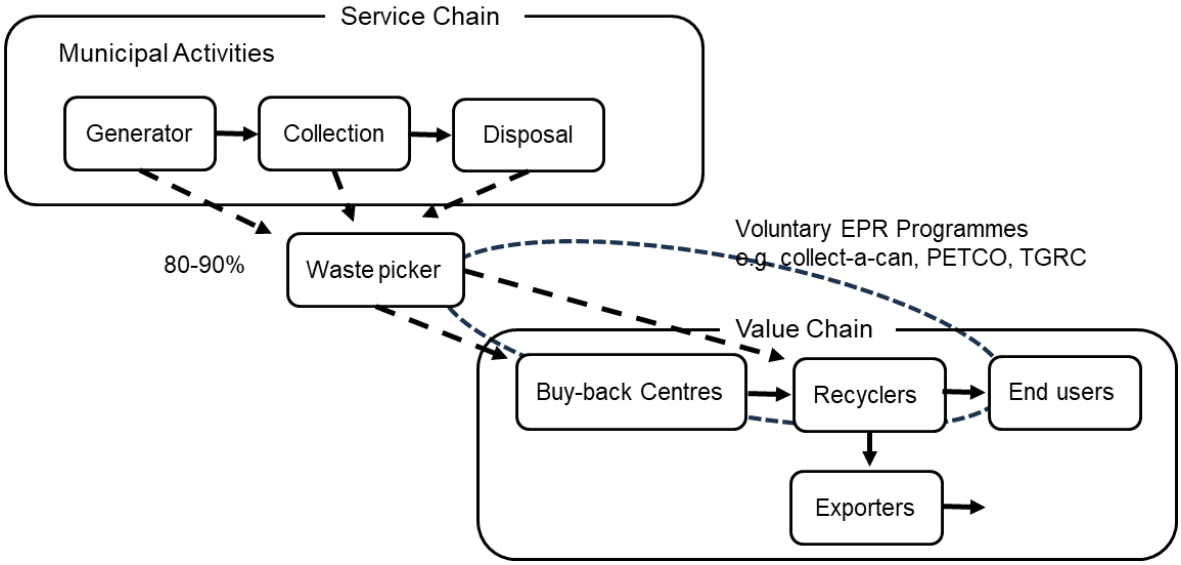

Figure 2-2: The role of informal waste pickers in the service and value chains in South Africa (Source: Godfrey *et al*., 2017)

2.6.2.1 Waste pickers

The role of waste pickers differs vastly per country and location, depending on the demographics and waste management system in place. In South Africa, there are three groups of waste pickers: those who work within the community and pick waste from bins, streets and business premises; those who collect in the towns; and those who reclaim at landfill sites (Mamphitha, 2011; Ezeah *et al.,* 2013; Pholoto, 2018; Godfrey *et al*., 2017; Mokobane, 2017).

According to Parra and Vanek (2023:9), waste pickers in Colombia are defined as

> "[a] person who habitually performs the activities of recovery, collection, transportation, or classification of solid waste for its subsequent reincorporation into the productive economic cycle as raw material and who derives one's [sic] own and the family's livelihood from this activity."

Between 60 000 and 90 000 waste pickers recover paper and packaging as secondary resources from the service chain and introduce them to the value chain in South Africa (DEFF & DSI, 2020). According to Godfrey *et al*. (2017), in weight, between 80% and 90% of all paper and packaging is collected by informal waste pickers in South Africa. As the collected materials are passed

through the service and value chain, the value increases, with those at the top of the hierarchy benefiting most (Barford & Ahmad, 2021).

2.6.2.2 Waste pickers co-operatives

Organising waste pickers into organisations or cooperatives remains the ideal and desired way of improving the coordination of their grievances and their responsibilities (Ezeah *et al*., 2013). Waste picker organisations are fall under the definition of "social and solidarity economy" where their voices more heard and appreciated when they speak on behalf of a group (Mamphitha, 2011).

According to Parra and Vanek (2023:9), formal organisations of waste pickers in Colombia are defined as:

> *"Organisations that, in any of the legal forms allowed by the regulations in force, include within their corporate purpose the provision of public waste management services in recycling, are registered with the Superintendence of Household Public Services (SSPD) and are made up entirely of waste pickers."*

Such organisations are ideal for providing social support to their members, who are mostly excluded and marginalised. For waste pickers, the main benefit of belonging to cooperatives is that they create their own ways of supporting each other. For example, in the case of recycling, they have collective bargaining power with buy-back centres; they have created a market for themselves with fixed margins per kilogramme of waste. This was a resounding victory because created certainty. Waste pickers could estimate the amount of money they could earn from a specific amount of waste. However, Godfrey *et al.* (2016) point out that there is a failure rate of 91.8% in creating sustainable jobs by cooperatives and SMEs. The South African national government, municipalities and industry have all prioritised working with cooperatives, and the South African Waste Pickers Association actively encourages and supports its members to form cooperatives (DEFF & DSI 2020).

The status of cooperative formation among informal waste pickers in Madibeng Local Municipality reveals a prevalent reluctance within the community. A significant impediment is the negative past experiences, where members of cooperatives were perceived as not contributing adequately while expecting equal benefits. This has created scepticism among waste pickers about the viability of cooperative structures. Moreover, concerns about the potential unequal distribution of benefits within cooperatives and the fear of losing financial autonomy further contribute to the hesitancy. The lack of trust in the Madibeng local municipality, stemming from unfulfilled promises and assistance commitments, exacerbates the reluctance to engage in cooperative efforts.

Additionally, the absence of formal business management training leaves waste pickers uninformed about the potential advantages of cooperatives.

2.6.2.3 Municipalities

Section 24 of the Constitution of the Republic of South Africa (1996) provides that everyone has the right to a healthy environment, which includes protection from pollution and ecological degradation, as this promotes conservation and secures ecologically sustainable development. Solid waste management in South Africa is primarily a local government function: Section 156(1)(a) of the Constitution, read with Schedule 5, assigns responsibility for refuse removal, refuse dumps, solid waste disposal and clearing to local government. The role players in the individual municipalities are the officials dealing with the waste management process, the waste collectors employed by the municipality, and the workers at the landfill site who are responsible for the site, the separation of waste, and its recycling (Pholoto, 2018).

In South Africa, integration is steered by Section 10(1) of the National Environmental Management: Waste Act 59 of 2008, which requires all provincial municipalities to develop integrated development plans (NEMWA, 2008).

2.6.2.4 Buyers

The buyers of waste are dealers, recycling SMEs, scrap yards and processors. All these stakeholders play an important part in the cycle (Ezeah *et al*., 2013). Most role players in the private industry will not purchase from individual waste pickers, as they insist on quality and volume, thereby creating a role for the middleman or buyer. Viljoen *et al*. (2019:295) define buy-back centers (BBCs) as “central waste collecting points; paying cash to hawkers and other individuals for waste paper and, in some cases, other types of waste, such as glass, scrap metal, and plastic.”

2.6.2.5 Recyclers

Recyclers play a vital role in waste management and reduction. They gather, sift and process recyclable materials, such as paper, plastic, glass and metal. Collecting, sorting, cleaning and processing are some of the steps involved in the recycling process (Reyneke, 2016). Recycling has economic, as well as environmental, benefits. In the gathering, sorting and processing of recyclable materials, recycling generates employment opportunities. Additionally, it minimises waste disposal costs for towns and businesses (Mamphitha, 2011).

According to Samson *et al*. (2021), recyclers limit the amount of waste sent to landfills and incinerators, which can have negative environmental effects. Additionally, recycling conserves

natural resources by decreasing the demand for raw materials. Samson *et al*. (2021) state that recycling is a crucial component of waste management and contributes to a more sustainable future. By minimising waste and conserving resources, we can safeguard the environment and improve the quality of life of future generations.

2.6.3 Types of recycling

The concept of recycling includes any materials that can be recovered and reused and which others normally consider trash (Grigore, 2017). This collection, or recovery, manifests itself in three ways.

Primary recycling is also called "closed loop recycling": recyclable material is recovered and reused without being changed in any way, usually for the same purpose. It involves materials, such as food, clothing, glass and building materials. This process puts the informal waste sector at the heart of its waste management operation (Francis, 2016; Grigore, 2017; Hopewell *et al.,* 2009; Singh *et al*., 2017).

Secondary recycling is when materials or products are reused in some other way to create a new product, such as plastic bottles being made into polyester or recycled plastics – then used to make garden furniture (Francis, 2016; Grigore, 2017; Hopewell *et al*., 2009; Singh *et al*., 2017).

Feedstock or chemical recycling refers to a process that involves the chemical alteration of a product or material in order to make it recyclable. Chemical recycling is defined as “the process in which polymers are chemically converted to monomers or partially depolymerised to oligomers through a chemical reaction" (Francis, 2016; Grigore, 2017:4; Hopewell *et al*., 2009; Singh *et al.,* 2017).

Quaternary recycling, also known as waste-to-energy recycling, is when plastic, together with other organic waste, is burned to create steam and heat, which is then used in the generation of energy (Francis, 2016; Grigore, 2017; Hopewell *et al*., 2009; Singh *et al*., 2017).

Therefore, recycling has become a necessary process for the recovery of materials, either for second-hand use or for resale to industries.

2.6.4 Importance of recycling

Recycling has had a positive influence on the economy (Wilson & Novak, 2009; Dias, 2016). The benefits of recycling include:

- saving energy by reducing the need to process new material;

- removing waste from the environment by turning it into another product or material for re-use;
- creating local jobs in the informal sector; and
- removing waste from landfill sites, thereby saving on the cost of land.

Motlhoki (2019) shows that waste recycling is an emerging economy, operated and managed by informal waste pickers (Scheinberg *et al*., 2016). Governments are generally aware of the potential economic spinoffs derived from tapping into this space (Samson, 2015).

2.6.4.1 Importance of waste separation at source

Waste separation at source is a critical component to a successful recycling management in terms of enhancing the quality of recyclables and will optimise incineration (Zhuang *et al*., 2008). Separation at source requires a behavioural shift, and a regulatory element is essential to ensure that, the aim of government authorities is to achieve an increase of sorted recyclables. (Moh, 2017).

2.6.4.2 Importance of the informal waste sector in recycling

The informal waste sector plays a crucial role in recycling efforts globally, contributing significantly to waste management and resource recovery. In many developing countries, where formal waste management systems may be limited or inefficient, the informal sector emerges as a vital player in recycling operations. According to a study by Wilson *et al*. (2017), informal waste pickers often collect, segregate, and recycle materials from the waste stream, diverting a substantial number of recyclables from landfills. Furthermore, their involvement contributes to job creation and poverty reduction, as highlighted in research by Medina (2018). The informal waste sector not only helps address environmental challenges posed by improper waste disposal but also demonstrates the socio-economic importance of integrating informal workers into formal waste management strategies (OECD, 2019). Recognizing and supporting the informal waste sector is imperative for achieving sustainable and inclusive waste management practices globally.

2.7 Overview of the informal waste sector

Cities all over the world are expanding as people prefer to settle in more urban environments. Consequently, the volume of waste increases as it is a by-product of human consumption patterns. Without effective municipal solid waste management, structural waste escalates. Cities are left dirty and full of waste, thereby harming the environment. In some instances, local municipalities are left to collect waste at certain intervals and dump it into landfills which, in some cases, are privately owned (Samson, 2015).

According to Benson and Vanqa-Mgijima (2010:2), South Africa has a long history of people collecting waste off the streets to survive. The authors suggest that, since the adoption of neo-liberal policies in South Africa, the scale of private reclaiming has increased, as has the opportunity for poor people to take part in the reclaiming chain. Job losses have shifted people onto the streets in order to earn an income or sustain a livelihood, and, as Medina (2008) indicates, waste collection and selling is an activity that saves many people from starvation. The DEFF and DSI (2020) estimate the number of waste pickers in South Africa to be in the range of 60 000 to as many as 215 000.

Municipal waste management activities, appointed private waste management companies and NGOs are referred to as "formal sector activities" in the recycling economy, which include the collection, handling and treatment of all waste types (Rogerson, 2001; Ralfe, 2007; Viljoen *et al*., 2012; Chisango, 2017). The linkages between informal and formal recycling activities are a necessary and irreplaceable element to keep both the informal and formal recycling sectors functioning (Ralfe, 2007; Matete & Trois, 2008).

The existence of such formal sector activities would require significant investment. At the moment, municipalities have no capital investment or maintenance capacity to operate such structures. The Government's first strategic goal – and ultimate goal - is to divert waste away from landfills. In South Africa and elsewhere in the world, the role of diverting waste away from landfill sites has been played by informal waste pickers (Viljoen, Blaauw, & Schenck, 2016 and 2019). According to Figure 2-2 above, at the top of a good strategy for overcoming waste generation is the option of waste avoidance. Where waste cannot be avoided, society is encouraged to reduce consumption. This is followed by re-use and recycling. It must be noted that the municipalities have no interest in or capabilities for recycling, except to open up landfills to informal waste pickers to collect recyclable waste before it becomes buried in the ground.

The entire national discussion around recycling in South Africa shows that we, as citizens and Government, have relied on informal waste pickers for our health and clean cities without any form of financial appreciation or even subsidy for them. All we have done as a society is label them as "unruly, uneducated, and unskilled" (Samson, 2008b). Due to the 4th Industrial Revolution, the world is continuously shedding manual jobs in favour of technology. Many people, both educated and uneducated, are left with the burden of being unemployed. As a result, they seek employment in the informal sector which has become an important source of income in developing nations (OECD, 2016). For these individuals, working in the informal economy is their only means of earning an income and taking care of their families (Mkhize *et al*., 2014; Schenck *et al*., 2016b).

Informal waste pickers source recyclables from landfills and streets, which they then sell into the formal economy. In this way they create employment for themselves and their families because they tend to operate as units, often as mother and child or both parents working together. This phenomenon has not been adequately studied to understand and gain insight into the nature of this sector of the informal economy (Godfrey *et al.,* 2019). The in-depth studies of circular economy have the potential of initiating extensive business prospects based on the informal economy.

The concept of recycling and the role played by informal waste pickers have enjoyed a significant amount of research (Komane, 2014; Motlhoki, 2019; Schenck *et al*., 2019b; Samson, 2020b). These studies have placed waste pickers at the heart of the solution to waste recycling (Schenck *et al*., 2020) and argue for better working conditions for waste pickers in order to improve their lives. Komane (2014) and Schenck *et al*. (2018) have all registered the appalling conditions under which waste pickers operate. They further illustrate how little waste pickers earn and argue that, if their working conditions were improved, the world - and cities in particular - would benefit. The rates of recovery of recyclable materials would increase as waste pickers would be even more motivated to recoup waste. The literature review shows that waste pickers are a free benefit to municipal solid waste management and that they are, in general, resilient groups of individuals (Liyanage *et al*., 2015).

The challenge of these studies is that they argue for improvements in the lives of waste pickers without formal recognition of the latter. This creates the perception on the part of waste pickers that they are treated as objects. Without formal recognition, waste pickers are bound to continue to earn a meagre income. It is unfair for informal waste pickers not to participate in their own destiny, as we prescribe who they can become (Godfrey *et al*., 2016). The DEA has since promised to promulgate measures for incorporating waste pickers into municipalities (DEA, 2016). This has shifted the research focus in the informal economy to study and provide measures and instances that would be best suited for their incorporation in the South African context (DEA, 2016).

At the moment, informal waste pickers face hazards at work and work irregulated hours (Mkhize *et al*., 2014; Schenck *et al*., 2016), because there are no payable taxes to the State and no labour laws governing their work. As a result, many studies are confined to gaining knowledge of the nature of the informal economy and how it can be changed so that the lives of waste pickers are improved. As researchers contend with these micro issues, the municipalities continue to contend with increasing waste. The current level of waste generation is estimated to be R1.3 billion metric tonnes per year, estimated to rise to R2.2 billion tonnes by 2025 (Hoornweg & Bhada-Tata, 2012). This is not going to happen in the distant future. It is only two years ahead of today.

2.7.1 Understanding the informal economy

The term ‘informal economy’ includes “all income-earning activities that are not regulated by the state in social environments where similar activities are regulated” (Coletto & Bisschop, 2017). In short, the informal economy encompasses activities that can be subjected to formal financial laws, but are not, such as tax, pay-as-you-earn and applicable labour laws. Not formalising the work of informal waste pickers has pros and cons. While they benefit from State taxes and a lack of monitoring, their work remains unregulated, and they are, therefore, unprotected in terms of pensioners’ State subsidies and social welfare coverage (Van Daele, 2008). It is this disadvantage that has mainly drawn the attention of scholars and policymakers to the situation of waste pickers.

Several scholars have defined the concept of informality in terms of average earnings and employment status. Their definition has confined informality to the relationship between the State (tax and benefits) and its regulatory systems (namely labour laws and safety laws), thereby reducing the real argument of the benefit of the informal economy to just the waste pickers’ ability to generate a meagre income and the relative environmental protection of the State, and how both can exist symbiotically. At the moment, informal waste pickers benefit almost nothing from this relationship, unless they are used as subjects for study purposes. Perhaps it is this approach that has limited scholars and policymakers from gaining an in-depth knowledge of the skill set of informal waste pickers and why they have continued to work in waste recycling even when new opportunities arise (Schenck *et al*., 2016).

As Coletto and Bisschop (2017:280-294) put it, in learning about the structure of the informal economy, scholars would “allow for the demystifying of common assumptions about informal work being merely a result of deprivation, a lack of formal working opportunities, or inadequate planning." In most instances, the informal economy provides more autonomy, economic flexibility, entrepreneurial spirit and sustainable livelihoods as it allows individuals to learn through risk management. The Government’s intention to integrate informal waste pickers into municipalities is destined to be wrought with problems both informal waste pickers and the municipalities. The South African municipal waste management system does not appear to be ready to accommodate waste pickers (Schenck & Blaauw, 2011).

The structure and design of local municipalities is not, and was not, fashioned to absorb informal waste pickers. To be part of the municipal structure, one requires a specific skill set in terms of the Local Government Municipality Structures Act (Act No.117 of 1998) Applications for employment in municipal positions are invited from everyone in society, and the volumes of applications from the public are vast. Given the very low–or non-existent–qualifications of most waste pickers, this would lead to their exclusion (Motlhoki, 2019; Mkhize *et al.,* 2014). Therefore,

the concept of employment through absorption into municipalities may not pass the legal test, and it should be shelved in a country where levels of unemployment in the formal sector are high, even for qualified graduates. Thus, integration of waste reclaimers should consider another form (DEA, 2019). In providing guidelines for integrating waste pickers, the DFFE has outlined several options available that must be taken into account for successful integration.

2.7.2 Contributions of informal waste pickers

Firstly, recycling did not come about as a way of seeking employment. It was a means of survival through the scavenging of food at dumpsites (Samson, 2017). However, as waste increased an opportunity presented itself for 'scavengers': as waste pickers were known, to sell materials to others and eventually to industries. Thus 'scavenging' evolved to incorporate collecting tins, plastics and cardboard, which are now sold to industries for repurposing (Samson, 2010). Notably, informal waste pickers created a market for themselves, which is now a form of economy less understood (Sentime, 2014; Liyanage *et al*., 2015), and this market has its own benefits, first to waste pickers and then to the environment. For waste pickers, it is a form of generating income (Dias, 2016). The environment is saved from harmful materials that were destined for landfills. The increasing amount of waste that remains uncollected is a breeding ground for bacteria which are harmful to humans.

Informal waste recycling has attracted many unemployed citizens worldwide to seek an income. Medina (2008) records that there are over a million people surviving on the sale of recycled material. This number is on an upward trend. Consequently, recycling rates around the world have almost quadrupled. Recycling started to become a common feature of household practices, with governments supplying each house with recycling bins in order to collect waste (Robinson, 2014). Recycling has become a modern and valuable solution to managing raw resources. It has focused attention on the re-use of unwanted products and the recycling of existing and discarded products into new products (Motlhoki, 2019). As a result, more products are now manufactured in such a way that they can be re-used.

Several studies have concluded that recycling programmes can help realise sustainable community development. This area requires political will as governments need to shift away from focusing on waste as a job for desperately poor people and instead see it as a resource that can generate income or revenue (Samson, 2012). Having recognised waste as a resource, it can then be considered for investment. This notion has positively shifted the attention and mindset of society away from associating waste picking with a poor man's work (Samson, 2012). Recycling is useful in reducing the input costs of production. The use of recycled materials also saves us energy, which is a natural resource. However, the economic logic with regard to recycling differs

between developing and developed countries. Developing countries focus on collection and separation because of the cost advantages (Chikarmane, 2012).

In summary, recycling is beneficial to both the environment and informal waste pickers. While it started as a way of salvaging food and materials for personal use (Samson, 2008), recycling is now a viable resource for employment and building capital (Motlhoki, 2019). Authors, such as Chikarmane (2012), Scheinberg and Simpson (2015), Dias (2016), and Schenck *et al*. (2016) attach the following major benefits to recycling:

- waste recycling;
- reducing the amount of waste reaching landfills;
- conserving natural resources, such as water, trees and minerals;
- creating opportunities for decent work;
- saving energy; and protecting the environment, reducing water and air pollution.

Thus, it has become increasingly evident that incorporating existing informal recycling systems into the operations of formal municipal solid waste management has positive spin-offs (Dias, 2016).

2.7.3 Social profiling of waste pickers

Informal waste recycling is most often conducted by the poor, vulnerable and marginalised, such as the unemployed, migrants from rural areas, the uneducated, undocumented foreigners, the disabled and the elderly. Waste recycling is often not a choice but an adaptive response in order to generate income for survival (Ezeah *et al*., 2013). The socio-economic and socio-demographic characteristics (level of income, gender, age distribution, marital status) of waste pickers differ from country to country and from one location to another.

2.7.3.1 Racial profile

In African cities, informal waste pickers are a distinct and often heterogeneous social group comprising a wide range of individuals and groups (Nwosu *et al*., 2015:2). In India, waste pickers are almost exclusively from a lower caste, as the Scheduled Castes system segregates citizens based on the idea of linage. In South Africa, 80% of waste reclaimers are black and 20% are coloured, according to a study by Schenck *et al.* (2019).

2.7.3.2 Gender profile

Ogando *et al.* (2017) discovered that security concerns are particularly pronounced among female waste pickers, who are also troubled by power imbalances within the sector, especially in

countries where gender dynamics perpetuate the oppression or marginalisation of women. In South Africa, the waste reclaimer demographic is predominantly male, resulting in a competition for salvaging materials at landfill sites that favours the physical strength of men, leading to slightly higher earnings for males compared to females (Motlhoki, 2019; Viljoen *et al.,* 2015). Viljoen *et al.* (2015) attribute this income disparity to the physical limitations faced by females, who may lack the strength required to transport loads over long distances to reach measuring scales and buy-back centers. Samson (2010:6) reported diverse gender compositions within reclaimer groups, with some being predominantly or exclusively male, while others exhibit a more balanced distribution or even a majority of women. Furthermore, a gender-based division of labour is evident, where men tend to focus on collecting more lucrative materials like metal and planks, leaving women to concentrate on other materials such as glass (Samson, 2010). These findings underscore the variability in gender dynamics within reclaimer communities, revealing potential disparities in income-generating opportunities based on the type of materials collected.

2.7.3.3 Age profile

Makhubele *et al.* (2019), who used secondary data from the 2017 National Institute for Occupational Health (NIOH) study collected from 332 waste pickers at two landfill sites in Johannesburg, found that the age ranges of the participants were divided as follows: 18 to 30 years of age 45.2% respondents, 31 to 40 years of age 32.5% respondents, 41 to 50 years of age 12.1% respondents, and 51+ years of age 8.7% respondents.

The age of waste pickers relative to country and location also differs significantly. In South Africa, the average age is 39, with a median age of 38 years, but waste pickers as young as 17 and as old as 71 were also identified in a study by Schenck *et al.* (2019). The age profile might be influenced by the high levels of youth unemployment and the fact that, in South Africa, 'youth' in the employment context denotes individuals up to 35 years of age. In a study conducted in Pakistan by Majeed *et al.* (2017), the average age for males and females was between 25 and 45. These variations highlight the importance of considering local socio-economic factors and cultural contexts when studying waste picker demographics.

2.7.3.4 Education profile

Makhubele *et al.* (2019) found that 78% of the respondents in their study had secondary education. While most waste pickers have a low level of education, some have secondary education, and even graduates are now engaged in recycling because they could not find immediate employment in the formal sector (Samson, 2015). Waste pickers play a crucial role in society by providing employment opportunities for the poor and uneducated (Marello, 2013).

However, their productivity is limited by factors such as a lack of education, skills, and business management abilities. Empowering waste pickers can lead to social and environmental benefits, but it requires addressing these internal constraints and providing necessary training and support (Marello, 2013).

2.7.3.5 Employment opportunities

In many developing countries, the unemployment rate is very high. For example, South Africa's unemployment rate stood at over 32.9%, and the youth unemployment rate increased to 64% in 2022 (Stats SA, 2023). India had an unemployment rate of 8.1% for 2021, while Brazil's decreased to 11.1% in 2021. Many waste pickers were previously employed in the formal sector, but due to globalisation, urbanisation, the COVID-19 global pandemic and political turmoil the prospects of employment in the formal labour market, which is saturated and stagnant, diminished (Makhubele *et al*., 2019).

2.7.3.6 General disposition

Many waste pickers could not support their families or were unable to find employment in the formal sector and, therefore, turned to this 'shameful' occupation just to earn a living (Komane, 2014). Waste pickers are not proud of the job they do; they do it out of necessity to survive (Makhubele *et al.,* 2019).

2.7.4 Needs of informal waste pickers

Waste pickers have successfully carved out a niche for themselves as the best agents for the environment and the economy. Since their recognition in several countries, they have managed to help municipalities with the collection of recyclables. This relationship has a dual nature: the waste pickers have collected these recyclables and sold them to improve their livelihood, while city streets and public spaces are kept clean (Dias, 2016).

2.7.4.1 Providing jobs and income

The Global North communities, such as France, Italy and the United States, have encouraged the formulation of waste pickers' organisations to be the public voice of informal waste pickers who execute one aspect of the duties of municipalities by recovering recyclable materials (as in Brazil, Argentina and India) and are, therefore, part of the solid waste management (Makina, 2020). This recognition has increased the work opportunities for informal waste pickers, which has resulted in increased income for them (Coletto & Carbonai, 2023; Dladla, 2018).

Since Brazil started creating waste picker cooperatives in the 1990s, it has managed to establish a social accord whereby waste pickers are integrated into municipalities' segregation schemes (Chen & Carré, 2020). They were contracted as service providers. This scheme led to municipalities using waste pickers as awareness agents for recycling by informing the community about the benefits of recycling and that this activity generates an income. The scheme alone provided enough for the waste pickers to support their families (Coletto & Carbonai, 2023).

2.7.4.2 Inclusion and dignity

Today, waste pickers, many of whom are women, are no longer just a feature of a specific region; they are everywhere. The example of waste reclaimers' victory in Bogota has become a trademark for the worldwide movement of informal waste pickers (Dladla, 2018). Waste pickers started to fight for commercial rights while arguing for the maintenance of livelihoods as a human right. They also insisted that all informal workers should have access to social protection, as well as healthy and safe working conditions (Komane, 2014). Using their social strength, informal recyclers have managed to secure childcare centres with the support of municipalities. The situation of waste pickers in Argentina has shown that municipalities can indeed cater to the needs of recyclers' children (Dias, 2017:1). They have built partnerships by providing material recovery facilities where informal waste pickers can work in one place and gather a reasonable number of recyclables for resale (Guya, 2019).

2.7.4.3 Improving livelihoods means improving lives

The formation of cooperatives has consolidated the work and strength of informal waste pickers by establishing ways to develop inclusive solid waste systems and progressive legislation (Chen & Carré, 2020). According to Dias (2017:1), they have successfully managed to achieve the following:

- Secure income is a financial state of allowing individuals to convert their savings into fixed amounts of money for investment;
- Improved welfare is the state of contributing to the well-being and prosperity of informal waste pickers; and
- Expanding assets is an additional move to accumulate more resources for sustainable and renewable utilisation.

2.8 Challenges faced by informal waste pickers

Waste pickers have, for many decades, faced resentment from the general public in addition to their unfavourable working environments. Their status is considered low due to the nature of their

work, which is prejudiced and undignified (Samson, 2010; Mkhize *et al*., 2014). While recognition of their work is acknowledged across the globe, waste pickers continue to face opposition from municipalities and members of society (Gerdes & Gunsilius, 2010; Times Live, 2019).

Landfills in most countries are privatised or privately managed. This creates challenges with regard to accessing waste as a resource by informal waste pickers and compromises their livelihood (Guya, 2019). Entry to landfills requires access permission, which needs to be granted by the municipalities, which have not yet understood how to assist waste pickers. As a result, the latter lack protection from local governments and have no legal rights conferred on them. At the same time, society does not make collecting waste easy (Dladla, 2018). They have an overriding perception that waste pickers are uneducated and poor, with their 'profession' labelled the poorest of the poor. Waste pickers are seen as nuisances to society and to waste management practitioners (Wilson & Novak, 2009). The demographic data inform us that waste pickers are made up of marginalised groups and migrants who constitute the urban poor (Medina, 2008).

2.8.1 Resentment of society

Generally, informal waste pickers face common work characteristics, such as high levels of labour market churning, limited access to health and education, low income, intergenerational poverty and use of child labour (Samson, 2010). Society has not yet started to appreciate the work performed by informal waste pickers, particularly those who work on the streets. As they push trolleys along streets, they also attract criminals who mug them (Dladla, 2018). They are seen as a cause of health, safety and environmental problems because they empty refuse bins in search of recyclable materials, leaving a trail of dirt on the ground. This could be resolved by creating sorting stations and providing buildings with a scheme that will encourage them to sort materials at source, minimising their exposure to risk (Ezeah *et al*., 2013). However, their predicament is not simply an economic one. They face resentment from society, emotional abuse and their pride is battered (Komane, 2014). Informal waste pickers have no place to hide. They work in public spaces in full sight of the rich, who may not understand their plight. This attitude forces waste pickers to harden and become resilient (Mkhize *et al*., 2014).

2.8.2 Unhealthy relationships with the municipality

South African waste pickers predominantly operate in a highly individualistic manner, which has further marginalised them (Samson, 2008). As a result, they find it difficult to establish relationships with the local municipality and generators of waste. They avoid contact, as they believe that any such relationship will not be mutual. In fact, they believe that they are excluded to such an extent that, from the outset, the exploitative situation in which traditional waste

collectors found themselves placed them in a weak position as opposed to the more powerful positions of both society and municipalities (Samson, 2008).

It is important that, when trying to organise waste pickers, they need to feel involved and consulted. They would prefer to be part of the decision-making process for integration because of the autonomy they have enjoyed over time. Research results show that waste pickers would consider working with municipalities or even being managed by them – if they felt valued and were consulted in matters pertaining to them (Aljaradin *et al*., 2015).

2.8.3 Difficulty of belonging to a group

Working for survival has taught many waste pickers to work as individuals and, consequently, they find it difficult to work with another person who is seen as a competitor (Samson, 2008; Aljaradin *et al*., 2015). It is too difficult for them to organise as a collective as they vie for the same resources. However, there are signs that the situation is turning around. Various case studies of waste pickers' organisations in Egypt, Brazil and many European countries have reported significant success (Mkhize *et al*., 2014). Waste reclaimers have organised themselves into established cooperatives and unions, which have successfully lobbied governments for policy inclusion and recognition of their work as significant drivers of recycling (Barford & Ahmad, 2021). It is their experiences that continue to help shape policy reform in South Africa and elsewhere to advocate the integration of informal waste pickers into mainstream solid waste management (Mkhize *et al*., 2014; Scheinberg & Simpson, 2015).

2.8.4 Harsh working conditions

There is a general concern that the conditions under which waste pickers work are unfavourable (WIEGO, 2014). Worldwide, these conditions are shared by waste pickers who are not integrated (Komane, 2014). Waste pickers usually perform their work in a very unplanned/disorganised manner without taking protective measures for their health and safety. They are exposed to hazards and unhealthy, evil smelling environments, which they are not oblivious to. As previously alluded to, most waste pickers say it is because they do not have a choice. They are driven by poverty and family commitments to work in such an environment in order to earn a living (Viljoen *et al.,* 2015).

2.8.5 Non-recognition (lack of legal status) of informal recyclers

The European Union is an umbrella of member states that are committed to improving the lives of individuals within the informal economy and who are perceived to have devised the world's most developed system for waste management (Scheinberg *et al*., 2016). Even such organised

countries still battle to formulate definite legislation to protect and formalise the status of waste pickers. Due to the lack of such legislation, waste pickers remain outside the system because they do not have legal status that protects their work and employment status. Recognition of informal waste pickers is essential for their social welfare and would limit confrontation with municipalities. International organisations have always advocated decent treatment of waste pickers in order to give them human dignity. The ILO (Van Daele, 2008:3) defines decent work as:

> *"…productive work for women and men in conditions of freedom, equity, security, and human dignity."*

Moreover:

> *"Decent work involves opportunities for work that is productive and delivers a fair income, provides security in the work place and social protection for workers and their families, offers prospects for personal development and encourages social integration, gives people the freedom to express their own concerns, organise and participate in decisions that affect their lives, and guarantees equal opportunities and equal treatment for all" (Van Daele, 2008).*

The amount of waste generated by growing cities is reaching unprecedented levels, with global municipal waste generation currently estimated at 2.59 billion tonne by 2030, which is in six years' time (Awogbemi *et al*., 2022). This is of profound concern because municipalities on their own have neither the technology nor the institutional capacity to handle the enormous amounts of waste generated.

Many developing countries and economies in transition towards urbanisation and industrialisation are not equipped to deal with waste (Chokoe & Meso, 2017). Consequently, recyclable waste, which would have provided work and a basic income for informal waste collectors, remains unretrieved, and waste collectors forfeit the opportunity for integration into any waste management system. The management of waste (both urban and industrial) has become increasingly problematic with the advances of urbanisation and the kinds of materials used - so much so that countries are now encouraging the implementation of EPR waste streams. South Africa already has EPR in place for waste tyres, with the DEA having recently gazetted its intention to call for EPR for paper and packaging waste, electrical and electronic equipment, and lighting. This is essential because this project has resulted in job creation, which is essential for the country with its unemployment sitting at 32.9% (Stats SA, 2023).

2.8.6 Addressing challenges through integration

Some of the challenges faced by waste pickers can easily be resolved by integration, which would restore dignity to the work of informal waste pickers (Chaturvedi, 2015). Many scholars who have cited the benefits of such programmes have promoted the notion of integration as an advocacy measure. The most limiting factor in the integration of informal waste pickers has been the lack of regulations regarding the manner in which municipalities should respond to these new partners in solid waste management (Gerdes & Gunsilius, 2010). Chaturvedi (2015) has indicated that private companies rely mostly on the work done by informal waste pickers to stay afloat. They buy materials from the informal waste pickers, as they have no capacity to do it themselves. Chaturvedi (2015) argues that the exclusion of informal private sector actors results in conflict, which delays the recovery rate of recycling.

Dias (2016) gives a practical example of how both private companies and informal waste pickers can work side by side without conflict. In the example provided, large companies offer informal waste picker service contracts to collect recyclable materials. This symbiotic relationship is necessary to help informal waste pickers obtain more secure work. On their own, informal waste pickers may not be able to offer the guarantees required to secure contracts. Thus, using established and reputable companies may be beneficial to the development of more formal working conditions for informal waste pickers. Coletto and Bisschop (2017) emphasise that informal waste pickers' roles cannot easily be taken over by formal waste management structures.

Informal waste pickers are resilient in their work and are prepared to work long hours (Medina, 2008; Sentime, 2014), and this trait is rare in formalised employment. Furthermore, by contributing meaningfully to waste management, they have moved governments to legislate the extended producer's responsibility programme (DEA, 2019), forcing companies to ensure that materials are recyclable, thereby creating more resources for recycling. Liyanage *et al*. (2015) argue that governments should not miss this opportunity to derive value from informal waste pickers. The integration of waste pickers would undoubtedly increase the service offered by them and invite more people into recycling activities through other forms of recycling and waste management.

The phenomenon of urbanisation has become part of both developed and developing nations, and has brought with it increased waste (Dias, 2016) which has become a challenge to society and needs to be removed purely because it brings about environmental hazards. In many instances, significantly large investments would be required to secure relevant technology and remove waste (Neo, 2010). Only informal waste pickers (Samson, 2012) can remove this waste easily. As they perform this duty to society for free, they also learn to trade their products in order to feed their families (Sentime, 2014; Liyanage *et al.,* 2015). Existing waste pickers' organisations

worldwide have always fought for the cause of waste pickers to be recognised and finally have a recognised role (Samson, 2017).

Samson (2017) emphasises that such concerted efforts and struggles for recognition have achieved more than simply improving waste pickers' incomes and livelihoods. The outcomes are a more inclusive and expanded public sector, in which waste pickers have created a newly recognised municipal service. They have earned the right to be the face of municipalities with regard to recycling, including the right to participate in the decision-making process of municipalities (Samson, 2017). For these reasons, it is worth integrating them into the formal waste management systems in order to maximise their roles (DEFF & DSI, 2020). As a bet practice, all states must be urged to provide guidelines for the integration of these important role players in waste management (DEFF & DSI, 2020).

2.8.7 Occupational risk

Based on the available literature, it is clear that the work that waste pickers do poses an occupational risk. According to Mokobane (2017), who investigated how gender influences physical mobility amongst waste pickers in Johannesburg, walking while pulling a trolly is the cheapest option of transportation for waste pickers. They have to wake up early in the morning, around 03:00, to walk to their areas of interest that correspond with the Pikitup (the official waste management provider in Johannesburg) waste collection schedule. Pulling a trolley in traffic is a challenge as many motorists display hostile behaviour, with taxi drivers being the main culprits. Mokobane (2017) points out that a dangerous habit which waste collectors have developed in order to save travelling time, is to ride their trollies downhill at neck-break speeds, using their bodies as a steering wheel and their feet as brakes. For safety reasons, females prefer to walk with men as they could be mugged, raped or have their trollies stolen.

Mlotshwa *et al.* (2022), who conducted a study of waste pickers in Durban Central, point out that waste pickers have minimal access to public toilets and water as these public facilities are mostly dysfunctional. Furthermore, while waste picking, they touch all types of waste, including human waste, meat packages that contain blood, and glass, to name but a few. This renders the waste pickers prone to infections that pose a health hazard. Waste pickers at landfill sites run the risk of respiratory issues caused by the constant burning of waste, especially plastic, which produces highly toxic fumes. Schenck *et al.* (2019) mention that waste pickers at landfill sites are exposed to mechanical risks (for example, cuts, lacerations, fractures and vehicle accidents). Finding live ammunition is a possibility, especially in countries which experience wars. Inexperienced waste pickers may see the live ammunition as scrap metal and face the risk of explosions. According to Sapkota *et al*. (2020), who conducted a study amongst waste workers in Nepal, the participants

in the study cited health concerns and feeling prejudiced as the main hazards related to their profession. In addition to the negative attitude of the general public, waste pickers also mentioned facing discrimination and stigma from their own families and colleagues. Sapkota *et al*. (2020) mention that bodily harm and wounds sustained by waste pickers are often recognised as occupational risks associated with their profession.

According to Mothiba *et al*. (2016), chemical risks (e.g., gases, hazardous chemicals and air pollution) can cause serious illnesses among waste pickers. Nkosi and Muzenda (2014), conducting a study on the solid waste management system in Mamelodi East, pointed out the danger of methane gas emanating from decomposed waste that can cause major explosions. Florin (2018), who conducted a study in Istanbul, Turkey, refers to a methane explosion in 1993 at a city dump in Istanbul that killed 39 people and buried up to some 10 slum dwellings under tonnes of burning garbage. This accident later led to the establishment of a formalised waste management service in Istanbul. According to Uhunamure *et al*. (2021), waste pickers in Limpopo do not consider working at landfill sites a hazard, as money is more important than health. Anierobi *et al.* (2022) state that the recyclable waste collected in Enugu Metropolis, Nigeria, significantly reduces the environmental impact of global climate change.

2.9 Key factors regarding waste picker integration

Waste picking is a reality in both developed and developing countries; however, many countries have managed to integrate successfully the informal process of waste picking into a formal process in which waste pickers are recognised for their contribution to preserving the environment and are gainfully employed.

2.9.1 Waste picker integration - global best practice

Solid waste management is a challenge for large urban areas around the world. Removing garbage from residential, institutional and commercial locations in cities is a major logistical and operational task, confirming the view that waste has become a very visible aspect of urbanisation. Where waste is not collected, communities find alternative ways of managing it. This, for instance, includes burning waste, which leads to a range of environmental and public health problems (Wilson *et al*., 2013). Waste management is a function of local municipalities and, by its design, consumes a large portion of the city‘s budget for the purchase of heavy machinery and trucks, as well as financing the management of landfills. Waste pickers could be a very affordable method of reducing the amount of waste which is taken to landfills (Anierobi *et al.,* 2022).

Waste pickers have in recent years saved the South African local municipalities substantial amounts of money by reducing the amount of waste destined for landfills (Godfrey *et al*., 2016).

They are both environmental and recycling agents. It is only fair to conclude that informal waste pickers have earned their right to participate in the formal municipal solid waste management system. They are now recognised as an important feature in waste recycling processes in most cities around the globe. Their activities remain labour-intensive, low-tech, low-paid and often managed autonomously or within the family (Dias, 2011; Wilson *et al*., 2013).

Informal waste pickers have no legal status (Scheinberg *et al*., 2016) and thus feel isolated. They feel that the economic niches that support them and their families are being eliminated when the municipalities offer contracts to big companies without offering them an alternative opportunity. There is a record of clashes among local governments, private institutions, municipalities and informal waste pickers. The conflict is growing because informal waste pickers do not belong to any formal structures. The waste pickers have no rights or a voice (GAIA, 2021). Many informal waste pickers still enjoy working alone and not within cooperatives (Sekhwela, 2017).

For us to be able to understand our stance on global practices, it is perhaps essential to understand what we see as practice. ‘Best practice’ can be described as a way of doing something that is superior to any other method and delivers results that are superior to any other. The ‘best practice’ is accepted as the best possible way to do something, and this way then becomes the standard (Ujoumunna, 2020).

The best practice for the integration of informal waste pickers can thus be described as a beneficial and effective way of assisting waste pickers and recognising their value to municipal solid waste management. ‘Best practice’ represents the most efficient course of action in any acquired scenario. It is, therefore, understandable that waste picker integration manifests itself as guidelines and not necessarily as a law (DEA, 2019). It expects some form of ethical and general understanding from those in leadership positions when dealing with the plight of waste pickers and the need for acknowledging and formalising their work.

2.9.2 The need for waste picker integration and recognition

Across decades, formal research has focused on understanding the work and plight of informal waste pickers (Mkhize *et al*., 2014). It was as a result of such studies that the attention of governments was drawn to the difficult circumstances of waste pickers. Scholars reported how little they earned and the conditions under which they operated, which deprived them of their dignity (Chikarmane, 2012; Dias, 2017). It was confirmed that waste pickers were not appreciated for the work they do voluntarily and were suffering health hazards (Sentime, 2014; Liyanage *et al*., 2015; Schenck *et al*., 2016).

The first world conference of waste pickers in Bogota, Colombia (WIEGO, 2014), gave some dignity to waste pickers by recognising them as agents of the environment and not scavengers. The conference accepted that individuals who are engaged in salvaging waste should be called waste pickers. This wording, as simple as it meets the eye, remains the first step in restoring dignity to informal waste pickers and recognising them as individuals worthy of decent work. The term 'waste picker' was seen to aptly capture the activities performed by informal waste pickers (Samson, 2010; Medina, 2008).

Waste recycling and its explosion into the public scene were driven by poverty, a lack of employment opportunities and the economic meltdown. Many streets in developing cities are filled with these individuals, who are not necessarily illiterate. According to Schenck *et al*. (2016) and Scheinberg and Simpson (2015), across many countries, including South Africa, waste pickers have common characteristics, namely:

- they are less understood by the society in which they operate;
- they are frequently harassed, even by law officials;
- in some cities, waste pickers are migrants; and
- in some cities, they work as family units.

Some individuals labour at recycling sites because they could not find appropriate employment in the formal sector, and most economies do not create opportunities for individuals to acquire the necessary skills with which to consider formal job opportunities (Stats SA, 2019). The contribution of waste pickers in collecting, sorting and selling recyclable material is equal to performing a social duty to the citizens and the State. By providing this service, waste pickers contribute to local economies, public health and safety, and environmental sustainability. Even though they provide this vital service to municipalities for free, they remain the least recognised and receive little help from local governments (DEA, 2016; Dias, 2016). Given the benefits of having waste pickers, the question of whether they should be recognised or awarded a particular status in the function of solid waste management should not arise. Following the definition of what best practices entail, those in authority, elected by members of society, mostly poor masses, should have long ago addressed their plight. The definition expects ethical responses to the issue of waste pickers. Where the state fails, it is the function of civil organisations and NGOs to assist waste pickers in organising themselves and speaking about their rights (Chikarmane, 2012).

The nature of reporting in available literature has played a role in how fast African countries integrate informal waste pickers (Nwosu *et al*., 2015). In order to change the societal landscape to favour the work of informal waste pickers who are, after all, reported to be carrying out a highly valuable duty to society and the environment (Dias, 2016), countries need to recognise informal

waste pickers at the policy level. Such policy should detail advocacy for the informal sector and the provision of amenities, to name but a few (Nwosu *et al*., 2015:9). Medina (2008) strongly supports the notion that informal waste pickers are responsible for a high percentage of recovered recyclables from municipal solid waste. It is their efforts that are reducing the cost of waste collection (Godfrey *et al*., 2016).

These benefits have contributed to the call for the integration of informal waste pickers into the municipal solid waste collection service chain (Viljoen *et al*., 2012; Schenck *et al*., 2016). Integrating them into the municipal systems should transform how they currently render services to the cities and, consequently, improve their own lives. This process would require the meaningful involvement of the informal waste pickers through a multi-staged and multi-dimensional process (Masood & Barlow, 2013), and, therefore, this process cannot simply be achieved overnight (Dias, 2011). Many cities require informal waste pickers to function effectively. Cities, like Cairo, for example, use scrap collectors for waste collection services at no cost to local authorities or the general public. This situation needs to be examined from moral and ethical viewpoints to establish whether governments do have a moral duty to improve the lives of those working with waste (Schenck & Blaauw, 2011). African countries are battling poverty and high levels of unemployment, and an intervention like this would go a long way in improving this situation (Schenck & Blaauw, 2011).

2.9.3 Principles of integration

In South Africa, the lack of a coordinated strategy for integrating waste pickers into the formal economy resulted in discord between municipalities and informal waste pickers prior to 2019 (Nowicki *et al.,* 2019). South Africa has a national waste strategy (DEA, 2011) and does recognise the value of waste pickers, but fell short of providing municipalities with guidelines for integrating waste pickers. It was only in 2019, following consultation with industry players, that a draught guideline was produced for how municipalities can integrate waste pickers. At the moment, waste pickers are not exactly sure of what to expect from municipalities as they are banned from entering landfills (Nowicki *et al*., 2019; Times Live, 2019). One waste picker was recorded as saying, "The municipality treats us like we are criminals." and "The municipality does nothing to help us; they used to chase us away" (Nowicki *et al*., 2019:1).

Integration has to occur within a specific setting and with clear objectives (Wilson *et al*., 2015). It is settled that the integration of informal waste pickers has social, economic and environmental benefits (Aljaradin *et al*., 2015), but, more importantly, waste pickers themselves are ready to consider involvement with municipalities and private companies to would work under their umbrellas. They believe that they would benefit by forming partnerships with municipalities, which

could bring them the desired access to landfill sites (Wilson *et al*., 2013; Scheinberg *et al*., 2015). Integration refers to the attainment of close and seamless coordination between several departments or organisations. To achieve this seamless coordination, there should be clear principles to follow in making sure that the virtual contract works between municipalities and informal waste pickers. This study proposes some principles that could guide the process.

2.9.4 Participation

Chengappa (2013) confirms that the relationship between authorities and municipalities is not smooth across the board. It is a view shared by many researchers and even waste pickers (Nowicki *et al.,* 2019). For any strategy to work, all stakeholders must be given a chance to participate fully in how that relationship will be governed. First and foremost, guidelines should not be imposed on waste pickers. A sizeable representation, inclusive of all stakeholders, should be formed to formulate rules of engagement. It is then imperative for each waste picker to have a voice and to belong to a cooperative in order to be represented (Chikarmane, 2012; DEA, 2019). They subscribe to the saying, “Nothing for us, without us” (Maema, 2017).

2.9.5 Recognition

The first requirement for engagement is to understand who the key players in the decision-making structures are. As with the revised version in 2014 of the national waste strategy, the role of waste pickers is acknowledged. Once they are acknowledged as players in municipal solid waste management, it becomes easier to engage with them (Robinson, 2014; Samson, 2016; Dias, 2016). Waste pickers expect several outcomes with regard to formal recognition (Chikarmane, 2012; WIEGO, 2014; Godfrey *et al*., 2016; Dias, 2016), and a few are enumerated here:

- they want to improve their own business model to work in ‘better’ jobs;
- they need access to landfills, which are prioritised;
- waste pickers do not need charity. They want to earn their space in the recycling chain; and
- they want protection from the State, their dignity restored, protective wear, and decent work.

Informal waste pickers have in the past experienced serious rejection and harassment from society and even law enforcement officers (Times Live, 2019). To respond to harassment, they need to organise themselves into unions or cooperatives to have a single voice. For example, in Bogota, Colombia (WIEGO, 2014), informal waste pickers have successfully adopted legal strategies to defend their right to work. The strategy has earned them the right to access, sort and

recycle reclaimable materials. While this victory was necessary, it was not easily accepted by some quarters in municipalities.

The South African Waste Pickers Association, assisted by the environmental justice organisation *Ground Work*, has for years been advancing the waste picker struggle. The national government has now recognised waste pickers through the National Waste Management Strategy (NWMS), as well as the Waste Picker Integration Guideline for South Africa (DEFF & DSI, 2020). Municipalities have an obligation to register all waste pickers working in their area of jurisdiction. After registration they have to develop plans as to how they will work with waste pickers in order to create an enabling environment for their livelihoods to thrive (DEFF & DSI, 2020).

The African Reclaimers Organization partnered with consumer goods manufacturer Unilever South Africa and the University of Witwatersrand, piloting a project to help reclaimers advance towards formal integration into the Johannesburg waste collections system (Dias, 2016).

2.9.6 Working conditions

Integrating informal waste pickers into the municipal solid waste management model would result in improved working conditions and social change (Komane, 2014). The author demonstrates that, according to their demographics, most waste pickers are people from deprived communities. Ensuring that municipalities give them working uniforms and a stipend for attending and working for a certain number of days would be much appreciated by them (Masood & Barlow, 2013). However, the approach should be informed by what is feasible and urgent. It cannot, therefore, be achieved overnight (Dias, 2016). The draught guidelines by the DEA (2011) should be commended as the most important step towards the integration of informal waste pickers.

2.9.7 Compensation and development

The saddening reality is that waste pickers have, for centuries, not benefited from the services they offer to the municipality. There is sufficient literature to suggest that waste pickers are contributing to the collection of recyclables from solid municipal waste, and therefore they are saving municipalities substantial costs regarding space (Godfrey *et al*., 2016); however, they are not receiving payment for the service they render. Furthermore, if this service were provided by private companies, it would be very costly. They are offering a service and skill that should justifiably be paid for (Robinson, 2014). Waste pickers want to improve their ways of recycling and require municipalities to empower them to have a chance at developing their business. It is notable that waste pickers have not asked to be given another job by the municipality. All they want is to be acknowledged and paid for their services (Ntuli, 2019).

2.10 Recognising and valuing waste pickers

The fact that waste pickers add value to the economy and environment is undisputed. There are many success stories of waste pickers earning their right to recognition and formal employment, which are discussed below.

2.10.1 International examples of waste picker integration

The process of integrating waste pickers requires all stakeholders to have a full understanding of the complexities and difficulties faced by informal waste pickers (Samson, 2015; Komane, 2014). Waste pickers, if correctly stationed and settled, have the potential to be part of global recycling programmes. In considering global trends, the present researcher has elected to give a brief overview of several countries' handling of the concept of waste picker integration.

2.10.1.1 Examples from India

The city of Bangalore in India provides an example of how municipalities can grapple with waste and informal waste pickers. Bangalore had previously not recognised the contribution of informal waste pickers to the city's solid waste management. The NGO that was working with waste pickers noted that scrap dealers and municipal workers exploited waste pickers (Chengappa, 2013). According to estimations, India has 1.5 million waste pickers. These organised themselves into a mass-based organisation called 'Hasirudala,' meaning 'green force.' They successfully managed to achieve the formalisation and recognition of waste pickers in Bangalore through their advocacy. At the heart of this recognition is the role played by non-governmental organisations. The recognition, formation and operation of waste picker collectives are not smooth processes. It requires consistent support from network partners to achieve success (Chengappa, 2013).

Other waste pickers in India, in areas such as Pure and Bangalore, have championed their destination out of rubbish heaps (Chikarmane, 2012) by fighting for their rights to decent work. They started by unionising themselves as informal waste pickers, forming a bigger representation called Kagat Kach Patra Kashtakiri Panchayat (KKPKP), which spearheaded their battle for recognition as workers. Due to their persistent fight to show their role in MSWM activities, waste pickers have agreed with the municipalities on a service user fee (Chikarmane & Narayan, 2005). The important observation from this scheme is that movements, such as the KKPKP, can exemplify what waste pickers can achieve by themselves: they can be the masters of their own destiny and work side by side with municipalities without being absorbed into them (Chikarmane & Narayan, 2012).

2.10.1.2 Examples from Argentina

Argentina has a sizeable number of waste pickers called ‘cartoneros’ - literally "people of cardboard". The explosive increase in the number of cartoneros happened during the 2001 economic crisis. It is estimated that there are about 10,000 informal waste pickers in Buenos Aires alone, who mostly work at night and sort plastic, glass, cardboard, paper, metal, wood and anything else that might be useful to sell to the recycling companies (Robinson, 2014). In recognition of their service – the city claimed that they reduced the amount of waste in landfills by 44% in just one year – Buenos Aires has provided the cartoneros with transportation, uniforms and better prices for their reclaimed materials (Robinson, 2014; Dias, 2017). The payment scheme of the city separates informal workers into two groups, namely those who work within cooperatives and those who do not. Those who do not are defined as ‘informal’ and receive only incentives. Finally, to improve their lives through their decent work, members of the cooperatives pay taxes in order to earn a living wage and secure health and pension benefits. The most important lesson is that, even in Argentina, the success of informal waste pickers was pioneered through the formation of cooperatives (Marello, 2013).

2.10.1.3 Examples from Brazil

Brazil has set a standard for how informal waste pickers can play a role in solid waste management practices. As a result of the efforts of UNICEF, Brazil has brought together a variety of institutions at various levels of government to lead the process of recognising the work of waste pickers (Samson, 2008) and has acknowledged that informal waste pickers are the sole agents responsible for the largest part of urban recycling (Scheinberg, 2012).

At the moment, waste pickers are included in the policy formulation of the government (Samson, 2015), resulting in their earning an income from the municipalities’ shared schemes of waste collection. In this system, payment for all members of the team is based on the productivity of the entire reclamation process at a specific point. The main benefit of the programme for the municipality was to ensure that all members of the cooperative attended and committed to the process so that the rate of recycling and collection would increase. The Brazil experiment shows that cooperatives are in a favourable position to advocate successfully decent working conditions for informal waste pickers while also promoting their livelihoods (Dias, 2017).

2.10.2 Lessons to be learned from Africa

The continent of Africa has not been spared the challenges of waste generation. Post-colonial Africa is grappling with economic and societal development and has seen an upsurge in the amount of waste generated. Waste can be seen throughout the outskirts of developing towns and

cities at dumping sites, creating an unhealthy environment and a breeding ground for bacteria and infections. Even in Africa, waste is projected to increase due to population growth and consumption patterns. There is an urgent need to restructure the efforts of municipalities to bring on board informal waste pickers. Chikarmane (2012) uses the Indian model of incorporating waste pickers to show the benefits that can accrue from their recycling efforts. The present study will sample, on a random basis, a few countries to see how they have managed to respond to the formalisation of waste pickers.

There is a considerable body of literature which discusses the state of recycling in Africa (WIEGO, 2014; Schenck & Blaauw, 2011). Several studies show the beneficial nature of recycling for informal waste pickers and the environment (Nzeadibe, 2015). Nevertheless, the literature focuses on the origins, nature of work, and challenges faced by informal waste pickers, and little light is shed on the level of success in the integration of informal waste pickers and the economic opportunities available in recycling (Motlhoki, 2019).

The urban poor who practise recycling on the continent are generally viewed incorrectly as a lost tribe consisting of social misfits. This notion is held by many writers who associate informal waste collectors with deprivation, threats to the struggle for well-being, socio-political contestations for the right to reclaimable waste, and tensions (Nwosu *et al*., 2015). However, the fact is that waste collectors are ordinary people who treat waste as a resource essential for their survival (Robinson, 2014).

2.10.3 Lessons to be learned from South Africa

The informal sector in South Africa is active in collecting and sorting post-consumer dry recyclable materials which are accessed from two main sources: kerbside or street collection, and landfill reclamation (Rogerson, 2001; Ralfe, 2007; Viljoen *et al*., 2012; Chisango, 2017).

Samson (2012:42) indicates that, in 2004, the African National Congress (ANC) noted the existence in South Africa of two economies, operating parallel to each other. Samson (2012:42) quotes the ANC (the ruling party of the day) as follows:

> *"The first is an advanced economy based on skilled labour, which is becoming more globally competitive. The second is a mainly informal, marginalised, unskilled economy populated by the unemployed and those unemployable in the formal sector."*

The South African government has been recognising the role which waste picking plays in recovering recyclables from the environment and supporting livelihoods since 1998 (DEA 1998).

Despite the Department of Science and Technology having released its Development and Innovation Road-Map in 2015 (DFFE & DSI, 2020), there have been few changes to date to the working conditions of landfill waste pickers.

2.11 Challenges that waste pickers experience

Waste pickers are individuals who collect and recycle materials, such as plastic, cardboard, paper and metals and prevent them from ending up in landfills (GAIA, 2021). They play a crucial role in achieving environmental justice and mitigating climate change by turning waste into a livelihood. In South Africa, waste pickers recover a significant percentage of post-consumption packaging and paper (GAIA, 2021). However, despite their important social, environmental and economic contributions, waste pickers face numerous challenges, including social stigmas, abuse from officials and limited access to certain waste due to privatisation (GAIA, 2021). The following are some challenges which waste pickers face daily.

2.11.1 Lack of legal recognition

In many cases, waste pickers operate in a legally grey area, and their rights may not be officially recognised. Establishing legal frameworks and protection for waste pickers can be a challenge, as it often requires changes in existing laws and regulations. Shogole (2019) states that social inclusion refers to the recognition of informal reclaimers as legitimate stakeholders in the waste management system, which involves granting them legal recognition. The DEFF and DSI (2020) stated that the process of waste picker integration involves making changes in various areas, such as integrating waste pickers' work and addressing political, economic, social, legal and environmental aspects related to waste pickers.

2.11.2 Health and safety risks

Informal waste picking can be hazardous, with waste pickers exposed to unsafe working conditions. According to Gutberlet and Uddin (2018), biological contamination from unclean and contaminated garbage, such as packaging and access to perishable food items and exposure to medical waste, is one of the direct health threats linked to the collection and sorting of domestic waste. Sharp objects, such as shattered glass, wood or metal, can also cause lacerations and perforations. Contaminated plastics, such as polyethylene terephthalate and polypropylene containers, increase the danger of infection, allergies, respiratory disorders and other health complications. In addition, sorting e-waste can result in exposure to harmful compounds, which can cause allergies, respiratory disorders, and the cumulative effects from heavy metal pollution. Gutberlet and Uddin (2018) point out that household waste poses indirect health risks, including the presence of rats, cockroaches and pigeons, which can transmit diseases, such as

Leptospirosis. Lack of ventilation in recycling centres can also cause disease vector proliferation, while littering and discarded waste can affect animals and environmental health.

2.11.3 Resistance from formal waste management actors

Formal waste management companies or municipalities may resist the inclusion of waste pickers, viewing them as competitors (DEFF & DSI, 2020). Overcoming these conflicts of interest and fostering collaboration can be challenging. Peres (2016) reported that waste pickers are resilient and engage in everyday forms of resistance by refusing to conform to societal expectations and asserting their presence in the city. They are able to do so by capitalising on their knowledge of the system and strategically asserting themselves or withdrawing as needed. This resistance challenges the traditional spatial segregation in a city, such as Cape Town, and disrupts the notion that waste pickers should be confined to, for instance, the Cape Flats. While these acts of resistance may not make headlines, they exert a political presence and contribute to pushing the boundaries of acceptability.

2.11.4 Social stigma

Waste picking is often associated with poverty and marginalisation, leading to social stigma. Overcoming this stigma and promoting the recognition of waste pickers as essential contributors to waste management can be difficult. Barford and Ahmad (2021) point out that waste pickers are often unrecognised, with their geographical spread making them almost invisible in many countries. Moreover, waste picking is often seen as representing low-status and marginal members of society. In Brazil, the illiteracy level among waste pickers is around 40% (Kumar, 2020). In Pretoria (South Africa) and Delhi (India), most waste pickers are rural migrants to the cities. In India, waste pickers are often ‘dalits,’ people positioned at the bottom of the hierarchical caste system and assigned to low status occupations (Kumar, 2020).

Non-Muslims are often tempted to take on the ‘impure’ task of waste work (Nas & Jaffe, 2004). A South African study revealed a clear racial dimension, with most waste pickers surveyed being black. In the Western Cape, though, many waste pickers are Coloureds. Within groups of people working with waste, better paid, higher-status roles tend to go to those who are more empowered - with an added gendered dimension (Schenck & Blaauw, 2011). For example, men tend to collect more valuable materials, while women collect lower valued materials. In Bantar Gebang (Indonesia), 99% of unpaid waste pickers are female (Sasaki *et al*., 2014). The low status of waste picking and its sub-divisions reinforce identity-based forms of discrimination and socio-economic disadvantage.

2.11.5 Sustainability

Ensuring the long-term sustainability of waste picker integration efforts is crucial. Dependence on external funding and the risk of reverting to informal practices if support wanes are ongoing concerns. Ntuli (2019) reported that the majority of waste pickers work individually, but South African municipalities are now requiring them to form cooperatives in order to integrate them and overcome their marginalisation. However, studies have shown that 91.8% of these cooperatives fail, and there is a lack of research on the challenges which these cooperatives face. Ntuli (2019) concluded that waste picker cooperatives in South Africa can succeed only if they receive support and recognition from stakeholders. However, if cooperative incentive schemes are used without understanding the political intent behind the cooperative model, these cooperatives will continue to fail. Ntuli's study (2019) provides a counter-perspective on the cooperative model and highlights the importance of like-mindedness and intention in helping waste picker cooperatives achieve their economic goals. Peres (2016) reported that the street waste pickers he interviewed in South Africa were not aware of the alliances formed by waste pickers in other parts of the country. This lack of awareness may be due to the transient nature of street waste pickers compared to those working at landfills.

2.11.6 Corruption in municipality structures

Shabani (2015), who conducted research on community participation in solid waste management services in Tanzania, pointed out that the implementation and enforcement of waste regulations are hindered by poor governance and corruption, as well as a lack of awareness, community participation and appreciation for environmentally sound waste management practices. The most powerful and educated member of the public advocate community participation in municipal solid waste management, but, due to corruption, still act conventionally and enforce environmental laws. Schoeman and Rampedi (2022) state that inefficiencies in service delivery or corruption can lead to increased expenditures, reducing resources for poverty reduction and economic development. Mudavanhu (2019) highlighted the fact that violence, sexual harassment and other forms of exploitation and abuse, such as corruption and bribery, are prevalent in the informal economy.

2.11.7 Influx of foreigners

Informal waste recycling is primarily conducted by the poor, vulnerable and marginalised, including the unemployed, rural migrants, uneducated foreigners, the disabled and the elderly as an adaptive response to generate income for survival (Ezeah *et al*., 2013). Schoeman (2022)

found that the trolley pushers in the City of Johannesburg (CoJ) were largely black African males in the 30-39 age group, with over three-quarters of them being foreigners.

Viljoen (2014) found that most street waste pickers in South Africa are South African citizens, with 14.1% being foreigners from Lesotho, Zimbabwe, Namibia, Swaziland, Mozambique, Botswana, Tanzania, and Zambia, primarily active in Johannesburg, Durban, and Pretoria.

2.11.8 Technologically challenges

Emerging technologies, such as robotics and artificial intelligence, are transforming the nature of work, potentially undermining and destabilising employment opportunities in the Fourth Industrial Revolution (Chen & Carré, 2020). Samson (2015) reported that modern waste management often involves high tech methods by importing technologically intensive recycling systems from advanced capitalist countries and contracting formal sector private companies to manage these systems. This trend excludes waste pickers from the image of cities, deprives them of their work opportunities and thus dispossesses them of their livelihood.

2.12 Municipal incompetence

Informal waste picker integration is a key responsibility of all municipalities as the custodians of solid waste management. Municipalities should spearhead the initiative of integration and build an implementation plan into their Integrated Waste Management Plans and by-laws. The Solid Waste Management Department should be given an adequate budget as it has the legislated mandate to deliver efficient services. Municipalities are unable to execute their mandate due to financial constraints and this has resulted in the mushrooming of illegal dumping. Consequently, due to the high unemployment rate in the country, the number of informal waste pickers will increase.

2.12.1 Lack of municipal services

Due to financial constraints, municipalities are unable to provide effective solid waste management services to squatter camps and rural settlements. Communities in squatter camps who have no waste collection services rely on backyard dumping. Backyard dumping is the illegal disposal of garbage or waste in an unpermitted location-a transgression of environmental legislations which results in health hazards. Heaps of waste become fertile ground for the breeding of airborne bacteria. This situation has to be turned around. Section 24 of the Constitution guarantees all citizens the right to an environment that is not harmful to their health and well-being. This fundamental right underpins all environmental policies and legislation

because the Constitution is the supreme law of the land (Constitution of the Republic of South Africa, 1996).

Individuals, no matter how rich or poor, deserve protection by the Government. The fact that waste and solid waste remain uncollected is an indictment of municipalities.

2.12.2 Lack of motivation for integration

Integration of informal waste pickers has benefits for the municipality by extending the life-span of the landfill site. It has been recorded by Statistics of South Africa that the country is faced with a high unemployment rate, which is another reason community members resort to informal waste recycling. Informal waste recycling, if integrated within the formal sector or within municipalities, would be a contributor to a circular economy.

Integration would capacitate informal waste pickers to pay the necessary attention to their financial, hygiene and health aspects. Training informal waste pickers would boost their earnings and formalise their individual businesses, would increase the number of direct formal jobs in the country and stimulate economic opportunities to realise innovation within the informal sector.

The Madibeng Local Municipality has initiated training and registered informal waste pickers at their Hartbeesfontein Regional Landfill Site, Brits Waste Transfer, Kosmos Waste Transfer and Damonsville Waste Transfer. The training has been extended to the community informal waste pickers, located in the rural areas of the municipality, as part of testing for a positive spinoff.

The challenges faced are (a) an unallocated budget for the initial stage of informal waste picker integration, (b) the unavailability of a management document on the integration of informal waste pickers, and (c) the political leadership's lack of understanding of the importance of integration as they consider this exercise unimportant compared to service delivery issues. The municipality needs to include the integration of informal waste pickers in their Integrated Waste Management Plan.

Waste pickers are estimated to collect between 80% and 90% of discarded packaging and paper in South Africa, thus protecting what would otherwise become smoke and damaging the environment (Samson, 2020). Not only do informal waste pickers save paper and plastic from going to landfill sites, they have also saved municipalities millions of rands in landfill space (Godfrey *et al*., 2016). The number of people working as informal waste pickers is continuously increasing (Komane, 2014), which demonstrates that there is a growing informal economy, which is further driven by South Africa's high unemployment. In the first quarter of 2023, it was recorded at 32.9% and is among the highest in the world. According to the Quarterly Labour Force Survey

(QLFS), this is an increase of 0.2 percentage points compared to the fourth quarter of 2022 (Stats SA, 2023).

Research has shown that people who resort to waste reclamation are not necessarily illiterate. Some are very proficient in English and have completed their secondary education, while others have just lost their jobs and cannot afford to live without employment (Samson, 2010; Motlhoki, 2019; Mkhize *et al*., 2014). They contribute to the economy by selling collected material, earning them a living. The integration of waste pickers is argued as a best practice to appreciate the role played by informal waste pickers in solid waste management systems (Wilson & Novak, 2009). Motlhoki (2019) also agrees with the incorporation or integration of informal waste pickers. They argue that in doing so, municipalities will maximise the product to collect more waste and improve the lives of informal waste pickers. With an estimated 27.1% of South Africans not finding employment (Stats SA, 2019), the government needs to tap into the informal recycling market (Aljaradin *et al*., 2015). DEA (2016) puts the value of informal recycling at R5 billion to the South African economy, which can be maximised by integrating informal waste pickers into solid municipal streams, as they remain integral to the implementation process of the recent and important policies for environmental protection and urban waste management. DEA (2012) acknowledges the burden of the state in improving the lives of its citizens.

At the moment, waste picking is an enterprise of mainly black/African individuals. For the State to improve the lives of informal waste pickers by formalising their work in any form would be addressing a socio-political matter. The State should exercise political will to protect these valuable members of society, particularly in South Africa, where issues of redress cannot be removed from the table. The issue of class cannot and should not be separated from race. The State must be biased towards the integration of informal waste pickers as it would improve the lives of marginalised communities, pursuant to South Africa's National Waste Management Strategy of 1998. Waste picker integration and recognition would advance a number of key policy priorities for South Africa. First, it would answer the call of the National Waste Management Strategy (DEA, 2011) for providing guidance to municipalities and industry regarding measures to improve the lives of informal waste pickers. This supports the country's commitment to realising the 2030 SDGs and promoting employment and decent work for all. In so doing, the State would reduce inequality and eliminate poverty (DEA, 2019).

The successful integration of waste pickers would require the buy-in of all stakeholders, including the metro police, who at times are said to abuse waste pickers (Times Live, 2019). For them, it seems they endorse society's ignorantly held view that waste pickers are a nuisance as they loot streets even at unholy hours searching for waste in the city. The lessons learned in other countries like Brazil, India, and China, which are discussed in this chapter, show that it is a best practise to

include waste pickers in solid waste management. Brazil is the first country to integrate waste pickers through their cooperatives into the municipal solid waste management system and therefore the first to adopt a national waste policy that recognises the contributions of waste pickers and provides the legal framework to contract them as service providers. The governments of the densest areas, where people move closer to cities to create squatter camps, may need to consider such a model, which was also adopted, though differently, by India (Chikarmane, 2012). South Africa is no exception to the upsurge in waste generation. Towns and cities are covered in waste, which the municipal solid waste system is unable to recover. Waste pickers have always rendered this service for free, almost serendipitously. It was an intended benefit, as they focused mainly on collecting scrap for resale purposes.

2.13 Chapter summary

In conclusion, waste pickers play a crucial role in waste management and recycling processes in cities around the world. They have proven to be cost-effective and have saved municipalities substantial amounts of money by reducing the amount of waste sent to landfills. It is only fair to recognise their contribution and integrate them into the formal municipal solid waste management system. However, informal waste pickers currently have no legal status and often feel isolated and marginalised. There is a need for best practises that support and assist waste pickers, acknowledge their value, and provide them with alternative opportunities. This integration should be guided by ethical considerations and a general understanding of the importance of waste pickers in preserving the environment.

The chapter highlights the need for waste picker integration and recognition. Informal waste pickers, who play a valuable role in collecting and recycling waste, often face difficult circumstances and lack recognition for their work. The first step towards restoring their dignity is recognising them as waste pickers rather than scavengers. Waste pickers contribute to local economies, public health, safety, and environmental sustainability, yet they receive little support from local governments. It is important for governments to recognise and integrate waste pickers into solid waste management systems, providing them with the necessary support and amenities. This integration would not only improve the lives of waste pickers but also contribute to poverty reduction and unemployment alleviation in African countries.

The lack of a coordinated strategy for integrating waste pickers into the formal economy in South Africa has resulted in discord between municipalities and informal waste pickers. However, there is recognition of the value of waste pickers and the potential benefits of their integration. To achieve successful integration, certain principles should be followed. Firstly, the participation of all stakeholders is crucial. Waste pickers should have a voice and be included in the formulation

of rules and guidelines. They should also be represented through cooperatives or unions to ensure their interests are protected.

Secondly, recognition of waste pickers as key players in municipal solid waste management is essential. This includes acknowledging their contributions, providing access to landfill sites, and ensuring their dignity and rights are protected. Thirdly, improving working conditions for waste pickers is important. This can be done by providing working uniforms and stipends and creating an enabling environment for their livelihoods to thrive. Additionally, waste pickers should be compensated for the services they provide. They are saving municipalities substantial costs, and their skills and services should be valued and paid for.

Overall, the integration of waste pickers into the formal economy requires clear principles and guidelines, as well as collaboration between municipalities, waste pickers, and other stakeholders. By recognising and valuing waste pickers, South Africa can harness their potential and contribute to a more sustainable and inclusive waste management system.

CHAPTER 3: CONTEXTUALISING THE CASE STUDY AREA - MADIBENG LOCAL MUNICIPALITY

3.1 Introduction

The aim of this chapter is to provide contextual information about the case study area. This chapter outlines the characteristics of the Madibeng Local Municipality, its demographics, fixtures, opportunities, challenges which the municipality faces, and the *status quo* of waste management services.

3.2 Overview of the case study area

The Madibeng Local Municipality, a Category B municipality, is located in the North West Province of South Africa, with Pretoria, Johannesburg, Rustenburg and Krugersdorp as bordering neighbours. Madibeng consists of several urban and rural areas, 9 000 farm portions, as well as a properly established and serviced industrial area (Stats SA, 2022). The two main economically contributing areas within the Madibeng Local Municipality are Brits and Hartbeespoort. The municipality is demarcated into 41 wards and functions through an executive mayoral system (Stats SA, 2022).

The Madibeng Local Municipality is one of the five local municipalities in the Bojanala Platinum District Municipality and is characterised as the main corridor or entry into the North West Province of South Africa. It is also a main hub for the district, owing to its local economic and strategic position of sharing borders with Gauteng and the North West (Madibeng Integrated Development Plan (IDP, 2021/22). It is estimated that the town of Brits covers approximately 5 447 km^2 of the 3 839 km^2 of land in the Madibeng Local Municipality, with an estimated population of 475 796 people (Stats SA, 2022). The Madibeng Local Municipality consists of both urban and rural settlements located on the outskirts of Brits, as presented in Figure 3-1.

Figure 3-1: Location of the Madibeng Local Municipality (Source: Municipalities of South Africa, 2023).

The population of the municipality stands at 536 111 (IDP, 2021/22). The population of the Madibeng Local Municipality is predominantly Setswana-speaking (55%). The employment rate stands at 45.4% (IDP, 2021/22).

3.3 Challenges faced within the Madibeng Local Municipality

According to the Integrated Development Plan (IDP, 2021/22), the main challenges faced by the Madibeng Local Municipality include the following:

3.3.1 Spatial Development Framework (SDF)

A national law passed by Parliament in 2013 and called the Spatial Planning and Land Use Management Act (Act No. 16 of 2013) (SPLUMA) grants the Department of Rural Development and Land Reform (DRDLR) the authority to enact regulations in terms of the SPLUMA to provide further information on how the law should be applied. The National Development Plan 2030, Chapter 8 (on Transforming Human Settlement and the National Space Economy), specifically mentions the need for a National Spatial Development Framework for the integration and coordination of the energies and economic effects of strategic interventions in the national space.

This means that the Spatial Planning and Land Use Management Act No. 16 of 2013 must be in line with this plan.

The Integrated Development Plan's vision and strategy must be translated into the municipality's intended spatial development using the Municipal Spatial Development Framework (MSDF), as required by law. It should depict the various—and occasionally contentious—spatial consequences of the physical, social, economic and environmental sectors and provide information for both public and private investment decisions. With regard to Sections 76–78 of the Local Government's Municipal Systems Act (Act No. 32 of 2000 - the "MSA") Section 77 outlines the criteria which a municipality must consider before selecting a method for delivering a public service. Any matter that the municipality determines as required for municipal planning may be included in order to achieve its constitutional goals.

Informal dwellings constitute a challenge to the SDF (Stats SA, 2022). The municipality does not have a land-use management plan that is in line with the current demarcation. Large tracts of the Madibeng municipal area, especially the remote farm areas and the rural areas, are outside the current planning schemes. The following five town-planning schemes are outdated but currently in operation, resulting in varying development norms and standards being applied in the limited area covered by these schemes:

- Brits Town Planning Scheme, 1958;
- Peri Urban Town Planning Scheme, 1975;
- Letlhlabile Town Planning Scheme, 1990;
- Hartbeespoort Town Planning Scheme, 1993; and
- Kosmos Town Planning Scheme, 1999

3.3.2 Health

According to the Integrated Development Plan (IDP, 2021/22), health infrastructures need to be documented in relation to their number, distribution and sufficiency in catering for the health care delivery to the population. The wealth status of the people has some correlation to the environment, as some diseases are more prevalent in poverty-stricken areas, usually linked to a severe lack of funds and environmental degradation.

3.3.3 Sewerage system

As per Statistics South Africa (Stats SA, 2022), the number of flush toilets connected to sewerage stood at 29.7% of households within the Madibeng Local Municipality. This reflected as under-serviced regarding sanitary facilities, such as a properly functioning sewerage system and toilets.

3.3.4 Clean drinking water

The percentage of piped water inside dwellings was estimated at 65% of households (Stats SA, 2022), which indicated a high number of communities in the municipality (35%) that did not have access to clean drinking water, and, as a result, households in these communities relied on open and unsafe sources of water for domestic use.

3.3.5 Housing

According to the IDP (2021/22), the Madibeng Local Municipality had, over the course of eight to ten years, experienced a high number of informal settlements mushrooming, which put pressure on the municipality's infrastructure which had been designed to service two urban areas, namely, Brits and Hartbeespoort Dam, and three townships, namely, Mothutlung, Letlhabile, and Oukasi. The population residing in these areas numbered about 10% of the general population. As per the municipality's IDP (2021/22), it encompassed a significant number of housing units (a total of 64 465 units in 2012). With an estimated 5% annual growth rate, the housing demand for 2013/14 was projected to register a 71 071 units' backlog. The municipality and provincial department did deliver housing to the population, but the municipality experienced a challenge addressing the backlog due to the factors below:

- The lack of suitable land for housing, due to private land ownership.
- The purchase of land is expensive, and the municipality did not have the capital to finance any purchases.
- The municipality's financial status could not afford the expansion for service delivery.
- The available land was not suitable for spatial development and construction of housing structures.
- The municipality was unable to execute housing functions effectively (IDP, 2021/22).

3.3.6 High rate of illiteracy and lack of skills

Areas within the Madibeng Local Municipality are predominantly rural, far from the cities, and characterised by a low level of formal education. Approximately 22% of the population in these areas have some form of education (primary or secondary school), with about 17% holding vocational qualifications, 16% being semi-skilled, and 11% holding a tertiary qualification (IDP, 2021/22). The urban centres (Brits and Hartbeespoort Dam) are characterised by higher levels of education due to schools and infrastructure provided in town (IDP, 2021/22).

According to the Madibeng IDP (2021/22), 536 111 people in the Madibeng Local Municipality were employed–an estimated 41.71% (FRP, 2023) of the population. This automatically

translates into a serious problem of unemployment and leads individuals to find alternative income through informal waste recycling.

3.3.7 Waste management challenges

According to the IDP (2021/22), municipalities faced significant challenges in managing solid waste due to its technological, financial and capacity demands. External stressors included economic growth, population growth and a lack of funds, which restricted operational expenditure and led to difficulties in collecting waste. Littering and illegal dumping are the results of citizens dropping or scattering waste in streets, watercourses and open areas. Unsuitable vehicles for waste collection are often used, such as advanced compactor trucks that are not suitable for local conditions, or vehicles designed for materials with a higher density than solid waste, resulting in small load-carrying capacities and low productivity. Additionally, waste needed to be lifted high to be dropped into these vehicles, causing inefficiency and unhygienic manual handling (IDP, 2021/22). The waste management situation in the Madibeng Local Municipality is elaborated on in Section 3.5 of this chapter.

3.3.8 Report of the Auditor General

The Madibeng Local Municipality received the disclaimer of opinion from the Auditor General : an audit of financial statements which comprised the statement of the financial position as on 30 June 2021, the statement of financial performance, the statement of changes in net assets, the cash-flow statement and the statement of comparison of budget and actual amounts spent in that financial year (2020), as well as notes which accompanied the financial statements, including a summary of significant accounting policies(AGSA, 2022).

3.4 Opportunities within the Madibeng Local Municipality

According to the Madibeng Local Municipality IDP (IDP, 2021/22), the main opportunities within the Madibeng Local Municipality include tourism, agriculture, mining and property development.

3.4.1 Tourism

The study area has the potential to find new opportunities to contribute to and expand the local economy in urban and rural areas, as the IDP (2021/22) identified tourism as a contributing element to the economic growth of the municipality. Tourism in the Madibeng Local Municipality is unique as it encompasses different aspects, ranging from heritage tourism to cultural activities, wildlife and scenery. The municipality has three major tourism attractions situated in its area of jurisdiction. The Magaliesberg Mountain Range extends in an east-west direction across the southern half of Madibeng. The Hartbeespoort Dam is located in the southern part of the

municipality and is fed by the Crocodile River. The Magaliesberg Mountains and Hartbeespoort Dam are preferred by many people for residential purposes, as well as weekend tourist attractions (IDP, 2021/22). Moreover, historical and archaeological sites are located in the Magaliesberg and Witwatersberg environs. The Cradle of Humankind is situated in the Witwatersrand and is proclaimed a World Heritage Site.

3.4.2 Agriculture

The agricultural sector in the municipality is one of the largest contributors to the local economy, with growth estimated at 17.7% in 2016 (IDP, 2021/22). The Madibeng rural farming communities have been classified into commercial sector farmers, emerging farmers and household food security producers.

The municipality has different types of agricultural activities, such as intensive agriculture, extensive agriculture, subsistence agriculture and game farming. Intensive agriculture is the most dominant economically active agricultural sector and covers the southern half of the country which relies on the Crocodile River, Hartbeespoort Dam and Rooikoppies Dam for irrigation. Extensive agriculture is the second largest economically active agricultural sector in the region. It is dependent on rainwater and the Moretele and Tolwane Rivers for irrigation. Game farming in these areas is located in the north-western quadrant of the region, flanked by the Rooikoppies Dam and the Elandsberg Mountains. This location makes it accessible to tourists, as well as visitors to the game-farming region.

Subsistence agriculture is exclusively located in the north-eastern quadrant of Madibeng and is characterised by informal settlements. It is situated along the banks of the Tolwane River, and irrigation water is extracted from this river. Subsistence agriculture supplements the income, as well as the food supply, of the residents and contributes significantly to the welfare of the communities in this region.

3.4.3 Mining

Mining is the main economic contributor and job-creating activity in the municipality. The Municipal Spatial Development Framework provides for mineral resource mining. The location of the Merensky Reef next to the Bakwena Platinum Highway offers opportunities for the integration of mining activities with other economic sectors (IDP, 2021/22) Some of the world's richest platinum deposits and the largest chromate reserves are found in this municipality. Where sustainable development is the key objective, strategies will be implemented to bring stability to the resources and simultaneously stimulate economic growth (IDP, 2021/22).

3.4.4 Property development

According to the IDP (2021/22), new developments have been established in the urban areas of the municipality, Brits and Hartbeespoort Dam. The municipality unlocked the property development for an economic turnaround and the attraction of new opportunities. It is evident that property development contributes to a spinoff in the economy of the municipality (IDP, 2021/22). The municipal council identified new investment projects:

- revamping the Brits Taxi Rank;
- the construction of flea markets in rural areas to attract investors for rural economic spinoff; and
- construction of Waste Transfer Stations in Letlhabile, Mmakau, and Oukasi.

The municipality's location plays a major role in accessing other provinces of South Africa, including Gauteng and Limpopo, which are also gateways to other local municipalities. The Madibeng Municipality is situated on the periphery of the N4 highway, which is the main route to other countries further into Africa. The Madibeng Local Municipality has a railway line from Gauteng through to other provinces and an extensive road network owing to agriculture and mining activities.

3.5 Waste management in the Madibeng Local Municipality

According to the Madibeng Annual Report (2018/19), out of the total number of 186 531 households, 76 400 households (41%) have solid waste removed at least once a week. A total of 10 500 households (6%) removes solid waste less frequently than once a week. Of the remaining households, 32 300 (17%) are using some communal or own refuse dump, while 67 331 households (36%) have no rubbish disposal. This implies that 59% of households are below the minimum service level percentage.

The municipality's Waste Management By-law (2019) gives effect to the right contained in Section 24 of the Constitution by regulating waste management within the area of the municipality's jurisdiction to provide, in conjunction with any other applicable law, an effective legal and administrative framework within which the municipality can manage and regulate waste management activities. The by-law further provides for waste to be avoided, or where it cannot be altogether avoided, to be minimised, re-used, recycled, recovered, or treated and disposed of in an environmentally sound manner. The by-law also promotes and ensures effective delivery of waste services.

3.5.1 The Madibeng Municipality Integrated Waste Management Plan

Section 11 of the National Environmental Management Waste Act (Act No. 59 of 2008) requires that all organs of state develop integrated waste management plans (IWMP). Section 12 of the Waste Act outlines what the content of the IWMPs should be, while Section 13 stipulates the reporting mechanisms for the implementation of IWMPs. In the Madibeng Local Municipality, the IWMP is incorporated under sector plans to the IDP. The Madibeng Local Municipalities' IWMP was reviewed during 2016 and the final document was adopted by Council on December 9, 2016. The Integrated Waste Management Plan of the Madibeng Local Municipality was reviewed in 2016 and the final document was adopted by Council on 9 December 2016. The Madibeng Local Municipality is the process of reviewing the Integrated Waste Management Plan in 2023.

The municipality's IWMP (2016) has set targets and goals that need to be achieved, as presented in Table 3-1 below.

Table 3-1: The municipality's IWMP set targets and goals (Source: IWMP Madibeng Local Municipality, 2016)

Targets	Indicators	Comments
Improve waste collection services delivered at the minimum service level agreement	Percentage of rural households receiving waste collection at the minimum service level	The Madibeng Local Municipality intends to increase its refuse collection from 42% to 70% by 2022.
Increase the recovery and re-use of waste by at least 5% by 2021	Recycled waste tonnages within municipality Tonnages of waste disposed to landfill	Tonnes of Waste 2018 (SAWIS) Hartbeesfontein 86 453. The municipality plans to increase tonnage of material recovery at the landfill site.
Formalise at least two waste recycling initiatives, practices and structures in the municipality, with community involvement where reasonably practicable	Two formal waste reclaiming/recycling initiatives	The municipality embarked on the formalisation of recycling and entrepreneurial initiatives to fast-track green jobs.
Registration of all waste management activities outlined in the Waste Information Regulations by 2021	Number of municipalities and private industries registered on SAWIS	Data base developed for all waste management activities within the municipality

Targets	Indicators	Comments
Create awareness of integrated waste management in the general public, including youth and school children, through increased reporting in social media, on community radios and in printed media	Number of awareness activities conducted Number of cleaning campaigns per annum Number of articles/prints per annum	Educational talks on pollution Environmental education programme
Increased awareness of waste management among municipal officials	Number of engagements with officials	Waste characterisation
Increased awareness among the general public and municipal structures of the benefits of recovery, re-use and recycling of waste	Number of engagements with community members/ forums	Environmental clubs within communities School-based environmental clubs

The Madibeng Local Municipality Integrated Waste Management Plan's goal and target are crafted in a manner which should facilitate the endeavours of the municipality, NGOs, community and other stakeholders to contribute meaningfully to the preservation of our environment, protecting it for future generations. The IWMP (2016) addresses service delivery, education and awareness regarding issues that may contribute to slowing down (or halting) negative climate change, minimising waste disposal to the landfill site - as an element to extend its lifespan - and igniting interest in recovery, re-use and recycling of waste materials to create 'green jobs'.

3.5.2 Waste recycling initiatives in the Madibeng Local Municipality

The following recycling activities are authorised by the municipality and include:

- recycling group at Damonsville Transfer Station;
- recycling group at Mothotlung Transfer Station;
- recycling group in Hartbeespoort, Syferfontein;
- alternative building material project (polystyrene recycling) at Kosmos Transfer Station; and
- the recycling group at Hartbeesfontein Landfill site.

At the time of this study, there were no official updates on the progress of the above initiatives available from the Madibeng Local Municipality.

3.5.3 Provision for waste pickers integration in Madibeng

The Integrated Waste Management Plan of the Madibeng Local Municipality does not include waste picker integration. The strategy addresses waste minimisation with limited scope in three aspects: encouraging recycling, encouraging minimisation and developing a garden refuse strategy. It is recommended that, as the municipality is engaged in a review process of the Integrated Waste Management Plan, this should include complying with the National Waste Management Strategy of 2020.

3.6 Chapter summary

The purpose of Chapter 3 was to provide the reader with the context of the study area. This chapter has outlined the characteristics of the Madibeng Local Municipality, its demographics, opportunities and challenges, as well as the *status quo* of waste management services in the municipality. It has been established that the municipality faces significant challenges in managing solid waste due to the accompanying technological, financial and capacity demands. External stressors include economic growth, population growth and a lack of funds, which restrict operational expenditure and lead to difficulties in collecting waste.

CHAPTER 4: METHODOLOGY

4.1 Introduction

In this chapter, the research methodology which was followed during the research is presented. This includes the research design, research approach, target population and sampling techniques. The data collection and data analysis for both the quantitative and qualitative research methods adopted in this study are explained. Trustworthiness and the validity and reliability of the research instrument are presented, followed by the ethical considerations and limitations of the research.

4.2 Research design and approach

Babbie and Mouton (2010) posit that a research design is a plan indicating how the research will be conducted. Creswell (2014) agrees and state that a research design can be described as "the way toward directing the study." The sub-sections below outline the research approach and design followed.

4.2.1 Exploratory case study design

The concept of waste picker integration is a fairly new idea in South Africa (DEA, 2019). It requires an approach that may lead to an exploration of this phenomenon using a variety of data sources so that the results may be inclusive enough to be considered credible and generalisable. Therefore, this study employed an exploratory case study design which allows for multiple research tools to be used to explore comprehensively the nature of the phenomenon under investigation (Ridder, 2017:288). The case study method explores a real-life contemporary bounded or multiple-bounded system over time, through detailed, in-depth data collection involving multiple sources of information, and offers a case description and case themes (Creswell, 2014).

Gustafsson (2017) defines a case study as a form of qualitative research that can inform professional practice or evidence-informed decision-making in policy-making realms. The author further argues that, when applied correctly, case studies afford researchers an opportunity to describe a phenomenon in context using a variety of data sources; these sources could be individuals or organisations and their relationships, or communities.

Gustafsson’s definition of the case study design underpins the present research which interrogates the nature of informal recycling, and the relationships between informal waste pickers and the local municipalities. Yin (2009) also supports the use of a case study when its focus is to

answer the questions of “How” and “When”, or when contextual conditions believed to be relevant to the phenomenon under investigation need to be covered. Choosing a case study design allowed the present researcher to collect data through face-to-face interviews in order to understand how integration can be modelled and why it has not been undertaken as yet. The case study approach also allows us to understand the context against which municipalities make decisions about solid waste management and how prevailing factors affect the integration of informal waste pickers.

The advantage of case studies is that they are data-driven, based on people's experiences and practices, and lead to an understanding of the complexity of social life. They offer a data source for further analysis, can be linked to action, and are more persuasive and accessible due to their close proximity to people's experiences (Krusenvik, 2016). The disadvantage of case studies is that they may lack rigour, are time-consuming and are difficult to conduct. They are vulnerable to generalisation and technical limitations, making it difficult to determine data sources and negotiate access. Researchers face challenges when investigating situations naturally, potentially leading to the ‘observer effect,’ and are often perceived as producing ‘soft’ data which lack the vigour expected of social research. To ensure the credibility of generalisations extrapolated from trustworthy findings, researchers must be cautious and demonstrate similarities or contrasts with other cases (Krusenvik, 2016).

As much as the study was aimed at understanding the informal waste practices of the Madibeng Local Municipality, it was imperative to gain insight into and discover new information on the challenges behind the apparent reluctance of municipalities to integrate waste pickers into the formal structure. Thus, this combination of qualitative and quantitative data collection methods aimed to achieve a deeper level of insight through the exploratory nature of the research, in addition to providing statistical evidence to support research decisions (Cresswell, 2012:3).

4.2.2 Research approach

According to Creswell and Creswell (2018), there are three research approaches to consider: qualitative, quantitative, and mixed methods, and the basic idea is that a combination offers a better understanding of the research problems than using only one approach. Creswell and Creswell (2018) go further and posit that the mixed-methods approach takes a pragmatic view by collecting quantitative and qualitative data sequentially in the design. Thus, the researcher would be basing the study on the assumption that the collection of diverse types of data is the best way to provide a fuller and more rounded understanding of the research problem than using only one method of data collection.

Kumar (2014) states that a quantitative approach is focused on collecting numerical data, while a qualitative approach aims to collect words, thoughts and feelings. Creswell and Creswell (2018) agree and mention that a quantitative approach is used to test objective theories by examining the relationship among variables, whereas a qualitative approach is used to explore and understand the meaning that individuals or groups assign to a social phenomenon.

A design which combines both quantitative and qualitative data can assist in interrogating the nature of informal recycling and the relationships between informal waste pickers and the local municipalities. For the purposes of this research, data collection included observations, surveys, interviews and document analysis, as explained in Section 4.6 below.

4.3 Justification for the selection of the case study area

The Madibeng Local Municipality (see Chapter 3 of this thesis for contextual information) was selected as a case study area for the following reasons:

- The researcher, as a senior municipality employee, is working directly with waste management in the Madibeng Local Municipality. The researcher, therefore, had access to data and information. It was also a convenient location in which to conduct the research because of its proximity and the time and resources available to the researcher.
- The Madibeng Local Municipality is the main hub for the district, owing to its local economic and strategic position of sharing borders with Gauteng and the North West, and due to its estimated population of 536 111 people (IDP, 2021/22) who provide ample opportunities for waste picking.
- The Madibeng Local Municipality's urban areas are Brits and Hartbeespoort, which are both surrounded by rural settlements located on their outskirts. There are waste transfer stations at Damonsville, Mothotlung, Syferfontein, Kosmos Transfer Station, and the main landfill site at Hartbeesfontein. Three distinct groups of waste pickers work within the Madibeng Local Municipality. The community informal waste pickers group (CIWP) is itinerant and active in the townships within the Madibeng Local Municipality, while the landfill informal waste pickers group (LIWP) is active at the Hartbeesfontein regional landfill site used for the disposal of municipal solid waste (MSW), and the street informal waste pickers group (SIWP) is active in the town of Brits. This provides an opportunity to study three types of waste pickers.
- The Madibeng Municipality's 41% refuse collection service opens up a golden opportunity for waste pickers to gather valuable waste materials that would otherwise be destined for a waste dump if collected by the municipality.

4.4 Population and sampling

In this section, the target population and the sampling strategy used will be presented.

4.4.1 Population

A population is defined as the complete set of individuals or groups that could participate in the study (Macmillan & Schumacher, 2006). Wiid and Diggines (2013) state that a population is the total group of people or entities from whom the researcher could extract information pertinent to the study. Du Plooy-Cilliers *et al*. (2014:133) explain that the population selected for the study should have at least one characteristic in common with the research question and that it is important that the parameters of the population focus on the size, nature and unique features of the population. Du Plooy-Cilliers *et al*. (2014) further advise that the researcher should differentiate between a target and an accessible population, where the accessible population is those available for the study.

The target population for this study was waste pickers, municipal workers and buyers in the Madibeng Local Municipality. The actual number of waste pickers is very difficult to determine as they tend to move from one area to another. The population of waste pickers working in the community is estimated to be around 460 individuals; there are about 17 buyers of recyclable materials, which includes SME recycling companies; and 20 municipal employees work directly and indirectly with waste management in the Madibeng Local Municipality.

4.4.2 The target population characteristics

A similar approach to that of Pholoto (2018) was used to select the target population. The selection of the three informal waste picker groups was considered in the context of the spaces in which they reside and conduct their work. This was done to illustrate how the environment in which they conduct their labour affects the form of their activity, the limits they face and, ultimately, the social interactions or relationships they are able to establish with society. The targeted informal waste pickers who were needed to participate in the research were members of the community-, landfill- and street informal waste picker populations. The community informal waste picker (CIWP) group is itinerant and active in the townships within the Madibeng Local Municipality, while the landfill informal waste picker group (LIWP) is active at the Hartbeesfontein Regional Landfill site used for the disposal of municipal solid waste (MSW). The street informal waste picker group (SIWP) is active in the town of Brits.

Since the exact number of waste pickers working within the Madibeng Local Municipality was unknown at the time of conducting this research, a specific target population (number) could not

be accurately calculated. However, based on the estimation that more than 400 waste pickers work in the area, a target of approximately 200 to 250 waste pickers was set. The research, however, aimed to include the maximum number of individuals from each of the waste picker groups, buyers and municipal officials.

4.4.3 Sampling strategy

According to Taherdoost (2017), the concept of sampling refers to the selection of individuals from the target population. The selection is performed in such a manner that each individual has the same chance of being selected for the sample. The two primary forms of sample design are probability and non-probability sampling (Taherdoost, 2017).

4.4.3.1 Probability sampling

Probability sampling ensures an equal chance of inclusion in the sample population, with each individual having a known non-zero chance of being included in the sampling (Cooper & Schindler, 2014). Common techniques include simple random, stratified and cluster random sampling.

- **Simple random sampling:** Simple random sampling techniques ensure equal opportunity for all individuals to participate in the sample (Cooper & Schindler, 2014; Greener & Martelli, 2020).

- **Stratified sampling:** Stratified sampling categorises population into groups or strata, using simple random techniques to select samples, allowing for efficient population analysis (Cooper & Schindler, 2014; Greener & Martelli, 2020).

- **Clusters random sampling:** Clusters random sampling categorises a population into subgroups, using simple random techniques to select subgroups for the sample population (Cooper & Schindler, 2014; Greener & Martelli, 2020).

4.4.3.2 Non-probability sampling

Non-probability sampling selection involves varying chances of each individual being considered in a sample, using techniques, such as quota sampling, purposive sampling, convenience sampling and snowball sampling (Creswell, 2014).

- **Quota sampling:** Quota sampling involves dividing a population into groups and selecting participants based on their characteristics, similar to stratified sampling (Saunders *et al*., 2016).

- **Convenience sampling:** Convenience sampling involves selecting participants based on factors, such as accessibility, physical proximity and willingness, allowing researchers to select participants based on their convenience (Creswell, 2014; Saunders *et al*., 2016).

- **Snowball sampling:** Snowball sampling involves selecting a small group of knowledgeable individuals to respond to research questions and then requesting additional participants from the initial group (Creswell, 2014; Saunders *et al*., 2016).

- **Purposive sampling:** Purposive sampling, also known as judgmental or subjective sampling, is a method used by researchers to identify participants based on their understanding and knowledge. It is ideal for qualitative research, in which experts on the topic or the participants are selected based on specific criteria, such as years of experience or qualifications (Creswell, 2014; Saunders *et al*., 2016).

For this research, non-probability sampling, employing a convenience sampling technique, was used, owing to the convenience of waste pickers who were available to answer the questions in the survey. Waste pickers do not work set hours, and the researcher had to visit the sites more than once to interview the waste pickers based on availability. The municipal workers who participated in the study were selected through purposive sampling based on their understanding, knowledge and involvement in the Madibeng Local Municipality's solid waste management. The buy-back centre participants were selected using convenience sampling based on factors, such as accessibility, physical proximity and willingness to participate in the study.

4.5 Data collection

For this study, the researcher chose questionnaires with qualitative and quantitative questions in which rapport was established with waste pickers, buyers and municipal employees prior to the interview. Five questionnaires in all were compiled: three for the three different groups of waste pickers (Appendix C), and one each for the municipal officials (Appendix D) and owners/managers of BBCs. (Appendix E). These latter two categories were of particular interest as key players in the integration of informal waste pickers. There were both open-ended and closed-ended questions, the latter requiring participants to answer "yes" or "no" or choose an appropriate answer from a list. The open-ended questions encouraged participants to share their thoughts, feelings and ideas regarding waste picking and the possibility of integration into the formal employment structure of the Madibeng Local Municipality.

The questionnaires were completed by the interviewers and not the participants to ensure that further probing questions could be asked where needed. The research assistants conducted interviews using different paper-based interview guides, containing both closed-ended and open-

ended survey questions, for the different study participant groups. The researcher captured the data in an Excel spread sheet to screen for data analysis.

An overview of the research objectives and the questions used to achieve them is presented below. Table 4-1 displays the research objectives, the participating groups and a range of identical and differing questions (in five questionnaires) formulated to be relevant to each group. The research objectives, as well as the approach and intention with each specific group, determined the type questions asked. The questionnaires started with closed-ended questions to enhance the platform of engagement between the interviewee and interviewer. The strategy employed helped ease the transition to open-ended questions.

Table 4-1: Research objectives and questions formulated for data collection

Data Focus	Participant group	Survey/ Interview Questions	Justification
Biographical and Demographical profile of the municipal respondents	Municipality	Questions 1 to 9	To ensure representation of research respondents
Biographical and Demographical data of the buy-back centre respondents	Buy-back Centre	Questions 1 to 7	
Research Objective 1: To determine the socio-economic profile of the waste pickers in the Madibeng Local Municipality.			
Biographical and demographical data of waste pickers	Waste Pickers	Questions 1 to 21	To develop an understanding and to ensure that respondents are representative of the waste picker population.
This set of questions relates to the respondents' level of education.	Waste Pickers	Questions 8 to 15	
This set of questions relates to the respondents' employment history.	Waste Pickers	Questions 16 to 21	
Research Objective 2: To determine the status of informal waste reclaiming practices in the Madibeng Local Municipality.			
This set of questions relates to the respondents' work as community waste pickers.	Waste Pickers	Questions 22 to 39	Determine informal waste reclaiming status
This set of questions relates to the income patterns of the respondents.	Waste Pickers	Questions 40 to 51	

Data Focus	Participant group	Survey/ Interview Questions	Justification
This set of questions relates to the respondents' access to basic needs.	Waste Pickers	Questions 52 to 55	
The working relationship between waste pickers	Waste Pickers	Question 59	
Population growth of waste pickers	Waste Pickers	Question 60	
Knowledge of municipality legislation	Waste Pickers	Question 61	
Would you like to tell us anything else that concerns you or that you think we should know?	Waste Pickers	Question 64	General open question
Knowledge of municipality legislation	Waste Pickers	Question 71	Determine informal waste reclaiming status
Research Objective 3: To determine the current status of waste management services and infrastructure in the Madibeng Local Municipality.			
Current status of waste management and infrastructure in Madibeng	Municipality	Interview with open-ended Questions 10 to 13	To determine formal waste reclaiming status
Status of informal waste reclaiming practices	Municipality	Interview with open-ended Questions 14 to 18	
Socio-economic profile of waste pickers	Municipality	Interview with open-ended Questions 19 to 23	
This set of questions relates to the buy-back centre business operations.	BBCs	Interview with open-ended Questions 8a, 8b and 8c	To determine the informal structure of BBCs within the Madibeng Local Municipality.
BBC owners' knowledge and skills	BBCs	Questions 9 and 10	To determine BBC waste reclaiming status
How many South Africans do you employed?	BBCs	Question 11	Employment opportunities created

Data Focus	Participant group	Survey/ Interview Questions	Justification
This set of questions relates to the buy-back centres' business operations.	BBCs	Questions 18 and 36	To determine BBC waste reclaiming status
This set of questions relates to the income patterns of the BBC businesses.	BBCs	Questions 52 to 55	
Research Objective 4: To determine the current enabling environment within the Madibeng Local Municipality to allow for integration of informal waste reclaiming practices (legal framework, such as guidelines, policies, by-laws; views of decision-makers within the municipality)			
Relationship with other groups/organisations	Waste Pickers	Questions 56 to 58	Challenges that Madibeng Local Municipality will face
What are the health and injury risks when collecting recyclable goods?	Waste Pickers	Open-ended Question 62	
What is the positive contribution from the municipality towards your work?	Waste Pickers	Open-ended Question 65	Questions relate to integration from informal waste picker point of view
Have you held meetings with the municipality about your work?	Waste Pickers	Open-ended Question 66	
What is your expectation from the municipality as informal waste picker?	Waste Pickers	Open-ended Question 67	
Do you want to be integrated within the municipality? Yes or No. Specify.	Waste Pickers	Open-ended Question 68	
What contribution are you prepared to make to the municipality should you be integrated?	Waste Pickers	Open-ended Question 69	
What benefits do you expect if integrated in the municipality?	Waste Pickers	Open-ended Question 70	
Integration of informal waste pickers	Municipality	Open-ended Questions 24 to 29	Integration from the municipality's point of view

Data Focus	Participant group	Survey/ Interview Questions	Justification
Establishment of opportunities in reclaiming facilities (townships, informal settlements)	Municipality	Open-ended Questions 30 to 34	Establishment of opportunities
What are the health and injury risks when collecting recyclable goods?	Waste pickers	Open-ended Question 43	Waste pickers' risks
This set of questions relates to integration of informal waste pickers	BBCs	Open-ended Questions 46 to 52	BBCs' views on integration of waste pickers
Relationship with informal waste pickers	BBCs	Questions 12 and 17	
Relationship with other groups/organisations	BBCs	Questions 37 to 42	
Integration of informal waste pickers	BBCs	Open-ended Questions 24 to 29	

4.5.1 Survey regarding waste pickers

The primary goal of this research was to compare the effectiveness of private and cooperative waste source separation models, with local site visits serving as a supplement. Site visits are systematic investigations of data acquired from real-world settings (Creswell, 2014) – in the present case, data gathered from interviews with three groups of wasted pickers. This research did not make provision for an in-depth scrutiny during site visits but simply included site visit observations as a tool to supplement and verify the information provided by the various groups of participants in the research. Unfortunately, site visits could not be conducted at the private companies due to the unavailability of the various owners. The three cooperatives availed themselves for site visits.

4.5.1.1 Developing the survey questionnaire (Appendix C)

The questionnaires were developed as instruments to source data for the study. The research team developed three different questionnaires to draw data from landfill informal waste pickers, street informal waste pickers and community informal waste pickers. The three categories of informal waste pickers perform the same duties in different working areas. That allowed for similar and different questions in their questionnaires.

4.5.1.2 Piloting the survey questionnaire

The researcher tested the questionnaire by interviewing three waste pickers to see whether the strength of the questions would provide useful feedback for the study. The researcher then weighed up their responses and relevance against the set research objectives which were to address the research problem. The aim was to revisit the questionnaire for adjustments based on feedback from the three waste pickers, but the latter found no issues with the questions.

4.5.1.3 Identifying and approaching survey participants (waste pickers)

The researcher submitted a letter of request to conduct this study to the Madibeng Local Municipality's Accounting Officer (see Appendix B: Madibeng Local Municipality Permission Letter). The questionnaires included the information that participation was voluntary and there would be no recording of names. The participants were met at their areas of work to avoid disrupting their activities. Informal waste pickers at the landfill site were briefed and showed willingness to participate. Street informal waste pickers were approached on the streets and briefed individually, with some declining to participate, as they needed to chase the target of their daily harvest of materials. The community informal waste pickers were approached in their working spaces, which made it easier to probe them.

4.5.1.4 Distributing and collecting the survey questionnaires

The researcher engaged three interviewers to assist with the interviews at the various sites. Interviews with participants could not always be scheduled, as the participants could not afford to interrupt their daily work and were interviewed when they were available. The interview team visited the sites at Damonsville, Mothotlung, Syferfontein, Kosmos Transfer Station and the Hartbeesfontein Landfill Site on many occasions over an eight-week period (1 September 2021 to 18 October 2021) to conduct interviews with the aim of obtaining as many sets of responses as possible.

The research team consisted of the primary researcher (PhD student) and three research assistants. The researcher attended ethical training and adhered to all provisions of the NWU Ethics approval process. The three assistants were informed and trained on how to approach and interview the informal waste pickers. The data collection was overseen by the primary researcher at all times (i.e. the team went to one area for data collection at the same time, and the team utilised combined transport to reach areas on the outskirts of Madibeng Local Municipality). Data sheets were submitted on daily basis and recorded by the researcher and any discrepancies or uncertainties were immediately addressed with the research assistants. The research assistants had a good understanding of waste management and were trained on the

aspects of waste management. The selection of research assistants had a positive contribution to data collection without compromising the data collection process.

4.5.2 Interviews with municipal officials and buy-back centre respondents

The questions posed to the buyers required information regarding the buy-back centre they utilised, their employment at the buy-back centre, their income from the buy-back centre and their relationships with the various stakeholders. The buyers were interviewed regarding their current disposition and health, as well as their ideas on the prospect of being incorporated into a formal organisation.

4.5.2.1 Developing the interview questionnaire (Appendices D and E)

The questionnaires were developed in such a manner that the first section focused more on closed-ended questions that would draw the attention of the participant. The more comfortable a participant feels with regard to answering questions, the better the opportunity to move swiftly to open-ended questions. Developing the questionnaires took into consideration whether the questions would be addressed to the buyers at the BBCs or to the municipal officials.

4.5.2.2 Piloting the interview questionnaire

A pilot study was conducted to test the research instrument and to ensure any mistakes, uncertainties or clarifications were dealt with before embarking on the main study (Cooper & Schindler, 2014). The questionnaires were first piloted with two participants from each category - landfill informal waste pickers, street informal waste pickers, community Informal waste pickers, buy-back centres and municipal officials - to ensure that the data were reliable and valid and to allow the researcher to tweak the questions for understanding. The pilot study confirmed the relevance of the questions and provided clarity where needed. No issues were reported by the participants.

4.5.2.3 Scheduling and conducting interviews

The sections below outline the scheduling and conducting of interviews with informal waste pickers, buy-back centres and the municipality.

4.5.2.3.1 Informal waste pickers

The interviews with the informal waste pickers were done between September 1, 2021, and October 18, 2021. The researcher had a team of three research assistants to do the data collection via observations, recordings and questionnaires. Landfill informal waste pickers were

prioritised as they were easy to access at the workstation on a daily basis. The street informal waste pickers were approached on the streets to collect data by using the questionnaire. The community informal waste pickers were traced and interviewed at their different locations or villages.

4.5.2.3.2 Buy Back Centres

The interviews with buy-back centres were planned from October 23, 2021, until November 3, 2021. The research team did not have appointments with the management. On arrival, they introduced themselves and the purpose of the visit to the buy-back centres. The buy-back centre management was informed of the details of the research and of their right to participate or not. In the case of the BBCs, the researcher found that some interviews took longer than planned or anticipated due to how busy the buy-back centres were.

4.5.2.3.3 Municipal officials

The interviews with municipal officials were planned with appointments at their respective offices and were successful due to their appreciation of the need for research in the Madibeng Local Municipality. The appointments were on different dates and in time slots depending on their availability. The researcher did not set a pre-arranged schedule for the municipal officials. Whenever they were available, they would inform the researcher, as they had been provided with the questionnaires prior to the interviews.

4.5.2.4 Capturing data from interviews

The completed questionnaires were handed back to the researcher. The collected data were transferred by the researcher to an Excel spreadsheet, in which columns present the questions and rows capture each respondent's data.

4.5.3 Observations

Waste storage practices involve temporary storage at waste transfer stations before the waste is transported to the landfill site for disposal.

The pollution control, separation and segregation measures implemented by the municipality include applying the landfill permit on how to manage the landfill site and other relevant measures, such as the air quality by-law, the waste management by-law, and the integrated waste management plan. The separation at source happens in other security complexes. Working practices and procedures include safety aspects (PPE, site notices, access control). However, the working practices of informal waste pickers on this site are a hazard to the Madibeng Local

Municipality, as they do not understand the risk they are facing. It was observed that some informal waste pickers smoke cigarettes on the job. The landfill management insists on implementing the right procedures, but informal waste pickers are uncontrollable. The municipality has site notices, access control and an incident register.

The researcher and his research assistants visited the landfill site to watch how informal waste pickers acted in their work environment. The waste pickers were not informed of this exercise to allow them to be free and not change their routine of activities. The data collection team decided to be discreet and participate indirectly so as to dismiss possible suspicion on the part of the waste pickers. The observation was done by writing up notes on the occurrence of activities which related to how the waste pickers reacted during the arrival of trucks and waste vehicles. A camera was used for video and audio recording.

The observations during the site visit included the type of building, facilities and machinery on the site. The number of informal waste pickers was high at the landfill site. However. it was observed that the facilities were non-inclusive to waste picker participation; even sanitation facilities were unavailable. The municipal staff, though, were well taken care of with regard to the condition of buildings, facilities (including sanitation facilities), machinery and equipment, such as the yellow plant, onsite as per the landfill permit. The Madibeng Local Municipality has a total of fifteen staff members at the landfill site, including the supervisor, five operators, two access clerks and seven general workers assisting with landfill management.

The site visits also provided an opportunity to retrieve documented evidence, such as waste tonnage information, training-related documents and certificates of registration or licences (where applicable). No formal observation checklists were used, and observation information was captured intuitively.

4.5.4 Document review and evaluation

The following documents were reviewed during the study:

- The National Environmental Waste Act, Act of 107 of 1998, regarding the law in respect of waste minimisation (NEMA, Act 107 of 1998).
- The National Development Plan, Vision 2030, to establish the direction of the then South African Government regarding current and future plans for the inclusion of informal waste pickers in the formal economy and their contribution to the circular economy (NDP, 20230).

- The National Waste Management Strategies of 2011 and 2020 which seek to find direction on how municipalities should approach the integration of informal waste pickers (NWMS, 2011; 2020).
- The Waste Picker Integration Guideline as a guiding document for municipalities to initiate the inclusion of informal waste pickers (WPIG, 2020).
- The Madibeng Local Municipality Integrated Development Plan which aims to establish whether integration of informal waste pickers is in their five-year plan (IDP, 2021/22).
- The Integrated Waste Management Plan of the Madibeng Local Municipality – which does not mention informal waste picker integration (Madibeng IWMP, 2016).
- The waste management by-law of the Madibeng Local Municipality which allows for the integration of informal waste pickers (Madibeng Waste Management by-law, 2021).
- Lastly, the landfill permit on inclusion of landfill informal waste pickers (Permit No. GMB-B33/2/0121/41/P81).

4.6 Data analysis

Data analysis, according to Saunders *et al.* (2016), is the act of transforming raw data into information that is understandable and useful for decision-making. Different statistical methods were used to analyse the collected quantitative and qualitative data in the present study.

4.6.1 Descriptive statistics

The acquired quantitative data were summarised using descriptive statistics in the form of graphs and tables to uncover relevant relationships and patterns within the data (Pallant, 2016).

4.6.2 Software use in analysis

The researcher used Qualitative Data Analysis (QDA) software to analyse the qualitative data collected from the waste pickers. The data were transferred from the Excel sheet into Word documents and uploaded into the program. The researcher employed an open coding process, as described by Grbich (2013), in which main and sub-codes were produced by analysing the data word-for-word and line-by-line to recognise concepts and categories. The QDA coding functionality was utilised to create codes.

4.6.3 Thematic analysis

Thematic analysis, according to Braun and Clarke (2013), is a technique for systematically discovering, categorising and translating understanding into patterns of meaning, also known as themes, that are present in a data collection. The advantage of thematic analysis is that it is a

widely used method for identifying trends in qualitative data, offering flexibility, ease of learning and support for the interpretation of themes. It is applicable to research questions beyond individual experiences and allows for exploring new perspectives and identifying commonalities and differences among participants (Braun & Clarke, 2013; Kiger & Varpio, 2020).

Thematic analysis has several disadvantages, including being time-consuming, heavily reliant on researcher judgment, limited in its interpretation and not suitable for complex data sets. Subjectivity and interpretation can introduce bias or inconsistency, affecting the generalisability of findings. Additionally, there are no clear guidelines or criteria for conducting and reporting thematic analyses, resulting in varying levels of quality and rigour in the research (Braun & Clarke, 2013; Kiger & Varpio, 2020). Thematic analysis is a six-step procedure for analysing qualitative material gathered from interviews (Braun & Clarke, 2013):

Step 1: Familiarisation with the data: The transcribed data were inspected manually, individual by individual, question by question, line by line, to search for relationships and interesting segments of the test. Codes were defined and linked to the text. These codes were sorted and clustered to form themes and sub-themes in relation to the objective of this study (Braun & Clarke, 2013; Grbich, 2013).

Step 2: Generating initial codes: After having become familiarised with the available data, researchers must generate preliminary codes, which represent interesting and insightful attributes of the data. Coding is the process of applying codes to blocks of text to highlight similarities and differences. Codes are labels or tags used to measure the meaning of data collected for a study. They are produced by recognising interesting features and recurrent patterns in the data set, providing a hint of the conversation's subject within the data (Braun & Clarke, 2013; Grbich, 2013).

Step 3: Searching for themes: The third phase of qualitative data analysis involves analysing categorised codes, which are graded based on underlying themes. These themes are broad units of information that consist of multiple codes grouped together to form a common idea. Codes help organise data into themes, and there is a relationship between codes and their categorisation within the same theme. The study identified themes from literature and applied them to the collected data. If further themes emerged during coding, they were added to the existing ones. The thought process focused on the relationship between codes, subthemes and themes (Braun & Clarke, 2013; Grbich, 2013).

Step 4: Reviewing themes: Thematic analysis involves a broader review of identified themes, addressing merging, refining, separating or omitting preliminary themes. Meaningful coherence of data within themes is crucial, and distinctions between them must be recognised. Researchers

read data excerpts to ensure coherence and provide meaning to each corresponding theme (Braun & Clarke, 2013; Grbich, 2013).

Step 5: Defining and naming themes: It refines and defines the reviewed themes and subthemes of the data extracts, supplementing the preceding phase. Continuous analysis is necessary to improve recognised themes. Researchers revisit data excerpts for each theme and organise them into a coherent, internally consistent account with an accompanying narrative. They name each theme and give distinct working definitions, representing the essence of each theme in a clear and incisive way. A cohesive narrative of the data must emerge from the themes, as the definitions provide the interpreter with an idea of the themes' concern (Braun & Clarke, 2013).

Step 6: Producing a report: The final phase of the thematic analysis involves creating an understandable article with clear examples connecting to themes, literature and research questions. The ultimate analysis should provide a concise, coherent, logical and interesting account of the story of the data. It should go beyond just describing themes and illustrate an analysis with practical evidence that addresses the research question. The final analysis should communicate the results in a way that satisfies the reader's demand for trustworthiness and validity (Braun & Clarke, 2013).

4.7 Trustworthiness of the research

According to Bryman *et al*. (2016), trustworthiness in a study depends on the reader's judgment, and it can be established in four ways: credibility, transferability, dependability and confirmability. These concepts are similar to internal validity (credibility), external validity (transferability), reliability (dependability), and construct validity (conformability), which measure the quality in quantitative research. Satisfying these concepts is essential to ensuring the validity of qualitative research and its reliability.

4.7.1 Credibility

A researcher's credibility could be established by addressing the 'fit' between the material presented and the respondents' perspectives. To establish credibility, the researcher employed a mixed-methods strategy to triangulate the acquired data, as well as peer review, in which the data analyst examined the collected data.

4.7.2 Transferability

Transferability addresses the extent to which the finding could be generalised. The researcher has no insight into sites where transferability is needed, but provided thick descriptions to ensure anyone seeking transferability to their study could do so.

4.7.3 Dependability

To ensure dependability, the researcher could subject the study to an audit. The researcher kept a well-documented account of the study's activities and progress. When a reader can judge the research process, it is easier to establish dependability.

4.7.4 Confirmability

Confirmability refers to the ability to establish that the findings and interpretations of the researcher were derived from the collected data. Confirmability can be established only when credibility, transferability and dependability have been confirmed. The researcher established confirmability by taking copious amounts of notes during the study and interacting with the participants.

4.8 Ethical considerations

McLain and Kim (2018) state that many different ethical issues may arise during different phases of a research study and that the researcher should find a balance between the values of research and the best interests of the participants to ensure the integrity of the data. Each learning institution has its own ethics committee dealing with the code of ethics; however, the well-being of the participants is paramount. The following ethical considerations were adhered to during the present study, especially during the data collection phase, which entailed direct interaction between the research team and participants.

According to the North-West University, ethical considerations should be acknowledged and taken into consideration during research. The study involved human participants, but did not include any vulnerable individuals (children, persons with disabilities). The research proposal was submitted to the Scientific Committee of the Environmental Management Research Group in the Unit for Environmental Sciences and Management of the North-West University (Potchefstroom Campus) for consideration.

The Scientific Committee found that the project proposal was in accordance with the scientific method and adhered to the required standards as set out in the Academic Rules for Master and Doctoral Students at the North-West University. The Scientific Committee concluded that the

methodology put forward posed a low ethical risk, and proposed an expedited review by the Faculty of Natural and Agricultural Sciences (FNAS) Ethics Committee. The FNAS Ethics Committee concluded that the research presented a low ethical risk and approved the research proposal and methodology (NWU-01349-20-A9).

4.8.1 Research integrity

Pursuant to the ideals of ethics, formal permission from the municipal manager of Madibeng Local Municipality was obtained through a meeting to introduce the research project. Formal approval was granted with a written memo to commence with the study, using the area under municipal jurisdiction. Once the data had been captured, the findings were reported in a comprehensive and honest manner with no interference, bias, or manipulation of the results. The work was funded by the National Research Foundation, and no conflict of interest was declared.

4.8.2 Obtaining informed consent

Study participants were randomly drawn from informal waste pickers, to whom the researcher introduced himself as a doctoral student from the North-West University, Potchefstroom Campus, interested in seeking ways to build literature that might in the future improve the working conditions of waste pickers. It was explained to each participant that participation was voluntary and that if they felt uncomfortable, they could withdraw from the study if it was their will to do so.

4.8.3 Research anonymity

The questionnaire was well explained, and it was stressed that the participants' names were not required to protect their identity and that the data collected could not in any way be traced back to them. With permission from the municipal manager, gloves and face masks were issued to waste pickers who participated in the study. Besides observing their normal day-to-day routine, no single waste picker was requested or subjected to any additional workload or to any new and unusual work.

4.8.4 Confidentiality

Confidentiality refers to the management of private information and anonymity (O'Reilly & Kiyimba, 2015:54). Any identifying information about the participants was removed and was not made available to anyone but the team of interviewers and the data analyst. This information will be kept as per the requirements of the North-West University (Potchefstroom Campus) for the required period of time. The researcher will keep the information in a secure and safe location on an external hard drive, until such time as the hard drive should be cleared.

4.8.5 Participants right to privacy

It was explained to the participants that they had the right to privacy and that none of their personal or identifying information would be made public or could be linked to their responses. The participants understood that their participation was voluntary and that they could withdraw from the study at any time without any adverse consequences.

4.9 Methodological assumptions and limitations

The following methodological assumptions and limitations were encountered during this research:

There were some challenges with regard to convincing the waste pickers that the study was not part of a programme to identify informal workers. Therefore, some waste pickers were reluctant to discuss their families, marital status or previous employment in the formal sector. Some were also not prepared to share information, such as formal education and training, skills, the sector they had been employed in, and the reason for leaving that position or company. A number of waste pickers were also not prepared to reveal whether they owned or lease the trolley used to collect waste, from whom they obtained it, or how it was financed. These missing data fields may cause the data to be skewed. The municipality and buy-back centre participants interviewed understood the purpose of the study and were prepared to share information. The study was not designed to be an in-depth behavioural study. Apart from the literature with a social sciences focus that has been included in the literature review, no other input from social scientists was obtained.

4.10 Chapter summary

In this chapter, the research methodology used in the study is summarised. The research design, approach, target population, and sampling techniques are discussed. The data collection and analysis methods for both quantitative and qualitative research are explained. The trustworthiness of the research instrument is discussed, along with its validity and reliability. The ethical considerations and limitations of the research are also presented.

The research design used in this study is an exploratory case study design. The research approach is described as a combination of quantitative and qualitative methods. The selection of the case study area is justified, and the target population and sampling strategy are explained. The data collection methods used in the study include surveys, interviews, observations, and document review and evaluation.

The data analysis methods used in the study include descriptive statistics, software analysis, and thematic analysis. The trustworthiness of the research is discussed in terms of credibility,

transferability, dependability, and confirmability. Ethical considerations in the research include research integrity, obtaining informed consent, and research anonymity. This chapter provided information on the research design and approach, data collection methods, and methods of data analysis. Ethical considerations, methodological assumptions, and limitations were also discussed.

The next chapter presents the findings of the data analysis to form a meaningful foundation for critical decision-making in relation to the research question of this study.

CHAPTER 5: RESULTS AND DISCUSSION

5.1 Introduction

The aim of the research is to determine how informal waste reclaiming practices may be integrated into or supported by the formal municipal waste management system. Chapter 5 reports on the findings and the results of the analysis of the quantitative and qualitative data collected via questionnaires from the respondents to achieve the following four research objectives:

- **Research Objective 1:** To determine the current socio-economic profile of the waste pickers in the Madibeng Local Municipality
- **Research Objective 2:** To determine the status of informal waste reclaiming practices in the Madibeng Local Municipality
- **Research Objective 3:** To determine the status of waste management services and infrastructure in the Madibeng Local Municipality
- **Research Objective 4:** To determine the current enabling environment within the Madibeng Local Municipality to allow for the integration of informal waste reclaiming practices (legal framework, such as guidelines, policies, by-laws; views of decision-makers within the municipality).

Quantitative and qualitative data were collected from waste pickers, waste buyers and municipal officers as explained in Chapter 4. Section 5.2 provides the demographic profile of participants. The results of the surveys and interviews were supplemented by a literature review and observations. Each research objective is reported on individually, with Section 5.3 providing the quantitative survey results (RO1 and RO2) and Section 5.4 providing the qualitative research results (RO3 and RO4).

5.2 Demographic profile of participants

In this section, a summary of the biographical and demographical data of the 15 municipal officials, the 18 buy-back centres and the 217 waste picker participants will be presented. More comprehensive information on the demographic profile of participants is provided in Chapter 5.

5.2.1 Biographical and demographical profile of the municipality respondents

Eleven of the fifteen municipal respondents were males, while four were females. In a total of eleven male respondents, nine were of black African cultural background and two were white males with an Afrikaans cultural background. Four respondents were black African females. The languages spoken by the participants were English, Afrikaans, Setswana, Tshivenda, SiSwati, Sesotho, and IsiZulu.

The respondents held different positions within the municipality: one administrator, one audit manager (SME), one chief environmental specialist, one coordinator (waste management), one director (community services), four environmental specialists, two general workers, two politicians, and two supervisors (waste management). The respondents reported that they represented the following municipal departments: Administration, Auditor-General, Community Services, Political Office, Waste and Environmental Management.

5.2.2 Biographical and demographical data of the buy-back centre respondents

Of the eighteen buy-back centre respondents, six were female and twelve were male (11 African males, 1 Afrikaans male). The languages spoken by the individual respondents were English (3), Afrikaans (3), Setswana (7), Xitsonga (2), and Shona (3). Two of the buyers were from Cameroon, four from Zimbabwe, and twelve were South Africans. The twelve South Africans were born in Gauteng (2), Limpopo (2) and the North West (8). Two of the buyers were 21 and 22 years old and were, respectively, from South Africa and Zimbabwe. The other buyers were in the age range from 28 to 63 years old.

5.2.3 Biographical and demographical data of the waste picker respondents

The 217 waste picker respondents represented three groups: community informal waste pickers (140 respondents), landfill informal waste pickers (38 respondents) and street informal waste pickers (39 respondents). Of the waste picker respondents, 183 had between one and fifteen years' or more working experience in waste picking. Since determining the socio-demographic information of waste pickers was a specific research objective (Research Objective 1), a detailed account of the socio-demographic data of waste pickers is provided in Chapter 5 (Section 5.3.2 and sub-sections).

5.3 Findings from the quantitative survey results

In this section, the survey response rate, as well as the socio-economic profile of the waste pickers (RO1) and the status of informal waste reclaiming practices (RO2), are provided.

5.3.1 Survey response rate

In this study, 217 (86.8%) of 250 targeted informal waste pickers agreed to participate in the research. These participants included members of the community, landfill, and street informal waste picker populations (Table 5-1).

Table 5-1: Waste picker groups included in the survey *(n* = 217)

Waste picker group	Frequency	Percentage
Community informal waste picker (CIWP)	140	64.5%
Landfill informal waste picker (LIWP)	38	17.5%
Street informal waste picker (SIWP)	39	18.0%
Total	**217**	**100%**

The 217 informal waste pickers comprised 140 (64.5%) participants from the community informal waste pickers group (CIWP), 38 (17.5%) participants from the landfill informal waste picker group (LIWP) and 39 (18%) participants from the street informal waste pickers group (SIWP). The CIWP group is itinerant and active in the townships within the Madibeng Local Municipality, while the LIWP group is active at the Hartbeesfontein Regional Landfill site used for the disposal of municipal solid waste (MSW), and the SIWP group is active in the town of Brits.

It must be noted that previous research focused mainly on landfill informal waste pickers (LIWP) and street informal waste pickers (SIWP) (Schenck & Blaauw, 2011; Mothiba, 2016; Motlhoki, 2019; Uhunamure, 2021), while the uniqueness of this study is that it included community informal waste pickers (CIWP) for the first time in a research project. According to Morais *et al.* (2022), who conducted a global literature review on human waste picking, the 15-20 million people worldwide earning a living from waste picking can include children, women, elderly people and migrants.

5.3.2 RO1: Socio economic profile of the waste pickers in the Madibeng Local Municipality

In this section, the respondents' biographical information, such as gender, age, cultural groupings and language, is presented.

5.3.2.1 Gender

Based on race, gender and nationality, waste pickers are one of the most marginalised groups in society from a historical perspective of South Africa (DEFF & DSI, 2020:15–16). For women, waste picking is a challenge, as they suffer greater indignities and health hazards than men due

to the lack of ablution facilities in the areas where they work (DEFF & DSI, 2020:15–16). On landfill sites and streets, women are exposed to crime and may face the risk of gender-based violence. Many women work fewer hours as waste pickers per day than men because they have caring responsibilities towards their children (DEFF & DSI, 2020:15–16). While men can use their greater physical strength to monopolise valuable materials, women are often forced to collect fewer valuable materials. The above-mentioned factors may result in the fact that women have more hazardous working conditions and a lower income than their male counterparts (DEFF & DSI, 2020:15–16).

According to Gutberlet and Uddin (2018), waste workers, especially waste pickers handling hazardous waste, are at risk of developing chronic respiratory symptoms due to exposure to airway inflammation and glucan. Vulnerable populations, such as children and pregnant women, are increasingly being exposed to waste and e-waste hazards globally. Gutberlet and Uddin (2018), state that e-waste recycling operations can result in higher levels of exposure to harmful substances, impacting the health of future generations. Children living near informal recycling areas are particularly affected, experiencing adverse effects on their growth and development. Ezeah and Roberts (2013) pointed out that the presence of open dumps and landfills increases the risk of disease transmission through disease-carrying animals. This renders communities living near these areas, particularly children, women and the elderly, more susceptible to various diseases, such as diarrhoea, typhoid, anthrax, cholera, malaria and a variety of skin disorders.

Based on the above, it is clear that there are different trends in the gender profile of waste pickers that may be area-dependent or dependent on factors, such as infrastructure requirements, distance of recyclables from households, etc.

The gender profile of the participants is presented in Table 5-2 below.

Table 5-2: Gender profile of survey respondents (*n* = 217)

Waste picker group	Female		Male	
	Frequency	**Percentage**	**Frequency**	**Percentage**
Community informal waste picker (CIWP)	74	34.1%	66	30.4%
Landfill informal waste picker (LIWP)	18	8.3%	20	9.2%
Street informal waste picker (SIWP)	25	11.5%	14	6.5%
Total	**117**	**53.9%**	**100**	**46.1%**

Females were only slightly more represented than males, with 117 (53.9%) females and 100 (46.1%) males in total. The majority of the CIWP group are females who work from home, which makes it more convenient for them and ensures a safe environment, while men work at landfill sites, which is more unsafe for women. A study conducted by Viljoen (2014) found that men are in the majority amongst street waste pickers, mainly due to the risk involved for women. It must be noted that the gender data collected for this research (Table 5-2) reflect the gender profile of 217 waste pickers targeted during a specific time period at specific locations within the Madibeng Local Municipality, while the actual gender profile of the total population of waste pickers operating in the entire Madibeng Local Municipality may differ.

Research by Uhunamure (2021:4) conducted on waste pickers in the Limpopo Province reported similar results, with almost equal representation of female and male waste pickers (52.6% females and 47.4% males). However, contradicting findings were made by Motlhoki (2019), who established that the majority of waste reclaimers in South Africa are male. Similarly, Schenck and Blaauw (2011:417), in their survey among street waste pickers in Pretoria, found that 97% of the waste pickers with whom they engaged were males and 3% were females. On the other hand, Mothiba (2016:47), who conducted a study amongst 176 waste pickers in the City of Tshwane Metropolitan Municipality (CTMM) landfill sites, found a gender distribution of 66% female and 34% male waste pickers.

Samson (2010:6) reported that the different studies on reclaimer groups reveal diverse gender compositions. Some groups are exclusively or predominantly male, while others show a more balanced distribution between men and women. In a few instances, women outnumber men among reclaimers. Additionally, there is evidence of a gender-based division of labour, with men often focusing on the collection of more lucrative materials like metal and planks, while women concentrate on other materials such as glass. These findings underscore the variability in gender dynamics within reclaimer communities and suggest potential disparities in income-generating opportunities based on the type of materials collected.

5.3.2.2 Age

Age refers to an individual's place in the life cycle and his/her membership in a cohort of individuals born at a similar time. Age is a significant predictor of attitudes and behaviours, with differences in attitudes ranging from foreign affairs to social policy. Researchers can use cohort analysis to track a group of people across their lives, analysing changes in views over time and understanding how different formative experiences interact with the life cycle and ageing process (Doherty *et al*., 2015). Based on this information, it is clear that age can be used to determine

people's views about waste picking. The age profile of the respondents is presented in Table 5-3 below.

Table 5-3: Age profile of survey respondents (*n* = 217)

Age	Frequency	Percentage
18 - 25 years	22	10.1%
26 - 35 years	64	29.5%
36 - 45 years	45	20.7%
46 - 55 years	36	16.6%
56 - 65 years	28	12.9%
> 66 years	14	6.5%
Did not disclose their age	8	3.7%
Total	**217**	**100%**

The average age of the waste pickers included in this research was 42 years. The majority of the respondents were between 26 and 35 years of age (29.5%) (an age range that, according to Bhengu (1997), is regarded as *youth/young*[1] *people*), followed by those in the 36 to 45 years of age (20.7%) range. Eight of the respondents (3.7%) did not disclose their age. Younger people (age range 18–25 years) and the elderly (older than 65 years) represented the smallest percentage of the sampled waste picker population, at 10.1% and 6.5% respectively. The youngest respondent was 19 years old, and the oldest respondent was 91 years old. It should, however, be noted that no person under the age of 18 was interviewed due to ethical restrictions of this research purposefully excluding minors.

It should be noted that the data from all waste picker groups, including the CIWP group, are included in Table 5-3. The CIWP group is active in the townships in the Madibeng Local Municipality, where anyone, regardless of age, can participate in informal waste picking due to the accessibility and location of waste picking activities (whereas the LIWP waste pickers mostly consist of the middle-aged).

Uhunamure (2021:3) conducted a similar study with 114 participants at three landfill sites in the Limpopo Province. Access to these sites was controlled by the landfill management who restricted access to minors. Once more, the findings of the present research agree with those of Uhunamure (2021:4), who established that the majority of the respondents were middle-aged (between 31 and 40 years of age). Schenck *et al.* (2019:6) interviewed 373 participants at nine landfill sites in

[1] In South Africa, youth is generally defined as young people aged between 14 and 35 years.

four South African provinces and found the average age of those waste pickers to be 39, with waste pickers as young as 18 and as old as 71 also identified in their study. Schenck *et al*. (2019:7) reported that children were present at one of the landfill sites, which could be problematic in terms of managing health and safety risks for minors.

5.3.2.3 Marital status

Marital status is a significant predictor of health outcomes in epidemiological, public health and social surveys. Marriage can improve individuals' economic well-being, mental and physical health, and the well-being of their children (Wood *et al.,* 2007). This marital status variable will assist in determining the general life quality of the waste pickers. The marital status of the respondents is presented in Table 5-4.

Table 5-4: Marital status of survey respondents (*n* = 217)

Marital status	Frequency	Percentage
Never married/Single	119	54.8%
Married (Traditional or Western)	37	17.1%
Living with a partner	29	13.4%
Widow/widower	16	7.4%
Separated/Divorced	14	6.5%
Question was not answered	2	0.9%
Total	**217**	**100%**

The majority of the respondents (119, or 54.8%) had either never married or were single, while 37 (17.1%) were married and 29 (13.4%) were living with a partner. Sixteen (7.4%) of the respondents were widowed, and 14 (6.5%) were separated or divorced from their partners.

In this study, the number of respondents who stated that they were married was relatively low when compared to report by other researchers. The majority (50%) of the waste pickers in the study by Uhunamure (2021:4) were married, with 33.3% being single, 8.8% being divorced, and 6.1% being widowed. Schenck and Blaauw (2011:424), in their research on street waste pickers in Pretoria, found that 47% of the respondents were married and 53% were unmarried. Sibanda (2019) who studied the health and socio-economic status of 81 waste pickers in Mayville, Cato Manor and Westville in Durban found that the majority of respondents were single, with 38% having never married and 11% being widowed. They faced challenges as single parents, with some stating that they had no partners and preferred waste picking to prostitution.

5.3.2.4 Country and province of origin

As the research focuses on the possible integration of waste pickers into the municipality, it is important to understand where these reclaimers come from. Many of the waste pickers lived illegally in South Africa, which disqualified them from possible integration into municipal structures. The respondents' country of origin is provided in Table 5-5, while the province they were born in is provided in Table 5-6.

Table 5-5: Country of origin of survey respondents (*n* = 217)

Country of origin	Frequency	Percentage
South Africa	189	87.1%
Zimbabwe	18	8.3%
Mozambique	5	2.3%
Lesotho	2	0.9%
Swaziland	2	0.9%
Malawi	1	0.5%
Total	**217**	**100%**

Most respondents (189 or 87.1%) reported that they were from South Africa, while 27 respondents (12.9%) were from countries, such as Zimbabwe (8.3%), Mozambique (2.3%), Lesotho (0.9%), Swaziland (0.9%) and Malawi (0.5%).

According to the findings of Mudavanhu (2019:102), who conducted research on waste pickers in the Western Cape (Stellenbosch and Oudtshoorn), Eastern Cape (Graaff-Reinet) and North West (Potchefstroom and Vryburg), all the respondents were born in South Africa. Schenck and Blaauw (2011:417) reported 14% Xitsonga speakers in their sample of waste pickers, which may have included people from Mozambique, where this language is a recognised majority language.

In the present research, the actual citizen status and the legal immigration status of the respondents were not determined. Wilson *et al*. (2021) reported on the challenges of illegal immigrants working as waste pickers on Johannesburg landfill sites, which included harassment by police or authorities and the danger of xenophobic violence by local people. In his research of waste pickers in the City of Tshwane, Reyneke (2016) found that foreign immigrants were barred from soft waste picking and forced to seek refuge in fringe recycling. The ability of waste pickers to adapt to a hostile environment must not be underestimated. Florin (2018), who conducted a study amongst waste pickers in Istanbul, Turkey, reported that, in August of 2011, a law was introduced banning the informal collection of packaging waste; this law was enforced in 2016.

Notwithstanding this threat, the waste pickers were still able to collect waste by adapting to the situation. They learned how to become invincible, for example, in the main tourist areas of Istanbul, which are closely monitored and controlled. They work skips and dustbins quickly and discreetly, leave the area clean, and ensure that they stay out of the way of pedestrians. Furthermore, Florin (2018) identified large numbers of refugees and illegal immigrants operating in Istanbul as well, presenting similar challenges to those in South Africa. The problem of illegal immigrants operating as informal waste pickers is thus not unique to South Africa.

The respondents' province in which they were born is provided in Table 5-6.

Table 5-6: Province of origin of survey respondents (*n* = 217)

Province born	Frequency	Percentage
North-West	118	54.4%
Limpopo	37	17.1%
Gauteng	20	9.2%
Mpumalanga	6	2.8%
KwaZulu-Natal	4	1.8%
Western Cape	2	0.9%
Eastern Cape	2	0.9%
Foreigners	28	12.9%
Total	**217**	**100%**

More than half of the respondents (54.4%) were born in the North-West Province, which is where the Madibeng Local Municipality is located. Approximately 32.7% of the respondents were born elsewhere in South Africa, with respondents born in neighbouring provinces, Limpopo (17.1%) and Gauteng (9.2%), being the most prevalent of the other South African provinces. Twenty-eight respondents (12.9%) were born in other countries.

In Mudavanhu's research (2019:102), the majority of the respondents were born in the provinces where they operated as waste pickers. Schenck and Blaauw (2011:418), who conducted their study amongst street waste pickers in Pretoria, however, reported that only 3% of their respondents were born in Gauteng, while the majority were from neighbouring provinces (i.e., 63% from Limpopo, 20% from Mpumalanga and 9% from KwaZulu-Natal).

5.3.2.5 Ethnic group and home language

Ethnic group and home language information is important in research because language plays a crucial role in the construction and maintenance of ethnic identity. Most of the respondents (95.9%) reported that they were African (black), while 4.1% indicated that they were either Coloured or Caucasian (white). Schenck *et al*. (2019:6) reported that their respondents consisted of 80% African (black) and 20% Coloured participants, while in Mudavanhu's study (2019:134) 94% of the participants were Africans and 6% were Coloureds.

For the research conducted in Madibeng, the ethnic group profile correlates with the demographic profile of the Madibeng Local Municipality, with 90% of the population being black Africans, 0.9% being Coloured, 4.1% being Caucasian (white), and 0.5% being Indian or Asian (0.54%) (Madibeng, 2018).

The home language of respondents is presented in Tables 5-7.

Table 5-7: Home language of survey respondents (*n* = 217)

Home language	Frequency	Percentage
Setswana	104	47.9%
Xitsonga	24	11.1%
Isizulu	18	8.3%
Shona	17	7.8%
Sepedi	16	7.4%
Afrikaans	9	4.1%
Tshivenda	8	3.6%
IsiNdebele	6	2.8%
IsiXhosa	6	2.8%
Sesotho	6	2.8%
SiSwati	3	1.4%
Total	**217**	**100%**

Approximately 48% of the respondents were Setswana speakers, followed by Xitsonga, IsiZulu, Shona, and Sepedi. None of the respondents reported English as their home language. This result was not unexpected since the research was conducted within the Madibeng Local Municipality in the North-West Province, where the local population is from the Tswana ethnic group and predominantly Setswana speaking. It must be kept in mind that some of the Xitsonga and Shona-speaking participants may be foreigners who come from Zimbabwe.

According to Schenck and Blaauw (2011:418), who conducted their research amongst street waste pickers in Pretoria, the respondents' dominant home languages were Sepedi (43%) and IsiNdebele (20%). Setswana had the lowest representation with 2%. The Sepedi and IsiNdebele-speaking respondents were mostly from Gauteng, while Setswana is the dominant language in the North-West Province, located in close proximity to Pretoria.

5.3.2.6 Level of education

According to Bouchrika (2023), education is important because it is regarded as a prerequisite for social acceptance. Education is supposed to give an individual a sense of value as a productive member of society. No one can ever take away the steadiness that education adds to life. In today's economy, education brings financial security in addition to stability (Bouchrika, 2023). Education aids in the eradication of poverty and hunger, allowing people the opportunity to live better lives (Bouchrika, 2023). The level of education of the respondents is presented in Table 5-8 below.

Table 5-8: Level of education of survey respondents (*n* = 217)

Level of education	Frequency	Percentage
No Schooling	22	10.1%
Up to Grade 7	37	17.1%
Grade 8	11	5.1%
Grade 9	14	6.5%
Grade 10	22	10.1%
Grade 11	37	17.1%
Grade 12	72	33.2%
Did not respond	2	0.9%
Total	**217**	**100%**

One-third (33.2%) of the respondents had a Grade 12 qualification, while 10.1% reported that they had had no form of schooling; 17% of the respondents had had schooling up to Grade 7; and 38.8% had been at school from Grade 8 to Grade 11 (but did not finish school).

Uhunamure (2021:5) reported that only 0.9% of the respondents in his study had no formal education, while 48.2% had primary school education and 50% had secondary school education. Schenck and Blaauw (2011:420) reported that all of their respondents had some level of education, with 76% having attended primary school and 24% having attended secondary school. These trends indicate that, although waste pickers generally have some form of education, their

general schooling levels are typically low, which might be the main reason for their inability to secure regular work within the formal sector (also refer to Section 5.2.2.9 on employment history). Viljoen (2014) found that a significant majority of waste pickers had low education levels, with 92.9% not having completed formal schooling. Viljoen *et al*. (2016) pointed out that low education made it particularly difficult for young waste pickers to enter the formal work sector.

Table 5-9 outlines the reasons provided by waste pickers for abandoning their schooling.

Table 5-9: Reasons for abandoning school (*n* = 217)

Reason for abandoning school	Frequency	Percentage
Finished school	72	33.2%
Did not finish school due to:		
Financial constraints	81	37.3%
No family support	12	5.5%
Orphan	6	2.8%
Abandoned school	6	2.8%
Never attended school	5	2.3%
Teenage pregnancy	4	1.8%
Lack of motivation	4	1.8%
Had to stop schooling to support family	3	1.4%
Bad Health	3	1.4%
Crime	3	1.4%
War in their country	2	0.9%
Addiction to substance	1	0.5%
Did not answer question	15	6.9%
Grand Total	**217**	**100%**

The primary reason for leaving school provided by the respondents was financial constraints experienced by the family (37.3%), followed by a lack of family support (5.5%), or being orphaned due to the passing of parents or guardians (2.8%). Other reasons for abandoning school were addiction to substances, bad health, crime, teenage pregnancy and war in their country.

Similarly, the research by Schenck and Blaauw (2011:420) among street waste pickers in Pretoria established that the primary reasons for leaving school was general poverty and the inability to pay school fees which had forced them to leave school and support their family. These findings are supported by Mudavanhu (2019:171), who cited poverty and financial constraints as the main

reasons for his respondents' leaving school. Mudavanhu (2019) specifically highlighted the concerns related to the reduced employability of people who had abandoned school at an early stage. Viljoen (2014), investigating the social and economic conditions of street waste pickers in South Africa, identified the following reasons for the abandonment of schooling by waste pickers:

- **Financial difficulties**: Financial hardship and poverty arise when parents die, leaving children without support, no one to pay school fees, and only a welfare-based education.
- **School-related:** failed multiple times, lived far from school, received bad treatment or abuse, never attended school or quit school.
- **Family-related problems:** included working on a farm, losing a mother, having a child, abandoning parents, lack of support, being pregnant, parents having too many children and losing grandparents.
- **Behavioural issues:** expelled from school due to disciplinary issues, bad influence, naughtiness. Other factors included gang involvement, street behaviour, drinking, drug addiction, rehabilitation, a lack of motivation, and stress.
- **Health-related:** health problems, illness or disability.
- **Age-related:** Too old.

5.3.2.7 Skills level of waste pickers

Waste pickers are informal workers who gather, sort, recycle and sell recyclables. In spite of the common perception that they are unskilled labourers, they possess a variety of talents that are crucial to their employment: the ability to recognise various waste materials, an awareness of the market value of various waste items, and the capacity to negotiate pricing with buyers (Viljoen *et al*., 2016).

In response to the question of whether respondents had any other training or skills that they might be able to use in another job, only 22.6% of the respondents indicated that they possessed other skills, while 66.8% indicated that they did not have any other skills. Approximately 11% of respondents did not answer the question. Viljoen *et al*. (2016) pointed out that, due to the lack of basic education, skills and formal training, people have no choice but to accept involuntary low-level employment. According to Mudavanhu (2019:188), although some waste pickers had very little formal education, they were able to obtain formal and informal training in various skill sets, such as building, carpentry, construction work, driving, gardening, machine operating, painting, panel beating, paving and plastering, to name a few.

The forty-nine respondents (22.6%) who indicated that they had some form of training or skills were further requested to indicate whether the training was formal or informal (Table 5–10).

Table 5-10: The formal or informal training which some survey respondents had received (*n* = 49)

Formal/informal training	Frequency	Percentage
Formal	23	46.9%
Informal	24	49.0%
Did not answer question	2	4.1%
Total	**49**	**100%**

Respondents with either formal or informal training were almost equally represented, with 46.9% having had formal training and 49% having received informal training. Mudavanhu (2019:94) similarly indicated that 45.8% of his respondents had been able to receive some type of formal training after school. Table 5-11 outlines the type of formal or informal training which waste pickers had received.

Table 5-11: Type of formal or informal training which survey respondents had received (*n* = 49)

Type of formal/informal training (skills)	Frequency	Percentage
Security officer	6	12.2%
Welding	5	10.2%
Computer training	5	10.2%
Painting	4	8.2%
Plumbing	4	8.2%
Electrician	2	4.1%
Brick paving	2	4.1%
Hospitality and tourism	2	4.1%
Office administration	2	4.1%
Builder	1	2.0%
Business man	1	2.0%
Assistant chef	1	2.0%
Carpenter	1	2.0%
Catering	1	2.0%
Drawing	1	2.0%
Home based care	1	2.0%
ICT Office programme	1	2.0%
Life skills programme	1	2.0%
Mechanic	1	2.0%
Panel beating	1	2.0%
Paving/Painting	1	2.0%
Receptionist	1	2.0%

Type of formal/informal training (skills)	Frequency	Percentage
Rock Art	1	2.0%
Upholstery	1	2.0%
Did not answer question	2	4.1%
Total	**49**	**100%**

The most frequently mentioned types of training received were security officer training (12.2%), welding (10.2%), computer training (10.2%), painting (8.2%) and plumbing (8.2%).

Again, Mudavanhu (2019:94–95) reported training in similar skill sets, with some respondents having been specifically trained as drivers, machine operators and re-cycling operators, which could potentially make them employable in the formal waste sector. According to the DEFF and DSI (2020:84), the integration of waste pickers requires a range of skills, for example, participatory planning, translation, organising, facilitation and outreach skills, which are not readily available within municipal structures, and may require the input of consultants/service providers.

5.3.2.8 Language proficiency of respondents

The language proficiency of a person is a very important factor that influences the ability to find a job and sustaining it (Viljoen *et al*., 2016:183). The respondents' English language proficiency (both understood and spoken), which is the main language used in the South African workplace (and in situations where people need to communicate but have different home languages), is presented in Table 5-12.

Table 5-12: How well English is understood and spoken by survey respondents (*n* = 217)

English understood	Frequency	Percentage
Not at all	21	9.7%
Somewhat	71	32.7%
Well	123	56.7%
Did not answer question	2	0.9%
Total	**217**	**100%**
English is spoken	**Frequency**	**Percentage**
Not at all	28	12.9%
Somewhat	63	29.0%
Well	124	57.1%
Did not answer question	2	0.9%
Total	**217**	**100%**

More than half of the respondents (56.7%) indicated that they understood English well, while 32.7% indicated that they understood English to a degree, and only 9.7% admitted that they did not understand English at all. The proficiency in spoken English showed similar trends, with 57.1% of respondents indicating that they could speak English well, 29% indicating that they could speak English to a degree, and 12.9% saying that they could not speak English at all.

According to the research by Mudavanhu (2019:112-156) in the Western Cape, English language proficiency was poorer, with only 14% of the respondents indicating that they understood English well and only 12% saying that they could speak English well. Afrikaans proficiency, however, performed better than English proficiency in the research by Mudavanhu (2019). This finding may be an indication that the dominant working language of a region influences the language proficiency of employees. Both Viljoen *et al.* (2016) and Mudavanhu (2019) highlight that a lack of language proficiency is a significant barrier for waste pickers in their efforts to find alternative employment.

5.3.2.9 Employment history

In the second quarter of 2023 the unemployment rate in South Africa was 32.6% and the youth unemployment rate (15-34 years of age) was 45,3% (Stats SA, 2023). The inability to find employment in other more formal sectors is often the reason for waste pickers to resort to informal waste picking (Mudavanhu, 2019; Viljoen *et al*., 2016).

Data were collected regarding the last full-time job term, the position of the last full-time job, and the reason respondents left their full-time job. According to Mudavanhu (2019:234), a payslip is an indication that the respondent had held a formal position during his or her employment history. A slight majority of respondents (50.2%) reported that they had previously held a ‘formal’ position (where they received a payslip), while 47.0% indicated that they had never held a job where they received a payslip.

Similarly, according to Viljoen *et al.* (2016:180), who had conducted a study on a sample of 914 street waste pickers in thirteen cities across South Africa, 52.4% of the respondents had held formal jobs with benefits in the past. This means that 47.6% lacked formal job experience, which could be a barrier to finding alternative employment in future (Viljoen *et al*., 2016:184).

Table 5-13 provides the previous job profiles of the 109 respondents who indicated that they had held a formal job in the past.

Table 5-13: Job profiles of respondents who indicated that they had held a formal job the past (*n* = 109)

Last full-time job	Frequency	Percentage
General worker	14	12.8%
Operator	9	8.3%
Cleaner	8	7.3%
Cashier	7	6.4%
Security	5	4.6%
Domestic worker	4	3.7%
Driver	4	3.7%
Gardening	4	3.7%
Worked in a mine	3	2.8%
Electrician	3	2.8%
Farm worker	3	2.8%
Maintenance	3	2.8%
Planters/Farm work	3	2.8%
Welder	3	2.8%
Clerk	2	1.8%
EPWP	2	1.8%
Supervisor	2	1.8%
Builder (Construction)	1	0.9%
Butchery	1	0.9%
Carpenter	1	0.9%
Chef	1	0.9%
Co-ordinator (WP)	1	0.9%
Dispatch	1	0.9%
Environmental scientist	1	0.9%
Factory worker	1	0.9%
Landfill assistant	1	0.9%
Loading cargo (Sasko bakery)	1	0.9%
Manager	1	0.9%
Mechanic	1	0.9%
Merchandiser	1	0.9%
Packing	1	0.9%
Painter	1	0.9%
Paver and rock art	1	0.9%
Quality controller (Clipsal)	1	0.9%
Roofing	1	0.9%
Secretary	1	0.9%

Last full-time job	Frequency	Percentage
Store man	1	0.9%
Teacher	1	0.9%
Teller	1	0.9%
Till controller	1	0.9%
Truck driver	1	0.9%
Upholstery	1	0.9%
Assistant driver	1	0.9%
Woolworths co-ordinator	1	0.9%
Question was not answered	3	2.8%
Total	**109**	**100%**

According to the data collected, the respondents had held a variety of jobs in the past, which included general workers (12.8%), operators (8.3%), cleaners (7.3%), cashiers (6.4%) and security officers (4.6%), amongst others. The respondents in the research by Schenck and Blaauw (2011:419), similarly, reported formal jobs, such as farm workers, builder assistants, painters and petrol attendants. Schenck and Blaauw (2011), however, mention that, although the waste pickers in their study indicated that they had had formal jobs in the past, these had normally been part-time and of short duration. The inability to hold a formal, full-time job may have been the reason for their participation in informal waste picking as a way of making a living.

The previous full-time job tenure of the respondents is presented in Table 5–14 below.

Table 5-14: Previous full-time job tenure of survey respondents (*n* = 217)

Full-time job tenure	Frequency	Percentage
0 - 1 year	12	5.5%
2 - 5 years	43	19.8%
6 - 10 years	17	7.8%
11 - 20 years	19	8.8%
> 21 years	6	2.8%
Never had a full-time job	120	55.3%
Total	**217**	**100%**

The majority of respondents (55.3%) reported that they had never had a full-time job. Forty-three respondents (19.8%) had been employed for two to five years, and nineteen (8.8%) had held a position for eleven to twenty years. Only six of the respondents (2.8%) had held a job tenure of more than 21 years. Likewise, Uhunamure (2021:5) reported that, in his study, the majority of

respondents (46.5%) had been employed for one to three years, while 24.6% had had four to five years of employment, and 28.9% had been employed for more than six years. According to Viljoen *et al*. (2016:184), many of the older waste pickers who had had long periods of full-time employment were now doing waste picking to supplement their pensions or old age grants.

The reasons provided by respondents for leaving full-time employment are provided in Table 5-15.

Table 5-15: Reasons provided by survey respondents for leaving their full-time employment (*n* = 217)

Reasons for leaving full-time employment	Frequency	Percentage
Laid off - business/mine/factory closed	26	12.0%
Laid off - business downsizing	11	5.1%
Quit the job for medical reasons	11	5.1%
Quit the job because the wage was too low	11	5.1%
Laid off - business moved	10	4.6%
Quit because of bad treatment from employer	6	2.8%
Disciplinary reasons	3	1.4%
Other	16	7.4%
Did not answer the question	3	1.4%
Never had a full-time job	120	55.3%
Total	**217**	**100%**

The primary reasons why respondents had left their places of employment were circumstances beyond their control, which included being laid off due to the business/mine/factory closing (12%), due to the business downsizing (5.1%), and because the business relocated (4.6%). Eleven respondents (5.1%) indicated that they left the job because the wage was too low. Other reasons mentioned by respondents included taking an early package, an injury at work and relocation. These reasons align with the findings by Viljoen *et al*. (2016:184), namely, that their respondents had left jobs for medical reasons, because of low wages, layoffs due to businesses that were sold or closed down, and due to disciplinary actions.

Lastly, the respondents in the present research were asked whether they were seeking full-time employment. Approximately 65% of them indicated that they were seeking full-time employment, while 32.3% indicated that they were not actively seeking full-time jobs. Seven of the respondents (3.2%) did not answer the question. According to Viljoen *et al.* (2016:184), 70% of their sample of waste pickers preferred full-time employment and indicated that waste picking was “a survival

activity". Entry into this low-wage labour segment is involuntary, as the person does not have the needed skills or education to find something better in the labour market (Viljoen *et al*., 2016).

The reasons, provided by the seventy (32.3%) respondents who were *not* seeking formal employment, are provided in Table 5-16.

Table 5-16: Reasons for not seeking full-time employment (*n* = 70)

Reasons for not seeking full-time employment	Frequency	Percentage
Age barrier	**36**	**51.4%**
Pensioner	23	32.9%
Already past my prime years	1	1.4%
At my age I prefer to be self employed	1	1.4%
I'm too old to work	11	15.7%
Being independent (including business mind-set)	**20**	**28.6%**
I need to be self-employed and concentrate on my business	1	1.4%
I am in pursuit of my passion and dreams	1	1.4%
I make furniture and sell it when not recycling	1	1.4%
Self-employed	17	24.3%
Health issues	**5**	**7.1%**
Education barrier	**3**	**4.3%**
Cannot read or write English or Afrikaans	1	1.4%
Did not go to school	1	1.4%
Without any skill or higher education finding a job is not easy	1	1.4%
Question was not answered	6	8.6%
Total	**70**	**100.0%**

Four main themes emerged based on the responses from participants who indicated that they were not seeking full-time employment: (i) age barrier, (ii) health barrier, (iii) being independent (including business mind-set) and (vi) education barrier. Approximately 51% of respondents indicated that the age barrier prevented them from seeking full-time employment (outside of waste picking). These respondents indicated that they were "pensioners," "too old to work" or at "an age where they preferred to be self-employed." Viljoen *et al.* (2016:184) also state that many waste pickers are pensioners who use waste picking to supplement their pensions or Government grants. Twenty respondents (28.6%) in the present research preferred being independent, indicating that they preferred to be "self-employed," "in pursuit of their passion or dreams" or that they "had another job".

According to Mothiba (2016:53), who conducted a study among 176 waste pickers in the City of Tshwane Metropolitan Municipality, 3% of the respondents valued waste picking as this made

them independent (they did not have to report to anybody) and, thus, self-employed. This is confirmed in the Guidelines for Waste Picker Integration (DEFF & DSI, 2020:14) and by Komane (2014). Five (7.1%) respondents stated that they had health issues that prevented them from working formally elsewhere. Lastly, three respondents (4.3%) indicated that they had education barriers: they could not read or write English or Afrikaans, or they had not gone to school. This finding is supported by Viljoen *et al*. (2016:183) and Mudavanhu (2019:113), who state that the lack of education and language proficiency is a barrier for waste pickers in their efforts to find alternative employment.

5.3.3 RO2: Status of informal waste reclaiming practices in the Madibeng Local Municipality

This section outlines the characteristics of waste picking in the Madibeng Local Municipality by providing an overview of waste picker job characteristics, duration of working as a waste picker, work hazards, waste pickers' social situation, the sources of recyclable waste, types of recyclable waste collected, methods used to transport collected recyclable waste, storage, selling and rewards for their effort. This will assist the reader in understanding where and how waste pickers manage and respond to each element of the informal waste picking business process. The latter is presented in Figure 5-1 below, which will serve as a structure for the presentation of the sub-sections in Section 5.2.3.

The informal waste picking business process can be briefly described as follows: Waste pickers function exclusively in the informal recycling value chain, where they obtain, buy or lease a trolley to collect waste from households, waste containers, businesses and the streets. The collected waste is then taken to informal waste sorting sites (spaces provided by the municipality for waste pickers) where recyclable materials, such as paper, plastic, glass, wood, clothes and food are separated from the waste that cannot be recycled or that does not have a resell value. The salvaged waste is then grouped and sold to recycling buyers. The informal waste picking business process is presented in Figure 5-1 below.

Figure 5-1: Informal waste picking business process (Source: Researcher's own compilation)

5.3.3.1 Characteristics of informal waste picker's work

The work of waste pickers varies across different cities and regions, and there is no consistent terminology to describe them (Peres, 2016; Samson, 2010). The term 'scavenger' is considered inappropriate due to its negative association with animal imagery (Samson, 2010). Waste pickers rely on waste generated by households and businesses, which they collect from waste bins or skips (Schenck & Blaauw, 2011). This work is characterised by poor working conditions, exposure to health and safety risks, low social status and extreme poverty (Morais *et al*., 2022). It is dirty, dangerous and demanding work with low rewards (Mamphitha, 2011). Moreover, according to Sapkota *et al.* (2020), waste reclaimers also face discrimination and stigma not only from the general public, but also from their own families and colleagues.

The term 'waste picker' refers to individuals who make a living by collecting and reclaiming reusable and recyclable materials from discarded waste (Samson, 2009). Scheinberg *et al*. (2016) highlight that waste pickers in the European Union are predominantly from three vulnerable groups: ethnic minorities, migrants and refugees without legal status or identity documentation, and individuals excluded from the labour market, such as young people, the elderly, women heads-of-household, and homeless individuals. These groups face social exclusion and limited

educational opportunities. According to Parra and Vanek (2023:9), a waste picker is defined in Colombia as:

> *"a person who habitually performs the activities of recovery, collection, transportation, or classification of solid waste for its subsequent reincorporation into the productive economic cycle as raw material and who derives one's [sic] own and the family's livelihood from this activity."*

Despite the challenges, waste pickers play a valuable role in waste management by reducing landfill waste and recovering valuable materials for recycling, thereby reducing the need for importing raw materials (Mamphitha, 2011). In the context of Cape Town, waste pickers are referred to as 'strollers' and their work as 'skarrelling' (Peres, 2016). 'Strollers' is a local euphemism for street children or youth engaged in informal street work, while 'skarrelling' is Afrikaans slang meaning "always on the lookout for something" or "struggling but doing something about it" (Peres, 2016). However, the term 'waste picker' is used in cross-country advocacy work and by the South African Waste Pickers' Association (SAWPA), which represents some waste pickers in South Africa (Samson, 2010).

The job characteristics of waste pickers, which include duration of work, working hours and number of working days per week, are outlined in the sub-sections below.

5.3.3.2 Duration of time working as a waste picker

The duration of employment in a certain position refers to the length of time a person has worked in that position. It is also referred to as tenure. The length of time spent in a particular position is significant since it can affect a worker's salary, benefits and job stability. Long-tenured employees are often more competent and skilled than those who are new to their position. The respondents' duration of time working as waste pickers is presented in Table 5-17.

Table 5-17: Duration of time working as a waste picker (n = 217)

Duration of time working as a waste picker *(Average 4 years and 5 months)*	**Frequency**	**Percentage**
1 to 3 Months	8	3.7%
4 to 6 Months	8	3.7%
7 to 11 Months	13	6.0%
1 to 3 Years	88	40.6%
4 to 6 Years	54	24.9%
7 to 9 Years	22	10.1%
10 to 15 Years	16	7.4%
> 15 Years	3	1.4%
Question was not answered	5	2.3%
Total	**217**	**100%**

The majority of respondents (40.6%) had been working as waste pickers for between one and three years, while approximately 35% of respondents had been waste pickers for between four and nine years, and 9% of respondents had been waste pickers for more than 10 years. Approximately 14% of the respondents were relatively new to waste picking, with less than one year of waste picking experience. On average, the respondents had been waste pickers for a period of 4 years and 5 months.

Data collected by Mamphitha (2011) from twenty waste pickers in Johannesburg through semi-structured interviews found that thirteen (65%) of the participants had been waste pickers for one to six years, while seven (35%) had been picking waste for an average of about ten years. Mlotshwa *et al*. (2022), who conducted a study amongst eight waste pickers in the city of Durban, reported that seven of their participants had waste reclaiming experience of between seven and twenty years, with the eighth respondent having 31 years of waste reclaiming experience.

5.3.3.2.1 Waste pickers' working hours

Waste pickers generally have very long working hours, with some waking up at 4 a.m. to travel to their working area (often located far from their homes), which they reach around 6 a.m. to collect waste (before waste collection vehicles arrive) (Maema, 2017). According to Mlotshwa *et al.* (2022), males had fewer domestic responsibilities (at home) than women and were able to work longer hours and earn more money than their female counterparts. Sub-sections 5.2.3.1.3 to 5.2.3.1.5 provide information on the working hours and days of respondents.

5.3.3.2.2 Start and end of their work day

The start and ending (knock-off) times of the respondents' work day are presented in Table 5-18 below.

Table 5-18: Start and knock-off times from work (n = 217)

Start Time			Knock-off time		
Time	**Frequency**	**Percentage**	**Time**	**Frequency**	**Percentage**
04:00	2	0.9%	10:00	3	1.4%
05:00	21	9.7%	11:00	4	1.8%
06:00	49	22.6%	12:00	8	3.7%
07:00	40	18.4%	13:00	11	5.1%
08:00	76	35.0%	14:00	16	7.4%
09:00	16	7.4%	15:00	28	12.9%
10:00	3	1.4%	16:00	45	20.7%
11:00	2	0.9%	17:00	66	30.4%
12:00	0	0.0%	18:00	15	6.9%
13:00	0	0.0%	19:00	10	4.6%
14:00	1	0.5%	20:00	4	1.8%
Question was not answered	7	3.2%	21:00	2	0.9%
			Question not answered	7	3.2%
Total	**217**	**100%**	**Total**	**217**	**100%**

The majority of respondents (76%) stated that they started working between 06:00 and 08:00 in the morning, while approximately 10% of respondents started between 04:00 and 05:00. Only a few (roughly 10%) indicated that they started later than 9:00 in the morning. Approximately 76.5% of respondents finished work between 13:00 and 17:00. These hours generally relate to waste collection schedules of municipalities, which normally do not stretch beyond 17:00. Waste pickers working beyond 17:00 may be benefitting from waste being brought to the kerb-side in the afternoon for collection on the next day. In this study the average working hours for waste pickers in general was 8 hours and 33 minutes.

Upon closer consideration of the data, it was interesting to note that differences existed between street and landfill waste pickers. Landfill informal waste pickers (LIWP) had clearly defined start and knock-off times: between 07:00 and 08:00 and between 15:00 and 17:00 respectively. Their average daily working hours was 8 hours and 4 minutes. Only a limited number of waste pickers can be allowed to work at the landfill sites at any given time. The average working hour for CIWPs

was 8 hours and 34 minutes, and for SIWPs it was 8 hours and 56 minutes. According to Peres (2016:32), who conducted a study amongst waste pickers in Cape Town, “picking at landfills remains outlawed.” This information is contradicted by the findings of Mudavanhu (2019:85), who stated that “the landfill site was previously accessible to anyone interested in waste picking,” but for security reasons access was restricted to 40 to 50 waste pickers per day.

In Madibeng, waste pickers who want to work at the Madibeng Local Municipality landfill site need to submit a Municipal Landfill and Transfer Station: Recyclers Application to the Department of Community Services, Division: Waste and Environmental Management (see Annexure E: Waste Picker Permit). Applicants need to submit personal details that include a South African identity number, or a passport number for people coming from other countries. The application form states that only a limited number of recyclers can be accommodated at the landfill or transfer station facilities. The recycling companies and individuals at the landfill site and transfer station facilities, are expected to abide by the conditions and rules of the municipal waste landfill and transfer stations. It is compulsory for the staff of these companies – when they are on the landfill site or at the transfer station - to assist with waste picking per supervisory arrangement. Entry to the landfill site is obtained by showing their permit to security staff at the gate who will allow them to conduct waste picking. Landfill waste pickers work during landfill operating hours, from 7:30 until 16:00, as prescribed by the landfill licence conditions. The group is thoroughly observed and managed by municipal officials in charge of the site operation.

However, street informal waste pickers (SIWPs) and community informal waste pickers (CIWPs) have start and knock-off times beginning around 04:00 to 11:00 and ending around 17:00 to 21:00. There is no clear start-and-knock-off trend for these waste pickers and their movements are probably influenced by waste collection schedules. The rural or community informal waste pickers depend on accessing materials from local businesses, such as taverns and shops, as well as from households. They, therefore, mostly harvest their materials between 11:00 and 17:00. Informal street waste pickers who reside on the outskirts of the urban area need to cover long distances (mostly on foot) and be on time to access refuse bags and wheelie bins, which are normally taken out early (between 06:00 and 07:00) for kerb-side collection. This may explain the relatively early starting times of the majority of the respondents. According to Mamphitha (2012:50), approximately 75% of his respondents started around 03:00 and finished at around 17:00.

It is clear that the type and place of waste picking influences the starting and ending times of waste pickers’ activities.

5.3.3.2.3 Working hours per day

According to Viljoen (2014) and Mamphitha (2011), waste pickers need to work approximately 8 to 12 hours per day to reclaim sufficient amounts of waste. The number of working hours per day of respondents is presented in Table 5-19 below.

Table 5-19: Number of working hours per day of respondents (n = 217)

Working hours per day	Frequency	Percentage
2 - 5 Hours	24	11.1%
6 - 8 Hours	77	35.5%
9 - 10 Hours	67	30.8%
> 10 Hours	44	20.3%
Question was not answered	5	2.3%
Total	**217**	**100%**

The average working hours per day was 8 hours. Approximately 65% of respondents indicated that they worked between 6 and 10 hours per day, while about 20% indicated that they worked more than 10 hours per day. Only 11.1% of respondents indicated that they worked less than 5 hours (2 to 5 hours) per day. These latter respondents were mostly those who collected waste during a specific time window (i.e., kerb-side reclamation early in the morning before waste collection by the municipality) or were opportunistic homeless people gathering any recyclables for daily trade. Waste pickers collecting waste from landfill sites would typically work about 6 to 7 hours per day (aligned with landfill site operating hours), while street informal waste pickers would typically work for longer hours (on average 9 hours per day) due to the limited recyclables available for collection and the long distance that they needed to cover to gather sufficient materials for trading. Community informal waste pickers (CIWPs) worked about 8 hours per day.

According to Mamphitha (2011), approximately 75% of his respondents worked 12 hours per day, starting at around 3:00 and finishing at around 17:00. The remaining 25% of the respondents worked flexible hours, indicating that “as long as waste is available, [they] would pick it up”.

5.3.3.2.4 Number working days per week

The number of working days per week is presented in Table 5-20 below.

Table 5-20: Number of working days per week (n = 217)

Number working days per week	Frequency	Percentage
1 Day	2	0.9%
2 Days	2	0.9%
3 Days	2	0.9%
4 Days	10	4.6%
5 Days	68	31.3%
6 Days	39	18.0%
7 Days	83	38.2%
Question was not answered	11	5.1%
Total	**217**	**100%**

Eighty-three (38.2%) of the waste pickers indicated that they worked 7 days per week, while approximately 49% of respondents averaged between 5 and 6 days per week. Only 16 respondents (7.3%) indicated that they worked 4 days or less per week. These are regarded as 'casual informal waste pickers' who collect waste only sporadically as a means of meeting their needs for that day.

According to the research by Uhunamure (2021:5), who investigated waste pickers at three landfill sites in the Limpopo Province, South Africa, most of their respondents worked 5 days or more per week (approximately 26% picked waste 5 days a week, 34.2% of the respondents worked 6 days a week, and 36% worked 7 days a week). Mokobane (2017), who investigated waste pickers in Johannesburg, found that they mostly worked 5 days per week and regarded Saturdays and Sundays as reset days (probably also because waste is typically not collected by the municipality on these days, and thus waste was not being placed outside for kerb-side collection). Furthermore, according to Wilson *et al.* (2021), on average, women had worked more years as waste pickers than men. The majority of women worked 5 days per week on the landfill, while men were more likely to work 6 or 7 days.

5.3.3.3 Collection of recyclable waste

The sub-sections below reflect on the collection of recyclable waste by focusing on the available sources of recyclable waste, types of waste collected, and days needed to collect sufficient waste to sell.

5.3.3.3.1 Available sources of recyclable waste

Available sources of recyclable waste that waste pickers can utilise are presented in Table 5-21 below. Respondents were requested to indicate all possible sources from which they collect recyclable waste.

Table 5-21: Available sources of recyclable waste (respondents were requested to select all applicable options)

Sources of recyclable waste	Frequency	Percentage (*n* = 217)
Shops/businesses	147	67.7%
Dustbins outside houses	143	65.9%
Schools	51	23.5%
Industrial areas	50	23.0%
Along the road	16	7.4%
I buy from people	3	1.4%

As indicated in Table 5-21, 147 of the 217 respondents (67.7%) indicated that they harvested their recyclables from shops and businesses, while 143 (65.9%) respondents collected waste from dustbins (or bags) outside houses (kerb-side reclamation). Schools (23.5%) and industrial areas (23%) were also popular sources of recyclable waste. Sixteen (7.4%) of the respondents indicated that they collect recyclables along the road (as litter), and only three respondents (1.4%) purchased recyclables from other people.

These findings are supported by Mamphitha's research (2012:69), which established that waste pickers collected recyclables from households, schools, businesses, government buildings and streets. Mokobane (2017), who investigated waste pickers in Johannesburg, found that their daily collection areas (which included mainly households and businesses) corresponded with Pikitup's (which is the responsible entity for waste collection in the City of Johannesburg) waste collection schedule. (Pikitup is the responsible entity for waste collection in the City of Johannesburg)

5.3.3.3.2 Types of recyclable waste collected

Reyneke (2016:59) stated that recyclable waste can be classified into 'soft waste' (e.g., paper, different types of plastic, glass and cardboard) and 'scrap-metals' (e.g., iron, copper, aluminium, zinc, brass and steel objects). Both these categories of recyclable waste are collected from streets (kerb-side collection) and landfills (Barnes *et al*., 2021). According to Mudavanhu (2019), the time available to waste pickers at the waste source plays a major role in their collecting behaviour and

the amount of money they can make from the waste stream (also see Section 5.2.3.5. regarding waste pickers' income).

The types of recyclable waste collected are presented in Table 5-22 below. Again, waste pickers were requested to indicate all applicable options.

Table 5-22: Types of recyclable waste collected (respondents were requested to select all applicable options)

Recyclable waste types	Frequency	Percentage (n = 217)
Cans	197	90.8%
Plastic	178	82.0%
Glass	144	66.4%
Paper	138	63.6%
Cardboard	132	60.8%
Metals	96	44.2%
Tetrapak	57	26.3%
Batteries	43	19.8%
Globes (lighting)	18	8.3%

Cans (i.e., cooldrink cans, canned food tins) were the most frequently collected waste type due to their high resale value, with 90.8% of respondents indicating that they collected this waste stream, followed by plastic (82%), glass (66.4%), paper (63.6%) and cardboard (60.8%). Approximately 44% of respondents collected metals, while 26.3% of them collected tetrapak (i.e., milk cartons, juice boxes). Batteries and globes were collected at lower frequencies (by less than 20% of respondents). These collection rates are most likely linked to the prices of these products and the markets for these waste streams in and around the Madibeng Local Municipality.

Mudavanhu (2019) reported that the waste pickers investigated in his research prioritised collecting metal and plastics because they were the most valuable types of waste. They did not collect boxes because the BBCs (presumably buyers or recycling centres) did not pay well for them. They only collected boxes when they had time to spare. Wilson *et al*.'s (2021) study found that men tended to collect items of greater value, such as electronics, metal and cans, while women collected items, such as plastic, glass and paper. Anierobi *et al.* (2022), in their research on waste pickers in the Enugu Metropolis, Nigeria, found that the following materials were preferred by waste pickers: plastic, paper, polythene, nylon, rubber, charcoal, wood, garbage food, textiles that include clothing, leather, glass, aluminium, silver materials, gold, iron, steel and copper.

5.3.3.3.3 Days needed to collect sufficient waste to sell

According to Mudavanhu (2019), waste pickers need to accumulate sufficient volumes of recyclable material before selling it to buyers to make their effort worth the amount of money they earn. The number of days required to collect enough recyclable waste to sell may depend on a variety of variables, including the type of recyclables, the location of the waste source, and the demand for the recyclable waste. For instance, if the waste source is located in a densely populated area with a high waste creation rate, it may take less time to gather enough recyclables for sale. Similarly, it may take less time to gather enough recyclable waste to sell if there is a high demand for a particular sort of waste (Mamphitha, 2011; Viljoen, 2014; Mudavanhu, 2019; Anierobi *et al.,* 2022).

The number of days needed by waste pickers to collect sufficient waste to sell is presented in Table 5-23 below.

Table 5-23: Number of days needed to collect sufficient waste to sell (n = 217)

Number of days needed to collect sufficient waste to sell	Frequency	Percentage
1 Days	7	3.2%
2 Days	2	0.9%
3 Days	3	1.4%
4 Days	9	4.1%
5 Days	59	27.2%
6 Days	32	14.7%
7 Days	50	23.0%
10 Days	1	0.5%
12 Days	1	0.5%
14 Days	5	2.3%
15 Days	3	1.4%
> 15 Days	37	17.1%
Question was not answered	8	3.7%
Total	**217**	**100%**

Approximately 65% of respondents needed between 5 and 7 days to collect enough waste to sell. Only 9.6% of respondents indicated that they needed between 1 and 4 days to collect sufficient waste, while 4.7% of them needed between 10 and 15 days to collect sufficient waste. Approximately 17% of respondents took more than 15 days to collect sufficient waste to sell.

Based on the responses of these respondents, it can be assumed that the amount of recyclable waste may either be very limited in these cases or that competition to access waste may be a limiting factor.

Mamphitha (2011:53) reported that, on average, waste pickers collect waste for up to 3 days before they had sufficient waste to deliver to buyers. Waste pickers working on landfill sites in KwaZulu-Natal indicated that they spent about one week collecting waste before having sufficient volumes to sell to buyers (DEFF & DSI, 2020).

5.3.3.4 Waste transportation

The first step in the waste recycling chain is to collect and then transport the recyclable waste from its source to a buyer of recyclable waste. This section discusses the different means that waste pickers use to move their recyclable waste from point A (collection) to point B (point of sale).

5.3.3.4.1 Types of transportation used

Waste pickers need to transport their collected recyclable waste from the point of collection to the buy-back centres. Schenck and Blaauw (2011) state that acquiring a means of transportation was one of the important success factors in waste picking because waste pickers with a means of transportation (i.e., a trolley) could move faster and, therefore, make more money. According to Mokobane (2017), the cheapest mode of transportation for waste pickers in South Africa was walking while carrying the collected recyclables on their heads or on their backs. Another frequently used option was walking while pulling/pushing a trolley (or sometimes wheelbarrows) into which they had placed the collected recyclable waste (Anierobi *et al*., 2022; Mokobane, 2017).

The different methods of transportation which waste pickers used are presented in Table 5–24.

Table 5-24: Different transportation methods which waste pickers use (n = 217)

Different transportation methods	Frequency	Percentage
Trolley	15	6.9%
I use waste bags given to me by people I sell to	8	3.7%
Hired vehicle	4	1.8%
Carried on my head	4	1.8%
I have own transport	4	1.8%
Wheelbarrow	3	1.4%
I'm using a child’s pram	1	0.5%
Question was not answered	178	82.0%
Total	**217**	**100%**

It is noteworthy that the majority of respondents (178 or 82%) did not answer this question or indicated that it was not applicable. It may be that these waste pickers worked at landfills or satellite sites where there was no need to move their recyclables over a long distance. Of the 39 participants who responded to the question, 15 used a trolley and 8 used waste bags provided to them by sellers. Other modes of transport, such as hired vehicles, carrying waste on their heads, using their own transport, and/or wheelbarrows or prams, were mentioned at lower frequencies.

According to the research by Mamphitha (2011:25) conducted in Johannesburg in 2011, the primary methods of transporting recyclable waste were by hand, wheeled bins, wheelbarrows, handcarts or other trolleys. Asim *et al*. (2012) reported that in the study area of Allama Iqbal Town, Pakistan, recyclable waste was collected by 'Korreywalas' (or household waste pickers) using donkey carts to transport it to transfer stations. Florin (2018), who conducted a study in Istanbul, Turkey, found that waste pickers, referred to as 'Toplayclar', used trolleys for their waste transportation. Trolleys are typically acquired from merchants, other waste pickers or retailers, while some waste pickers manufacture their own trolleys. According to Mamphitha (2011), waste pickers regularly service their trolleys, which gave the latter a lifetime of three to six months before a new one was required.

Mamphitha's (2011) study reported that the majority of the investigated waste pickers bought their trolleys from merchants, other waste pickers or retailers, such as Pick 'n Pay, for R50. Dladla (2018), who conducted a study in Johannesburg to investigate municipal relationships with waste pickers, reported that well-constructed trolleys, with reflectors to make them more visible, were donated by a private company to a group of waste pickers as a municipal project. Mokobane (2017) pointed out that a problem with owning a trolley was that it could be stolen.

5.3.3.5 Collected recyclable waste utilisation and storage

As mentioned earlier, recyclable waste cannot be sold to waste buyers in small quantities and thus needs to be stored. In this section, aspects surrounding the storage of recyclable waste, and its possible utilisation for personal use, are presented.

5.3.3.5.1 Utilisation of recyclable waste for personal use

Access to recyclable waste gives waste pickers the opportunity to acquire items for personal use; for example, clothes, sheeting for erecting temporary structures as shelters, and household goods, such as pots and pans (Mudavanhu, 2019). To determine the extent of the utilisation of recyclable waste for personal use, the respondents were asked the question "Are there goods that you collect for personal use?" A total of 81.6% (177) of respondents reported that they themselves used some recyclable waste products, while 16.6% (36) of respondents indicated that

they did not personally use recyclable waste. Types of recyclable waste items reclaimed for personal use by respondents are presented in Table 5-25.

Table 5-25: Types of recyclable waste items kept for personal use by respondents

Types of recyclable waste reclaimed for personal use	Frequency	Percentage
Furniture	7	3.23%
Clothing	5	2.30%
Iron, TV, DVD player, Stove	5	2.30%
Electrical appliances	3	1.38%
Appliances and furniture	3	1.38%
Board to help build living structures, e.g., shack and furniture	1	0.46%
Buckets	1	0.46%
Clothes and electronics (irons, TV, radio) and chairs	1	0.46%
Clothes, iron, cell phones, pens	1	0.46%
Food, clothing and some furniture	1	0.46%
Furniture and electrical appliances if they work	1	0.46%
If I find something I could use I take it for myself	1	0.46%
If I found something I can use; wood I use for making fire at my house	1	0.46%
Light bulbs	1	0.46%
Wood that I use to make furniture	1	0.46%
Not answer or refused to answer	184	84.79%
Total	**217**	**100%**

The items that respondents kept – and fixed, if necessary - for personal use ranged from furniture, clothing, electronic appliances, cell phones to buckets and building materials (Table 5-25). Schenck and Blaauw (2011) state that waste pickers collected an array of items that they used to improve their personal well-being, which included clothing, electronic devices (for example, cell phones), food, kitchen essentials and building materials. Mudavanhu (2019) concurs that some waste pickers collect items for personal use, for example, clothes that can be worn, household goods, and scrap roofing sheets to build temporary housing structures.

5.3.3.5.2 Reclamation of food for own or family consumption

Against the background of South Africa's high unemployment rate, crime and loadshedding contributed to food insecurity, especially in poorer communities (Mudavanhu, 2019; Schenck *et al*., 2019). Another primary contributor is the influx of people from other African countries due to

the latter's local economic and political climate (Chidzungu, 2017). Morais *et al*. (2022) point out that waste pickers live in absolute poverty, which means hunger and malnutrition in most cases. According to Chen and Carré (2020), a 2009 survey in Southern Africa across poor areas in eleven cities, showed a high reliance on informal food resources, and that the primary food source for some waste pickers was dustbins or landfill sites. The collection of food from dustbins or landfill sites poses a serious health risk; for example, food poisoning that may cause diarrhoea, parasite infection and nausea (Mothiba, 2016). According to Mudavanhu (2019), for safety and health reasons, waste pickers are not allowed to pick any food from the landfill site. Food that arrives by dump trucks or commercial vehicles is dumped into a hole and immediately covered by dirt.

It was evident that most informal waste pickers seemed uncomfortable with responding to the question regarding food reclamation from bins. It was recorded that 92.6% of them chose not to answer the question.

Mlotshwa *et al.* (2022), who conducted a study of waste pickers in Durban Central, reported that one young waste picker collected vegetables from the market refuse bins, which he then sold. Schenck *et al.* (2019) reported that many waste pickers depend on food they find at landfill sites – despite the health risks mentioned.

The waste pickers were then asked to indicate the type of food collected/reclaimed, if applicable (Table 5-26). Only sixteen participants responded to the question.

Table 5-26: Possible food reclamation from bins (n = 217)

Type of food reclaimed from bins	Frequency	Percentage
Meat, maize meal	3	1.38%
Any clean edible food	2	0.92%
Fruits and consume them	2	0.92%
Solid food like bread and fruits	2	0.92%
All good food not mixed with diapers	1	0.46%
Any kind of food	1	0.46%
Any kind of food - even braai pack of chicken if it is not off	1	0.46%
Anything to eat	1	0.46%
Groceries from Spar	1	0.46%
Sometimes bread and expired can food	1	0.46%
Sometimes I find bread and I eat it while working	1	0.46%
Question not answered	201	92.60%
Total	**217**	**100.00%**

The types of foods collected from the bins for personal or family consumption included any edible portions of food, such as bread, fruits, meat and maize meal, to name but a few. Chidzungu (2017) and Mlotshwa *et al*. (2002) reported that waste pikers were tempted to pick up dump food and eat it on the spot with dirty hands. Chidzungu (2017) witnessed how meat, dumped by a truck, found its way to cooking in the open fires, while the rest was taken home for family consumption or possible sale to other households (even though the municipality attempted to thwart the retrieval of dumped food).

5.3.3.5.3 Storage of recyclable waste

According to the Global Alliance for Incinerator Alternatives (GAIA) (2021:19), storage space for recyclables is important to protect them from the elements (i.e., weather) and to keep them from being stolen. Furthermore, being able to access a storage facility increases the volumes that can be collected, which may increase the bargaining power of sellers (Marello, 2013:12). It is economically more feasible for waste pickers to collect and store their recyclables, since selling recyclables in bulk allows for better prices (Marello, 2013).

Respondents were asked to indicate whether they stored their recyclable waste somewhere (between collection and sale). A total of 78.3% of the respondents indicated that they stored their recyclable waste before they sell it, while 18% of the respondents did not do so. This means that these respondents traded their recovered materials daily or that they traded waste soon after collection at landfill sites.

Respondents said that they stored recyclables in bags, crates, old steel drums, plastic containers, bins, recycle bags or, in some cases, in bulk containers. Places of storage included back yard storage, landfill sites where they work, hiding their reclaimed items in the open field, storing them in owned or rented spaces, or storage at municipal transfer stations.

GAIA (2021) pointed out that waste pickers face the challenge of finding adequate space and shelter for the sorting and storage of collected recyclable materials. Without storage space, collected recyclable materials cannot be held safely as they run the risk of being stolen. Another challenge is that unsheltered materials can be damaged or destroyed by the weather. Marello (2013) points out that access to storage space can increase the collected volume, which increases bargaining power with buy-back centres. Furthermore, Mlotshwa *et al*. (2022) state that in the Durban City Centre there is one material recycling facility (MRF) where waste pickers can safely sort and bundle waste for collection by buyers. The research further reported that an interesting strategy used by women waste pickers (working in the Durban-area) was that they built relationships with retail stores where they cleaned the retailer's waste area for free in

exchange for recyclable waste. Using this strategy, some of these women were able to secure storage space for their recyclable waste.

5.3.3.6 Selling of recyclable waste materials

Waste pickers make a living by searching for and recovering recyclable waste materials at landfill sites, on the street or from dustbins, and then typically selling them to buy-back centres that, in turn, insert them into the recycling value chain (Samson *et al*., 2021; Morais *et al*., 2022). In this section, the selling of recyclable waste materials by the investigated waste pickers is presented.

5.3.3.6.1 Buyers of recyclable waste materials

According to Ezeah *et al*. (2013), buyers of recyclable waste (from waste pickers) typically include recycling dealers, recycling small and medium-sized enterprises (SMEs), scrap yards and processors - all of which play an important part in the waste-to-worth life cycle. Some buyers in private industry will not purchase from individual waste pickers, as they rely on quality and volume, thereby creating a role for a middleman (Ezeah *et al*., 2013).

The buyers of recyclable waste materials from the respondents in the present research are indicated in Table 5-27.

Table 5-27: Buyers of recyclable waste (respondents were requested to select all applicable options)

Buyers of recyclable waste	Frequency	Percentage (over 217)
Private individuals	140	63.6%
Buy-back centres/depots	75	34.1%
Other sellers	5	2.3%

The majority of respondents (140 or 63.6%) sold their recyclable waste to private individuals, while 34.1% of the respondents preferred to sell their recyclable waste to buy-back centres or waste depots. It must be noted that the waste pickers in townships and on landfill sites stated that they mostly sold to an ‘individual’ who collected the recyclable waste from them. In reality, this ‘individual’ was the representative of a buy-back centre. Five of the respondents (2.3%) indicated that they sold their waste to ‘other sellers,’ such as private individuals, hawkers or to larger recycling companies (Viljoen, 2014).

Mudavanhu (2019:125) mentions in his study, done in Johannesburg, that waste pickers at the landfill sites mainly sold their recyclables to assigned buy-back centres that collected the recyclable waste from them at the landfill site. This led to a different set of problems, as the buy-

back centre did not conduct daily collections. Buying prices differed between different buy-back centres, and that resulted in the waste pickers selling their recyclable waste to other buyers who offered higher prices. Anierobi *et al*. (2022), who conducted a study on waste pickers in the Enugu Metropolis, Nigeria, stated that collected recyclable waste was transported to buyers in sack bags, wheelbarrows or trollies - in many instances far away from the source of the waste.

Waste pickers were asked to indicate the distance they needed to travel to buy-back centres, as presented in Table 5-28.

Table 5-28: The distance to recyclable waste buy-back depots (n = 217)

Distance to buy-back depots	Frequency	Percentage
30 minutes' walk (approximately 5 to 7 km)	32	14.7%
60 km away (Pretoria area)	19	8.8%
32 km away (Rosslyn area)	9	4.1%
5 to 7 km away (Brits Central)	8	3.7%
18 km away (De Wildt area)	3	1.4%
23 km away (Ga-Rankuwa area)	2	0.9%
30 km away (Hebron area)	1	0.5%
I don't know	2	0.9%
Question was not answered	141	65.0%
Total	**217**	**100%**

A total of 141 (65%) of the respondents indicated that they did not have access to buy-back centres and, therefore, did not answer the question. Thirty-two respondents (14.7%) reported that they travelled about 30-minutes on foot (approximately 5 to 7 km) to their nearest buy-back centre. The remaining respondents travelled between 10 and 60 kilometres (both on foot or by car for longer distances) to reach their waste buy-back centres. It seemed that the possibility of obtaining higher prices was the reason for waste pickers being willing to travel longer distances to buy-back centres.

Research by Mamphitha (2011:45) indicates that some waste pickers cover an average of 5 to 30 kilometres per day, mostly on foot, between waste reclamation points and buyers. According to Viljoen (2014), waste pickers will sell their different types of recyclable waste to different BBCs depending on who pays the highest price. According to Marello (2013), who conducted a waste picking study in Mexico, access to transportation ensured higher income and made the waste pickers more productive.

5.3.3.6.2 Frequency of waste selling

It is economically feasible for waste pickers to collect recyclables, store them until they have a certain quantity, and then sell them in bulk to buy-back centres, which allows for better prices. Consequently, some waste pickers pool their recyclable waste before selling it and then share the higher revenue generated (Marello, 2013).

The frequency at which waste pickers sell their recyclables is presented in Table 5-29 below.

Table 5-29: Frequency of selling of waste (n = 217)

Frequency of selling waste	Frequency	Percentage
Daily	35	16.1%
Weekly	105	48.4%
Every second week	13	6.0%
Monthly	30	13.8%
Less frequent than monthly (i.e., every second month)	15	6.9%
Question was not answered	19	8.8%
Total	**217**	**100%**

The majority of respondents (105 or 48.4%) indicated that they sold their waste on a weekly basis, while 16.1% indicated that they sold their waste on a daily basis. Forty-three respondents (19.8%) stated that they sold their waste every second week or monthly. Only fifteen respondents (6.9%) sold their reclaimed waste less frequently than monthly.

The recorded frequency of selling is not unexpected, since approximately 65% of respondents estimated that they needed 5 to 7 days to collect sufficient waste before it was feasible (in terms of time, energy and money) to sell it. One of the waste pickers mentioned that “[i]t takes about two months to fill a skip bin with glass before I can sell it” (Waste Picker 211).

Furthermore, the distance from source to buy-back centre (Table 5-28) may also influence the frequency of selling waste. This is supported by Barnes *et al*. (2021), who points out that the distance to a buy-back centre is a limiting factor for waste pickers, as there is a limit to how far trolleys can be pushed or bulk bags can be dragged per day.

5.3.3.6.3 Income patterns of waste pickers

Waste pickers’ income varies vastly according to gender, location, type of work, quantity, type and market value of waste available and buy-back centres. Some waste pickers live in extreme poverty, but many others earn multiple times their country’s minimum wage (Mamphitha, 2011;

Viljoen, 2014; Mudavanhu, 2019; Anierobi *et al.,* 2022). The income patterns of waste pickers are presented in the sub-sections below.

5.3.3.6.3.1 Daily and weekly income patterns of waste pickers

The respondents were asked to respond to "How much income do you usually earn for a day's or week's waste that you collect?" The Rand value (per respondent) was used to calculate the minimum, maximum and average (usually daily and weekly) income of the three different waste picker groups.

The daily and weekly income patterns of waste pickers are presented in Table 5-30 below, which distinguishes between the minimum, maximum and average daily and weekly income of the three different waste picker groups, namely community informal waste pickers (CIWP), landfill informal waste pickers (LIWP) and street informal waste pickers (SIWP).

Table 5-30: The usual daily and weekly income of waste pickers (n = 217)

Different waste picker groups	Usual income for a day's waste			Usual income for a week's waste		
	Minimum	Maximum	Average	Minimum	Maximum	Average
CIWP	R20	R900	R182	R25	R4 500	R1 066
LIWP	R20	R200	R104	R40	R1 500	R548
SIWP	R20	R1 500	R258	R150	R5 000	R1 081

The indicated daily average of waste pickers ranged from R104 (LIWPs) to R258 (SIWPs) and the weekly average income ranged from R548 (LIWPs) to R1 081 (SIWPs). The usual income reported by respondents compares well with what other authors have reported in South Africa. According to Barnes *et al*. (2021), the average income amongst 3 000 informal waste pickers in Bellville, Cape Town, in December 2016 was approximately R2 900 per month, or R97 per day. Blaauw *et al*. (2019) mentions weekly income ranges from R449 to R1 142.

5.3.3.6.3.2 Best daily and weekly income patterns of waste pickers

The respondents were asked to respond to the question "What was the best income you have earned for a days or week's waste?" The Rand value (per respondent) was used to calculate the minimum, maximum, and average best daily and weekly income of the three different waste picker groups. The best daily and weekly income patterns of the waste pickers are presented in Table 5-31 below, which distinguishes between the minimum, maximum and average best daily and weekly income of the three different waste picker groups.

Table 5-31: Best daily and weekly income patterns of waste pickers (n = 217)

Different waste picker groups	Best income for a day's waste			Best income for a week's waste		
	Minimum	Maximum	Average	Minimum	Maximum	Average
CIWP	R30	R3 800	R 390	R50	R7 000	R1 512
LIWP	R60	R200	R 162	R120	R2 400	R757
SIWP	R70	R1 500	R 365	R240	R7 000	R1 627

The CIWPs best average income for a day's waste was R390, the LIWP's was R162 and the SIWP's was R365. The average best income for a week's waste for the CIWPs was R1 512, the LIWP's was R757 and the SIWP's was R1 627. It should be noted that the information on income is self-reported, with the possibility of amounts being over- or underreported. In the research done by Uhunamure (2021), who investigated waste pickers at three landfill sites in the Limpopo Province, South Africa, 32.5% of respondents earned between R500 and R1 000 rand per month, 47.4% earned between R1 001 and R1 500 per month, and 4.4% earn more than R1 500 per month.

5.3.3.6.3.3 Lowest daily and weekly income patterns of waste pickers

The respondents were also asked to answer to the question, "What was the lowest income you have earned for a day's or week's waste?" The Rand value (per respondent) was used to calculate the minimum, maximum and average lowest daily and weekly income of the three different waste picker groups. The lowest daily and weekly income patterns are presented in Table 5-32 below.

Table 5-32: Lowest daily and weekly income patterns of waste pickers (n = 217)

Different waste picker groups	Lowest income for a day's waste			Lowest income for a week's waste		
	Minimum	Maximum	Average	Minimum	Maximum	Average
CIWP	R10	R400	R92	R15	R3 600	R681
LIWP	R20	R100	R51	R30	R750	R273
SIWP	R10	R900	R165	R70	R3 200	R713

The lowest average income pattern for CIWPs was R92 per day. The LIWPs averaged an income of R51 per day, and the SIWPs an average of R165 per day. The lowest average income for a week's recyclable waste for the CIWPs was R681 per week, and the LIWPs averaged an income of R273 per week. The SIWP's average income amounted to R713 per week.

It is interesting to note that Wilson *et al*. (2021), who conducted a study amongst 361 waste pickers in Johannesburg, found that the women interviewed earned on average 22% less per month than male waste pickers. This finding is supported by Motlhoki (2019), who states that males tended to collect more recyclable materials from landfill sites because they fared better in the competition over salvageable materials as they are dropped off either by individuals, cars or trucks. As a result, men's earnings were slightly higher than those of women. Viljoen *et al.* (2015) attribute this to the fact that females lack the physical ability and strength to carry loads over long distances to find measuring scales and buy-back centres. Associations between gender and income were not established in the current research.

5.3.3.6.4 Money made at last sale

The respondents were asked to indicate the amount of money they had earned with their latest sale. The average amount was calculated by adding up all the values and then dividing the resultant sum by the number of respondents who answered the question. The income earned at the last sale is presented in Table 5-33 below – including the average number of days it took them to collect enough recyclable material for this sale.

Table 5-33: Waste pickers' earnings at last sale (n = 209)

Different waste picker groups	Average Collection Days	Average income of last sale
CIWP	12 Days	R1 072.25
LIWP	7 Days	R568.03
SIWP	14 Days	R1 017.76

The community waste pickers' money made at their last sale averaged R1 072.25 after having collected recyclable waste for 12 days, while the landfill informal waste pickers averaged an income of R568.03 from their last sale after having collected recyclable waste for 7 days. The street informal waste pickers earned an average of R1 017.76 with their last sale after 14 days of collecting recyclable waste. From the data, it is clear that the waste pickers have more or less a similar income, when the average collection days are taken into consideration.

5.3.3.6.5 Waste pickers' expectations and perceptions regarding of income

Waste pickers were asked to indicate whether their income was better, as good as, or worse than expected (Table 5-34).

Table 5-34: Expectations and perceptions of income (n = 217)

Perceptions of income vs expectations	Frequency	Percentage
Better than expected	101	46.5%
Worse than expected	71	32.7%
As good as expected	29	13.4%
Question was not answered	16	7.4%
Total	**217**	**100%**

The majority of respondents (46.5%) perceived their actual income to be better than expected, while 32.7% respondents rated their income as worse than expected. Only 13.4% perceived their actual income as being "as good as expected" and 16 (7.4%) did not answer the question.

5.3.3.6.6 Other sources of income

It was found that, in many cases, waste picking was an additional source of income to supplement other (primary) income. Viljoen (2014) reported that some waste pickers received grants or took on a small job in between waste picking. Participants in the research were asked to indicate whether they had any other sources of income (which they or other household members earned). They were also asked to indicate the approximate additional income earned per month (Table 5-35).

Table 5-35: Waste pickers' other sources of income (n = 217)

Sources of other income	Participant		Other Household Members	
	Number	Average	Number	Average
Child support grant	40	R821	35	R901
Old age grant	23	R1 862	8	R2 105
Another job	25	R1 811	7	R3 493
COVID relief grant	7	R350	0	R 0
Disability grant	4	R1 463	1	R1 900
Vendor	4	R438	0	R0
Pension from a previous job	3	R3 833	0	R0
Total	**106**	**R1 511**	**51**	**R2 099**

The waste pickers' other sources of income were dominated by various grants that were paid directly to them or other household members namely: child support grants (between R821 and R901 per month), old age grants (between R1 862 and R2 105 per month), COVID relief grants (approximately R350 per month) and disability grants (between R1 463 and R1 900 per month).

These grant receivers are South African citizens. Some respondents also indicated that they had another job, worked as a vendor, or had access to pension funds from previous jobs. It is evident that not all depended on their recycling ventures but also earned a little money from other opportunities available to them.

5.3.3.7 The social situation of waste pickers

The social situation of waste pickers relates to the respondents' access to basic needs, namely housing, dependence and access to food.

5.3.3.7.1 Respondents' housing structures

According to Mudavanhu (2019), access to shelter is very important for a person's well-being. Viljoen (2014) posits that street waste pickers' sleeping conditions indicate their living conditions and socio-economic status. Poor sleeping conditions deprive individuals of dignity and access to basic needs, such as education and household facilities, which indicate their socio-economic status. Proper sleeping arrangements also impact their ability to integrate into society and maintain their dignity. The type of housing structures of waste pickers is presented in Table 5-36.

Table 5-36: Respondents' housing structures (n = 217)

Housing structure	Frequency	Percentage
House (bricks/reeds, etc.)	88	40.6%
Shack	73	33.6%
Backyard Room	24	11.1%
Backyard Shack	21	9.7%
On the Street	11	5.1%
Total	**217**	**100%**

The majority of respondents (40.6%) indicated that they lived in houses (bricks, reeds, etc.), followed by 33.6% of respondents who lived in shacks. Some of the respondents stayed in backyard rooms (11.1%) or backyard shacks (9.7%) and eleven respondents (5.1%) indicated that they lived on the street (homeless).

Informal waste pickers in South Africa are often referred to as 'hobos' or homeless people. According to the research done by Mudavanhu (2019:102), 50% of the participants lived in shacks, 25% in brick houses, 15% in other structures, 4.5% in backyard shacks, 2.3% in back rooms and 2.3% lived in the veld or on the streets. Reyneke (2016) reported that, at the Hatherley Landfill, makeshift shelters (referred to as 'mkhukhus') had been erected that served as temporary

accommodation – though for long periods of time - for those waste pickers whose permanent residences were far away from the landfill site. Makina (2020), who studied waste reclaimers in Tshwane, South Africa, reported that during the rainy season, waste pickers on the streets faced the added challenge of protecting their goods from being damaged. Some waste pickers found shelter under bridges, in the entrances of post offices, at bus stops or petrol stations. However, these options were not always available as some such places already had 'residents' who did not welcome newcomers. Waste pickers who slept at their regular locations used heavy plastic to cover themselves and their trolleys to protect their goods (Makina, 2020).

5.3.3.7.2 Number of persons dependent on waste pickers' income

The number of people who depended on waste pickers' income is presented in Table 5-37 below.

Table 5-37: Number of persons dependent on waste pickers' income (n = 217)

Category of waste pickers	Frequency	Total number of financially dependent persons	Average number of dependants per waste picker
Community informal waste picker	110	442	4.02
Landfill informal waste picker	31	122	3.94
Street informal waste picker	34	126	3.71
Average			**3.94**

The average number of persons who depended on their income was 3.9. This finding is in line with the finding of Schenck and Blaauw (2011), who reported that, on average, four people depended on the income of each waste picker.

5.3.3.7.3 Respondents' number of children

The distribution of respondents' number of children is presented in Table 5-38.

Table 5-38: Distribution of respondents' number of children (n = 217)

Category of waste pickers	Frequency	Total number of children	Number of children <18 years	Average
Community informal waste picker	110	305	172	2.77
Landfill informal waste picker	29	86	61	2.96
Street informal waste picker	34	94	56	2.76
Average				**2.80**

Of the community informal waste pickers, 110 reported that they had children (in total 305 of whom 172 were younger than 18). With regard to landfill waste pickers, 29 stated that they had children (in total 86 of whom 61 were less than 18 years old), and 34 street informal waste pickers said that they had children (in total 94 of whom 56 were under 18 years of age). When the number of child support grants is taken into consideration, there is a possibility that many households that qualified for these grants did not receive them. Wilson *et al*. (2021), who conducted a study amongst waste pickers in Johannesburg, found that the number of people in a household was 4, which included on average 1.5 children.

5.3.3.7.4 Money sent to relatives

Many waste pickers, who are migrant workers, send money home to assist with household and medical expenses, and possibly school fees, or to support elderly members. The respondents were asked to indicate whether they sent money to relatives. Approximately 75% of the respondents indicated that they did not send money to their relatives and family, while 23.5% did support their relatives and family financially. A total of 1.4% did not respond to the question.

Schenck and Blaauw's (2011) research conducted among street waste pickers in Pretoria, found that only 9% of waste pickers were able to send money home on a monthly basis, 23% of waste pickers sent money to their relatives four times a year, 23% twice a year, and 9% once a year. A total of 36% were not able to send money at all. The latter group indicated that they earned just enough money to barely sustain themselves.

5.3.3.7.5 Times going without food during the last month

Some days, especially rainy days, there is a shortage of recycled materials to sell to buy food, which results in the affected person going hungry for a few days (Makina, 2020). The respondents were asked *"How many days in the last month was there no food to eat of any kind in your house because of a lack of resources to get food*?" (Table 5-39).

Table 5-39: Numbers of days which respondents spent without food during the last month

Category of waste pickers	Frequency	Total number of days without food	Average
Community informal waste picker	30	97	3.2
Landfill informal waste picker	10	27	2.7
Street informal waste picker	7	18	3.0
Average			3.02

Table 5-39 shows that 30 community informal waste pickers recorded a total of 97 days without food. Ten landfill informal waste pickers recorded a total of 27 days with no food and 7 street informal waste pickers recorded a total of 18 days with no food. The average number of days without food per month was between 2.7 and 3.2 days. Mudavanhu (2019) states that waste pickers support each other in different ways by sharing food or loaning money. Others indicated that on occasion, they received food from churches, individuals and businesses.

5.3.3.7.6 Food sources of the participants

Waste pickers are often vulnerable to food insecurity and malnutrition. Most of the time, the primary objective is to find food from a variety of possible food resources (Makina, 2020). The food sources of the participants in the present study are presented in Table 5-40. Respondents were asked to indicate all possible sources.

Table 5-40: Food sources of the participants (Respondents were asked to indicate all possible sources)

Sources of food	Frequency	Percentage
Buy own food and prepare food at home	190	80.5%
Buy ready-made food	24	10.2%
Somebody else offers food, e.g., church/individuals/restaurants etc.	17	7.2%
From dustbins	5	2.1%
From other waste pickers	0	0.0%
Total	**236**	**100%**

Approximately 80% of the respondents indicated that they bought their own food and prepared it at home, while 10.2% bought fast foods, and 7.2% of respondents received food from someone

else. Only 2.1% of the participants reported that they collected food from dustbins. None indicated that they received food from other waste pickers. It shows that informal waste pickers do not rely on other waste pickers for food. Schenck and Blaauw (2011) reported similar findings pertaining to the sources of food available to waste pickers. A total of 36% of their respondents received food donations from churches. No assistance was rendered to waste pickers by the local government or NGOs. Mlotshwa (2022) who conducted a study amongst waste pickers in Durban, reported that 50% of waste pickers interviewed depended on food scraps from landfills – which, of course, can lead to illness among them. Mudavanhu (2019) confirms that food is retrieved from waste and consumed. However, municipalities do not allow restaurants or shops to give left-over food (or food past its expiry date) directly to waste pickers. Instead, there are special arrangements for shops to dispose of their waste food in large holes at landfills after the waste pickers have left.

5.3.3.8 Relationship with other stakeholders

The relationship between waste pickers and other stakeholders are discussed in the sub-sections below.

5.3.3.8.1 The working relationship between waste pickers

The working relationship between waste pickers was tested with the following question: “Do you work together with other waste pickers to help one another?” The majority (84.3%) of the respondents reported that they had no working relationship with other waste pickers, while 12.9% stated that they did work with and assist fellow waste pickers. The latter group was requested to indicate how they assisted one another (Table 5-41).

Table 5-41: The different ways in which waste pickers helped each other (n = 217)

How waste pickers helped one another	Frequency	Percentage
Finding work	16	7.4%
Transport/getting lifts	14	6.5%
Help to collect/share what they have collected	13	5.9%
Food	3	1.4%
Sorting	3	1.4%
Selling for each other	1	0.5%
Clothing	1	0.5%

Sixteen of the waste pickers (7.4%) helped other waste pickers find work, while fourteen (6.5%) helped each other with transport or catching lifts. Thirteen (5.9%) of the waste pickers helped each other collect waste and shared what they had collected. Other supportive behaviours

included the sharing of food and clothing and selling on behalf of each other. An interesting finding was that they did not assist one another with loans, shelter to sleep, housing, personal care products, or care when colleagues were sick (which were some of the options provided in the survey questionnaire).

This finding is supported by Mudavanhu (2019), who stated that, although waste pickers worked independently, they did support each other in various ways, for example, by sharing food and lending money.

5.3.3.8.2 Population growth of waste pickers

The waste pickers were asked whether they had perceived a growth in the population of waste pickers. Most of them (91.2%) agreed that they had noticed an increase in the waste picker population, while 3.7% indicated that they had not noticed this. Eleven of the respondents did not answer the question.

According to Morias *et al*. (2022), there is an increase in the number of waste pickers in both developed and developing countries. The reasons suggested for the growth in the waste picker population including poverty, youth, limited job opportunities in the formal sector and a lack of parent care (Rathana, 2009).

5.3.3.8.3 Knowledge of municipal legislation

Lastly, waste pickers were asked about their knowledge and awareness of waste-related legislation in the Madibeng Local Municipality. Approximately 79% of the participants stated that they knew about a regulation or by-law in relation to waste management within the municipality and which was applicable to informal waste pickers, while about 20% were not aware of any municipal legislation and by-laws in relation to waste management.

According to Guya (2019), the Waste Act was passed in 2008 in South Africa to address the lack of legislation pertaining to waste management. The Act emphasises the waste hierarchy, prioritising waste avoidance and reduction over disposal and also mentions the National Waste Management Strategy as a tool for achieving its goals. Viljoen (2014) states that there is no meaningful relationship between municipalities and street waste pickers in South Africa. Although municipalities are responsible for integrating waste pickers into solid waste management plans, waste pickers have been ignored and excluded from the municipal waste management system. This finding is supported by Peres (2016:32), who conducted a study amongst waste pickers in Cape Town and reported that some local government officials in South Africa did not consider

waste pickers in their policies, despite recent plans to integrate them into the waste management programme.

5.4 Findings from the qualitative study

Following a case study approach, the present study aimed to determine how informal waste reclaiming practices might be integrated into or supported by the formal municipal waste management system. To achieve Research Objectives 3 and 4 of the study, qualitative data were collected through separate questionnaires from 217 waste pickers, 15 municipal workers and 18 buy-back centre staff (See Appendices B to D). The demographic characteristics of participants are presented in Section 4.6 of Chapter 4. The collected qualitative data were analysed using the six-step thematic analysis process as proposed by Clarke *et al*. (2015). The findings will be presented by themes and sub-themes to achieve Research Objectives 3 and 4 of the study.

5.4.1 RO3: The current status of waste management services and infrastructure in the Madibeng Local Municipality

The third objective of the study was to determine the status of waste management services and infrastructure in the Madibeng Local Municipality. The findings of the thematic analysis relevant to this research objective are presented in the section below.

5.4.1.1 Results derived from interviews with municipal officials

Table 5-42 summarises the main themes regarding waste management services and infrastructure that emerged from interviews with municipal officials based on the question: “How is the standard of your waste management infrastructure?” These themes emerged from the intuitive thematical analysis of phrases mentioned by the interviewees.

Table 5-42: Status of the Madibeng Municipality's waste management services and infrastructure

Themes	Phrases mentioned	Frequency (n = 15)	Percentage
1. Insufficient waste management infrastructure	*"Infrastructure," "facilities not up to standard," "vandalism of facilities," "damage to waste bins, compactors, vehicles," "no recycling bins," "outsourced services/equipment"*	7	47%
2. Effectiveness of solid waste management services	*"Irregular refuse collection," "infrequent waste collection," "poor access to houses to collect waste," "unequal waste collection," "informal settlements not serviced"*	5	33%
3. Plans to address solid waste management challenges	*"Illegal waste removal," "education," "training," "education programmes," "community involvement"*	5	33%
4. Recycling infrastructure	*"Recycling infrastructure," "transfer stations," "not used," "infrequent use"*	2	14%
5. Municipal programmes to encourage reclaiming practices in informal settlements	*"Capacity building programmes," "recycling in communities"*	2	14%
6. Operation of buy-back centres	*"Buy-back centres"*	1	7%

The findings derived from the sub-themes are presented in the next section.

5.4.1.1.1 Theme 1: Waste management infrastructure

In respect of the standard of the municipality's waste management infrastructure, it was established that the municipality certainly experienced some challenges in this regard, and that vandalism was the main reason for damage to infrastructure. Seven of the fifteen (47%) municipal respondents raised concerns regarding the local waste management infrastructure.

> "*The facilities are not up to standard and are not used for recycling*." (Municipal Worker 8)

> *"Some of the* [waste management] *infrastructure is still new, but due to vandalism some of the infrastructure is not in good condition*." (Municipal Worker 7)

Municipal Worker 11 pointed out that the reason for this state of affairs is the lack of security to protect the municipality's assets:

> "[Waste management infrastructure is] *not very good; there is serious vandalism of facilities due to lack of security guards.*"

> "*They* [the facilities] *are not in good condition due to vandalism and thus not used fully."* (Municipal Worker 1)

> "*Solid waste, for example, bricks, are not allowed in waste bins as they can damage the compactor hydraulics of waste removal vehicles."* (Municipal Worker 3)

It was found that only two fleet items were owned by the municipality, while the others were hired. To overcome this challenge, the municipality has contracts with service providers to render the necessary waste collection service on behalf of the municipality.

> "*The municipality sources out services to service providers.*" (Municipal Worker 5)

The municipality does not collect garden waste from households. There are garden waste transfer stations where communities can drop off their garden waste free of charge. Moreover, some private companies offer affordable, convenient garden refuse drum service contracts.

> "*The municipality does not render garden waste collection services. The problem is that the residents do not use the garden waste transfer station and waste gets dumped in open spaces. A further issue is that some people try to 'hide' garden waste with other waste, which causes issues with the compactor trucks.*" (Municipal Worker 2)

In conclusion, the municipality's waste management infrastructure is not up to standard and is often damaged due to vandalism. Lack of security to protect the infrastructure is a major contributing factor. The municipality relies on service providers to collect waste on their behalf. Garden waste is not collected by the municipality, but there are transfer stations available for residents to drop off their garden waste. Some residents do not utilise these stations, leading to illegal dumping and issues with waste collection trucks. Stubbs (2022) reported that the South African waste management industry is efficient, but the country annually generates an overwhelming amount of waste. Only 10% of the waste is recycled or recovered, while the rest is either landfilled or dumped illegally. Cape Talk (2022) reported that the City of Johannesburg was increasing its security at waste-management sites following a shooting incident at the Robinson Deep landfill. Two waste reclaimers were killed in a turf war between rival waste picking groups.

The city had been supporting the informal waste recycling sector but criminal elements had infiltrated its facilities.

5.4.1.1.2 Theme 2: Effectiveness of solid waste management services

According to the Madibeng Annual Report (2018/19), out of a total of 186,531 households, 76,400 households (41%) had solid waste removed at least once a week. A further 10,500 households (6%) had solid waste removed less than once a week. Of the remaining households, 32,300 (17%) were using some communal or own refuse dump, while 67,331 households (36%) had no rubbish disposal methods or routine at all . This implies that 59% of households were below the minimum service level percentage.

During interviews, the participants expressed different points of view on how they perceived the effectiveness of the Madibeng Municipality's waste management services, as reflected by the following contradictory statements:

> *"Daily refuse collection is done*." (Municipal Worker 6)

> *"Daily refuse collection is irregular and keeps on shifting back and forth (non-consistent) pattern*." (Municipal Worker 7)

> "*Only 41% of households are receiving refuse collection services.*" (Municipal Worker 11)

> "S*ome areas are serviced daily while others do not have any waste management due to municipal incapacity to extend service to those areas.*" (Municipal Worker 6)

An interesting finding was that five of the municipal worker respondents were of the view that refuse collection within the municipality was "very effective." It seemed that the consensus was that the waste collection services in Brits (the town itself) were considered to be sufficient, but that informal settlements did not receive consistent waste collection services.

> *"Informal settlements are not very effectively serviced due to the use of skips as a result of poor access to houses."* (Municipal Worker 11)

Another challenge pointed out by the participants was the exclusion of garden and builders' rubble from the municipality's refuse collection, which led to the creation of illegal dumping sites. This gives residents an opportunity to illegally dump their household waste, which in turn creates an alternative waste source for waste pickers.

According to the by-laws and policies of the Madibeng Local Municipality (2023), property owners themselves are responsible for the removal of garden waste or building rubble. However, there are no indications of where this waste can be legally disposed of. According to Guya (2019), the lack of by-laws in the Metsimaholo Local Municipality in Sasolburg causes issues between officials and waste pickers who sort their material on municipal land illegally. The rejected material left behind by waste pickers is considered illegally dumped waste, and municipal workers have to collect it. The Stellenbosch municipality solved this challenge in a different manner. Mudavanhu (2019) reported that the Stellenbosch landfill site accepted various types of waste, including household, industrial and garden waste. Waste pickers specifically focused on collecting garden waste, such as tree branches, which was then processed in a separate section of the site by being shredded and used to create garden compost at the sewage site. Municipal workers were responsible for this process, and the resulting compost was also sold to private individuals for their gardens.

> *"Refuse collection is consistent, but not all refuse is collected. Because building and garden waste is not collected, we see a lot of illegal dumping."* (Municipal Worker 13)

According to Polasi (2018), one of the factors associated with illegal dumping is the lack of sufficient or regular waste collection services. This leads to problems in waste management, such as waste not being collected according to the schedule, which results in residents illegally dumping their waste. The responsibility of cleaning up this illegally dumped waste falls on the municipality, which incurs additional costs that can amount to roughly 30 times more than proper disposal (Polasi, 2018). Effective waste management is a very important function of municipalities, as it plays an important role in the hygiene, sanitation and aesthetics of the town and its environment (Dladla, 2018). The challenges discussed above are, however, not unique to the Madibeng Local Municipality. According to Florin (2018), in Istanbul, only 47% of household waste is collected by rubbish trucks, and the rest is collected by informal or formal sectors. A study by Worku and Muchie (2012) in the City of Tshwane found that the city's waste management was not effective due to four identified factors that influenced solid waste management negatively: non-compliance with waste management regulations, failure to deploy enough rubbish bins within communities, incorrect perceptions of the potential benefits of proper waste management, and lack of management effectiveness.

5.4.1.1.3 Theme 3: Plans to address solid waste management challenges

Based on the challenges mentioned in Theme 1 and Theme 2 above, the respondents were of the opinion that the Madibeng Local Municipality needed to devise a "plan to address illegal

dumping in the towns or informal settlements", "improve refuse collection", and develop "programmes to encourage reclaiming practices". From the responses during interviews, it was clear that education of communities through environmental awareness campaigns, as well as the involvement of communities in clean-up campaigns, was regarded as an important focus area of the municipality.

> "*The municipality has a quarterly programme to remove illegal dumps*" - "*Education and awareness are also accelerated in ensuring that communities curb the behaviour of dumping*." (Municipal Worker 1)

Other plans by the Madibeng Local Municipality are to encourage community involvement through the formation of more street-based committees that report to ward committees and whose primary task is to report any problems in their areas of responsibility. Furthermore, the establishment and encouragement of recycling groups is supported by the provision of environmental and basic business management training and education. It was highlighted that, when there was a need to move communities to new locations, it needed to be well managed and supported with good planning that included prior awareness campaigns.

> "*We need to ensure community involvement through education and awareness campaigns prior to moving communities to new locations*." (Municipal Worker 13)

To prevent the creation of illegal dumps, regular waste removal needed to be conducted, and more skip bins needed to be placed in problem areas (also refer to Theme 2 above). The involvement of schools through outreach programmes, as well as cleaning programmes within communities, was considered important.

> "*We must include the youth and schools when we do awareness and education on waste. The youth is the future, and they can play a big role in preventing illegal dumping."* (Municipal Worker 5)

> *"If we give people access to enough bins/skips and we educate them on where they are and how they should be used, we may win the battle against dumping."* (Municipal Worker 8)

Dladla (2018) pointed out that there are various methods that municipalities can employ to prevent the illegal dumping of waste; for example, creating awareness in the community, informing the authorities about any illegal dumping that they observe, and planning and introducing volunteer community clean-up efforts. It is vitally important that municipalities provide communities with waste bins that they remove on a regular basis (Dladla, 2018; Guya, 2019). Municipalities should

encourage communities through awareness programmes to recycle their materials. For instance, ‘No Dumping’ signs can be placed at strategic problem areas with the contact number of the local waste management authority (in South Africa, this will be stolen in no time and recycled).

A question was asked to determine whether the informal settlement communities knew about the educational programmes pertaining to reclaiming practices offered by the municipality. Based on the comments by the respondents, it appears this knowledge was not widely spread within informal settlement communities. Environment education was provided via the Environmental Management unit, but it was perceived to be ineffective.

> *“The education programme is slow.”* (Municipal Worker 10)

This confirmed by Municipal Worker 3, who stated,

> *“Not all informal settlements know about reclaiming practises as education has not reached all settlements."*

Ndlovu (2016) found that waste management programmes, such as the S@S programme in Johannesburg, have not been successful in achieving their goals of waste separation and reducing landfill waste. This is primarily due to low resident participation and a negative attitude towards the programme. According to Jewaskiewitz (2021), the poor management and operation of landfill sites can be attributed to several factors. These include corruption, lack of leadership and responsibility, lack of waste management expertise, disregard for legislation and the environment, insufficient funds for infrastructure development and rehabilitation, misappropriation of funds, lack of political will, and low priority given to waste management and landfills.

Schoeman and Rampedi’s (2022) findings suggest that improving household waste separation programmes is crucial for cities, such as Johannesburg. Situational variables were identified as the main driver of household participation in recycling. To make the current programme successful, it is important to overcome situational barriers by simplifying the recycling process and providing knowledge, infrastructure and space for waste sorting and collection. Efforts should be made to create awareness about the benefits of recycling and eliminate barriers, such as the lack of waste-separation facilities. It is also important to show the public how their cooperative behaviour can make a positive impact on recycling efforts.

5.4.1.1.4 Theme 4: Recycling infrastructure

The Madibeng Local Municipality has three recycling facilities at Kosmos, Damonsville and Brits, as well as seven waste transfer stations in the municipality's responsibility area that have recycling

structures. Although recycling infrastructure is available in the municipality, it seems that especially the waste transfer stations are poorly used by the public.

Some municipal participants reported that the Madibeng Local Municipality had done nothing to address waste minimisation, while others reported that different strategies had been developed to address this challenge. Two of the municipal respondents (14%) stated that the municipality was distributing recycling bags to residents in an effort to encourage recycling and separation at source.

> "*We do have availability of transfer facilities and recycling infrastructure in the municipality, but they are poorly used by the public. We do, however, see that waste pickers use these facilities."* (Municipal Worker 5)

> *"Recycling infrastructure is infrequently used by the public. Recyclable waste ends up being disposed of with domestic waste and many times end up in landfill sites or are reclaimed by waste pickers from the black bags."* (Municipal Worker 8)

According to Maeteletja *et al*. (2019), waste disposal using landfills is the most common method worldwide, but the longevity of landfills is a challenge due to limited available land in urban areas. In South Africa, the increase in consumerism has led to an increase in waste generation, and the lack of recycling infrastructure in communities has resulted in a high influx of reusable waste at landfills. Informal recycling in developing countries is effective in reducing waste disposed at landfills and extending their use. Strydom (2018) found that the main reasons why people do not recycle are insufficient space, lack of time, dirty and untidy recycling processes, lack of knowledge about recycling, and inconvenient recycling facilities.

5.4.1.1.5 Theme 5: Municipal programmes to encourage reclamation practices in informal settlements

This section specifically focuses on the municipal programmes aimed at encouraging reclamation practices in informal settlements. According to the respondents, the municipality's efforts to encourage reclaiming practices in informal settlements included awareness programmes and education regarding the effectiveness of separation at source.

> "*We do capacity building with different stakeholder groups in the informal settlements, especially those dealing with recycling in the private sector*." (Municipal Worker 7)

> *"Madibeng [Local Municipality] has implemented programmes to encourage reclamation of waste in informal settlements."* (Municipal Worker 12)

Maurice (2023) reports on the successful efforts by the City of Tshwane Metropolitan Municipality in terms of encouraging reclamation practices in informal settlements. Regular clean-up campaigns, coupled with capacity and awareness, were done on a weekly basis. These initiatives were considered to be a success by both residents and the municipality.

5.4.1.1.6 Theme 6: Operation of buy-back centres

According to Viljoen *et al*. (2019), buy-back centres connect the formal economy of recycle companies with the informal economy of waste picker activities. Buy-back centres add value to recyclables by sorting, cleaning and baling them before selling them at higher prices to recycling exporters, manufacturers and other companies. According to the DEFF and DSI (2020), the buy-back centres' treatment of waste pickers has an influence on their profit margins, as waste pickers tend to sell to those buy-back centres that pay higher prices. Based on the results of the waste picker survey, buy-back centres in the Madibeng Local Municipality collectively bought about 2 000 kg of plastic, 1 838 kg of batteries, 1 750 cans, 1 663 kg of Tetrapak and 1 310 kg of metal per week from waste pickers. To be sustainable, small buy-back centres sell to larger buy-back-centres, which in turn sell to large recycling companies (Viljoen *et al*., 2019). To be regarded as operating optimally, a buy-back centre needs to receive and sell at least 40 tonnes of recyclable materials per month (Viljoen *et al*., 2019).

> *"There many buy-back centres operating around the area. Both waste pickers and buy-back centres benefit when waste is sold/traded. A lot of the waste that gets dumped at landfill sites are reclaimed and sold to buy-back centres."* (Municipal worker 5)

Interviews with buy-back centre respondents established that four of the buy-back centres conducted business at landfill sites, eighteen conducted business directly with waste pickers and eleven buy-back centre conduct business with waste recyclers situated in the villages.

Viljoen *et al.* (2019) state that the competitive advantage of buy-back centres is their ability to add value to recyclables according to industry standards. However, attracting large and sustainable volumes of recyclables is a challenge, despite the fact that increasing volumes of recyclables can lead to more jobs and income opportunities in the recycling industry. According to Viljoen *et al*. (2019), a proposed recycling model suggests increasing volumes of recyclables through informal sector activities and promoting responsible separation at source programmes. However, increased supplies of recyclables must be accompanied by an increase in demand for products

made from recyclables. Barford and Ahmad (2021) reported that the establishment of buy-back centres has led to fairer pay by mitigating volatile market prices for plastic waste and exploitation by middle agents.

5.4.1.1.6.1 Characteristics of Buy back centres

Buy-back centres form a very important part of the informal infrastructure within the Madibeng Local Municipality. Without them, waste pickers would have limited markets for their collected waste – a win-win relationship on which Viljoen *et al*. (2012) commented when they investigated the interaction between waste pickers in Bloemfontein and Pretoria and the local buy-back centres (BBCs). Viljoen *et al.* (2016), who conduct a study on waste pickers and BBCs in 13 large cities across South Africa, reported that they could not find a central or reliable database on BBC locations. However, the eighteen buy-back centre respondents in the present research confirmed that their businesses were registered with the municipality.

The data collected in Madibeng revealed that 38.89% of the buy-back centres had been in operation for 1 to 3 years (some for 4 to 10 years), while 16.67% had been operational for 11 to 20 years and a few (5.56%) for more than 21 years.

Viljoen *et al*. (2019) classify buy-back centres into four groups, namely, micro enterprises (5 or fewer employees), very small enterprises (6 to 20 employees), small enterprises (21 to 50 employees) and medium enterprises (50 but fewer than 200 employees). The majority (50%) of the buy-back centres in Madibeng employed 1 to 5 employees, followed by 22% of businesses that employed 6 to 10 employees. The slightly bigger buy-back centres (16.67%) employed between 11 and 20 employees, and the remaining 11% of buy-back centres had a staff of 21 or more employees. A total of 55% of the buy-back centres employed 1 to 5 South Africans while 5% of the buy-back centres employed more than 21 South Africans.

Buy-back centres operating in the Madibeng Local Municipality primarily received their waste from waste pickers. A total of 41.94% of waste was received from street waste pickers, with 22.58% of this waste having been household waste. Other waste sources included schools and industrial areas (6.45%). The majority of the buy-back centres (83.3%) bought plastic, followed by 77.8% that also bought paper and cans. Approximately 66% of the buy-back centres bought cardboard and metals and approximately 44% were interested in Tetrapak. The battery and globe (lighting) markets were limited, with only 5.6% of buy-back centres being interested in these items.

According to Barnes (2021), who conducted a study among buy-back centres in Cape Town, Western Cape, buy-back centres supported waste pickers in different ways. The most common support was to provide bulk bags to waste pickers, which had a positive impact on their

productivity. The second most common form of support was the provision of occasional meals, followed by loans, which was the third most likely form of support rendered. However, many buy-back centres had stopped providing loans as they experienced problems with payback (Barnes, 2021).

The DEFF and DSI (2020) state that the integration of garbage collectors must be suited to their specific circumstances. In smaller cities and rural regions, buy-back centres may play a larger role, but they must adhere to waste picker integration principles, pay fair prices and preserve openness.

5.4.1.1.6.2 Operating times of buy-back centres

Buy-back centres usually open at the same time as waste collection starts; however, closing times vary. Table 5-43 provides the opening and closing times of the 18 buy-back centres included in this research.

Table 5-43: Opening and closing times of buy-back centres

Opening Times	05:00	07:00	07:30	08:00	Grand Total
Closing Times					
15:00				1	1
16:00		1			1
17:00		2	4	5	11
18:00				2	2
19:00	1			2	3
Total	**1**	**3**	**4**	**10**	**18**

Seventeen buy-back centres started their business operation between 7:00 am and 8:00 am in the mornings. The closing times ranged from 15:00 to 17:00 with the majority of respondents (11 or 61%) closing at 17:00 pm.

Mudavanhu (2019), who conducted a study amongst waste pickers in three South African provinces, confirms that landfill sites with access control gates opened at 7:30 am, while at other landfill sites, with no access control, waste pickers came and went as they pleased. Operations, though, eased at around 5:00 pm and most waste reclaimers would leave the sites to go home - or slept on the sites in temporary structures. This may be one of the reasons why buy-back centres close at around 5:00 pm.

5.4.1.2 Results from the observations

The observations showed that there was no proper coordination and flawless working relationship amongst the informal waste pickers at the landfill site. When a truck or vehicle arrived at the site, informal waste pickers would jump onto it to be the first to salvage recyclables without allowing the landfill staff to direct the vehicle to where it should be offloaded. There was a sign of resistance to instructions when the officials tried to guide the waste pickers. It seemed that some of the latter might have been under the influence of alcohol. The situation became uncontrollable whenever trucks arrived at the site, which created conflict amongst the informal waste pickers.

5.4.1.3 Results from the review of the Madibeng Local Municipality documents

The review found that the documents of the Madibeng Local Municipality primarily focused on waste minimisation and separation at source, with limited mention of waste pickers. However, the newly reviewed waste management by-law includes provisions for the integration of informal waste pickers. There were no provisions in the municipality's documents that hindered waste picker integration. However, it was noted that some waste pickers might not have been ready to participate due to their concerns about their working schedules. The landfill permit allowed informal waste pickers at the landfill site, acknowledging their contribution to the extension of the permit. The waste management by-law, reviewed in 2021, did not include provisions for informal waste pickers, which might limit enforcement and hinder a productive relationship.

5.4.2 RO4: The current enabling environment within the Madibeng Local Municipality to allow for the integration of informal waste reclaiming practices

The fourth objective of the study was to determine the current enabling environment within the Madibeng Local Municipality to allow for the integration of informal waste reclaiming practices (i.e., a legal framework, such as guidelines, policies and by-laws; views of decision-makers within the municipality).

5.4.2.1 Results from surveys and interviews

Table 5-44 below shows the themes which emerged from the responses to questions about the enabling environment for waste picker integration. The thematic analysis was based on a combination of responses from municipal workers and waste pickers. The table does not indicate the frequency of comments as a percentage of the total respondents, since (a) not all of the waste pickers responded to the question, and (b) the responses are based on a combination of remarks made by both waste pickers and municipal officials.

Table 5-44: The support of the Madibeng Local Municipality's environment for the integration of informal waste reclaiming practices

Themes	Phrases	Frequency of mention
1. Current support from the municipality for waste pickers	*Help, support, assistance, trolleys, masks, bags, soap, gloves, access, informal recycling programme, access to facilities, allowed on landfill sites*	22
2. Positive contributions of waste pickers towards the municipality	*Reduce waste to landfill, render waste services, valuable to the municipality, benefit, positive contribution, reduce waste, waste reclamation, advantage, good employee, safe environment, clean environment*	20
3. Waste picker integration readiness	*Readiness, prepared, no legal framework, no policy framework, not ready, access to waste, vision for job creation, getting ready, on the right track*	18
4. Legal framework for integrating waste pickers	*Legal framework, policy framework, by-laws, insufficient legal environment, laws do not mention waste pickers*	18
5. Challenges experienced/expected in waste picker integration	*Challenges, difficulties, unwillingness to integrate, meeting expectation, illegal migrants, allocation of roles and responsibilities, liability if something goes wrong, non-favourable*	12
6. Willingness of waste pickers to integrate	*Unwillingness to integrate, not willing, do not want to integrate, do not see the need to integrate*	3 municipal participants, 56 waste pickers
7. Waste picker expectations	*Unreasonable expectations, meeting demands, needs and expectations, unable to meet expectations, negative consequences*	10
8. Absence of waste pickers' basic rights	Preference for working alone, Need for permission to enter landfills, struggle for recognition and rights, stereotypes of waste pickers, non-recognition	7

5.4.2.1.1 Theme 1: The municipality's current support for waste pickers

The responses gathered during the surveys and interviews reflected mixed feelings regarding the extent of support received from the municipality. Some individuals indicated that the municipality provided limited support to waste pickers on landfill sites in the form of free protective clothing and free access to municipal infrastructure for recycling purposes. In some cases, waste pickers

acknowledged that they were sponsored with trollies and received environmental education and free registration from recycling groups and their members.

> *"The municipality does not give us any free protective equipment"* (Waste Picker 100)

> "*We do not get any support from the municipality."* (Waste Picker 21)

However, twenty waste pickers reported that the municipality did support them in their work, providing access to recycling facilities and equipment, allowing them to recycle, assisting with equipment, and supplying (some) protective clothing (i.e., surgical masks and gloves).

> *"They [the municipality] supply us with plastic bags and soaps and they help supply recycling bags."* (Waste Picker 121)

> "*They [the municipality] supply us with bin liners and gloves."* (Waste Picker 23)

> "*They [the municipality] provided us with trolleys and surgical masks."* (Waste Picker 1)

The municipality had also adopted an informal waste picker programme that allowed them access to landfill sites and transfer stations in an effort to minimise waste going into landfill sites.

> "*In an effort to minimise waste, the municipality has introduced the informal waste pickers programme.*" (Municipal Worker 13)

> "*Recycling groups are registered and promoted by the environmental unit. Some groups were granted access to recycling facilities and landfills.*" (Municipal Worker 11)

According to the current literature, there are numerous strategies to support waste pickers in their daily tasks. For instance, GreenCape provides gloves to reclaimers to prevent cuts and exposure to disease (Arnoldi, 2018). GreenCape also runs a programme called *"earn a trolley"* that encourages waste pickers to engage in specific (positive) behaviours in order to receive equipment (Arnoldi, 2018). According to Quazi and Dobson (2012), an effort was made in the eThekwini Municipality's Durban CBD to assist waste pickers by designing trolleys according to their specific needs. The design focused on different challenges; for example, working in narrow alleys, pushing trolleys over long distances, allowing women to operate them with ease, and easy storage.

5.4.2.1.2 Theme 2: Waste pickers' positive contributions towards the municipality

During the interviews with the municipal officials and the surveys with waste pickers, the question was posed whether the respondents perceived waste pickers to make a positive contribution towards the municipality. The responses from the municipal officials indicated that they did regard waste pickers as making a positive contribution in terms of diverting waste away from landfill sites (i.e., increasing airspace, reducing responsibility of the municipality to divert waste, etc.)

Based on the findings related to RO3 (see Section 5.3.1 of this thesis), it may be argued that the Madibeng Local Municipality did not have the capacity to provide an effective solid waste management service to its customer base and needed to explore alternative options to improve service delivery. According to Shogole (2019), informal waste pickers may well play a critical role in improving waste service delivery (especially by diverting waste away from landfill sites) within municipalities. They are the first link in the waste recovery chain which ultimately reaches companies that use the waste as second-use material to manufacture new products. They remove tonnes of waste from city streets and keep it out of municipal landfills (DEFF & DSI, 2020).

> "*The waste pickers actually provide us with a valuable service by removing waste and reclaiming waste that would have otherwise been disposed to landfill."* (Municipal Worker 8)

> "*I think that waste pickers and their activities provide benefits to the municipality. They reclaim waste, which makes the municipality's job easier when it comes to recycling of waste."* (Municipal Worker 13)

The waste pickers, likewise, considered themselves valuable to the municipality.

> "*We provide a good service to the municipality."* (Waste Picker 13)

> *"We help the municipality to manage waste in a better way."* (Waste Picker 118)

> "*Yes, we are a benefit to the municipality, but the municipality is also a benefit to us, because they give us access to the waste that we sell."* (Waste Picker 25)

Based on these statements, the conclusion is that there existed an informal mutualistic symbiotic relationship between the informal waste pickers and the municipality. The former's benefits were that they had access to a waste resource that they could reclaim for free, and the municipality enjoyed the benefit of less waste and a cleaner environment that yielded cost savings. Sekhwela (2017) highlight similar benefits in his research.

Some waste pickers also remarked that they were willing to make positive contributions towards the municipality. The participants expressed their desire to improve their communities by irradicating illegal dumping, working with the municipality to keep the environment clean.

> *"I'll make my municipality better by being a good employee and keeping the environment clean.*" (Waste Picker 75)

> *"[I will] help make our community safe and healthy by irradicating illegal dumping.*" (Waste Picker 101)

They also believed they could contribute as mentors to assist other waste pickers in developing their business skills. Some participants saw themselves as partners with the municipality, using their skills and knowledge to improve general service delivery.

> *"We teach the young ones [young waste pickers] how to sort the waste correctly and what to do."* (Waste Picker 5)

> *"We can be good partners with the municipality and help them to improve waste services."* (Waste Picker 90)

However, some participants felt their contribution would be minimal due to their age or illness, while others were not willing to be integrated - in some cases for undisclosed reasons.

> "*No, I'm a pensioner.*" (Waste Picker 166)

> "*No, I'm not physically well*." (Waste Picker 194)

> *"I am not interested in making a contribution to the municipality. My main goal is making money."* (Waste Picker 22)

Overall, the interviews and surveys revealed that both municipal officials and waste pickers perceived waste reclamation to make a positive contribution towards the municipality. The municipal respondents believed that waste pickers helped divert waste from landfill sites and make the municipality's task easier in terms of recycling. Waste pickers themselves also considered their reclamation activities to be of value to the municipality and expressed a desire to improve their communities, assist in waste management and contribute to the recycling business despite obstacles, such as inadequate working conditions and the lack of legal recognition. However, there were some participants who felt their contribution would be minimal due to age or illness, and others who were solely focused on making money rather than

contributing to the municipality. According to Sekhwela (2017), it is the need for money and the desire to support environmental sustainability that drive waste pickers.

According Viljoen *et al*. (2019), further benefits of waste reclaimers' work are that they lessen the effects of waste, cut greenhouse gas emissions, and conserve energy and natural resources. Samson (2019) states that recognising their contributions and creating plans to include them into recycling systems are crucial.

5.4.2.1.3 Theme 3: Municipalities' readiness to integrate waste reclaimers

According to Samson (2019), ever more stakeholders are realising how important it is to incorporate waste pickers into municipal waste systems to maximise the economic, social and environmental advantages of waste revalorisation. Currently, many municipalities in South Africa are attempting to integrate waste pickers. Some research was done on these projects (Chidzungu, 2017; Shogole, 2019) to gain information with which to evaluate the role that informal waste pickers play in the waste economy and devise plans to incorporate them into municipal formal waste management systems for both their own benefit and the benefit of society at large. The findings of these research projects indicate that the "readiness of municipalities" plays a pivotal role in ensuring the successful integration of waste pickers into local waste management systems.

First and foremost, a municipality's readiness is reflected in its regulatory framework, as clear and supportive policies provide a legal foundation for the recognition and protection of waste pickers' rights. Additionally, infrastructural preparedness, such as designated sorting and recycling facilities, is crucial to optimise the efficiency of waste pickers' contributions. Moreover, educational initiatives aimed at raising awareness among citizens and municipal staff regarding the vital role which waste pickers play in waste reduction would contribute to a more supportive environment (Shogole, 2019). Overall, the readiness of municipalities encompasses legal, infrastructural and educational dimensions, all of which are essential for the successful and harmonious integration of waste pickers into the broader waste management framework.

Again, respondents from the municipality had mixed views concerning the Madibeng Local Municipality's readiness to provide for waste picker integration.

> *"I think they* [the municipality] *want to formalise them* [waste pickers]*, but do not have sufficient clear understanding of the informal waste picker trade and the challenges it poses."* (Municipal Worker 11)

The challenges associated with the formal integration of waste pickers into municipal structures, as highlighted by Seabi (2022), underscore a critical issue wherein decision-makers often lack a comprehensive understanding of the true magnitude and long-term implications of such integration efforts. Seabi's (2022), research points out that different stakeholders tend to develop and implement waste picker integration approaches based on their own interpretations, contributing to a lack of cohesion in the overall integration process. In this context, Seabi (2022) found are further substantiated by the observation that, despite the publication of the Waste Picker Integration Guideline of South Africa, role players in the Gauteng province did not adhere to the recommended steps outlined in Section H of the guideline. This discrepancy has resulted in an inconsistent understanding of waste picker integration among various stakeholders within the region.

This statement is supported by respondents' remarks indicating that they did not regard the municipality as being ready, because "it did not have the appropriate policy framework," "did not have a register of waste pickers" and "did not understand what integration would entail," amongst others similar comments. Others shared a more optimistic view and were of the opinion that the municipality was at least "working towards being ready," because the municipality provided "access to waste sites" and had the "vision of job creation."

> "Y*es, if they are registered with the groups that are granted permission to work on or retrieve recyclable material from the mentioned sites.*" (Municipal Worker 11)

> "*Politically, it accomplishes the municipalities' vision in terms of job creation, socio-development, and local economic supplementation."* (Municipal Worker 13)

In summary, stakeholders did recognise the importance of incorporating waste pickers into municipal waste systems for economic, social and environmental benefits. However, there were mixed opinions on whether municipalities were adequately prepared to integrate waste recyclers formally into their waste management systems.

The DEFF and DSI (2020) state that the integration of waste collectors in smaller towns and rural areas presents particular issues. Some regions have recovery facilities for recyclable material and buy-back centres, but others have no waste management services. Buy-back centres play a larger role and have more influence in these areas compared to larger cities. However, the greater the distance between rural regions and large urban centres, the more expensive it is for buy-back centres to transport items for sale. Consequently, buy-back centres frequently purchase only higher-value scrap metal, leaving other materials to enter the waste stream. Moreover, when buy-

back centres are confronted with decreasing prices, they may pass on a disproportionate amount of the decline to waste pickers.

5.4.2.1.4 Theme 4: Legal framework for integrating waste pickers

Linked to Theme 3 (readiness for waste picker integration) discussed above, Theme 4 reflects on the legal framework for integrating waste pickers into the Madibeng Local Municipality. The Waste Picker Integration Guideline (DEFF & DSI, 2020) states that there are a number of acts and policies that affect the integration of waste pickers into formal recycling structures. These include the following:

- Local Government: Municipal Finance Management Act;
- Municipal Systems Act;
- National Road Traffic Act;
- National Waste Management Strategy;
- Industrial Policy Action Plan; and
- National Environmental Management: Waste Act.

According to Dias (2011), alignment is needed between acts and policies to ensure effective integration of waste pickers into the formal recycling sector. While the importance of waste picker integration in highlighted as part of Pillar 2 of the National Waste Management Strategy (DEFF, 2020), the overwhelming perceptions of municipal workers were that waste picker integration was not adequately provided for in the legal framework of the Madibeng Local Municipality (also refer to Section 5.3.2.3 which provides results based on document analysis).

> "*Much still needs to be done to provide for a proper legal and policy framework within the municipality to allow for waste picker integration."* (Municipal Worker 8)

> *"I do not believe we have the correct policies and procedures in place at the moment to allow for integration. This is probably something that we will be able to address at a later stage."* (Municipal Worker 4)

According to the Madibeng Local Municipality air quality and waste management by-laws, (Madibeng Local Municipality, 2023) only *permitted* waste pickers are allowed on municipal property.

> "*Registration of waste transporters, recyclers, and facility owners is a municipality by-law requirement*." (Municipal Worker 1)

> "*The Madibeng Municipality did not have a specific operational policy that focuses on waste pickers. There is an inclusion of them in the municipality's Integrated Waste Management Plan that focuses on reducing the volume of waste that goes to landfill sites."* (Municipal Worker 2)

Based on research by Samson (2020), the City of Johannesburg has been successful in providing an enabling legislative framework for the integration of waste pickers. They have sufficiently provided for waste pickers in their by-laws, adopted a Reclaimer Empowerment Plan, and included integration in its Pikitup waste management utility's business plan (Samson, 2020). According to Marello (2013), legalising places for informal employment, increasing access to microfinance for waste pickers, and incorporating waste pickers into the formal solid waste management system through laws and policies are just a few methods of protecting and promoting the rights of informal workers, which could have a transformational effect on these vulnerable citizens.

5.4.2.1.5 Theme 5: Challenges experienced/expected regarding waste picker integration

Integrating waste pickers into formal waste management systems may present a multifaceted challenge. Resistance to change can be significant, as waste pickers may be hesitant to abandon their informal practices and fear a loss of autonomy (Hartmann, 2018). The lack of legal recognition of their work adds complexity, necessitating changes in laws and regulations to establish their rights and protection (Porras Bulla *et al*., 2021). Moreover, waste pickers often lack access to crucial resources, such as healthcare and education, which integrating them into formal systems may demand at the expense of strained municipal budgets (Yousafzai *et al*., 2020). Safety risks inherent in informal waste reclamation, including exposure to toxins and unsafe working conditions, must be addressed. Resistance from formal waste management actors, who may see waste pickers as competitors, poses additional obstacles (Ghisolf *et al*., 2017). Ensuring equitable distribution of benefits among waste picker communities is a challenge (Schenck & Blaauw, 2011), as is tracking progress and sustainability in the long term. Infrastructure development and training are resource-intensive prerequisites for integration, as is overcoming social stigma associated with waste picking (Mo *et al*., 2013; Bonsu & Nartey, 2023).

The question that explored the municipal respondents' personal views pertaining to the challenges of integrating informal waste pickers into the municipality's system revealed some interesting opinions. The consensus of the majority of respondents was summarised by the following statement.

> "*I foresee many challenges when integrating waste pickers into the formal waste management system."* (Municipal Worker 5)

It transpired that the main concerns seemed to revolve around integrating *illegal migrants*, the *unwillingness of waste pickers to work with the municipality*, *meeting (unrealistic) expectations of waste pickers*, concerns about *allocation of roles, responsibilities and authority* and *liability when something goes wrong*.

> "*They* [waste pickers] *must not be integrated; it will be difficult to work with them,*" (Municipal Worker 9)

> "*Many waste pickers are not South African citizens and therefore are difficult to integrate.*" (Municipal Worker 11)

Municipal Worker 2, on the other hand, raised concerns about liability and allocation of roles and responsibilities:

> *"Who will be to blame if something goes wrong. The waste pickers will point fingers to the municipality and we* [the municipality] *will have to face the responsibility of fixing it* [waste management problems]."

Samson (2020) states that waste picker integration is a new area of work that falls outside waste officials' current expertise. This is mostly the result of a lack of funding, training and support to ensure effective integration. However, the waste officials are challenged by their lack of authority, funding and skills to manage the situation, which leads to tensions between them and the waste pickers.

5.4.2.1.6 Theme 6: Willingness of waste reclaimers to integrate

Dladla (2018:17) states that the concept of waste reclaimer integration could be interpreted in a number of ways. A universal definition of such integration is *"recognition, consultation, inclusion, and registration of reclaimers"* and "*the inclusion of reclaimers within the existing waste management system"*. The willingness of waste pickers to integrate into a formalised waste management system is a cornerstone of the success of any waste picker integration programme (Nambuli *et al*., 2021). Their active participation and engagement are crucial for the smooth functioning of integrated waste management systems. When waste pickers are willing to integrate, it signifies a commitment to collaboration with municipal authorities and other stakeholders, fostering a sense of partnership in addressing environmental challenges. Moreover, a positive attitude toward integration facilitates the development of supportive relationships with the community and local authorities, contributing to the overall success and sustainability of waste

picker inclusion initiatives (Gunsilius, 2010). In essence, the willingness of waste pickers to integrate is a catalyst for building effective partnerships and achieving shared goals towards waste management. However, the present study did record resistance to integration on the part of the waste pickers, as perceived by some municipal officials.

> "*Many waste pickers may be unwilling to integrate.*" (Municipal Worker 14)

> *"I suspect that many of the waste pickers are happy with their current* [unintegrated, informal] *situation and may not want to integrate."* (Municipal Worker 23)

In this research, 137 waste pickers (63.1%) stated that they were willing to be integrated into the municipality, while 56 (25.8%) were not interested in any integration. Twenty-four participants (11.1%) did not complete the question.

Many waste picker participants, though, rejected the idea of integration. For instance, many noted that they "*did not see the need to integrate"* or explicitly stated that they "*do not want to be integrated*." Some participants did not think it was possible to be integrated because they were foreign nationals. Others did not want to be integrated into the municipality due to reasons, such as being pensioners, too old to work, or suffering from ill health. Others wanted to work independently and expand their activities, while yet others regarded the municipality as not being their employer of choice. There were also elements of mistrust linked to the possible integration into the municipality, which they interpreted as the municipality's opportunity to restrict their waste reclaiming activities. In their study, Sekhwela and Samson (2019) examined a pilot initiative implemented at the Robinson Deep landfill site by the Pikitup Waste Management utility of the City of Johannesburg. The authors established that the different opinions of the waste collectors and reclaimers regarding integration ultimately contributed to the project's failure. The willingness of waste pickers to be integrated into municipal structures is reflected by Schoeman and Rampedi (2022) who reported that the City of Johannesburg (CoJ) was working on formalising waste pickers and integrating them into the city's waste management operations. However, 79.2% of trolley pushers were not aware of this initiative. Despite this lack of awareness, 20.8 % of them, when asked, expressed willing to participate in the formalisation process. On the other hand, 34.5% were unsure or unwilling to participate for various reasons. The main reasons given included being illegal immigrants and, therefore, excluded from the formalisation process, past broken promises from people and organisations offering help, and a preference for working independently and determining their own income.

The unwillingness of waste pickers to integrate can pose significant challenges to municipalities' waste picker integration efforts. In essence, the unwillingness of waste pickers to integrate not only hampers the effectiveness of waste management efforts but also creates barriers to building collaborative and supportive relationships that are crucial for the success of integration initiatives. Overcoming these challenges requires a balanced approach that addresses the concerns and needs of waste pickers while emphasising the long-term benefits of integration for both them as individuals and the broader community (Porras Bulla *et al*., 2021).

5.4.2.1.7 Theme 7: Waste picker expectations

Waste pickers believe that they make a positive contribution to the municipality (also see Theme 2 in Section 5.3.2.1.2) and that they save the municipality and government money. In turn, they expect some kind of "benefit" or "support" from the municipality.

The key expectations of the waste picker participants mentioned in this research included: "*access to medical benefits,*" "*provision of personal protective equipment (PPE*)." "*Provision of transportation,*" "*housing benefits,*" "*full-time employment*" and "*financial support/remuneration."* Some also indicated that they expected benefits such as "*medical aid*" and "*pension funds*" to help their families when they no longer can work, while others prioritised "*an environment of safety and security.*" Additionally, the participants desired access to electricity, tools and machinery, such as compactors, water, sanitation and storage facilities to prevent theft of collected recyclable waste.

Some of the municipal respondents expressed fears about integrated waste pickers having "unreasonable expectations that the municipality cannot meet."

> "*I am afraid that they* [waste pickers] *may have unreasonable or unrealistic expectations. The municipality already has a very tight budget when it comes to waste management and we may not have the money or the capacity to provide those expectations."* (Municipal Worker 8)

> "*What if we cannot meet their* [waste pickers'] *expectations? What if they strike and riot and cause chaos in our town?"* (Municipal Worker 2)

From the responses it is clear that there are conflicting views regarding what the waste pickers may expect from the municipality, and what the municipality can reasonably and realistically provide within their limited budget, resources and capacity.

Schoeman and Ramutanda (2022) described waste pickers' challenges as follows. The trolley pushers in the City of Johannesburg (CoJ) are largely black African males in the 30-39 age group

who perform physically hard work, work long hours, and make very little money. They confront several obstacles, including worries about their safety on the roadways and unwarranted harassment by the Johannesburg Metropolitan Police Department (JMPD). They are open to engage in the formalisation process and believe that joining a cooperative would lead to increased wages. However, they feel mistreated by the inhabitants of Johannesburg, particularly taxi drivers, who do not recognise the role they perform in diverting waste from landfills. Over three-quarters of reclaimers are foreign nationals and their unlawful position in South Africa creates a serious impediment. Resolving their difficulties and integrating them into the regular waste market will require considerable political will (Schoeman, 2022).

5.4.2.1.8 Theme 8: Absence of waste pickers' basic rights

In South Africa, waste pickers struggle for recognition and rights, opposing being called scavengers due to the derogatory connotation (Chamane, 2009). They face persecution from authorities and competition from privatisation and businesses. In India, waste pickers also face discrimination and lack recognition under Indian laws (Reddy, 2018). This is supported by the following contributions from the participants:

> "Access to the landfill site must be conducted by the municipality and foreigners should be prohibited" (Waste Picker 59).
>
> "*Suspected of stealing or being a drug addict"* (Waste Picker 36).
>
> "*They are assisting to reduce waste to landfill but are problematic at times to co-operate with the municipality. Littering, illegal access, trespassing"* (Municipal Worker 11)

They are targeted and harassed by police and anti-social elements, and their basic rights are violated. The lack of recognition also makes them ineligible for government schemes and hinders their access to basic necessities (Reddy, 2018).

Informal waste pickers, who have no legal status, feel isolated and marginalised (Scheinberg *et al*., 2016). They face challenges when municipalities offer contracts to big companies without providing them with alternative economic opportunities. This has led to clashes between local governments, private institutions, municipalities and waste pickers. The lack of legal rights and representation of waste pickers exacerbates the conflict. Many waste pickers prefer to work alone rather than within cooperatives (Scheinberg *et al.,* 2016). Landfills in most countries are privatised or privately managed, making it difficult for waste pickers to access waste as a resource for their livelihoods (Schenck *et al.,* 2018). They need permission from municipalities to enter landfills, but municipalities have not effectively supported waste pickers. As a result, waste pickers lack

protection from local governments and do not have legal rights (Schenck *et al*., 2018). Society often perceives waste pickers as uneducated and poor, labelling their social status as the "poorest of the poor" and their work as “scavenging.” This perception leads to waste pickers being seen as nuisances by society and waste management practitioners (Wilson & Novak, 2009) – which, consequently, marginalises them (Medina, 2008).

5.4.2.2 Results of the Madibeng Local Municipality document review

The Madibeng Local Municipality Integrated Development Plan aims to establish whether integration of informal waste pickers is in their five-year plan (IDP, 2021/22). The Integrated Waste Management Plan of the Madibeng Local Municipality does not mention any form of informal waste picker integration (Madibeng IWMP, 2016). The waste management by-law of the Madibeng Local Municipality allows for the integration of informal waste pickers (Madibeng Waste Management by-law, 2021), and, lastly, the landfill permit does not mention inclusion of landfill informal waste pickers (Permit No. GMB-B33/2/0121/41/P81).

Table 5-45: Summary of the Madibeng Local Municipality document review

Review criteria	IWMP	Waste by-law	Waste management licence for Hartbeesfontein Regional landfill site	Waste management licence for Waste transfer stations
Criteria 1: Is there any mention of waste pickers in the document (yes/no)?	No	Yes	No	No
Criteria 2: If YES, to what extent is provision made for waste picker integration?		Authorisation or permit for landfill waste pickers on site	Landfill Permit (1998) prior development of NWMS (2011 and 2020)	Permitted to recover materials at three waste transfer stations
Criteria 3: If NO, are there any existing enabling mechanisms which could allow for waste picker integration (i.e., provision for co-operatives, public-private partnerships, etc.)	IWMP under review with input regarding inclusion/integration of informal waste pickers Madibeng is in partnership with DEFF, PETCO and Provincial Dept on training of informal waste pickers.	Reviewed 2021 with inclusion of waste picker		Kosmos, Brits and Damonsville transfer stations have facilities for recycling.
Criteria 4: Are there any provisions which may hamper/prevent waste picker integration (i.e., prohibition of waste pickers on landfill sites/prohibition of reclamation of waste-by-waste pickers, etc.).	Informal waste pickers doubt that they will benefit if they become integrated into the formal economy.			Commitment of informal waste pickers is key for success of integration.
Criteria 5: Stake holders' participation in integration	The Madibeng Local Municipality is on track, informal waste pickers need to see benefits of integration.			Support is there for informal waste pickers; they also need to join waste pickers associations to learn from others.

The document review of the Madibeng Local Municipality found that there was no mention of waste pickers in the document. However, there were existing enabling mechanisms that could allow for waste picker integration, such as the Integrated Waste Management Plan (IWMP) under review with input regarding inclusion or integration of informal waste pickers, and partnerships with the DEFF, PETCO and the Provincial Department for training informal waste pickers. There were no provisions that explicitly hampered or prevented waste picker integration, but the commitment of informal waste pickers was seen as key for the success of integration. Stakeholders' participation in integration was encouraged, and informal waste pickers were urged to join waste pickers associations to learn from others.

5.5 Chapter summary

The chapter discussed the municipality's efforts to promote reclaiming practices in informal settlements and the operation of buy-back centres. Various initiatives had been implemented, including awareness programmes and capacity building with stakeholders in the private sector. These efforts had successfully promoted reclamation practices through clean-up campaigns and building capacity among residents. Buy-back centres played a crucial role in connecting the formal and informal economies of recycling, but attracting large volumes of recyclables was a challenge. The establishment of buy-back centres had led to fairer pay for waste pickers and mitigated exploitation. However, there was a lack of a central database on buy-back centre locations in South Africa.

The chapter also discussed the talents, skills and training of waste pickers. Waste pickers possess various skills related to their work but have limited skills for other job opportunities. Some waste pickers had received formal and informal training in various fields. Language proficiency, particularly in English, is important for employment opportunities. The chapter highlighted the high unemployment rate in South Africa and how it contributed to citizens resorting to informal waste picking. Many waste pickers had held formal jobs in the past, but often part-time and short-term. Age, health and education barriers also affected their ability to seek full-time employment.

The characteristics of waste pickers' work were discussed. They face poor working conditions, health and safety risks, low social status and extreme poverty. Despite these challenges, waste pickers play a valuable role in waste management by reducing landfill waste and recovering valuable materials for recycling. However, they face challenges in collecting, transporting, storing and selling recyclable waste. They often rely on walking or using trolleys for transportation and face issues such as trolley theft. They also struggle to find adequate storage space for recyclable waste.

The chapter provided insights into the income and social situation of waste pickers in South Africa. Their income is influenced by factors, such as location, type of work, quantity and value of waste, buy-back centres and gender. Gender disparities exist, with women earning less than male waste pickers. Waste picking often serves as an additional income source, and waste pickers may also receive grants or have other jobs. The social situation of waste pickers is characterised by varied living conditions, with some living in houses or shacks, and others on the streets. Food insecurity is a concern, with some waste pickers experiencing days without food.

The chapter then reported on the current status of waste management services and infrastructure in the Madibeng Local Municipality. The municipality's waste management infrastructure was inadequate and was often damaged due to vandalism, with the lack of security to protect infrastructure being a major factor. The municipality relied on service providers to collect waste on their behalf; however, garden waste was not collected at all. Illegal dumping was a significant issue, and only a small percentage of waste was recycled or recovered. The chapter highlighted plans to address solid waste management challenges, including developing a plan to address illegal dumping, improving refuse collection and encouraging reclaiming practices. Overall, the chapter emphasised the need for increased awareness, education and community participation in recycling, improved infrastructure and support for waste pickers, and better integration of waste pickers into waste management practices. The municipality's efforts to promote reclaiming practices and the operation of buy-back centres were commendable, but there were still challenges to overcome in order to integrate waste pickers fully into formal waste management systems.

CHAPTER 6: CONCLUSIONS AND RECOMMENDATIONS

6.1 Introduction

In the previous chapter, the results of the descriptive data analysis conducted on the collected quantitative data and the findings of the thematic analysis conducted on the collected qualitative data were presented.

The main research question relates to how informal waste reclaiming practices can be integrated into the formal waste management system within South African municipalities. Interviews were conducted with the 217 waste picker participants that is made up of 140 Community informal waste picker (CIWP), 38 Landfill informal waste picker (LIWP) and 39 Street informal waste picker (SIWP) as well as 15 municipality participants and 18 Buyback Centre participants using questionnaires with the aim of collecting quantitative and qualitative data that was subjected to descriptive and thematic analysis with the aim of achieving the following research objectives:

- **Research Objective 1:** To determine the socio-economic profile of the waste pickers in Madibeng Local Municipality.
- **Research Objective 2:** To determine the status of informal waste reclaiming practices in Madibeng Local Municipality.
- **Research Objective 3:** To determine the current status of waste management services and infrastructure in Madibeng Local Municipality.
- **Research Objective 4:** To determine the current enabling environment within Madibeng Local Municipality to allow for integration of informal waste reclaiming practices.

Section 6.2 provides the conclusions, while Section 6.3 suggests recommendations for waste picker integration in Madibeng (Section 6.3.1) and South Africa (Section 6.3.2) as well as recommendations for future research (Section 6.3.3).

6.2 Conclusions

The main conclusions related to each of the research objectives are discussed individually in the sub-sections below (Section 6.2.1 to Section 6.2.4), while Section 6.2.5 provides the overall conclusions as it relates to the main aim of the research.

6.2.1 Conclusions related to Research Objective 1

RO1: To determine the socio-economic profile of the waste pickers in Madibeng Local Municipality (n = 217).

The demographic profile of waste pickers emerging from this research underscores important dimensions that significantly influence their roles and experiences within the waste management landscape. There were slightly more females (53.9%) than males (46.1%) among waste pickers in the study. The majority of female waste pickers worked from home, while men worked at landfill sites, which are considered more unsafe for women. A study by Viljoen (2014) found that men were the majority among street waste pickers due to the risks involved for women. However, research by Uhunamure (2021) in the Limpopo Province reported an almost equal representation of females and males. Contradicting findings were made by Motlhoki (2019), who stated that the majority of waste reclaimers in South Africa are male. Similarly, Schenck and Blaauw (2011) found that 97% of the waste pickers they engaged with were male. Mothiba (2016) found a gender distribution of 66% female and 34% male waste pickers in the City of Tshwane Metropolitan Municipality. Viljoen (2014) reported that the national average of male street waste pickers, which is 91.1%. In Pietermaritzburg and Nelspruit, there is an equal distribution of male and female street waste pickers, but there are not many pickers in these cities. According to Viljoen (2014), the majority of female street waste pickers are found in Durban, where they make up 28.4% of the pickers. In Cape Town and Johannesburg, the percentage of female pickers is much lower at 9.7% and 5.2% respectively. In Pretoria, 97.4% of the street waste pickers are male, which is close to the national average (Viljoen, 2014).

The average age of the waste pickers included in the research was 42 years. The majority of the respondents were between 26 and 35 years old, accounting for 29.5% of the sample. This age range is considered youth or young people, according to Bhengu (1997). The next largest age group was 36 to 45 years old, making up 20.7% of the respondents. Eight respondents (3.7%) did not disclose their age. The youngest respondent was 19 years old, while the oldest was 91 years old. It is important to note that no individuals under the age of 18 were interviewed for ethical reasons.

Marital status is an important factor that can impact health outcomes and overall well-being. Research has shown that marriage can improve economic well-being, mental and physical health, and the well-being of children (Wood *et al*., 2007). In this study, the majority of respondents were either never married or single (54.8%), while a smaller percentage were married (17.1%) or living with a partner (13.4%). Additionally, a small percentage were widowed, separated, or divorced from their partners. This distribution of marital status among waste pickers differs from findings in other studies. For example, other research has found higher percentages of married waste pickers, ranging from 47% to 50% (Uhunamure, 2021; Schenck & Blaauw, 2011). Overall, understanding the marital status of waste pickers can provide insights into their general life quality and the potential impacts of waste picking on their health.

According to the research, it was found that many waste pickers in South Africa are illegally in the country, which makes it difficult for them to be integrated into municipal structures. The majority of respondents (87.1%) reported being from South Africa, while a smaller percentage (12.4%) were from other countries such as Zimbabwe (8.3%), Mozambique (2.3%), Lesotho (0.9%), Swaziland (0.9%), and Malawi (0.5%).

In this study conducted in the Madibeng Local Municipality in the North-West Province, it was found that approximately 48% of the respondents were Setswana speakers, followed by Xitsonga, IsiZulu, Shona, and Sepedi. None of the respondents reported English as their home language. This result was expected due to the Tswana ethnic group and predominantly Setswana-speaking population in the area. However, it should be noted that some Xitsonga and Shona-speaking participants may be foreigners from Zimbabwe. Schenck and Blaauw (2011:418) conducted a study among street waste pikers in Pretoria and found that the dominant home languages of the respondents were Sepedi (43%), IsiNdebele (20%), and Setswana (2%). The Sepedi and IsiNdebele-speaking respondents are mostly from Gauteng, while Setswana is the dominant language in the North-West province, located in close proximity to Pretoria.

According to Bouchrika (2023), education is important for social acceptance and being a valuable member of society. It provides stability and financial security in today's economy. Education also plays a crucial role in eradicating poverty and hunger, allowing people to live better lives. In this study, it was found that 33.2% of the respondents had a Grade 12 qualification, 10.1% had no schooling, 17% had schooling up to Grade 7, and 38.8% had education up to Grade 8 to Grade 11 but did not finish school. According to Uhunamure (2021), only 0.9% of respondents in his study had no formal education, while 48.2% had primary school education and 50% had secondary school education. Viljoen (2014) found that a significant majority of waste pickers have low education levels, with 92.9% not completing formal schooling. This lack of education makes it difficult for young waste pickers to secure jobs (Viljoen *et al.,* 2016).

Waste pickers, who are informal workers involved in gathering and recycling trash, possess various skills that are essential to their work, including the ability to identify different waste materials, knowledge of the market value of waste items, and the ability to negotiate prices with buyers (Viljoen *et al*., 2016). This lack of basic education and skills can lead to involuntary low-level employment for some individuals (Viljoen *et al*., 2016). However, some waste pickers have been able to acquire formal and informal training in various skill sets, such as building, carpentry, driving, and gardening (Mudavanhu, 2019).

According to this study, respondents had either formal or informal training, with 46.9% having formal training and 49% receiving informal training. This is similar to Mudavanhu's (2019) findings,

where 45.8% of respondents received some form of formal training. The most common types of training mentioned were security officer training, welding, computer training, painting, and plumbing. Mudavanhu (2019:94–95) reported training on similar skillsets, with some respondents being specifically trained as drivers, machine operators, and recycling operators, which could potentially make them employable within the formal waste sector.

According to a study by Viljoen *et al*. (2016), language proficiency plays a crucial role in finding and maintaining employment. In South Africa, where English is the main language used in the workplace, the ability to understand and speak English is particularly important. The study found that 56.7% of respondents indicated that they understand English well, 32.7% somewhat understand it, and only 9.7% do not understand it at all. In terms of spoken English proficiency, 57.1% of respondents can speak English well, 29% can speak it somewhat, and 12.9% cannot speak it at all. Both Viljoen *et al.* (2016) and Mudavanhu (2019) highlighted that a lack of language proficiency is a significant barrier for waste pickers in their efforts to find alternative employment.

In the second quarter of 2023, South Africa's unemployment rate was 32.6%, with youth unemployment (15–34 years of age) at 45.3% (Stats SA, 2023). Many waste pickers turn to informal waste picking due to difficulties in finding employment in other sectors (Mudavanhu, 2019; Viljoen *et al*., 2016). Data collected on respondents' employment histories showed that 50.2% had previously held a formal job where they received a payslip, while 47.0% had never held such a job (Mudavanhu, 2019:234). The respondents in this study had a variety of past jobs, including general workers, operators, cleaners, cashiers, and security officers. According to Schenck and Blaauw (2011:419), these jobs were often part-time and for a short duration, indicating a difficulty in holding formal, full-time employment. This may explain why the respondents turned to informal waste picking as a means of making a living.

In conclusion, the research on waste pickers in South Africa reveals important demographic dimensions that influence their roles and experiences in the waste management landscape. The majority of waste pickers are female, with women primarily working from home and men working at landfill sites. The average age of waste pickers is 42 years, with the majority falling within the youth age range. Marital status varies among waste pickers, with a significant percentage being never married or single. Many waste pickers in South Africa are illegally in the country, which hinders their integration into municipal structures. Language proficiency and education levels among waste pickers are generally low, making it difficult for them to secure formal employment. However, some waste pickers have acquired skills through formal and informal training. Understanding the demographic profile of waste pickers is crucial for addressing their specific needs and improving their overall well-being.

6.2.2 Conclusions related to Research Objective 2

RO2: To determine the status of informal waste reclaiming practices in Madibeng Local Municipality.

The term "waste picker" refers to individuals who collect and reclaim reusable and recyclable materials from discarded waste (Samson, 2009b). Waste pickers in the European Union are often from vulnerable groups such as ethnic minorities, migrants, refugees, and individuals excluded from the labour market (Scheinberg *et al*., 2016). In Colombia, a waste picker is defined as someone who recovers, collects, transports, or classifies solid waste for economic purposes (Parra and Vanek, 2023:9). The work of waste pickers varies across different cities and regions, and there is no consistent terminology used to describe them (Peres, 2016; Samson, 2010). Waste pickers rely on waste from households and businesses, which they collect from waste bins or skips (Schenck & Blaauw, 2011). This job is characterised by poor working conditions, health and safety risks, low social status, and extreme poverty (Morais *et al*., 2022). Waste pickers also face discrimination and stigma from their own families and colleagues (Sapkota *et al*., 2020).

Despite the challenges, waste pickers play a valuable role in waste management by reducing landfill waste and recovering valuable materials for recycling (Mamphitha, 2012). In Cape Town, waste pickers are referred to as "strollers" and their work as "skarrelling" (Peres, 2016). However, the term "waste picker" is used in cross-country advocacy work and by the South African Waste Pickers' Association (SAWPA) (Samson, 2010). The duration of employment, also known as tenure, is the length of time a person has worked in a specific job or position. It is an important factor as it can impact a worker's salary, benefits, and job stability. Long-tenured employees are typically more competent and skilled compared to newcomers. According to the study, the majority of waste pickers have been working for between one and three years, with approximately 35% having been waste pickers for between four and nine years, and 9% having been waste pickers for more than 10 years. The average duration of employment for waste pickers is 4 years and 5 months (Mamphitha, 2011; Mlotshwa *et al*., 2022).

Waste pickers often work long hours, starting as early as 4 a.m. to travel to their work area and collect waste before waste collection vehicles arrive. Male waste pickers tend to work longer hours and earn more money than their female counterparts (Maema, 2017; Mlotshwa *et al*., 2022). The majority of waste pickers start working between 06:00 and 08:00 in the morning, with only a small percentage starting later than 9:00. Most waste pickers finish work between 13:00 and 17:00, aligning with the waste collection schedules of municipalities. The average working hour for waste pickers is 8 hours and 33 minutes (Mamphitha, 2012). Waste pickers work different days per week, with 38.2% working seven days, approximately 49% working between five and six days,

and only 7.3% working four days or less per week (Uhunamure, 2021; Wilson *et al*., 2021). Yu *et al*. (2020) reported that the waste pickers they study have daily work hours ranging between two and 14, with mean and median hours of 9.05 and 9.00, respectively.

In this study it was found that the majority of respondents (67.7%) collected recyclable waste from shops and businesses, while 65.9% collected waste from dustbins or bags outside houses. Schools and industrial areas were also popular sources for collecting recyclable waste, with 23.5% and 23% of respondents respectively. Only a small percentage (1.4%) purchased recyclables from other people. Mamphitha's (2012) and Mokobane's (2017) research have shown that waste pickers collect recyclable waste from various sources such as households, schools, businesses, government buildings, and streets. Waste pickers in Johannesburg mainly collect waste from households and businesses, which aligns with the waste collection schedule of the responsible entity for waste collection in the city.

According to Reyneke (2016), Mudavanhu (2019), Wilson *et al*. (2021) and Anierobi *et al*. (2022), recyclable waste can be classified into two categories: "soft waste" which includes paper, plastic, glass, and cardboard, and "scrap-metals" which includes metals like iron, copper, aluminium, zinc, brass, and steel. These categories of recyclable waste are collected from street/kerb-side collection and landfill reclamation. The most frequently collected waste type was cans, followed by plastic, glass, paper, and cardboard. Metals and tetrapak were also collected, but at lower frequencies. Waste pickers prioritise collecting metal and plastics because they are the most valuable types of waste. Clark (2019), Mamphitha (2012), Schenck and Blaauw (2011), Mokobane (2017), Anierobi *et al.* (2022), pointed out that waste pickers need to collect sufficient volumes of recyclable material before selling it to make their effort worthwhile. The time required to gather enough recyclable waste may vary depending on factors such as the type of recyclable garbage, the location of the waste source, and the demand for the recyclable waste. Approximately 65% of respondents in the study needed between five and seven days to collect enough waste to sell. Waste pickers typically collect waste for up to three days before they have enough to sell to buyers. Having a means of transportation, such as a trolley, allows waste pickers to move faster and earn more money.

According to research conducted in Johannesburg by Mamphitha (2011:25), recyclable waste in the area was primarily transported by hand, wheeled bins, wheelbarrows, handcarts, or other trolleys. In Allama Iqbal Town, Pakistan, Asim *et al.* (2012) found that recyclable waste was collected by "Korreywalas" using donkey carts. In Istanbul, Turkey, Florin (2018) discovered that waste pickers referred to as "Toplayclar" used trolleys for waste transportation, which were acquired from merchants, other waste pickers, or retailers. Medina (2008) reported that waste pickers' carts can also interfere with traffic, and if they use animals to pull their carts, manure may

end up on the streets. Municipal authorities often ban waste pickers' activities, but this only drives their activities underground. The trolleys had a lifespan of three to six months before a new one was needed. Mamphitha (2011) noted that most waste pickers bought their trolleys for R 50 from merchants, waste pickers, or retailers. Dladla (2018) reported that well-constructed trolleys with reflectors were donated to waste pickers as a municipality project. Mokobane (2017) mentioned the issue of trolley theft. (Medina, 2008).

According to Mudavanhu (2019), waste pickers have access to recyclable waste and can use items like clothes, sheeting, and household goods for personal use. In this study, 81.6% of respondents reported using recyclable waste products for personal use, while 16.6% indicated that they do not use recyclable waste in this way. Schenck & Blaauw (2011) also found that waste pickers collect various items for personal use, such as furniture, clothing, electronic appliances, cell phones, buckets, and building materials. Waste pickers in South Africa, who live in absolute poverty, often experience hunger and malnutrition (Morais *et al*., 2022). They rely on informal food resources, such as dustbins or landfill sites, which pose serious health risks (Chen & Carré, 2020; Mothiba, 2016). However, waste pickers are not allowed to collect food from landfill sites for safety and health reasons (Mudavanhu, 2019). This study found that the majority of waste pickers (87.1%) do not reclaim food from bins, while 11.1% do. Some waste pickers rely on food found at landfill sites, but this can cause illness. The types of foods collected from bins for personal or family consumption include bread, fruits, meat, and maize meal (Chidzungu, 2017; Mlotshwa *et al.*, 2002). Waste pickers are tempted to eat the dumped food on the spot with dirty hands, and some even take-home dumped meat for personal consumption or possible sale (Chidzungu, 2017).

Having storage space for recyclables is important for waste pickers to protect them from the elements and prevent theft (GAIA, 2021). This study revealed that 78.3% of waste pickers store their collected recyclable waste before selling it, while 18% do not. They store recyclables in various containers and locations, such as bags, crates, old steel drums, plastic containers, bins, backyards, landfill sites, open fields, owned or rented spaces, and municipal transfer stations. Some waste pickers, particularly women in the Durban area, have been able to secure storage space by building relationships with retail stores and offering to clean their waste areas in exchange for recyclable waste (Mlotshwa *et a*l., 2022).

Ezeah *et al.* (2013) found that buyers of recyclable waste include recycling dealers, SMEs, scrap yards, and processors. Private industry buyers may not purchase from individual waste pickers due to quality and volume requirements, creating a middleman role. This study found that the majority of respondents (63.6%) sell their recyclable waste to private individuals, while 34.1% prefer to sell it to buy-back centres or waste depots. Most waste pickers in townships and landfill

sites sell to private individuals who collect the waste. Only 2.3% sell their waste to other sellers, such as private individuals, hawkers, or larger recycling companies. Mudavanhu (2019) conducted a study in Johannesburg and found that waste pickers mainly sell their recyclables to buy-back centres at the landfill site. However, the buy-back centres do not conduct daily collections, which creates problems. The buying prices at different buy-back centres vary, causing waste pickers to sell their recyclable waste to other buyers offering higher prices (Mudavanhu, 2019:125).

Anierobi *et al.* (2022) conducted a study in Enugu Metropolis, Nigeria, and found that waste pickers travel long distances, often on foot, to buy-back centres to sell their recyclable waste. Approximately 14.7% of respondents travelled about 30 minutes on foot (approximately 5 to 7 km) to their nearest buy-back centre. The remaining respondents travelled between ten and sixty kilometres, either by foot or by car for longer distances, to reach their waste buy-back centres. Waste pickers are willing to travel longer distances to buy-back centres due to higher or better prices for recyclable materials (Anierobi *et al*., 2022). According to Mamphitha (2011), waste pickers typically cover an average distance of five to thirty kilometres per day, mostly on foot, as they travel between waste reclamation points and buyers. Viljoen (2014) states that waste pickers sell their recyclable waste to different buy-back centres based on who offers the highest price. This leads waste pickers to travel to areas where they can obtain better prices for their waste. Access to transportation ensures higher income and makes the waste pickers more productive (Marello, 2013 and Mamphitha, 2011).

The income of waste pickers in South Africa is influenced by various factors such as location, type of work, quantity and value of waste, buy back centre, and gender (Anierobi *et al*., 2022; Mamphitha, 2011; Mudavanhu, 2019; Viljoen, 2014). The average daily income for waste pickers in South Africa ranges from R104 to R258, with the SWP earning the most (R258 on average) and the LWP earning the least (R 104 on average) per day. The weekly average income ranges from R548 to R1 081, with the SIWP earning the most (R1 081 on average) and the LIWP earning the least (R548 on average) per week (Anierobi *et al*., 2022; Mamphitha, 2011; Mudavanhu, 2019; Viljoen, 2014).

Other studies have reported similar findings, with average monthly incomes ranging from R2 900 to R97 per day (Barnes *et al*., 2021) and weekly incomes ranging from R449 to R1 142 (Blaauw *et al*., 2019). The average self-reported income for waste pickers in South Africa is R390 per day and R1 512.00 per week, with the SIWP earning the highest income (Anierobi *et al*., 2022; Mamphitha, 2011; Mudavanhu, 2019; Viljoen, 2014). Gender also plays a role in income disparities, with women earning 22% less than male waste pickers (Wilson *et al*., 2021). This may be due to factors such as competition and physical limitations in carrying loads over long

distances (Motlhoki, 2019; Viljoen *et al*., 2015). It is important to note that waste picking often serves as an additional income source, with waste pickers also receiving grants and engaging in other jobs or activities to supplement their income.

The living conditions of informal waste pickers in South Africa, as depicted in the literature, reveal a multifaceted reality characterized by diverse housing arrangements and economic challenges. The majority of respondents lived in houses, while a significant portion resided in shacks, makeshift shelters, or even on the streets, highlighting the precariousness of their living situations. This echoes findings by Mudavanhu (2019) and Reyneke (2016), emphasizing the prevalence of shacks and temporary shelters, particularly near landfill sites. Additionally, the average number of dependents per waste picker's income aligns with Schenck and Blaauw's (2011) study, emphasizing the economic responsibility borne by these individuals. The financial support structure, with many waste pickers sending money home, reflects the findings of Wilson *et al*. (2021) and underscores the transitory nature of this work. However, despite their economic contributions, the literature indicates that a considerable number of waste pickers face food insecurity, with reported instances of days without food, mirroring observations made by Mudavanhu (2019) and Schenck and Blaauw (2011).

The literature further underscores the challenges waste pickers encounter in finding adequate shelter and protecting their goods, particularly during adverse weather conditions, as noted by Reyneke (2016) and Makina (2020). The support network among waste pickers, involving sharing food and financial assistance, as highlighted by Mudavanhu (2019), adds a layer of resilience within this vulnerable community. However, the reliance on food donations from external sources, such as churches, also points to the limited self-sufficiency of waste pickers in meeting their nutritional needs. Notably, the text reveals the absence of support from local governments or NGOs for these individuals, as echoed by Mlotshwa (2022), further emphasizing the gaps in institutional assistance. Moreover, the regulations restricting direct food donations to waste pickers highlight the challenges imposed by municipal policies, contributing to the complex dynamics of their daily lives, as elucidated by Mudavanhu (2019).

The findings regarding supportive behaviours among waste pickers, as outlined in the literature and survey results, reveal a complex social dynamic within this community. The sharing of resources, such as food and clothing, as well as selling items on behalf of each other, underscores a sense of communal support. However, the research also brings attention to the selective nature of this assistance, as waste pickers did not extend help in areas such as loans, shelter, housing, personal care products, or caregiving during sickness. This nuanced understanding of supportive

behaviours aligns with Mudavanhu's observations (2019) that, despite their independent work, waste pickers do exhibit solidarity by sharing essentials and providing financial aid. Concerning the growth in the waste picker population, the majority of respondents noted an increase. This finding is corroborated by Morias *et al*. (2022), who assert that there is a rising trend in the number of waste pickers both in developed and developing countries. The reasons provided for this growth, including poverty, limited job opportunities in the formal sector, and lack of parental care, align with the literature, particularly Rathana's work (2009).

Finally, the study explored waste pickers' awareness of waste-related legislation in the Madibeng Local Municipality. A substantial portion (79%) claimed knowledge of applicable regulations, while 20% were unaware. This finding is contextualized by Guya (2019), who mentions the Waste Act in South Africa, emphasising the importance of waste hierarchy and the National Waste Management Strategy. Additionally, Viljoen (2014) and Peres (2016) highlight a gap in the integration of waste pickers into municipal waste management plans, suggesting that, despite existing legislation, waste pickers may be overlooked in policy implementation.

6.2.3 Conclusions related to Research Objective 3

RO3: To determine the current status of waste management services and infrastructure in Madibeng Local Municipality.

It is concluded that the municipality's waste management infrastructure faces significant challenges, notably the pervasive issue of vandalism, which has led to the deterioration of facilities. This concern is underscored by municipal workers who point out that the lack of security guards exacerbates the vulnerability of waste management assets. The consequences of this situation are evident in the substandard condition of facilities, hindering their full functionality. The reliance on hired fleet items and outsourcing waste collection services to external providers appears to be a pragmatic response to address the limitations in municipal-owned resources. The literature, specifically the insights from Stubbs (2022), further contextualises the challenges faced by South Africa's waste management industry. Despite its efficiency, the country struggles with a substantial volume of annual waste, with only a merger 10% being recycled or recovered. The case of the City of Johannesburg, as reported by Cape Talk (2022), serves as a cautionary example, highlighting security concerns at waste-management sites, underlining the need for robust security measures in waste management infrastructure nationwide. In summary, the municipality grapples with infrastructure issues and security concerns, and its strategies align with broader trends in South Africa's waste management landscape, as elucidated by the literature provided.

According to the Madibeng Annual Report (2018/19), 41% of households in the municipality have solid waste removed at least once a week, while 6% have solid waste removed less frequently than once a week. 17% of households use communal or own refuse dumps, and 36% have no rubbish disposal. This means that 59% of households are below the minimum service level (Madibeng Annual Report, 2018/19). During interviews with municipal workers, there were contradictory statements about the effectiveness of waste management services. Some workers claimed that daily refuse collection is done, while others said it is irregular and inconsistent. One worker stated that only 41% of households receive refuse collection services, and another mentioned that some areas are serviced daily while others have no waste management (Madibeng Annual Report, 2018/19).

The challenge of waste pickers engaging in illegal activities, exacerbated by gaps in municipal waste management policies, is a critical issue requiring attention. As highlighted by Guya (2019) and Mudavanhu (2019), the absence of clear by-laws and guidelines on the disposal of garden and builders' rubble in municipalities like Madibeng and Metsimaholo creates a loophole for waste pickers. These individuals resort to sorting materials on municipal land illegally, leaving rejected waste for municipal workers to collect. This aligns with Polasi's (2018) observation that insufficient or irregular waste collection services contribute to illegal dumping. The situation demands a multifaceted approach, incorporating legal recognition and integration of waste pickers into formal waste management systems, as witnessed in Stellenbosch. Mudavanhu's (2019) documentation of the success in Stellenbosch, where garden waste collected by waste pickers is processed into compost on a designated site, underscores the potential benefits of inclusive waste management practices. Efforts to bridge the policy gaps, coupled with initiatives that recognise the role of waste pickers and provide them with legal avenues, can contribute to a more sustainable and effective waste management system.

Similar challenges exist in other areas, such as Istanbul, where only 47% of household waste is collected by rubbish trucks (Florin, 2018). A study in the City of Tshwane found that non-compliance with waste management regulations, insufficient trash bins, incorrect perceptions of waste management benefits, and lack of management effectiveness negatively impact solid waste management (Worku & Muchie, 2012). The study suggests that the Madibeng Local Municipality should develop a plan to address illegal dumping, improve refuse collection, and encourage reclaiming practices (source). Education and awareness campaigns, as well as community involvement in clean-up campaigns, are seen as important focus areas. The municipality has a quarterly programme to remove illegal dumps and emphasises education and awareness to curb dumping behavior. They also plan to encourage community involvement through street-based committees and the establishment of recycling groups. Prior awareness

campaigns and good planning are necessary when moving communities to new locations. Regular waste removal and the placement of skip bins in problem areas are important in preventing illegal dumps. The involvement of schools and youth in waste education and awareness programmes is crucial. Providing access to enough bins and educating people on their use can help combat dumping.

According to Dladla (2018), municipalities can prevent illegal dumping by creating community awareness, reporting illegal dumping to authorities, and organising volunteer clean-up efforts. They should also provide waste bins to communities and regularly remove them, as well as promote recycling through awareness programmes. "No Dumping" signs with the contact number of the local waste management authority may not be effective in South Africa due to theft and recycling of metal. The municipality's education on reclaiming practices is not widely spread within informal settlement communities. Municipal Worker 10 and Municipal Worker 3 confirm that the education programme is slow and has not reached all settlements. Ndlovu (2016) found that waste management programmes in Johannesburg have been unsuccessful due to low resident participation and a negative attitude towards the programme. Poor landfill management in Johannesburg is attributed to factors such as corruption, lack of leadership and responsibility, and insufficient funds for infrastructure development (Jewaskiewitz, 2021). Schoeman and Rampedi (2022) suggest that improving household waste separation programmes in Johannesburg is crucial, and overcoming situational barriers is important for successful recycling.

The Madibeng Local Municipality has three recycling facilities and seven waste transfer stations, but it seems that the public is not effectively utilising the waste transfer stations (Municipal Workers 5 and 8). Some participants in the municipality reported that no action has been taken to address waste minimisation, while others stated that strategies have been developed. A small percentage of respondents mentioned that the municipality is distributing recycling bags to residents to promote recycling and separation at source. According to Maeteletja, Manganyi, and Wichmann (2019), landfills are the most common method of waste disposal globally. However, the limited availability of land in urban areas poses a challenge to the longevity of landfills. In South Africa, the increase in consumerism has led to a rise in waste generation, and the absence of recycling infrastructure in communities has resulted in a significant amount of reusable waste ending up in landfills. Informal recycling in developing countries has proven effective in reducing waste disposed at landfills and extending their lifespan.

Strydom (2018) found that the main reasons why people do not recycle are insufficient space, lack of time, dirty and untidy recycling processes, lack of knowledge about recycling, and inconvenient recycling facilities. The municipality has implemented various initiatives to promote reclaiming practices in informal settlements, including awareness programmes and educating

communities about waste separation at the source (Municipal Worker 7). Capacity building with stakeholders in the private sector who deal with recycling has also been mentioned (Municipal Worker 7). The Madibeng Local Municipality has implemented programmes to encourage waste reclamation in informal settlements, aiming to improve waste management and promote sustainable practices (Municipal Worker 12). According to a report by Maurice (2023), the City of Tshwane Metropolitan Municipality in South Africa has successfully promoted reclamation practices in informal settlements through regular clean-up campaigns and building capacity and awareness among residents. These efforts were carried out on a weekly basis and were deemed successful by both residents and the municipality.

Buy-back centres play a crucial role in connecting the formal and informal economies of recycling. They add value to recyclables by sorting, cleaning, and baling them before selling them at higher prices to recycling importers, manufacturers, or companies (Viljoen *et al*., 2019). The treatment of waste pickers by buy-back centres affects their profit margins, as waste pickers tend to sell to centres that pay higher prices (DEFF and DSI, 2020).

In the Madibeng Local Municipality buy-back centres in the region collectively acquire substantial amounts of plastic, batteries, cans, Tetrapak, and metal from waste pickers on a weekly basis. Sustainability within this sector is highlighted as small buy-back centres engage in transactions with larger counterparts, which, in turn, collaborate with large recycling companies, emphasising the need for an operational threshold of at least 40 tonnes of recyclable materials per month (Viljoen *et al*., 2019).

Increasing volumes of recyclables can create more jobs and income opportunities in the recycling industry. The establishment of buy-back centres has led to fairer pay for waste pickers by mitigating volatile market prices and exploitation by middle agents (Barford & Ahmad, 2021).

Buy-back centres in Madibeng Local Municipality play a crucial role in the informal waste management system by providing waste pickers with a market to sell their collected waste. Viljoen *et al.* (2012) found that there is a mutually beneficial relationship between waste pickers and buy-back centres, as the centres offer a market for the goods collected by waste pickers. However, Viljoen *et al.* (2016) highlighted the lack of a central or reliable database on buy-back centre locations in South Africa. According to the study, 38.89% of buy-back centres in Madibeng have been operating for 1 to 3 years, while 16.67% have been operational for more than 21 years. The centres are classified into different groups based on the number of employees, with the majority employing 1 to 5 employees. Plastic is the most commonly bought material by these centres, which primarily receive waste from street waste pickers. Buy-back centres in Madibeng also provide support to waste pickers, such as providing bulk bags and occasional meals. The

integration of garbage collectors, including buy-back centres, should be tailored to specific circumstances and adhere to waste picker integration principles, fair pricing, and openness (DEFF & DSI, 2020).

The landfill site's facilities were inadequate for waste picker participation, with limited sanitation. Municipal staff were well-managed, but the number of informal waste pickers was high. The municipality implemented pollution control, separation, and segregation measures, but informal waste pickers' hazardous practices, including smoking, were not understood. The Madibeng Local Municipality's waste management documents primarily focus on waste minimisation and separation at source, with limited mention of waste pickers. A recently reviewed by-law includes provisions for the integration of informal waste pickers, but does not include provisions for their participation, potentially limiting enforcement and hindering productive relationships.

6.2.4 Conclusions related to Research Objective 4

RO4: To determine the current enabling environment within Madibeng Local Municipality to allow for integration of informal waste reclaiming practices.

The support received from the municipality for waste pickers is mixed. Some waste pickers receive limited support, such as free protective clothing and access to municipality infrastructure for recycling purposes. They also receive sponsorship for trollies, environmental education, and free registration from recycling groups and their members. However, some waste pickers do not receive any support from the municipality (Arnoldi, 2018). On the other hand, some waste pickers report that the municipality does contribute to their work. They receive access to recycling facilities, equipment, and some protective clothing like surgical masks and gloves. They also receive supplies like plastic bags, soaps, bin liners, and gloves from the municipality (Arnoldi, 2018).

The municipality has implemented an informal waste picker programme to minimise waste going into landfill sites. Informal waste pickers are allowed at landfill sites and transfer stations. Recycling groups are registered and promoted by the environmental unit, and some groups are granted access to recycling facilities and landfills (Arnoldi, 2018). Efforts have been made in other municipalities to support waste pickers. GreenCape provides gloves to prevent cuts and disease exposure, and they have a programme called "earn a trolley" that incentivises waste pickers to engage in positive behaviours to receive equipment. In eThekwini Municipality's Durban, trolleys have been designed specifically for waste pickers, taking into account their needs in narrow alleys, being easy to operate by women, and easy to store (Quazi & Dobson, 2012).

According to interviews with municipal officials and surveys with waste pickers, it was found that waste pickers are perceived to make a positive contribution towards the municipality by diverting waste away from landfill sites (Shogole, 2019). This helps increase airspace and reduces the responsibility of the municipality to handle waste. The findings suggest that the Madibeng Local Municipality lacks the capacity to effectively manage solid waste and needs to explore alternative options for improving service delivery. Waste pickers are described as the first step in the waste recovery chain, as they collect waste that is later used by companies to manufacture new products (DEFF & DSI, 2020).

The waste pickers provide a valuable service to the municipality by removing waste and reclaiming waste that would have otherwise been disposed of in a landfill (Municipal Worker 8). They also make the municipality's job easier when it comes to recycling waste (Municipal Worker 13). Waste pickers themselves consider their service to be valuable to the municipality (Waste Picker 13). Waste Picker 118 mentioned that they help the municipality manage waste in a better way (Waste Picker 118). Waste Picker 25 stated that they benefit from the municipality because they are given access to the waste that they sell (Waste Picker 25). Similar benefits were highlighted in a research study by Sekhwela (2017). Some waste pickers expressed their willingness to contribute to the municipality by helping to eradicate illegal dumping and keeping the environment clean. They also mentioned their desire to mentor other waste pickers and improve general service delivery. However, some participants felt that their contribution would be minimal due to their age or illness, while others were not interested in integrating with the municipality for unknown reasons.

The findings from interviews with municipal officials and waste pickers underscore the positive contributions of waste pickers to the municipality, particularly in terms of diverting waste from landfills and enhancing overall waste management practices. This aligns with existing literature, as Shogole (2019) emphasises the critical role informal waste pickers play in improving waste service delivery by diverting waste from landfill sites. The mutualistic symbiotic relationship between waste pickers and the municipality is evident, with waste pickers benefiting from access to free reclaimable waste, and the municipality enjoying reduced waste volumes and cost savings. Such relationships have been observed by Sekhwela (2017), highlighting the intricate dynamics between informal waste pickers and municipal waste management systems. Additionally, the willingness of waste pickers to contribute to community improvement and act as mentors aligns with Botha's (2017) assertion that the desire for financial gain and support for environmental sustainability drives waste pickers. The environmental benefits, as noted by Viljoen *et al*. (2019), further emphasise the positive impact of waste pickers' work in reducing waste effects, cutting emissions, and conserving resources. However, the challenges presented by age, illness, or a

focus on personal financial goals echo the complexities discussed by scholars like Samson (2019), emphasising the need for inclusive plans and recognition of waste pickers' contributions within recycling systems.

Municipal readiness includes having clear and supportive policies that recognise and protect the rights of waste pickers, as well as having the necessary infrastructure, such as sorting and recycling facilities, to support their contributions. Educational initiatives that raise awareness about the role of waste pickers also contribute to a supportive environment (Shogole, 2019).

The literature highlights the increasing recognition of the importance of integrating waste pickers into municipal waste systems for maximising economic, social, and environmental benefits (Samson, 2019). However, the success of such integration efforts is contingent upon the readiness of municipalities, encompassing legal, infrastructural, and educational dimensions (Shogole, 2019). The regulatory framework, characterised by clear and supportive policies, is essential for establishing a legal foundation that recognises and protects the rights of waste pickers. Infrastructural preparedness, including designated sorting and recycling facilities, is crucial for optimising the efficiency of waste pickers' contributions. Educational initiatives aimed at raising awareness among citizens and municipal staff further contribute to creating a supportive environment (Shogole, 2019). The research findings reveal mixed opinions on the readiness of municipalities, with some stakeholders expressing concerns about a lack of clear policy frameworks and understanding of waste picker integration (Municipal Worker 11). Additionally, challenges arise from inconsistent implementation of integration guidelines, leading to varying perceptions among stakeholders (Seabi, 2022). The disparities in integrating waste collectors in smaller towns and rural areas, as noted by DEFF and DSI (2020), further underscore the complexities associated with regional differences in waste management infrastructure and services. Addressing these challenges is crucial for achieving a cohesive and successful integration of waste pickers into municipal waste management systems.

The legal framework for integrating waste pickers in Madibeng Local Municipality is discussed in Theme 4. The Waste Picker Integration Guideline outlines various acts and policies that affect the integration of waste pickers into formal recycling structures. However, there is a need for alignment between these acts and policies to effectively integrate waste pickers (Dias, 2011). The National Waste Management Strategy recognises the importance of waste picker integration, but municipal workers in Madibeng Local Municipality feel that the legal framework does not adequately provide for this integration (DEFF, 2020). Municipal Worker 8 believes that more needs to be done to establish a proper legal and policy framework for waste picker integration, while Municipal Worker 4 thinks that the current policies and procedures are insufficient and may be addressed in the future.

According to the Madibeng Local Municipality air quality and waste management by-laws, only permitted waste pickers are allowed on municipal property (Madibeng Local Municipality, 2023). Municipal Worker 1 states that registration of waste transporters, recyclers, and facility owners is a municipality by-law requirement. However, the municipality does not have a specific operational policy for waste pickers (Municipal Worker 2). The City of Johannesburg has integrated waste pickers by implementing an enabling legislative framework, according to Samson (2020). They have included provisions for waste pickers in their by-laws and have adopted a Reclaimer Empowerment Plan, which is integrated into the business plan of the Pikitup waste management utility. This approach aligns with Marello's (2013) suggestion that legalising places for informal employment, increasing access to microfinance, and incorporating waste pickers into the formal solid waste management system through law and policy can have transformative effects on the rights of informal workers.

Integrating waste pickers into formal waste management systems is a complex challenge with several obstacles. Waste pickers may resist change due to fear of losing autonomy and may be hesitant to abandon their informal practices. The lack of legal recognition for their work requires changes in laws and regulations to establish their rights and protections (Samson, 2020). Integrating waste pickers into formal systems may strain municipal budgets as it demands access to crucial resources like healthcare and education. Safety risks associated with informal waste picking, such as exposure to toxins and unsafe working conditions, need to be addressed. Resistance from formal waste management actors who view waste pickers as competitors adds further obstacles. Ensuring equitable distribution of benefits among waste picker communities is challenging, as is tracking progress and sustainability in the long term. Infrastructure development and training are resource-intensive requirements for integration, and overcoming social stigma associated with waste picking is also necessary (Samson, 2020).

The majority of municipal workers expressed concerns about integrating informal waste pickers into the formal waste management system. Municipal Worker 5 stated that there would be many challenges in doing so. Some of the main concerns raised by the respondents included the integration of "illegal migrants," the unwillingness of waste pickers to work with the municipality, meeting unrealistic expectations, allocating roles and responsibilities, and liability if something goes wrong. Municipal Worker 9 believed that waste pickers should not be integrated because it would be difficult to work with them, while Municipal Worker 11 pointed out that many waste pickers are not South African citizens, making integration difficult. According to Samson (2020), waste picker integration is a new area of work that waste officials are not currently equipped to handle due to a lack of funding, training, and support. This lack of resources leads to challenges

for waste officials, as they do not have the authority, funding, and skills necessary to effectively manage the situation. As a result, tensions arise between them and the waste pickers.

According to Dlada (2018), integration of waste pickers can be interpreted in different ways, including recognition, consultation, inclusion, and registration within the waste management system. Nambuli *et al*. (2021) emphasise that the success of integration programmes relies on the willingness of waste pickers to integrate into formalised waste management systems. Active participation and engagement of waste pickers are crucial for the smooth functioning of integrated waste management systems. The study found that 63.1% of waste pickers expressed interest in integrating into the municipality, while 25.8% were not interested, and 11.1% did not complete the survey. Reasons for unwillingness to integrate include not seeing the need for integration, preference for independent work, mistrust, and concerns about restrictions on their activities. The failure of a pilot initiative in Johannesburg was attributed to differing opinions among waste collectors and reclaimers regarding integration (Sekhwela & Samson, 2019). The City of Johannesburg is currently working on formalising waste pickers, although many trolley pushers are unaware of this initiative (Schoeman, 2022). Despite the lack of awareness, 65.5% of trolley pushers are willing to participate in the formalisation process. The unwillingness of waste pickers to integrate can hinder waste management efforts and the development of collaborative relationships necessary for successful integration initiatives (Porras Bulla *et al*., 2021).

The research underscores the nuanced relationship between waste pickers and municipal authorities, revealing a disparity in expectations and concerns. Waste pickers perceive themselves as integral contributors to the municipality, believing that their efforts not only benefit the environment by diverting waste but also generate cost savings. Their expectations, as identified in the study, range from access to medical benefits and personal protective equipment to housing benefits, transportation, and financial support. The desire for full-time employment and additional benefits such as medical aid and pension funds showcases a multifaceted set of needs. Municipal respondents, however, express apprehensions about the feasibility of meeting these expectations within the constraints of tight budgets and limited resources. The fear of potential unrest and chaos in the town, as articulated by some municipal workers, underscores the delicate balance between the aspirations of waste pickers and the financial constraints faced by the municipality.

Schoeman's (2022) examination of waste pickers in the City of Johannesburg provides additional context to the challenges faced by this group. The trolley pushers, predominantly black African males, confront physically demanding work, extended hours, and meagre incomes. Safety concerns on roadways and unwarranted harassment by law enforcement further compound their challenges. Importantly, Schoeman highlights the willingness of waste pickers to engage in

formalisation processes, anticipating that joining cooperatives could lead to increased wages. The mistreatment they experience from certain segments of the population, particularly taxi drivers who fail to recognise their waste-diverting role, exacerbates their struggles. Moreover, the precarious legal position of foreign-national reclaimers presents a significant impediment, emphasising the need for political will to address and integrate them into the mainstream waste management system. Overall, the literature supports the contention that bridging the gap between waste pickers' expectations and municipal capacities requires a comprehensive, collaborative approach informed by a deeper understanding of the challenges they face.

Waste pickers in South Africa and India confront significant challenges that undermine their recognition, rights, and overall well-being. Chamane (2009) underscores the struggle against the derogatory label "scavengers" and the associated negative connotations, emphasising the need for respectful recognition. Reddy (2018) similarly highlights the discrimination faced by waste pickers in India, exacerbated by a lack of legal recognition under Indian laws. These challenges are further exemplified by the experiences shared by participants, such as Waste Picker 59, who advocates for municipal control over landfill access, revealing a complex relationship with authorities. Moreover, the narratives of Waste Picker 36 and Municipal Worker 11 highlight the prejudiced perceptions surrounding waste pickers, including suspicions of theft and drug addiction, as well as tensions with municipalities due to issues like littering and illegal access. The lack of legal status for informal waste pickers, as noted by Scheinberg *et al*. (2016), results in isolation and marginalisation. Additionally, the conflicts arising from municipal contracts with large companies, as discussed by Scheinberg *et al*. (2016), underscore the economic challenges faced by waste pickers when alternative opportunities are not provided. Schenck *et al*. (2018) further shed light on the privatisation of landfills, restricting waste pickers' access to essential resources for their livelihoods. The societal perception of waste pickers as the "poorest of the poor" and the derogatory term "scavenging" (Wilson & Novak, 2009) exacerbates their marginalisation, hindering their inclusion in government schemes and access to basic necessities (Reddy, 2018). In summary, the literature and participant contributions collectively highlight the multifaceted challenges faced by waste pickers, including discrimination, legal invisibility, economic struggles, and societal marginalisation. Addressing these issues requires comprehensive policy reforms, community engagement, and collaborative efforts among stakeholders.

According to the observations made during the site visit, it was found that the facilities at the landfill site are not inclusive and do not accommodate waste picker participation. Sanitation facilities were also found to be unavailable. However, the municipal staff at the site are well taken care of. The number of informal waste pickers at the landfill site is high. The Madibeng Local Municipality has a total of fifteen staff members at the landfill site, including a supervisor, five

operators, two access clerks, and seven general workers who assist with landfill management. Waste storage practices involve temporarily storing waste at waste transfer stations before it is transported to the landfill site for disposal. The municipality has implemented pollution control, separation, and segregation measures. These measures include following the landfill permit guidelines for managing the site and adhering to relevant regulations such as the air quality by-law, waste management by-law, and integrated waste management plan. The Madibeng Local Municipality's document review reveals that waste pickers are not mentioned in the document. However, existing mechanisms, such as the Integrated Waste Management Plan and partnerships with DEFF, PETCO, and the Provincial Department, could facilitate waste picker integration. The commitment of informal waste pickers is crucial for success, and stakeholder participation is encouraged. Informal waste pickers are also encouraged to join waste pickers associations to learn from others.

6.2.5 Overall conclusion of the research

In conclusion, the research on waste pickers in Madibeng reveals that the majority are female, with women primarily working from home and men working at landfill sites. The average age of waste pickers is 42 years, with the majority falling within the youth age range. Marital status varies among waste pickers, with a significant percentage being never married or single. Many waste pickers in South Africa are illegally in the country, which hinders their integration into municipal structures. Language proficiency and education levels among waste pickers are generally low, making it difficult for them to secure formal employment. However, some waste pickers have acquired skills through formal and informal training. Understanding the demographic profile of waste pickers is crucial for addressing their specific needs and improving their overall well-being.

Waste pickers, who collect and reclaim reusable and recyclable materials from discarded waste, play a valuable role in waste management by reducing landfill waste and recovering valuable materials for recycling. They often face poor working conditions, health and safety risks, low social status, and extreme poverty. Waste pickers primarily collect recyclable waste from shops, businesses, households, schools, and industrial areas. The most frequently collected waste types are cans, plastic, glass, paper, and cardboard. Waste pickers typically work long hours, starting early in the morning and finishing in the afternoon, and work an average of 8 hours and 33 minutes per day. They work different days per week, with the majority working seven days. Waste pickers rely on various means of transportation, such as trolleys, to transport recyclable waste. They store their collected recyclables in bags, crates, drums, containers, or rented spaces before selling them. The majority of waste pickers sell their recyclable waste to private individuals, while some sell to buy-back centres or waste depots.

Waste pickers in Madibeng travel long distances, often on foot, to sell their recyclable waste at buy-back centres. They are willing to travel longer distances for better prices. The income of waste pickers varies based on factors such as location, type of work, quantity and value of waste, buy-back centre, and gender. Women tend to earn less than male waste pickers. Access to shelter is crucial for waste pickers' well-being, and their living conditions vary. Food shortages can occur, particularly on rainy days. Waste pickers often work independently but form supportive networks. The waste picker population is growing, and they are often unaware of waste management regulations. Waste pickers have been ignored and excluded from the municipal waste management system.

The support provided by municipalities for waste pickers is varied, with some receiving limited support while others receive none. Waste pickers make a positive contribution by diverting waste from landfill sites and reclaiming recyclable items. Integrating waste pickers into formal waste management systems requires clear policies, infrastructure, and educational initiatives. Challenges in integration include resistance to change, lack of legal recognition, safety risks, and resistance from formal waste management actors. Equitable distribution of benefits and overcoming social stigma are important considerations. Municipal workers have expressed concerns about integrating waste pickers, including issues with "illegal migrants," unwillingness to work with the municipality, unrealistic expectations, and liability. Lack of funding, training, and support for waste officials also pose challenges. Some waste pickers are not interested in integration due to various reasons. Waste pickers in Madibeng prioritise access to medical aid, pension funds, safety, security, electricity, tools, machinery, water, sanitation, and storage facilities. They face challenges such as safety concerns and harassment by authorities. The illegal status of waste pickers in South Africa presents a significant obstacle to their integration. Waste pickers struggle for recognition and rights, facing persecution and competition from privatisation and businesses. Stakeholder participation and waste pickers associations are crucial for successful integration.

6.2.6 What do these conclusions mean for waste picker integration in Madibeng?

The informal waste pickers in Madibeng have expressed dissatisfaction with the municipality's handling of their concerns, often perceiving a lack of responsiveness. A notable concern is the absence of facilities for personal hygiene, such as toilets and showers, which contravenes principles of human dignity. The Informal waste pickers contribute to the waste management and recycling of the municipality, to achieve Municipality’s goal of the Integrated Waste Management Plan of 2016.

The Madibeng Local Municipality decided to introduce and develop a permit system specifically for informal waste pickers operating at the landfill site, without participation of the affected party. The permit system was structured as a control measure in a format of an indemnity. However, this system excludes other subsets of waste pickers, namely street informal waste pickers and community informal waste pickers.

Efforts have been made by the municipality to train informal waste pickers in collaboration with private companies, focusing on financial management and the establishment of cooperatives. However, the decision was made unilaterally without probing the concerns and interest of informal waste pickers, thus running the risk of not achieving the municipality's intention and plan. Despite this initiative, a significant number of informal waste pickers appear hesitant to engage in cooperative ventures. Their reluctance stems from past experiences when team members displayed insufficient commitment to the agreed-upon plans for material harvesting, leading to concerns about equitable compensation.

Recognising the importance of collaboration, the Madibeng Local Municipality and informal waste pickers should formulate a comprehensive Management Action Plan that encompasses all categories of waste pickers. This plan should adhere to relevant legislation and align with the Guideline for Integration of Informal Waste Pickers.

While the municipality's training and permitting initiatives signal a positive step towards potential integration into formal waste practices, informal waste pickers continue to face challenges. They often experience financial losses due to the municipality's lack of support in negotiating prices with middlemen. The middlemen, consequently, benefit more, leaving informal waste pickers with diminished earnings compared to the value of their traded materials.

Notably, Madibeng's informal waste pickers operate independently, lacking affiliation with organisations, such as the South African Waste Pickers Association. Operating in isolation, they have limited awareness of their counterparts' activities and the potential advantages of formal registration.

In areas beyond the landfill site, such as Brits, Kosmos and Damonsville, where informal waste pickers also operate, the municipality's existing infrastructure lacks adequate equipment to enhance their harvesting capabilities and, subsequently, their financial income.

6.3 Recommendations

Section 6.3 suggests recommendations for waste picker integration in Madibeng (Section 6.3.1) with the immediate way forward and priorities in Section 6.3.2. Section 6.3.3 provides

recommendations for waste picker integration in South Africa based on the findings of this research, as well as recommendations as to how this should be implemented. Lastly, Section 6.3.4 provides recommendations for future research.

6.3.1 Recommendations for Waste picker integration in Madibeng Local Municipality

Based on the current level of dissatisfaction and mistrust perceived by waste pickers, the municipality should establish a collaborative relationship with informal waste pickers, engaging with them to understand comprehensively their integral role in daily operational activities. A crucial step towards this would involve the development of a comprehensive Management Action Plan dedicated to informal waste pickers, aiming to fortify and formalise a working relationship. The Madibeng Local Municipality must actively work towards fostering an environment of trust with informal waste pickers by fulfilling commitments made to them. An innovative approach involves initiating exchange programmes for informal waste pickers with counterparts in other regions. If exchange programmes with other municipalities could be arranged, it would further enhance the progress made by waste pickers in their struggle for recognition, respect and civil freedom. Ezeah and Roberts (2013) point out in their research that enhanced programmes would allow for the exchange of experiences between waste pickers and other stakeholders from different regions, facilitating ongoing networking.

Furthermore, encouragement should be extended for their participation in, or registration with, organisations, such as the South African Waste Pickers Association. Such an affiliation would give them access to a platform via which they could network and formally connect with their compatriots.

For undocumented waste pickers, integration into municipal structures will not be legally possible. According to Chidzungu (2017), Zimbabwean migrants and South African reclaimers stand together to fight against Pikitup separation at source programmes that are linked to privatisation. Florin (2018) states that waste pickers' primary demand is the right to work when their lives are protected by reforms. Florin (2018) points out that, if waste pickers are not somehow integrated, they will become invisible and will operate on the fringes of society. For municipalities, this would mean that freelancing waste pickers will not disappear.

To facilitate targeted support, the municipality ought to construct a comprehensive database encompassing all informal waste pickers. This database would serve as a tool to identify areas where capacity-building initiatives are most needed. However, this will pose a challenge as waste pickers are drawn to areas where there are resources. For them, legislation is not important, as it does not put food on the table (Florin, 2018; Mahlase, 2017).

Additionally, a regular calendar should be implemented for scheduled meetings with informal waste pickers. These gatherings would provide a structured platform for engagement, allowing for the articulation of concerns and input pertaining to operational expectations.

To streamline communication and address issues efficiently, the establishment of committees is recommended. These committees should be composed of representatives from various sectors, including waste picker organisations, autonomous waste pickers, local departments, academics, NGOs, buy-back centres and industry, to ensure effective waste management (DEFF & DSI, 2020). These committees would serve as liaisons between informal waste pickers and the municipality, minimising the need for prolonged and unnecessary meetings.

According to Mothiba (2016), waste picking is classified as a type of informal employment. Since landfill waste pickers are self-employed but labour on municipal property, tight restrictions and control are necessary at all locations. The municipality is, therefore, primarily responsible for ensuring access control to landfill sites, providing waste pickers with safety training and PPE. For legal and safety considerations, the municipality should ensure that all informal waste pickers, whether local or foreign, operating in municipal facilities sign indemnity forms. Compliance with operational standards at the landfill site should be rigorously enforced to guarantee the safety and well-being of all involved parties (DEFF & DSI, 2020).

Recognising the potential for private sector collaboration, the municipality should actively facilitate partnerships with private companies to assist in building profiles for informal waste pickers. This not only contributes to their formal recognition as businesses but also enhances their opportunities for support and engagement.

A direct link between the municipality and buy-back centres is pivotal. This connection would streamline the process, enabling buy-back centres to purchase harvested materials directly from informal waste pickers. Such a direct engagement mechanism ensures fair compensation and supports the sustainable growth of waste picker livelihoods. This suggestion is supported by Viljoen's (2014) research which points out that buy-back centres create the market for the products of waste pickers. If they are effective, the waste pickers will be happy.

Creating awareness regarding the opportunities in waste reclamation and the contributions to the circular economy is a critical step. This awareness campaign should be designed to educate both informal waste pickers and the broader community about the environmental and economic benefits of reclaiming materials.

6.3.2 Priorities and way forward for waste picker integration in Madibeng

The first crucial step in advancing waste picker integration in Madibeng involves the municipality's developing a comprehensive database that registers all informal waste pickers. This database will serve as a foundational tool, providing insights into the number of reclaimers present on-site and facilitating a more nuanced understanding of their distribution and needs. The Madibeng Local Municipality has the responsibility to assist informal waste pickers in securing access to funding through other entities, including the Recycling Enterprise Support Program of the Department Environment Fisheries and Forestry.

Secondly, an imperative strategy for fostering a sense of collective identity and support among informal waste pickers is to encourage their affiliation with the South African Waste Pickers Association and African Reclaimers Association. By doing so, they would benefit from the advocacy and resources provided by these organisations, enhancing their visibility and collective influence. Furthermore, the formalisation of informal waste pickers in Madibeng necessitates a strategic approach resembling a business plan. This approach aims to empower waste pickers to generate positive earnings independently, reducing their direct reliance on municipal support. This shift towards a more self-sustainable business model ensures long-term viability and resilience.

Thirdly, to address the operational challenges faced by informal waste pickers in Madibeng, the municipality must prioritise the improvement of its facilities. This encompasses providing necessary amenities, such as sanitation facilities and rest areas, to enhance the overall working conditions and well-being of waste pickers. Moreover, in recognising the challenges faced by community informal waste pickers, who are geographically distant from the landfill site, targeted encouragement and support should be directed towards this group. This may involve tailored initiatives to address their unique needs and challenges.

In tandem with these efforts, the development of a comprehensive Management Action Plan tailored specifically to informal waste pickers is essential. This plan should outline strategic initiatives, policies and support mechanisms to strengthen the collaborative relationship between the municipality and waste pickers, ensuring a more organised and mutually beneficial working environment.

6.3.3 Recommendations for waste picker integration in South Africa

Based on the research findings, the following suggestions are made when considering waste picker integration in South African municipalities:

- **Provision for gender-sensitive integration strategies:** Integration approaches should be tailored considering the gender dynamics observed among waste pickers. Supportive environments should be created for female waste pickers, potentially exploring home-based waste picking models.
- **Generation-centric integration initiatives:** Integration programmes should be designed to cater to the specific needs and aspirations of the active working-age population (26 to 45 age range).
- **Inclusive communication:** Inclusive communication strategies, which accommodate varying language proficiency levels, should be provided for considering the linguistic diversity among waste pickers.
- **Layered educational approaches providing for skills transfer:** Waste picker integration programmes should provide for layered educational approaches recognising the diverse educational backgrounds of waste pickers. Vocational training programmes should be implemented to enhance the diverse skill sets within the waste picker community, and to facilitate the transition of waste pickers into alternative livelihoods within the waste management sector.
- **Culturally sensitive policies:** Waste picker integration policies should be culturally sensitive and inclusive, considering the diverse backgrounds of waste pickers from South Africa and neighbouring African countries.
- **Flexibility in integration models:** Integration models should provide for flexibility, considering the temporal patterns and daily work schedules of waste pickers. Collaboration with local businesses and residential communities should be fostered to optimise waste pickers' contributions based on their collection patterns.
- **Family-oriented support:** Waste picker integration should provide for family-oriented support mechanisms considering the living conditions and dependents of waste pickers. Programmes should address periods of food insecurity through holistic integration programmes.
- **Alignment with legal frameworks:** Integration initiatives must be aligned with existing waste-related legislation to ensure compliance and protection for waste pickers. Awareness of legislation must be fostered among waste pickers to enhance their legal understanding.
- **Trust-building strategies:** Waste picker integration should make provision for the implementation of mechanisms/strategies that foster trust between waste pickers and municipal authorities. Roles and responsibilities must be clearly allocated, expectations should be managed realistically, and clear protocols for collaboration should be established.

- **Addressing reluctance and concerns:** Concerns expressed by waste pickers, such as fears related to integration, allocation of roles, and liability should be addressed. Strategies to overcome reluctance, potentially involving mediation and dialogue, should be considered when embarking on waste picker integration programmes.
- **Develop clear policies:** Establish clear policies that recognise waste pickers as valuable contributors to waste management and outline their rights and responsibilities. These policies should address issues such as safety, working conditions, fair wages, and access to social benefits.
- **Provide infrastructure support:** Invest in infrastructure such as waste sorting and recycling facilities, buy-back centres, and storage facilities to support waste pickers in their work. This will help improve their efficiency and productivity.
- **Promote education and training:** Implement educational initiatives to improve waste pickers' language proficiency and education levels. Provide formal and informal training programmes to enhance their skills and knowledge in waste management and recycling techniques.
- **Foster stakeholder participation:** Encourage collaboration and engagement between waste pickers, municipalities, businesses, and other stakeholders. Involve waste pickers in decision-making processes and include their perspectives in waste management strategies.
- **Address legal status:** Advocate for legal recognition and regularisation of waste pickers' status in South Africa. This will help remove barriers to their integration and ensure their access to social benefits and protection under the law.
- **Raise awareness and reduce stigma:** Conduct awareness campaigns to educate the public about the importance of waste pickers in waste management and recycling. Challenge negative stereotypes and promote a positive image of waste pickers as essential contributors to sustainable development.
- **Provide support and resources:** Allocate sufficient funding and resources to support waste pickers and waste management officials. This includes providing necessary tools, machinery, safety equipment, and training programmes to ensure their well-being and efficiency.
- **Foster collaboration and networking:** Encourage waste pickers to form associations or networks to support each other and advocate for their rights. These networks can also facilitate information sharing, access to resources, and collective bargaining power.
- **Monitor and evaluate progress:** Establish monitoring and evaluation mechanisms to assess the effectiveness of integration efforts. Regularly review and update policies and initiatives based on feedback from waste pickers and other stakeholders.

6.3.4 Recommendations for future research

Considering the findings of this study, the following areas are proposed for future research:

- **Expanding the geographical scope:** To enhance the understanding of waste picker integration in South Africa, it is suggested that similar research is conducted in other geographical areas in South Africa.
- **Broader views on waste picker integration:** It may be useful to, in future, do research on views of other parties, such as the public, on waste picker integration.
- **Effectiveness of waste picker integration:** It may be beneficial to perform research on the effectiveness of waste picker integration in areas where integration has been attempted. This may present lessons learned for waste picker integration in future.

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ANNEXURE A: NORTH-WEST UNIVERSITY COVERING LETTER

13. Private Bag X6001, Potchefstroom
South Africa 2520

14. Tel: +27 18 299-1111/2222
Web: http://www.nwu.ac.za

Dear Sir/Madam

We are researchers from the North-West University Department of Geography and Environmental Sciences. We are doing research on waste pickers in South Africa, North-West Province at Madibeng Local Municipality Case Study. The information resulting from the study will be used to inform policy makers on policies which can make a difference in the lives of waste pickers. The results from the research might also be published in scientific journals

Activities of the project:

- We are going to ask you some questions that will take about 30 minutes of your time.

Please remember that:

- You do not have to do this. If you feel that you do not want to be part of the study you are free to withdraw at any time and your information will not be included in the results of the study.
- Your personal details and any other information will be kept confidential at all times.
- You have the right to ask questions about this study. If any questions arise while I am explaining this form, please ask them whenever you are ready. I will also give you time to think – please indicate if you want this time.
- No monetary compensation is offered for your participation.

The study will be used to inform policy makers on policies which can make a difference in the lives of waste pickers. The results from the research might also be published in scientific journals.

We value your cooperation in this matter.

ANNEXURE B: QUESTIONNAIRE AND INTERVIEW GUIDE COMMUNITY/RURAL WASTE PICKERS

Private Bag X6001, Potchefstroom
South Africa 2520

Tel: +27 18 299-1111/2222
Web: http://www.nwu.ac.za

01 June 2021

RE: INVITATION TO PARTICIPATE IN RESEARCH STUDY

Introduction

You are being invited to participate in a research study conducted by Lucky Lazarus Motlhoki, student Number: 23333502 under the supervision of Claudine Roos a Doctor in environmental management at the North-West University. The study is entitled “Integrating informal waste reclaiming practices into the formal waste management sector: Madibeng Local Municipality” and aims to identify integration of waste pickers that will assist in defining roles of both municipal officials and the informal waste pickers. You were selected as a possible participant in this study because it becomes more important to engage this process in depth with participants directly involved or affected thereof. The research will form part of a PhD dissertation, which will be submitted in partial fulfilment of the requirements for the degree, Doctor of Philosophy in Science with Environmental Sciences at the North-West University.

Interview procedure

If you agree to participate in this study, you would be requested to do the following:

- Indicate a time and date when you will be available for an interview. The interview should take no more than 30 minutes hour/s of your time.
- Indicate whether you would prefer to be interviewed in person, telephonically or via a technology such as Zoom or Skype.

- Agree to the recording (audio only) of the interview to ensure that it can be accurately transcribed. The recording will be deleted as soon as it has been transcribed. You will have the right to review and edit the audio recording if you so choose.
- Read through this consent form which is to be signed on the day of the interview.

Confidentiality

The records from this study will be kept as confidential as possible. No individual identities will be used in any reports or publications resulting from the study. All transcripts will be given codes (e.g. Participant 1) and stored separately from any names or other direct identification of participants. The information obtained through the interview will be used exclusively for this study and for no other purpose.

Potential risks and discomforts

No risks or discomforts are foreseen. In the event that a risk is identified, or discomfort is experienced, the interview will be stopped. You further have the right to end the interview at any time and for any reason.

Potential benefits to the interviewee and/or society in general

The study will contribute to social upliftment, community participation in formal economy, and knowledge of how to advance a clean an healthy environment. It will further provide insights on better economic growth, healthy relationship between Informal Waste pickers and Municipalities with positive spinoff.

Compensation

No compensation can be offered for participation in the research.

Withdrawal

You may withdraw from the study at any time and do not have to provide a reason.

Ethical clearance

This research has obtained ethical clearance NWU-03149-20-A9 from the Research Ethics Committee. If you have any concerns or questions in this regard, please contact Prof. Roelof Burger (roelof.burger@nwu.ac.za).

Contact details of researcher

If you have any questions or concerns about the research, please feel free to contact Lucky Motlhoki; motlhokiway1@gmail.com or 0711766208 and Claudine Roos; Claudine.roos@nwu.ac.za or 083 204 8703

INTERVIEWEE CONSENT

I _____ confirm that the above information was explained to me in a language and in manner that I understood. I further confirm that I am older than 18 years of age and hereby volunteer to take part in the study.

Signature_____Place_____Date____

_____

RESEARCHER CONFIRMATION

I _____ hereby confirm that the contents of this document was explained to the participant in a language and manner that he / she could understand.

Signature_____Place_____Date____

_____

We value your cooperation in this matter.

COMMUNITY/ RURAL WASTE PICKERS SURVEY IN MADIBENG LOCAL MUNICIPALITY, 2021

SURVEY DETAILS

(Can be completed after the interview)

Interviewer: Complete the following questions after the interview.

Date of interview..... Time of interview.....…….....

Fieldworker name…….....

Geographical details of the site where interview took place:

Name of the Buy-back Centre/Depot (if applicable).....……

Street Address (of site): …….

City/Town and suburb……..…

Questionnaire

Completed	Not Completed

SECTION A
This set of questions relates to the personal background of the respondent you are interviewing.

1. Respondent's gender:

Male	1
Female	2

2. With which cultural group do you associate yourself with?

African/Black	1
Coloured	2
White	3
Indian/Asian	4
Other	5
If other, please specify	

3. Language predominantly spoken by respondent. **Mark ONE only**

English	1
Sesotho	2
Sepedi	3
Isizulu	4
Isindebele	5
Xhitsonga	6
Afrikaans	7
Setswana	8
Isixhosa	9
Tshivenda	10
SiSwati	11
Shona	12
Other	13
If other please specify ……....	

4. From which country do you originate from?

South Africa	1
Zimbabwe	2
Namibia	3
Swaziland	4
Mozambique	5
Botswana	6
Lesotho	7
Other	8
If other please specify ……....	

5. If from South Africa, in which province were you born?

Gauteng	1
Mpumalanga	2
KwaZulu-Natal	3
Eastern Cape	4
Limpopo	5
North West	6
Free State	7
Northern Cape	8
Western Cape	9

6. How old are you? | | |

7. Which of the following describes your current marital status?

Never married / Single	1
Separated / Divorced	2
Married (Traditional or Western)	3
Widowed	4
Living with a partner	5
Other	6
Other, specify.....……..….....	

SECTION B

This set of questions relates to the respondent's education

8. What is the **highest** school or tertiary qualification you have **passed**?

Grade

0	1	2	3	4	5	6	7	8	9	10	11	12
Post School Qualification												13
Post School Qualification. Please mention the qualification ………………………………………………………………...												

Ask question 9 only if the waste pickers left school before passing Gr. 12.

9. Why did you leave school before completing Gr. 12?

....

10. Do you have any other training or skills that you might be able to use in another job?

Yes	1
No	2

11. If your answer in question 10 is **Yes,** please specify what training and skills you have, where you obtained the training and skills and whether it was formal or informal training. (field worker needs to probe)

1	2	3
Type of training/skill	Where obtained	Formal or informal

12. How well can you understand English? (field worker ask the question in English)

Not at all	1
Somewhat	2
Well	3

13. How well can you speak English?

Not at all	1
Somewhat	2
Well	3

14. Hoe goed kan jy Afrikaans verstaan? (Ask the question in Afrikaans) (*How well can you understand Afrikaans?)*

Not at all	1
Somewhat	2
Well	3

15. Hoe goed kan jy Afrikaans praat? *(How well can you speak Afrikaans?)*

Not at all	1

Somewhat	2
Well	3

This set of questions relates to the respondent's employment history.

16. Have you ever worked where you received a payslip?

Yes	1
No	2

17. If YES, what was your last full time job? (field worker needs to probe)

Job title: .....

18. How long did you have the last full time job?

Years ☐☐ Months ☐☐

19. Why did you leave your last job?

Laid off business/mine/factory closed	1
Laid off business moved	2
Laid off business downsizing	3
Disciplinary reasons	4
Quit the job because wage was too low	5
Quit the job because of medical reasons	6
Quit because of bad treatment from employer	7
Other, specify	8
Refused to answer	9

20. Are you currently looking for a full time job?

Yes	1
No	2

21. If not, why not?

.....
.....

SECTION D

This set of questions relates to the respondent's work as a Community waste picker.

22. What do you like about your work?
.....

23. What about your work don't you like?

.....

24. Why did you decide to collect recyclable waste? (Field worker must probe)

.....

25. How long have you been doing this job? (*Duplicate of Question 5.12*)

Years …….. Months …….....

26. Where do you find the waste? Mark all options applicable.

Dustbins outside houses	2
Schools	3
Industrial areas	4
Shops/businesses	5
Other	6
If other, please specify	

27. What recyclable waste do you collect? (Mark all applicable)

Paper	1
Cardboard	2
Plastic	3
Cans	4
Glass	5
Tetrapak	6
Metals	7
Batteries	8
Globes	9
Other, please specify.....	10

28. Do you use a trolley to collect the waste products?

Yes	1
No	2

29. If you use trolley to collect waste, do you own or hire it?

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

30. If you own a trolley how did you finance or buy it, please explain where and how you obtained the trolley.

.....
.....

31. Did/do you have to pay for it?

Yes	1
No	2

* **Fieldworker: In the next questions try and get a single time not a time range e.g. 5:00 am or 3:00 pm**

32. At what time of the day do you usually start with the waste collection?

	am
	pm

33. What time in the day do you stop working?

	am
	pm

34. (a). To whom do you sell the waste? Mark all applicable.

Private individuals	1
Buy-back centres/depots	2
Other sellers	3
If other buyers, please specify	

34. (b) How far is nearest Buy- back depots?

……

34. (c). What is the name of the nearest town to your village?

……..

35. Do you store your waste somewhere?

Yes	1
No	2

36. If your answer in question 35 is yes, please explain where you store the waste.

.....

.....

37. Are there goods that you collect for personal use?

No	1
Yes	2
If yes, please specify	

38. Do you collect food from the dustbins for own or family consumption?

Yes	1
No	2

39. If your answer is Yes to Question 29, what food do you collect for consumption?

.....

.....

SECTION E

This set of questions relates to the income patterns of the respondents

40. How often do you sell the waste you have collected?

41. How much income do you usually earn for a day's/week's waste that you collect?

Usual income for a day's waste	Usual income for a week's waste
Rand	Rand

42. What was the best income you have earned for a day's/week's waste?

Best income for a day's waste	Best income for a week's waste
Rand	Rand

43. What was the lowest income you have earned for a day's/week's waste?

Lowest income for a day's waste	Lowest income for a week's waste
Rand	Rand

44. How much money did you earn the last time you sold waste that you have collected?

Rand.....

45. Over how many days have you collected the waste that you sold last time?

.....days.

46. How many days in a week do you collect waste?

.....days.

47. Is your income as waste picker as good as expected?

Better	1
Worse than expected	2
As good as expected	3

48. What are the other sources of income available to you?

	Sources of income	**You (Rand)**	**Other household members (Rand)**
1	Another job		

2	Child support grant?		
3	Disability grant?		
4	Old age grant?		
5	Pension from a previous job?		
6	Other, please specify.....		

49. How many people (excluding yourself) depend on your income?

Number of people ☐☐

50. How many children do **you** have?

Number of children ☐☐

Number of children under 18 ☐☐

51. Do you send money away to relatives that do not live with you?

Yes	1
No	2

SECTION F

This set of questions relates to the respondent's access to basic needs.

52. In what type of structure do you usually sleep?

Construction Site	1
Backyard room	3
Veld/bushes	4
On the street	5
Backyard shack	6
Shack	7
Hostel/shelter	8
House (bricks/reeds etc)	9
Buy-back centre/ depot	10
Other	11
If other, please specify	

53. How many times in the last month was there no food to eat of any kind in your house because of lack of resources to get food?

☐

54. Where do you get your food? (Mark all applicable)

Prepare food at home	1
Buy ready-made food	2
From dustbins	3
From other waste pickers	4
Somebody else, e.g. church/ individuals/restaurants etc	5

55. If you receive food from somebody else, e.g. church/ individuals, specify from whom.....
.....

SECTION G

This set of questions relates to the respondent's relationship with other groups/organisations like the police/metro police, the public, buyers, family members, and co-waste pickers.

56. If you have ever dealt with the police, how have they treated you?
.....
.....

57. How does the public treat you?
.....
.....

58. How do the buyers at depots and buy-back centres treat you?
…….....
.....

59. Do you work together with other waste pickers to help one another?

Yes	1
No	2

60. If yes, in what way do you help each other? **Mark all applicable.**

Finding work	1
Transport/getting lifts	2
Loans	3
Food	4
Shelter to sleep/housing	5
Care when sick	6
Personal care products	7
Help to collect/share what they have collected	8
Selling for each other	9
Clothing	10

Other	11
If other, please specify	

61. Do you see more or less waste pickers on the streets since you have started collecting waste?

More	1
Less	2

SECTION H

This set of questions relates to work related injuries and health risks.

62. What are the health and injury risks when collecting recyclable goods?
.....
.....

63. On a scale of 1-10 (10 being very happy and 1 very unhappy) how happy are you with life at the moment?

1	2	3	4	5	6	7	8	9	10

64. Would you like to tell us anything else that concerns you or that you think we should know?

Specify.....
.....
.....

SECTION I

This set of questions relate to integration of informal waste picker

65. What is the positive contribution from the municipality to your work?

……
……
……

66. Do have held meeting with municipality about your work?

……
……
……...

67. What is your expectation from municipality as informal waste picker?

……
……
……

68. Do you want to be integrated within the municipality? Yes or No, Specify

……
……
…….....

69. What contribution are you prepared to make to the municipality should you be integrated?

……
……
…….

70. What benefits do you expect if integrated in the municipality?

……
……
…….

71. Do you know any regulation or By-law in relation to waste management within the municipality as an informal waste picker?

……
……
……

Interviewer: Thank the respondent for his/her participation.

For more information contact:
Dr Roos: 083 204 8703 or
Prof Schenck: 082 864 0600

ANNEXURE C: INTERVIEW GUIDE MUNICIPAL EMPLOYEES

FOR ATTENTION:

RE: INVITATION TO PARTICIPATE IN RESEARCH STUDY

Introduction

You are being invited to participate in a research study conducted by Lucky Lazarus Motlhoki, student Number: 23333502 under the supervision of Claudine Roos a Doctor in environmental management at the North-West University. The study is entitled "Integrating informal waste reclaiming practices into the formal waste management sector: Madibeng Local Municipality" and aims to identify integration of waste pickers that will assist in defining roles of both municipal officials and the informal waste pickers. You were selected as a possible participant in this study because it becomes more important to engage this process in depth with participants directly involved or affected thereof. The research will form part of a PhD dissertation, which will be submitted in partial fulfilment of the requirements for the degree, Doctor of Philosophy in Science with Environmental Sciences at the North-West University.

Interview procedure

If you agree to participate in this study, you would be requested to do the following:

- Indicate a time and date when you will be available for an interview. The interview should take no more than 30 minutes hour/s of your time.
- Indicate whether you would prefer to be interviewed in person, telephonically or via a technology such as Zoom or Skype.
- Agree to the recording (audio only) of the interview to ensure that it can be accurately transcribed. The recording will be deleted as soon as it has been transcribed. You will have the right to review and edit the audio recording if you so choose.
- Read through this consent form which is to be signed on the day of the interview.

Confidentiality

The records from this study will be kept as confidential as possible. No individual identities will be used in any reports or publications resulting from the study. All transcripts will be given codes (e.g. Participant 1) and stored separately from any names or other direct identification of participants. The information obtained through the interview will be used exclusively for this study and for no other purpose.

Potential risks and discomforts

No risks or discomforts are foreseen. In the event that a risk is identified, or discomfort is experienced, the interview will be stopped. You further have the right to end the interview at any time and for any reason.

Potential benefits to the interviewee and/or society in general

The study will contribute to social upliftment, community participation in formal economy and knowledge of how to advance a clean an healthy environment. It will further provide insights on better economic growth, healthy relationship between Informal Waste pickers and Municipalities with positive spinoff.

Compensation
No compensation can be offered for participation in the research.

Withdrawal
You may withdraw from the study at any time and do not have to provide a reason.

Ethical clearance
This research has obtained ethical clearance NWU-03149-20-A9 from the Research Ethics Committee. If you have any concerns or questions in this regard, please contact Prof. Roelof Burger (roelof.burger@nwu.ac.za).

Contact details of researcher
If you have any questions or concerns about the research, please feel free to contact Lucky Motlhoki; motlhokiway1@gmail.com or 0711766208 and Claudine Roos; Claudine.roos@nwu.ac.za or 083 204 8703

INTERVIEWEE CONSENT

I _____ confirm that the above information was explained to me in a language and in manner that I understood. I further confirm that I am older than 18 years of age and hereby volunteer to take part in the study.

Signature_____Place_____Date_____

RESEARCHER CONFIRMATION

I _____ hereby confirm that the contents of this document was explained to the participant in a language and manner that he / she could understand.

Signature_____Place_____Date_____

MUNICIPAL EMPLOYEES SURVEY IN MADIBENG LOCAL MUNICIPALITY, 2021

SURVEY DETAILS
(Can be completed after the interview)

Interviewer: Complete the following questions after the interview.

Date of interview.....Time of interview.....

Fieldworker name…….....

Geographical details of the site where interview took place:

Name of the Buy-back Centre/Depot (if applicable): ...……

Street Address (of site): …….

City/Town and suburb: …….

Questionnaire

Completed	Not Completed

SECTION A

This set of questions relates to the personal background of the respondent you are interviewing.

1. Respondent's gender:

Male	1
Female	2

2. With which cultural group do you associate yourself with?

African/Black	1
Coloured	2
White	3
Indian/Asian	4
Other	5
If other, please specify	

3. Language predominantly spoken by respondent. **Mark ONE only**

English	1
Sesotho	2
Sepedi	3
Isizulu	4
Isindebele	5
Xhitsonga	6
Afrikaans	7
Setswana	8
Isixhosa	9
Tshivenda	10
SiSwati	11
Shona	12
Other	13
If other please specify …….....	

4. From which country do you originate from?

South Africa	1
Zimbabwe	2
Namibia	3
Swaziland	4
Mozambique	5
Botswana	6
Lesotho	7
Other	8
If other please specify …….....	

5. If from South Africa, in which province were you born?

Gauteng	1
Mpumalanga	2
KwaZulu-Natal	3
Eastern Cape	4
Limpopo	5
North West	6
Free State	7
Northern Cape	8
Western Cape	9

6. How old are you? ☐☐

7. Which of the following describes your current marital status?

Never married/Single	1
Separated/Divorced	2
Married (Traditional or Western)	3
Widowed	4
Living with a partner	5
Other	6
Other, specify.....……..….....	

SECTION B

Current status of waste management and infrastructure in Madibeng

8. What is your position or job title?

……
……

9. Which department do you work in?

……

10. How effective is refuse collection in your municipality?

.....

11. Does your municipality have fleet for refuse collection?

……

12. Does your municipality have recycling facilities? How many?

……

13. How is the standard of your waste management infrastructure?

……

SECTION C

Status of informal waste reclaiming practices

14. Do you have informal waste pickers in your municipality?

.....

15. Does your municipality have a program or relationship with informal waste pickers?

.....

16. What is the municipality doing about waste minimisation to landfill site?

.....

17. How does the municipality consider informal waste pickers in their daily operation?

…….…….....

18. Do you have a database for all informal waste pickers in municipality?

……..

SECTION D: Socio-Economic profile of waste pickers

19. Do you consider informal waste pickers as contributors to the economy? Explain

……

20. Which opportunities are there for informal waste pickers in your municipality?

……

21. What Socio-Economic role does informal waste pickers play?

……

22. What contribution do you get from the work of informal waste pickers?

……

23. What can the municipality contribute to uplift socio challenges of informal waste pickers?
……

SECTION E: Integration of informal waste pickers

24. Do you allow informal waste pickers on municipal facilities?

.....
.....

25. Which environmental and waste management by-laws did municipality documented?
.....
.....

26. If you have by-laws, do they have a clause about informal waste pickers ?
……
.....

27. What is your personal view about integration of informal waste pickers within the municipality?
…….

28. What is the decision-makers political view about informal waste pickers?
……
…….

29. What is the plan to assist street informal waste pickers with their daily activities?
……

SECTION F: Establishment of opportunities in reclaiming facilities (Townships, Informal settlements.

30. What is the plan to address illegal dumps in the townships or informal settlements?
.....
.....

31. How effective is refuse collection in townships or informal settlements?
……..

32. What programs does the municipality introduce to encourage reclaiming practices in informal settlements?
……
.....
33. What benefits do informal settlements receive from your municipality?

……
……
……

34. Do the informal settlements communities know about reclaiming practices?

……
……
……...

Interviewer: Thank the respondent for his/her participation.

For more information contact:
Dr Roos: 083 204 8703 or
Prof Schenck: 082 864 0600

ANNEXURE D: INTERVIEW GUIDE BUY-BACK CENTRE WASTE PICKERS

FOR ATTENTION:

RE: INVITATION TO PARTICIPATE IN RESEARCH STUDY

Introduction

You are being invited to participate in a research study conducted by Lucky Lazarus Motlhoki, student Number: 23333502 under the supervision of Claudine Roos a Doctor in environmental management at the North-West University. The study is entitled “Integrating informal waste reclaiming practices into the formal waste management sector: Madibeng Local Municipality” and aims to identify integration of waste pickers that will assist in defining roles of both municipal officials and the informal waste pickers. You were selected as a possible participant in this study because it becomes more important to engage this process in depth with participants directly involved or affected thereof. The research will form part of a PhD dissertation, which will be submitted in partial fulfilment of the requirements for the degree, Doctor of Philosophy in Science with Environmental Sciences at the North-West University.

Interview procedure

If you agree to participate in this study, you would be requested to do the following:

- Indicate a time and date when you will be available for an interview. The interview should take no more than 30 minutes hour/s of your time.
- Indicate whether you would prefer to be interviewed in person, telephonically or via a technology such as Zoom or Skype.
- Agree to the recording (audio only) of the interview to ensure that it can be accurately transcribed. The recording will be deleted as soon as it has been transcribed. You will have the right to review and edit the audio recording if you so choose.
- Read through this consent form which is to be signed on the day of the interview.

Confidentiality

The records from this study will be kept as confidential as possible. No individual identities will be used in any reports or publications resulting from the study. All transcripts will be given codes (e.g. Participant 1) and stored separately from any names or other direct identification of participants. The information obtained through the interview will be used exclusively for this study and for no other purpose.

Potential risks and discomforts

No risks or discomforts are foreseen. In the event that a risk is identified, or discomfort is experienced, the interview will be stopped. You further have the right to end the interview at any time and for any reason.

Potential benefits to the interviewee and/or society in general

The study will contribute to social upliftment, community participation in formal economy and knowledge of how to advance a clean an healthy environment. It will further provide insights on better economic growth, healthy relationship between Informal Waste pickers and Municipalities with positive spinoff.

Compensation

No compensation can be offered for participation in the research.

Withdrawal

You may withdraw from the study at any time and do not have to provide a reason.

Ethical clearance

This research has obtained ethical clearance NWU-03149-20-A9 from the Research Ethics Committee. If you have any concerns or questions in this regard, please contact Prof. Roelof Burger (roelof.burger@nwu.ac.za).

Contact details of researcher

If you have any questions or concerns about the research, please feel free to contact Lucky Motlhoki; motlhokiway1@gmail.com or 0711766208 and Claudine Roos; Claudine.roos@nwu.ac.za or 083 204 8703

INTERVIEWEE CONSENT

I _____ confirm that the above information was explained to me in a language and in manner that I understood. I further confirm that I am older than 18 years of age and hereby volunteer to take part in the study.

Signature_____Place_____Date____

_____

RESEARCHER CONFIRMATION

I _____ hereby confirm that the contents of this document was explained to the participant in a language and manner that he / she could understand.

Signature_____Place_____Date_____

BUY-BACK CENTRE WASTE PICKERS SURVEY IN MADIBENG LOCAL MUNICIPALITY, 2021

SURVEY DETAILS
(Can be completed after the interview)

Interviewer: Complete the following questions after the interview.

Date of interview.....Time of interview.....…….....

Fieldworker name…….....

Geographical details of the site where interview took place:

Name of the Buy-back Centre/Depot (if applicable): ...……

Street Address (of site): …….

City/Town and suburb: …….

Questionnaire

Completed	Not Completed

SECTION A: This set of questions relates to the personal background of the respondent you are interviewing.

1. Respondent's gender:

Male	1
Female	2

2. With which cultural group do you associate yourself with?

African/Black	1
Coloured	2
White	3
Indian/Asian	4
Other	5
If other, please specify	

3. Language predominantly spoken by respondent. **Mark ONE only**

English	1
Sesotho	2
Sepedi	3
Isizulu	4
Isindebele	5

Xhitsonga	6
Afrikaans	7
Setswana	8
Isixhosa	9
Tshivenda	10
SiSwati	11
Shona	12
Other	13
If other please specify ……....	

4. From which country do you originate from?

South Africa	1
Zimbabwe	2
Namibia	3
Swaziland	4
Mozambique	5
Botswana	6
Lesotho	7
Other	8
If other please specify ……....	

5. If from South Africa, in which province were you born?

Gauteng	1
Mpumalanga	2
KwaZulu-Natal	3
Eastern Cape	4
Limpopo	5
North West	6
Free State	7
Northern Cape	8
Western Cape	9

6. How old are you? ☐☐

7. Which of the following describes your current marital status?

Never married/Single	1
Separated/Divorced	2
Married (Traditional or Western)	3
Widowed	4
Living with a partner	5
Other	6

Other, specify.....……..….....

SECTION B: This set of questions relates to the Buy-Back Centre

8. (a). The Buy-Back centre is it registered as a business.

Yes	1
No	2

If your answer is no, why did you register as a company?
……
……..

8. (b). How many years has the business (Buy-Back centre) in operation?
……
8. (c). How many job opportunities (formal and informal) created or generated?
.....
9. Do you have any other training or skills that you transferred to your workforce, informal waste pickers be able to use in another job?

Yes	1
No	2

10. If your answer in question 9 is yes, please specify what training and skills you have done, what training you have transferred to informal waste pickers, and skills and whether it was formal or informal training. (field worker needs to probe)

1	2	3
Type of training/skill	Where obtained	Formal or informal

11. How many South African you employed?
……

12. How is your relationship with informal waste pickers?

Not at all	1
Somewhat	2
Well	3

13. What do you think about their work to the community of Madibeng?

Not at all	1
Somewhat	2
Well	3

14. How often in a week you buy recyclables from informal waste pickers?

Once a week	1
Once in two weeks	2
Once a month	3

15. Where do you buy?

Landfill site	1
Street pickers	2
Villages	3

16. What do you think about the lifestyle of informal waste pickers?
……
…….
17. Do you think informal waste picking can be categorised as business?
……
…….

SECTION C: This set of questions relates to the respondent's work at Buy Back Centre.

18. What do you like about your work?
.....

19. What about your work don't you like?
.....
20. Why did you decide to collect recyclable waste? (field worker must probe)
.....

21. How long have you been doing this job?

Years ……..Months …….....

22. Where do you find the waste? Mark all applicable.

Dustbins outside houses	2
Schools	3
Industrial areas	4
Shops/businesses	5
Other	6
If other, please specify	

23. What recyclable waste do you collect? (Mark all applicable)

Paper	1
Cardboard	2

Plastic	3
Cans	4
Glass	5
Tetrapak	6
Metals	7
Batteries	8
Globes	9
Other, please specify.....	10

24. Do you use a trolley or truck to collect the waste products?

Yes	1
No	2

25. If you use trolley or truck to collect waste, do you own or hire it?
.....
.....
.....

26. If you own a trolley or truck how did you finance or buy it?
.....
.....
.....
.....
.....
.....

27. Did/do you have to pay for it?

Yes	1
No	2

* **Fieldworker: In the next questions try and get a single time not a time range e.g. 5:00 am or 3:00 pm**

28. At what time of the day do you usually start with the waste collection?

	am
	pm

29. What time in the day do you stop working?

	am
	pm

SECTION D: This set of questions relates to the income patterns of the respondents

30. How often do you sell the waste you have collected?

31. How tonnes of recyclables do you bring in per week?

WASTE STREAM	TONS	
Paper		1
Cardboard		2
Plastic		3
Cans		4
Glass		5
Tetrapak		6
Metals		7
Batteries		8
Globes		9
Other, please specify.....		10

32. How much do you pay as per kilogram?

WASTE STREAM	Price/kg	
Paper		1
Cardboard		2
Plastic		3
Cans		4
Glass		5
Tetrapak		6
Metals		7
Batteries		8
Globes		9
Other, please specify.....		10

33. What type of waste stream do you get it easily in your area?

……

34. Where do you trade your recyclable material?

……

35. How many days your Buy-Back Centre operate in a week?

.....days.

36. Which season do you experience a peak of recycling of informal waste pickers?

.....days.

SECTION E: This set of questions relates to the respondent's relationship with other groups/organisations like the police/metro police, the public, buyers, family members and co-waste pickers.

37. If you have ever dealt with the police, how have they treated you?

.....

.....

38. How does the public treat you?

.....

.....

39. How do you co-operate with small recyclers, of small trolleys?

…….....

.....

40. Do you have skills transfer program, to assist informal waste pickers to grow their business?

Yes	1
No	2

41. If yes, in what are the assistance you give them?

……

……

42. Do you see more or less waste pickers on the streets since you have started collecting waste?

More	1
Less	2

SECTION F

This set of questions relates to work related injuries and health risks.

43. What are the health and injury risks when collecting recyclable goods?

.....

.....

44. On a scale of 1-10 (10 being very happy and 1 very unhappy) how happy are you with life at the moment?

1	2	3	4	5	6	7	8	9	10



45. Would you like to tell us anything else that concerns you or that you think we should know?

Specify.....
.....
.....

SECTION G

This set of questions relate to integration of informal waste picker

46. What are the positive contributions from the municipality to your work?

……
……
……

47. Do have held meeting with municipality about your work?

……
……
……...

48. What are your expectations from municipality as informal waste picker?

……
……
……

49. What do you think about integration of informal waste pickers within the municipality?

……
……
…….....

50. What contribution you can make should municipality integrate informal waste pickers?

……
……
…….

51. What benefits do you think informal waste pickers will get if integrated in the municipality?

……
……
…….

52. Do you know any regulation or By-law in relation to waste management within the municipality as an informal waste picker?

……
……
……

Interviewer: Thank the respondent for his/her participation.

For more information contact:
Dr Roos: 083 204 8703 or
Prof Schenck: 082 864 0600

ANNEXURE E: ADDITIONAL DATA TABLES

Due to space constrains this section will be used to present additional biographical and demographical data

QUALITATIVE DEMOGRAPHICAL DATA

Table E.1: Demographical data of the 15 municipality participants

Participant	Gender	Culture group	Language	Job Title	Department
1	Female	African	Setswana	Director: Community Services	Community services
2	Male	White	Afrikaans	Audit Manager: Environmental	Auditor- general (SA)
3	Male	African	Setswana	Environmental Specialist	Waste and Environmental Management
4	Male	African	Setswana	Supervisor	Community services
5	Male	African	Tshivenda	Environmental Specialist Compliance	Community services
6	Male	African	Sesotho	Chief Environmental specialist	Community services
7	Female	African	English	Environmental Officer	Waste and Environmental division
8	Female	African	Setswana	General worker	Community services
9	Female	African	SiSwati	General worker	Community services
10	Male	African	Setswana	Politician	ANC
11	Male	White	Afrikaans	Coordinator: Waste Management	Community services
12	Male	African	IsiZulu	Single whip	Whippery
13	Male	African	Sesotho	Environmental Specialist	Waste and Environmental Management
14	Male	African	English	Supervisor: Waste Management	Community services
15	Male	African	IsiZulu	Administrator	Administrator’s office

Table E.2: Demographical data of the 18 Buy Back Centre participants

Buy Back Centre	Gender	Culture Group	Language	Country	Age
1	Female	African	Shona	Zimbabwe	30 years
2	Male	African	Setswana	South Africa	31 years
3	Male	African	English	Cameroon	34 years
4	Male	White	Afrikaans	South Africa	45 years
5	Female	African	Xhitsonga	South Africa	35 years
6	Male	African	Shona	Zimbabwe	33 years
7	Female	African	Setswana	South Africa	49 years
8	Male	African	Xhitsonga	South Africa	28 years
9	Male	African	Shona	Zimbabwe	22 years
10	Male	African	Setswana	South Africa	33 years
11	Male	African	English	Zimbabwe	45 years
12	Male	African	Setswana	South Africa	48 years
13	Male	African	Setswana	South Africa	41 years
14	Female	African	Setswana	South Africa	58 years
15	Male	White	Afrikaans	South Africa	63 years
16	Female	African	Afrikaans	South Africa	63 years
17	Male	African	English	Cameroon	37 years
18	Female	African	Setswana	South Africa	21 years

RESPONDENT'S EMPLOYMENT HISTORY

Table E.11: Have you ever worked where you received a payslip?

Q16	Frequency	Percentage
Yes	109	50.2%
No	102	47.0%
Not applicable	6	2.8%
Total	**217**	**100%**

Table E.12: The respondents last full time job

Q17	Frequency	Percentage
Builder (Construction)	1	0.5%
Butchery	1	0.5%
Carpenter	1	0.5%
Cashier	7	3.2%
Chef	1	0.5%
Cleaner	8	3.7%
Clerk	2	0.9%
Co-ordinator (WP)	1	0.5%
Dispatch	1	0.5%
Domestic Worker	4	1.8%
Driver	4	1.8%
Electrician	3	1.4%
Environmental Scientist	1	0.5%
EPWP	2	0.9%
Factory Worker	1	0.5%
Farm worker	3	1.4%
Gardening	4	1.8%
General worker	14	6.5%
Landfill assistant	1	0.5%
Loading cargo (Sasko bakery)	1	0.5%
Maintenance	3	1.4%
Manager	1	0.5%
Mechanic	1	0.5%
Merchandiser	1	0.5%
Packing	1	0.5%
Painter	1	0.5%

Q17	Frequency	Percentage
Paver and Rock art	1	0.5%
Planters/Farm work	3	1.4%
Quality controller (Clipsal)	1	0.5%
Roofing	1	0.5%
Secretary	1	0.5%
Security	5	2.3%
Store man	1	0.5%
Supervisor	2	0.9%
Teacher	1	0.5%
Teller	1	0.5%
Till controller	1	0.5%
Truck driver	1	0.5%
Upholstery	1	0.5%
Van boy/ Assistant driver	1	0.5%
Welder	3	1.4%
Woolworths co-ordinator	1	0.5%
Worked in a mine	3	1.4%
Operator	9	4.1%
Not applicable	111	51.2%
Total	**217**	**100%**

Table E.13: Other reasons the respondents resign

Q19 Other	Frequency	Percentage
Contract expired	8	3.7%
Early package	1	0.5%
I relocated	1	0.5%
Injured at work	1	0.5%
Needed new venture	1	0.5%
Pensioner	4	1.8%
Not applicable	201	92.6%
Total	**217**	**100%**

SOURCES OF RECYCLABLE WASTE

Table E.14: Types of recyclable waste items utilisation for personal use by respondents

Question: 37	Frequency	Percentage
Appliances	1	0.5%
Appliances and furniture	1	0.5%
Board to help build living structures, e.g. shack and furniture	1	0.5%
Broken appliances	1	0.5%
Buckets	1	0.5%
Clothes and electronics(irons, TV, radio) and chairs	1	0.5%
Clothes, iron, cell phones, pens	1	0.5%
Clothing	5	2.3%
Electrical appliances	3	1.4%
Food, clothing and some furniture	1	0.5%
Furniture	5	2.3%
Furniture and electrical appliances if they work	1	0.5%
Goods such as furniture	2	0.9%
If I find something I could use I take it for myself	1	0.5%
If I found something I can use, wood, I use for making fire at my house	1	0.5%
Iron and TV	1	0.5%
Iron, DVD player	1	0.5%
Iron, stove	1	0.5%
Light bulbs	1	0.5%
Stove	1	0.5%
TV	1	0.5%
Wood that I use to make furniture	1	0.5%
Not applicable	184	84.8%

Question: 37	Frequency	Percentage
Total	**217**	**100%**

Table E.15: Type of foods collection from the dustbins

QUESTION 39	Frequency	Percentage
All edible foods	1	0.5%
All good food not mixed with diapers	1	0.5%
Any clean food	1	0.5%
Any kind of food	1	0.5%
Any kind of food even braai pack of chicken if it is not off	1	0.5%
Anything to eat	1	0.5%
Fruits	1	0.5%
Fruits and bread	1	0.5%
Fruits and consume them	1	0.5%
Groceries from Spar	1	0.5%
Maize meal, washing soap	1	0.5%
Meat	1	0.5%
Meat, maize meal	1	0.5%
Solid food like bread and fruits	1	0.5%
Sometimes bread and expired can food	1	0.5%
Sometimes I find bread and I eat it while working	1	0.5%
Not applicable	201	92.6%
Total	**217**	**100%**

Table E.16: How recyclable waste is stored by the respondents

Place	Note	Frequency	Percentage
Back yard	At my backyard	89	
Back yard	Drum and recycling bag	1	
Back yard	In bin liners and skip bins	4	
Back yard	In drums and bags	4	
Back yard	In recycling bags at the back of the yard	5	
Back yard	Inside bin liners and bags	1	
Back yard	Inside drums and recycling bags	1	
Back yard	Inside the dustbins in the back of my yard	1	
Back yard	Inside unused drums, plastic containers and bags	1	
Back yard	Inside used maize meal bags	1	
Back yard	Store unbroken glasses inside old drums and bags	1	
Back yard	I store the waste in my backyard inside recycling bags	2	
Total	**Back yard**	**111**	**51.15%**
Landfill site	Create my own space around the landfill	9	
Landfill site	Have a designated area on site that I use as storage	15	
Landfill site	I use my empty stand where I do my job	1	
Landfill site	Landfill Site	10	
Landfill site	Store them inside recycling bags and skip bin	4	
Landfill site	Store them on designated area on site	1	18.43%
Total	**Landfill site**	**40**	**18.43%**
Open veld	Open veld near my house	9	4.15%
Own or rent space	Own open space	2	
Own or rent space	Renting a space	1	1.38%
Total	**Own or rent space**	**12**	**5.53%**
Transfer station	Store them on site in recycling bags and crates and have a store room for storing paper	1	
Transfer station	Store waste on site in sorted bulks white paper is store inside a locked room	1	
Transfer station	Stored in recycling bag, bottles and glasses are stored in bulk containers	1	
Transfer station	Stored in recycling bags and plastics on the other side of the yard	1	
Transfer station	Stores them at a designated area on site	1	
Transfer station	The municipality has offered the use of the facilities at the transfer station	1	2.76%
Total	**Transfer station**	**6**	**2.76%**
Question not answered		48	22.12%
Total		**217**	**100%**

Table E.17: The different ways waste pickers help each other

Q60	Frequency	Percentage
Finding work	16	31.4%
Transport/getting lifts	14	27.5%
Loans	0	0.0%
Food	3	5.9%
Shelter to sleep/housing	0	0.0%
Care when sick	0	0.0%
Personal care products	0	0.0%
Help to collect/share what they have collected	13	25.5%
Selling for each other	1	2.0%
Clothing	1	2.0%
Sorting	3	5.9%
Total	**51**	**100%**

Table E.18: Meeting with the municipality

60	Community informal waste picker	Landfill informal waste picker	Town informal waste picker	Population Total
I had a meeting with them when I started but they could not help me	1			1
No meeting was held	96	16	26	138
Yes, Several times	3	20	10	33
Yes but it was not successful			2	2
Yes, advice or how to conduct ourselves in landfill		1		1
Yes, just being advised to keep the site clean		1		1
Yes, we held meetings with municipality of Tshwane	1			1
Yes. We held the meeting at Madibeng municipality	1			1
Not applicable	38		1	39
Total	**140**	**38**	**39**	**217**

HAPPINESS SCALE

Table E.17: Frequency distribution of happiness scale

	Frequency	Percentage
1	19	8.8%
2	20	9.2%
3	16	7.4%
4	23	10.6%
5	24	11.1%
6	41	18.9%
7	31	14.3%
8	13	6.0%
9	4	1.8%
10	20	9.2%
Not applicable	6	2.8%
Total	**217**	**100%**