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THE ROLE PLAYED BY SUBSISTENCE WASTE PICKERS IN RECYCLING

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ABSTRACT

South Africa has one of the highest unemployment rates in the world. The majority of the economically active, but unemployed people enter the informal economic sector, as a means to make ends meet. Waste recycling falls into this informal sector. On average South Africa recovers about 52 percent of all recoverable paper and 26 percent of all recoverable plastic per annum. These figures are low when compared with developed countries where up to 90 percent of recoverable paper is recovered. As recycling creates job and income generating opportunities, it thus has a vital role to play in poverty alleviation. The research examines the role of subsistence waste pickers in the recycling industry in South Africa.

The research was qualitative and exploratory in nature. Data for this study was gathered through 30 semi-structured interviews with key stakeholders in the recycling industry. In total, informal waste pickers provide at least 84 percent of all recyclable materials in Johannesburg through merchants, recyclers and producers of recyclable material in Johannesburg. Informal waste pickers bring considerable socio-economic benefits to countries around the globe, providing work for the unskilled, providing a constant supply of secondary raw materials to the local manufacturing industries and significantly reducing the quantity of waste to landfill sites. However, the research will show that even in the best situations, waste pickers suffer ergonomic problems due to the physically taxing nature of their job, as well as psychological and social disadvantages stemming from their low social status.

Key words

Subsistence waste pickers, recycling industry, recyclable materials, unemployment, South Africa

DECLARATION

I declare that this research project is my own work. It is submitted in partial fulfilment of the degree of Master in Business Administration at the Gordon Institute of Business Science, University of Pretoria. It has not been submitted before for any degree or examination in any other University. I further declare that I have obtained the necessary authorisation and consent to carry out this research.

..... Date: 9 November 2011

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CONTENTS

1. CHAPTER 1: INTRODUCTION TO THE RESEARCH PROBLEM

1.1. Introduction

Unemployment in South Africa is remarkably high and rising, particularly after the 2008/2009 financial crisis. It is estimated that at least 25 percent of all economically active people in South Africa are unemployed (Davies & Thurlow, 2010). Unemployment is a serious concern – for its effects on economic welfare, production, erosion of human capital, social exclusion, crime, and general social instability. Unemployment is arguably the biggest threat facing South Africa's social, political and economic stability.

1.2. Recycling

Recycling is good for the South African economy as it decreases the necessity to import raw materials. More importantly, recycling creates job and income generating opportunities, thus helping alleviate poverty. Litter, particularly from discarded food and beverage packaging, is a major contributor to unhealthy infestations and urban decline. Collect-A-Can, a company that specialise in the recycling of aluminium cans in South Africa estimates that from 1993 - 2010, more than 750 000 tonnes of used metal cans were recovered in Southern Africa. Apart from the huge amount of landfill saved, the living environment of Southern Africans has been improved substantially. Recycling protects the environment by:

- Reducing the use of raw materials

- Reducing the impact of landfill on the environment. For example, on average, for every tonne of paper recycled, about $3m^3$ of landfill space is saved.
- Reducing air pollution, less iron ore, and reducing oxygen that plays a role in CO_2 generation. For every tonne of scrap metal recovered, there is also a reduction of coal based emissions of 1 tonne of CO_2. This is because significant quantities of raw coal and iron ore are used in the production of steel (scrap metal).
- Reducing energy as less energy is required to utilise recovered material compared with utilising raw material. Energy saved from paper recycling is sufficient to provide electricity to 512 homes a year. There is also a reduction in energy based emissions of 1.8 tonnes of CO_2. Recycling one tonne of plastic bottles saves 1.5 tonnes of carbon, decreasing the need for raw materials and saving energy.
- Reducing unsightly and unhealthy litter, particularly in pristine and living environments.

The recovery of waste materials can therefore assist municipalities who are feeling the brunt of financial infrastructure and space pressures, in reducing the volumes off landfill sites. The impact of litter is significantly reduced as it is collected from public places and roads – again helping municipalities. A study by Karani & Jewasikiewitz (2007) found that on average South Africa recovers about 52 percent of all recoverable paper per annum, 64 percent of all recoverable scrap

metal and 26 percent of all recoverable plastic. This is low relative to developed countries where up to 90 percent of recoverable paper is recovered, and reveals that a lot more can be done in this area.

Although the private sector is contributing more in terms of waste management, South Africa lacks an Integrated Waste Management Plan. A typical Integrated Waste Management Plan includes the recognition and support of community in waste management initiatives and strategy. Accordingly, there is a need to enhance private and public sector partnerships in waste management initiatives. Support for capacity building is critical in strengthening private and state institutions and legislative framework needed to encourage effective waste management systems. South Africa's estimated national waste generation rates range from 0.3 kilogram per capita per day for less developed areas to 0.8 kilogram per capita per day for more developed areas (Karani & Jewasikiewitz, 2007).

A study by McCarty & Shrum (2001) confirmed that economic status was negatively related to beliefs about the inconvenience of recycling, which in turn negatively influenced recycling behaviour. Even though it appears nearly most people have positive attitudes and beliefs regarding the environment, pro-environmental behaviour (purchase and disposal) has not been correspondingly ubiquitous, as evidenced by the unimpressive increases in recycling over the years (McCarty & Shrum, 2001).

1.3. Waste Picking

A regular feature of towns and suburbs in South Africa is the many people pushing trolleys filled with paper, plastic, scrap metal and cardboard boxes, all destined for recycling via recyclers and waste merchants. To date, the role these people play in the recycling industry has not been researched and measured.

According to an article by Jooste (Finweek, July 2009), about Petco (a South African company representing major brand owners, raw material producers, convertors, recyclers, and merchants), approximately 23 000 tonnes of PET (Polyethylene Terephthalate bottles i.e. milk and Coke bottles) were recycled in 2008 in South Africa. Based on this figure, if one person collects 200 PET bottles for 240 days of the year (i.e.1.6 tonnes of PET bottles per year), this potentially translates into the creation of an estimated 14 000 income opportunities for waste pickers. The waste pickers then sell to the recyclers of whom there were approximately 1675. Direct jobs in the PET recycling industry were estimated to be around 350 with a capital investment to date of R130 million. Increasing plastic bottle recycling could thus lead to job creation in the waste management, product development, manufacturing and marketing sectors.

Recycling is important not only because it promotes conservation of natural resources through reduced usage of virgin or primary materials but also because it reduces the amount of waste that has to be disposed off through landfilling or incineration (Baksi & Van Long, 2009). The individual's motivation for pro-

environmental behaviour can arise from both personal and social norms (Schultz, Nolan, Cialdini, Goldstein & Griskevicius, 2007), and thus consumer disposal decisions can have a significant impact on both individuals and the environment (De Coverly, McDonagh, O'Malley & Patterson, 2008).

Waste pickers collect discarded waste from concrete dustbins, open dumps, vacant land, containers, disposal sites and the street (Wilson, Velis & Cheeseman, 2006). Waste pickers are reviled because handling waste material is considered dirty (Anschütz & Scheinberg, 2006). Despite their plight, Anschütz & Scheinberg (2006) stated that waste pickers represent the foundation of most recycling activities.

A study by Hayami, Dikshit & Mishra (2006) on earnings for waste pickers in the Indian city of New Delhi found that their average earnings per day was about 40 percent lower than the minimum wages for casual labourers that were determined by the local municipal authorities. A study done by Gill (2007), also in New Delhi, showed that most pickers travel on foot, covering distances of approximately five kilometres per day. Gill (2007) argued that waste pickers exhibit the lowest rate of mobility towards better jobs, making it impossible for them to move out of their current work into alternative occupations.

A study by Gowan (2009) found that in the city of San Francisco, the informal trash (bottles, plastics, cardboard, and aluminium cans) collectors make between US$5

and US$20 a day, many working up to 12 hours daily, taking in two or three loads of 50 to 100 kilogram of trash each. According to an article by Jooste (Finweek, July 2009) Petco reported that approximately 5.4 billion beverage bottles were recycled in 2008 in South Africa. A study by Medina (2008) found that France recycle 30 percent of the garbage it generates whilst Britain recycle 28 percent, Japan 17 percent and USA 32.5 percent.

A socio-economic study carried out by Platt & Jeanes (1995) on the US cities of Baltimore, Washington, & Richmond concluded that maximizing the recycling of materials from the waste stream creates five times more jobs than those created by simply sending waste to landfill sites and incinerators. The different waste streams (scrap metal, plastic, paper and glass) yield different returns and bring fluctuations in income, with waste pickers earning a mean monthly income of an equivalent of US$41.28 (Gill, 2007).

More than something done merely for survival, the practice of waste picking may come to possess value detached from the particular worth of the things collected (Reno, 2009). Despite the health, safety and social problems and the adverse working conditions associated with informal recycling, it provides significant economic benefits that need to be retained, as it allows those involved to survive and be employed in regions that often have high unemployment (Wilson *et al*, 2006).

According to Wilson *et al*. (2006) four main categories of informal waste recycling can be identified in developing countries, depending on where and how material recovery takes place:

(a) Itinerant waste buyers

Waste collectors who often go from door to door, collecting sorted dry recyclable materials from households for which they barter or buy and then transport to a recycling shop of some kind. Apart from their labour, they invest capital to acquire and run a vehicle.

(b) Street waste picking

Secondary raw materials are recovered from mixed waste thrown on the streets or from communal bins before collection.

(c) Municipal waste collection crew

Secondary raw materials are recovered from vehicles transporting municipal solid waste to disposal site.

(d) Waste picking from dumps

Waste pickers sort through waste prior to it being covered. This is often associated with communities that live in shacks, built from waste construction material, on or near the dump.

1.4. Research Objectives

Informal waste pickers have been unrecognised stakeholders on the fringes of the urban waste landscape since the nineteenth century (Anschütz & Scheinberg, 2006). Little exploration has been conducted on the contributions of the urban poor to economic growth and environmental conservation (Hayami *et al*, 2006). The collection, sorting and packaging of recyclable materials is thus usually misunderstood or considered insignificant in the broader recycling industry. No study has been found in South Africa on the role played by waste pickers in the local recycling industry.

The purpose of this study is therefore to establish and highlight the role played by subsistence waste pickers in recycling in South Africa. The study could help policy makers and strategists to formalise the waste picking value chain of the recycling business and make it a critical and significant creator of jobs in the macro economy. The study could also help the recycling industry and raw material producers to develop new end-use markets and expand the recycling infrastructure for the benefit of the broader economic good.

1.5. Scope of Study

The scope of the study is limited to the role played by subsistence waste pickers in the recycling industry in South Africa. For the purpose of this study, waste pickers are the men and women who walk the streets of suburbs and metropolitan cities

collecting discarded cardboard, aluminium, steel, glass, textile, wood, plastics and paper destined for the waste recycling sites. They sort, clean, alter the physical shape of what they collect, facilitate transport and aggregate materials into economically viable products. Waste defined as anything with no value or use in its current state or form. The informal recycling sector refers to the waste recycling activities of waste pickers, extracting recyclable and re-usable materials from mixed waste (Wilson *et al.*, 2006). The informal sector refers to the labour-intensive, low-technology, low-paid, unrecorded and unregulated work often completed by individuals or family groups. Other synonyms used for waste in this research report are rubbish, trash, garbage, detritus, litter and refuse.

1.6. Structure of the Report

Chapter 2 provides a review of the literature related to the research problem. The section reviews literature on the reasons for waste picking, economics of waste picking, waste pickers working conditions and the key stakeholders in waste picking as well as the market for recyclable materials.

In Chapter 3, three research questions were formulated. The outcome of the literature review lays an important groundwork for the formulation of the research questions.

Chapter 4 provides an explanation of the research design and methodology to be used in the study. Included in this chapter is a discussion about the type of data to be collected, the methods of data collection as well as the method used to analyse and interpret the data.

Chapter 5 describes the data gathered during the empirical phase of the research.

Chapter 6 analyses the research data presented in *Chapter 5* in more detail and explores the emerging perceptions and views of all role players in the informal waste collection and recycling industry. The discussion was guided by empirical data gathered and frequently taps into the insights from the secondary data discussed in *Chapter 1 and Chapter 2.* The findings were drawn from the careful analysis and interpretation of the data.

Chapter 7 reflects on the main research problem as outlined in *Chapter 1,* as well as associated research objective. This chapter makes recommendations to the interested and affected parties, as well as stakeholders of this research, based on the findings and finally make recommendations for future research.

2. CHAPTER 2: LITERATURE REVIEW

2.1. Introduction

The foundation of the study is to identify extant literature relating to the role of informal waste pickers in recycling. Secondary data and information was generated via a desktop analysis of peer reviewed academic literature from different academic sources, namely, journal articles, e-journals, as well as other professional reports on the subject. The majority of the literature reviewed in this research is not older than five years.The literature review undertaken revealed that globally, significant attempts have been made to understand the significance of waste pickers in recycling. However, very little has been done in South Africa on this subject.

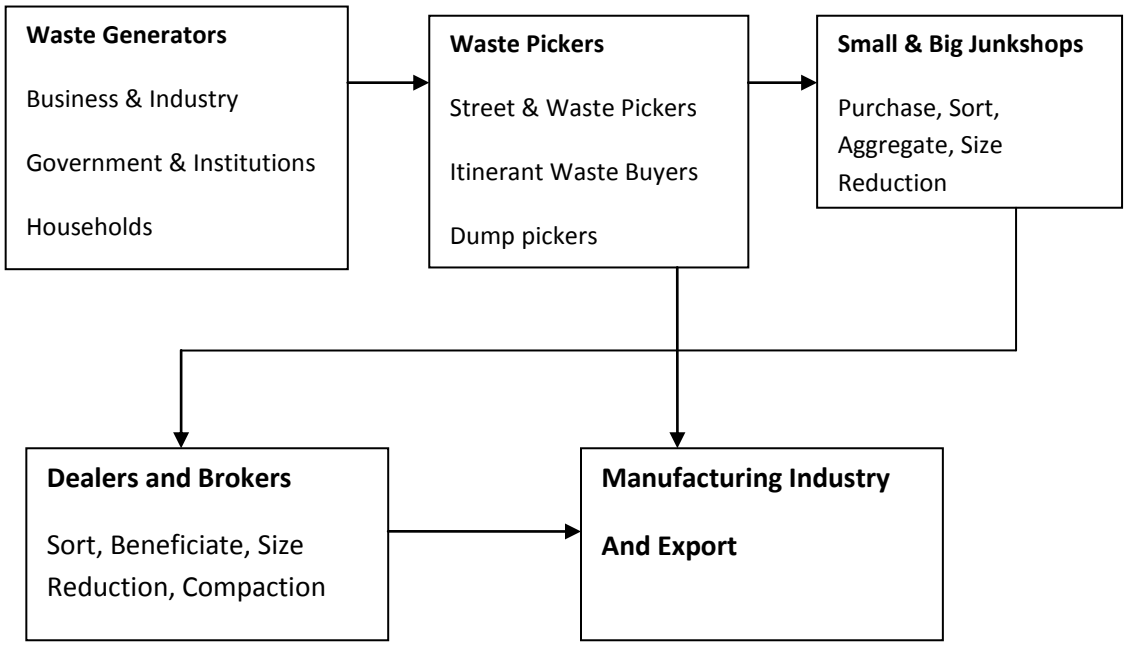
The literature and theory base to be discussed in this section focuses on the concepts and themes of waste recycling, the market for recyclable materials, economics of, and rationale behind waste picking, rewards for, and legitimacy of waste pickers as well as a preview of the working conditions of waste pickers. The literature review concludes by giving a review of the macro-economic environment of waste pickers in South Africa.

2.2. Waste Recycling

The United Nations Statistics Division (2004) on environmental statistics defines waste (garbage, trash, rubbish, refuse or litter) as material that is not a prime product (a product produced for the market) for which the generator has no further use in terms of his/her own purposes of production, transformation or consumption, and of which he/she wants to dispose. Waste may be generated during the extraction and processing of raw materials into intermediate and final products, the consumption of final products, and other human activities.

The secondary material value chain developed by Marchand (1998) provided an important framework to understand the role of different stakeholders in the generation, collection, treatment and final use of recyclable materials. The value chain is depicted in the Figure 1 below:

Figure 1: The secondary materials value chain



Source: Marchand (1998)

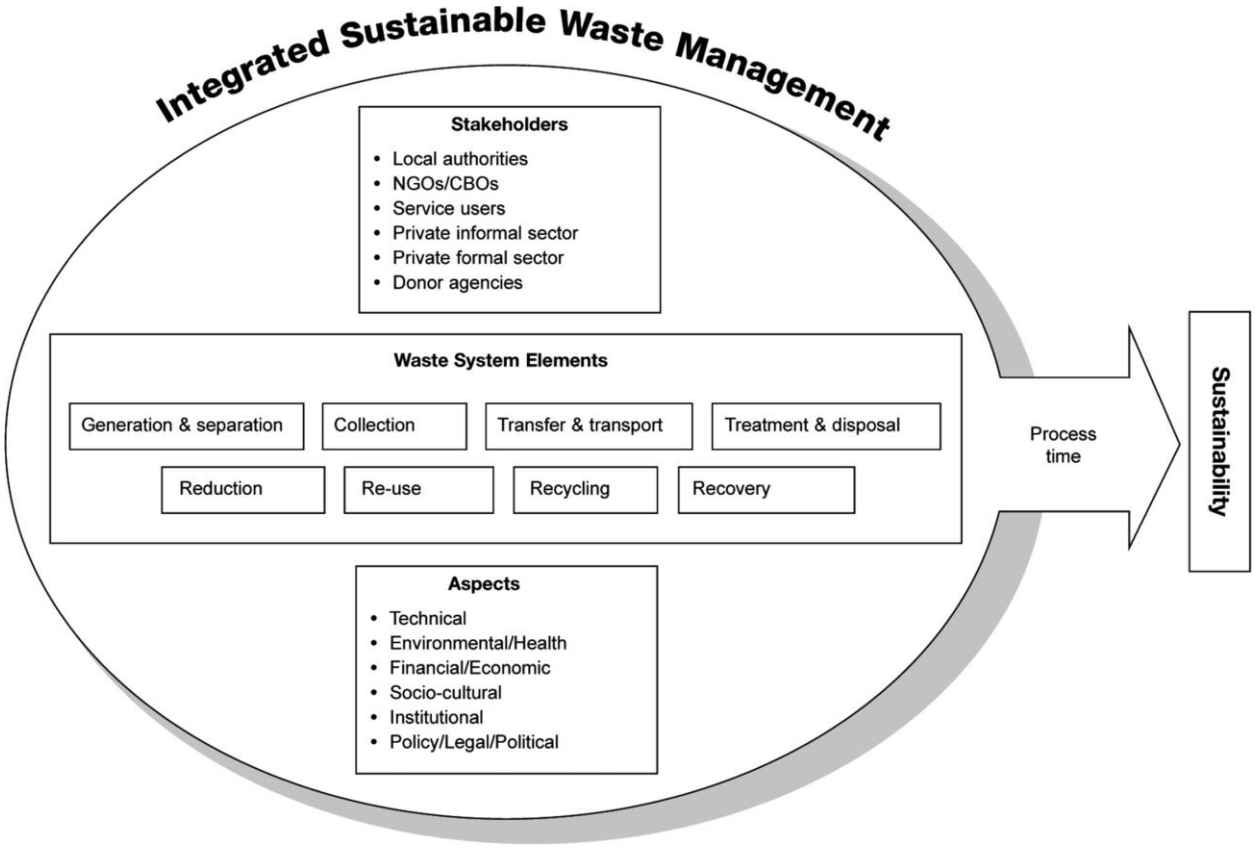
Langenhoven & Dyssel (2007) found that the recycling industry in the South African city of Cape Town is generally comprised of two tiers, namely, the first tier which relates to the intermediate market, including collectors, processors, brokers and converters; and the second tier which relates to end-use markets that use recovered materials as feedstock to manufacture new products.

According to the United Nations Statistics Division (2009) on environmental statistics, recycling is defined as any processing of waste material in a production process that diverts it from the waste stream, except re-use as fuel. Both reprocessing of the same type of product, and for different purposes are included in this definition. Recycling within industrial plants i.e. at the place of generation is

excluded. Ellis (2008) asserted that a tonne of household waste averaged an equivalent energy of about 3MWh, yet most of it is thrown away. So the landfilling of waste can be likened to pouring away almost two barrels of crude oil.

Residuals recycled or reused at the place of generation and waste materials that are directly discharged into the ambient water or air were excluded from this definition. Waste management is viewed as part of a generation, collection and disposal system (Seadon, 2010). The Integrated Sustainable Waste Management Framework, in Figure 2 below was developed by Anschütz, IJgosse & Scheinberg (2004) and positions recycling as a key waste system element to achieve sustainability:

Figure 2: The Integrated Sustainable Waste Management Framework



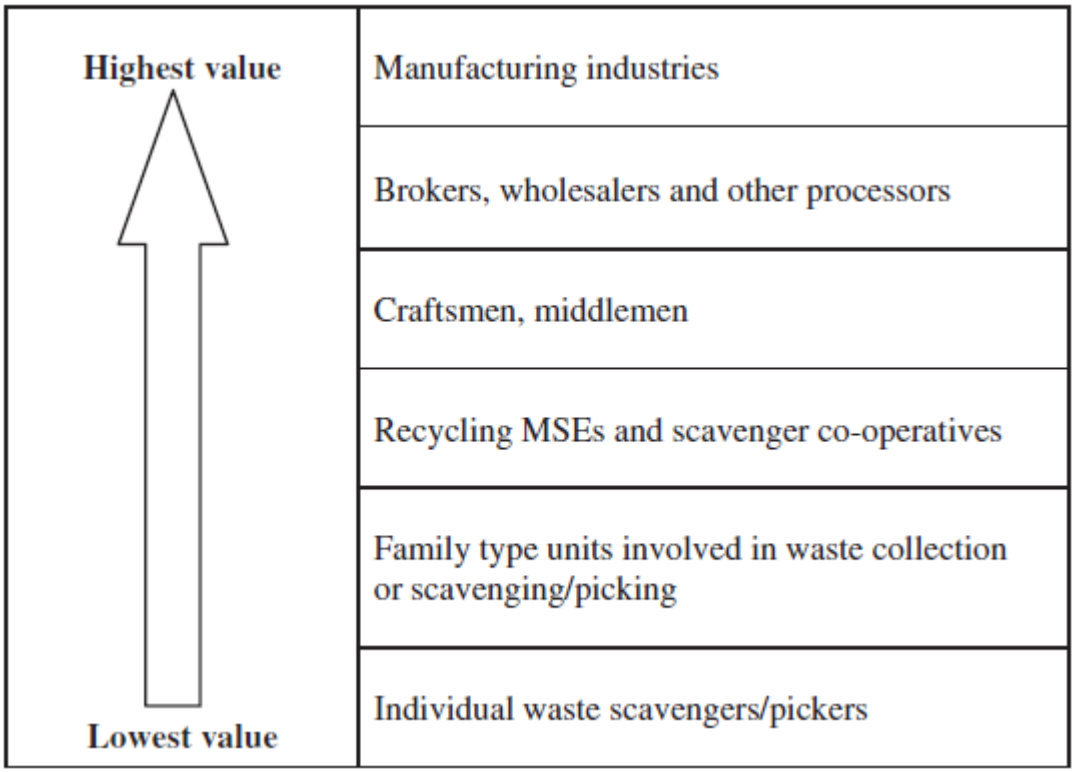
Source: Anschütz, Ijgosse & Scheinberg (2004)

The waste system elements, stakeholders and sustainability aspects were the three important dimensions in waste management identified by Anschütz, IJgosse & Scheinberg (2004) in The Integrated Sustainable Waste Management Framework. The unrecognised stakeholders in the Integrated Sustainable Waste Management Framework include street sweepers (usually females), workers on collection trucks or the dumpsite (usually males), and family-based informal waste pickers and small recycling businesses (usually junk shops) that buy materials.

Wilson *et al.* (2006) asserted that the way informal recycling activities are organised, has important consequences for income generation, social status and working conditions. As a general rule, the less organised the informal recycling sector is the less capable the people involved are of adding value to the secondary raw materials they collect, and consequently the more vulnerable they were to exploitation from immediate dealers.

According to Wilson *et al. (2006)*, the recycling network takes the form of a "hierarchy" as depicted in Figure 3 below:

Figure 3: The recycling "hierarchy"



Source: Wilson *et al.* (2006)

The higher a secondary raw material is traded, the greater the added value it possesses. Informal recyclers tend to occupy, and were restricted to, the base of the secondary materials trade hierarchy and this significantly reduces their potential income. Individual scavengers/waste pickers were the most vulnerable as they lack an organised supportive network.

The internationally accepted waste hierarchy is aimed at preventing waste, where possible, re-using, recovering and recycling it to reduce volumes, treating waste to render it less hazardous or harmful to the environment, and disposing of unavoidable waste to landfill as a last resort (Oelofse & Godfrey, 2008). McConnell (2007) believed a comprehensive solid management programme employs a four "R" strategy: review, reduce, reuse and recycle. It is not possible to reuse all materials in their original form, but the majority of products generated by residential and commercial users were recyclable and can be reprocessed and then reused (McConnell, 2007). Ambiguous waste definition by governments globally could hinder the promotion of sustainable waste recycling and re-use (Oelofse & Godfrey, 2008). Calcott & Walls (2005) argued that waste policy should provide the correct incentives to encourage product design to reflect environmental concerns as well as encouraging waste recycling, which effectively would divert solid waste from landfills. They concluded that producers should bear the social or financial cost of disposal for products that end up as trash. This concept of "extended producer responsibility" has been legally mandated by lawmakers for the

packaging, electronics, home appliances and automobile industries in Europe and Japan (Calcott & Walls, 2005).

A study by Bekin, Carrigan & Szmigin (2007) on the disposal behaviour of six environmentally conscious consumer communities in the United Kingdom found that compositing and recycling were the first options in the minds of the communities in terms of disposal and management of waste. McConnell (2007) argued that about 70 percent of the total waste generated by commercial office tenants comes from paper material, which is recyclable.

2.3. Market for Recyclable Materials

Waste markets were increasingly physically important in an emerging capitalist, consumer economy as they provide employment to the sizeable numbers of the urban poor working in the so-called unorganized sector of such an economy (Gill, 2007). The growing environmental consciousness within society has resulted in an increase in the amount of recycled waste over time in many countries (Baksi & Van Long, 2009). The degree to which a particular material is recycled depends on income levels, the existence of local and national markets, need for secondary raw materials, levels of financial and regulatory governmental intervention, prices of virgin materials, international trade in secondary raw materials and relevant treaties (Wilson *et al*., 2006).

The world throws away more than two billion tonnes of waste every year (Medina, 2008). According to a 2007 study by the City of Edinburgh Council, over 50 tonnes

of waste is collected in Edinburgh, Scotland everyday through street bin collections and street cleaning (Roper & Parker, 2008). Although recycling rates were at historic highs, trash heaps were piling up in rapidly growing countries like China and India (Medina, 2008). On average, one person generates 0.6 kilogram of waste per day in low-income countries, 0.82 kilogram in middle-income countries and 1.4 kilogram in high-income countries (Medina, 2008). The wealthier the person, the more waste she or he generates. The type of waste generated also depends on how wealthy a person is, that is, if you open a trash bin in New York City, you will find waste such as paper, wrappers, plastic, toys and electronics, but in poorer cities such as Cairo, waste piles were full of inedible remains of fruits and vegetables (Medina, 2008).

Beyond the realm of waste disposal, in many parts of the world exists “waste regimes” (Gill, 2007), complex social arrangements that enrol a broad range of institutions, regulations, and technologies in the circulation and transformation of wastes. When, sequential decision-making between a primary producer and a competitive recycling sector is assumed, it has been customarily argued that the presence of a recycling sector reduces the market power of the primary producer (Gaudet & Van Long, 2003). Wilson *et al.* (2006) asserted that it is very expensive to establish new formal waste recovery systems once existing informal ones have been allowed to decline or disappear. It is highly counterproductive to establish formal waste recycling systems without taking into account the existing informal systems (Wilson *et al.*, 2006).

2.4. Waste Picking

Reno (2009) citing Mydans (2006) & Erlanger (2007) stated that waste picking is portrayed as something done out of necessity, and the people doing it were suffering from abject poverty. How much recycling finally takes place depends on the decisions taken by both consumers, waste pickers and recycling firms (Baksi & Van Long, 2009).

Informal waste recycling is carried out by outcasts and marginalised social groups such as gypsies, rural migrants, immigrants and religious minorities who resort to scavenging/waste picking for income generation and some even for everyday survival (Wilson *et al.*, 2006). Reno (2009) contended that waste picking is only likely to increase globally as different wastes continue to move across borders, shadowing the circulation of goods and generating substantial economies of waste in the process.

2.5. Economics of Waste Picking

De Coverly, McDonagh, O'Malley & Patterson (2008) believed that waste is an inevitable consequence of consumption, thus as consumption has escalated, so too has the production of waste. Reno (2009) citing (Medina 2000) asserted that waste picking makes up a significant portion of the world's growing informal economic sector. For waste pickers, discarded wastes were neither simple utilities nor necessarily polluting, but complex and potentially enriching materials (Reno,

2009). The different waste streams yield very different returns (Gill, 2007). Brazil boasts one of the highest aluminium recycling rates, largely due to the 500 000 trash pickers who toil the streets collecting trash (Medina, 2008). Worldwide, at least 15 million people make a living by recovering and recycling trash (Medina, 2008).

Although the Integrated Sustainable Waste Management (ISWM) framework developed by Anschütz, IJgosse & Scheinberg (2004) situates waste pickers in the overall socio-technical system of provision of waste management, the role played by waste pickers in the recycling industry has not been clearly defined. In ISWM terms, the waste pickers have only a social identity and not a professional or economic one (Anschütz & Scheinberg, 2006). Many thousands of people from cities in developing countries depend on recycling materials from waste for their livelihoods (Wilson *et al.*, 2006). Insufficient collection, uncontrolled street collection points and improper disposal in open dumps allow refuse to be readily available for informal waste recycling through scavenging/waste picking (Wilson *et al.*, 2006).

Baksi & Van Long (2009), citing Gaskin (1974), Swan (1980), Martin (1982), Suslow (1986) & Tirole (1988) noted that extant literature has focused on the role of recyclers rather than that of the collectors of trash. Many development projects designed to ‘help’ or ‘rescue’ waste pickers treat picking as a disembedded phenomenon, separate from the local and global economy that produces waste,

thereby isolating researchers and development workers from the conceptual framework or tools that would help them understand the roles and functions of waste pickers (Anschütz & Scheinberg, 2006). According to Wilson *et al*., there were many ways and processes of extracting and adding economic value to the recovered waste materials, namely:

Collection

Identifying and picking of items or collecting mixed waste allows the sector to acquire the waste and turn it into a resource. Most primary materials recovered from refuse, such as paper, plastics, rags, metal, glass, and food leftovers, constitute a commodity as they all have a market price.

Sorting

This is the main process that increases the value of the waste recovered. The greater in the level of sorting, the greater is the value of the waste. For instance, if plastic is grouped into one major category, its value is lower than when it is further separated into sub-categories of hard and soft, then HDPE, PET, and LDPE. Sorting is done according to colour, size, shape and potential use or re-use of the materials so as to meet the end-user quality specifications.

Volume Accumulation

Additional volume adds value: larger volumes command higher per-unit prices. The greater the quantity, the better bargaining power the trader has. For small

quantities, transactions costs, such as checking quality, arranging transport and paying the seller, reduce the profit margin. Industrial feedstocks were massive in volume. It follows that storage space is required.

Pre-processing

Pre-processing includes washing, changing in shape-cutting, granulating, compacting and baling.

Small manufacturing craftsmanship

This is the creation of micro-enterprises that use the special skills of informal recyclers to transform recyclables into articles traded directly to the community and being affordable to the poor.

Market Intelligence

Proximity to markets where informal recyclers and traders conduct business allows for the flow of information which, in turn allows decisions to be made on accurate market prices, competitors, trading partners, etc

Trading

Trading happens in informal and formal markets. Links to the secondary materials network were crucial. Traders should be financially capable of adding and conserving the value of recyclable materials. The difference between buying and selling should also provide a buffer against risk.

2.6. Legitimacy and Rewards of Waste Pickers

The distinguishing characteristic of the work life of waste pickers is that they do not get paid in an institutionalised or regular manner for waste they collect (Gill, 2007). Potential profit margin is the main selection criteria used by waste pickers for targeting materials, although this also depends on accessibility, convenience, ease of transporting and handling (Wilson *et al.,* 2006). Without legitimacy, waste pickers may also be manipulated or exploited by the recycling business owners to whom they sell materials (Anschütz & Scheinberg, 2006). Individual waste pickers are the most vulnerable as they do not have an organised supportive network (Wilson *et al*., 2006). Forming waste pickers' cooperatives and associations could help enhance their position.

By circumventing intermediate dealers, waste pickers' income could be increased significantly and their activities more legitimised and socially acceptable (Wilson *et al*., 2006). The prices paid to waste pickers for recyclables were determined by fluctuations in supply and demand of a specific recyclable (Langenhoven & Dyssel, 2007). Douny (2007) maintained that in the Dogon of Mali, waste communicates the capacity to feed people as well as to fulfil their needs.

2.7. Working Conditions of Waste Pickers

Reno (2009) citing (Medina 2000), would argue that the suffering endured by many scavengers is not inherent to the activity of recovering materials others have wasted, they were created by structural inequalities, the profiteering of middlemen in the recycling market, and government neglect, all of which tend to restrict access to the best waste, foster poor labour conditions and diminish the returns from the sale of recovered material. Returns paid to waste pickers were generally low, partly as a result of the low bargaining power of pickers (Gill, 2007).

In the best situations, waste pickers suffer ergonomic problems due to the physically taxing nature of their work, and psychological and social disadvantages stemming from their low social status (Anschütz & Scheinberg, 2006). Karani & Jewasikiewitz (2007) asserted that most primary waste pickers in the SADC region including South Africa transport waste to recycling sites in one of the following ways:

- Carry by hand
- Wheeled bins, and / or
- Handcarts or other trolleys

The health and safety risks associated with informal recycling include occupational health risks. These were high in developing countries due to manual handling (for example, direct contact with broken glass, or paper that may have been saturated

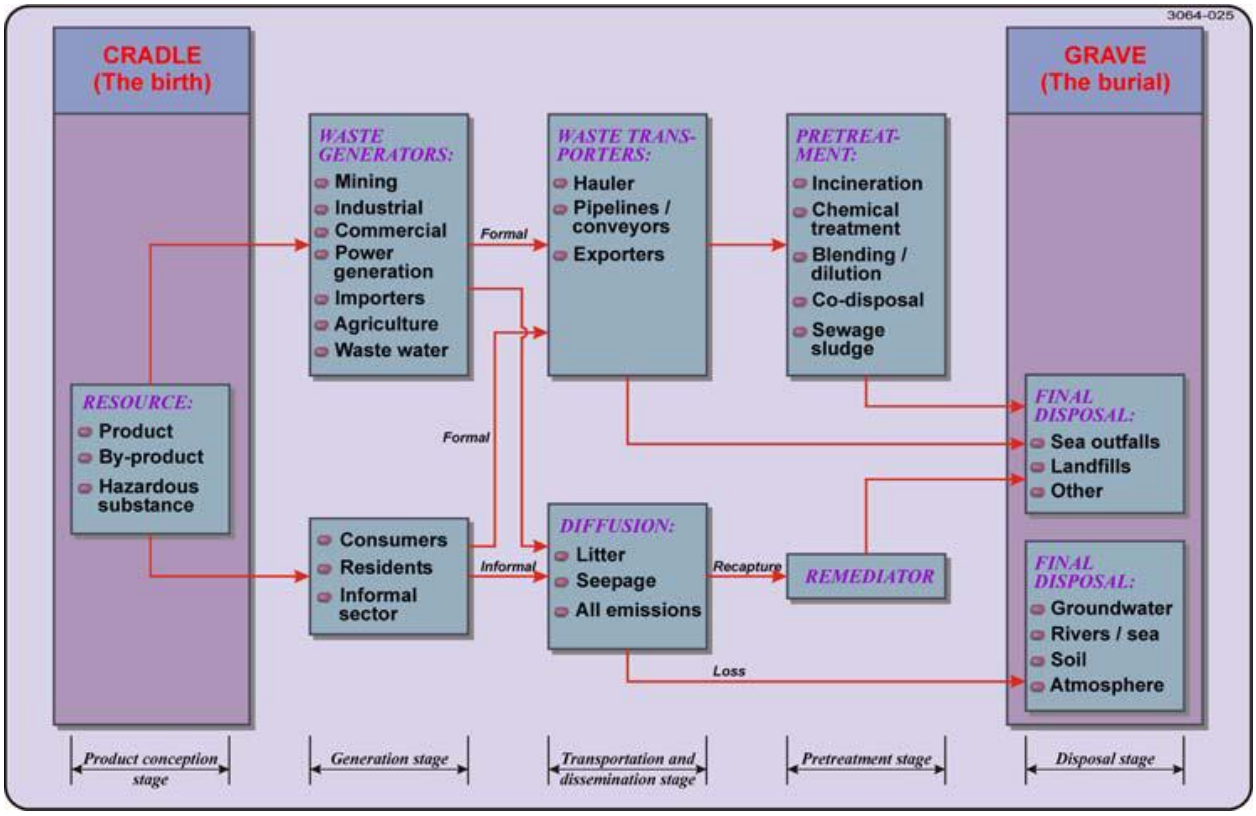
with toxic material) and a lack of protective equipment, resulting in direct contact with waste. Inhalation of bio-aerosols, and of smoke and fumes produced by the open burning of waste, can also cause health problems (Wilson *et al*, 2006). Public policies towards the informal sector were largely negative, and characterised by either repression, police harassment, neglect or collusion (Wilson *et al*., 2006). To address these problems, Wilson *et al.* (2006) argued that the first step is for those in authority to recognise the economic, social and environmental benefits derived from the informal recycling sector.

2.8. Macro-economic Environment of Waste Picking in South Africa

2.8.1 Waste Management

Analysis of waste generation in SADC countries including South Africa showed an understanding of the continuum of waste from source to final stage is critical to process and product innovations. For example, the role of waste segment generators is shown within the concept of “cradle to grave” - from initial product conception through to final disposal (Department of Water Affairs, 2001) as depicted in the waste cycle in Figure 5 below:

Figure 4: The "cradle to grave" concept



Source: Department of Water Affairs (2001)

According to Karani & Jewasikiewitz (2007), the private sector is doing a lot more in South Africa in the waste management sector, particularly in recycling. This is mainly due to the incentives and existing demands on industry to meet certain environmental criteria. Karani & Jewasikiewitz (2007) posited that at the bottom of the recycling pyramid were ad-hoc initiatives between non-governmental and community-based organisations, encouraging waste separation and recycling as a means to generate income and employment for poor communities, and contributing to cleaning up the environment. Using the 2005 Packaging Corporation of South Africa's (PACSA) statistics, Karani & Jewasikiewitz (2007) provided the percentage

of recycled materials per year in South Africa between 1900 and 2002 in Table 1 below:

Table 1: Percentage of recycled materials per year in South Africa between 1900 and 2002

Category	1990	1992	1994	1996	2000	2002
Paper	29	28.4	38	38	40	51.9
Metals	21	26.3	29.9	51	40.8	63.5
Plastic	11	14.8	17	17	11.9	25.5
Glass	14	22.4	19.4	17.6	19.5	28.9

Source: Karani & Jewasikiewitz (2007)

These statistics suggest that on average, 38 percent of paper; 39 percent of metals; 16 percent of plastic; and 20 percent of glass were recycled between 1990 and 2002. The amount of metals recycled between 1990 and 2002 has doubled whilst the amount of plastic and glass have increased by 100 percent. Paper recycling has improved by 79 percent during the time between 1990 and 2002.

Langenhoven & Dyssel (2007) concluded that paper and cardboard were by far the bulkiest commodities brought by waste pickers as well as the biggest revenue earners for them. Karani & Jewasikiewitz (2007) found that the economics of plastics recycling were determined by labour costs for collection, sorting and processing, as well as transport costs and electricity and water consumption costs involved in the washing and processing of recovered materials. The selling prices

for recycled polymer were limited to 60-70 percent of the virgin polymer prices, which were subject to normal supply/demand forces Karani & Jewasikiewitz (2007).

2.8.2 Unemployment

Unemployment is one of South Africa's most pressing socio-economic challenges, affecting 25 percent of the workforce (Davies & Thurlow, 2010). According to Harmse, Blaauw & Schenck (2009), in September 2006, the official unemployment rate was 25.5 percent. According to that statistics, black African people had the highest level of unemployment in South Africa, estimated at 30.7 percent. One of the most visible forms of unemployment is the day labourers - men standing at road sides or on corners, waiting for any job that may come their way (Harmse et al., 2009). Harmse *et al.* (2009) estimated that there were about 1000 places in South Africa where a total of about 45 000 mostly, black African men, stand, waiting to be picked up for any informal day jobs. These day labourers were generally low skilled and usually work in harsh conditions. Although their day jobs can provide a means of survival, on average, the incomes were inadequate, for supporting a family and other dependants. Davies & Thurlow argued that although informal employment has accounted for most of the job creation over the last decade, South Africa still has a small informal sector relative to other countries at similar income levels.

Wood vending is one such example of this sector, providing low incomes but also casual employment opportunities for unskilled labour in the midst of high unemployment in South Africa (Shackleton, McConnachie, Chauke, Mentz, Sutherland, Gambiza & Jones, 2006). Heinz & Posel (2008) showed that unemployment in South Africa is involuntary and that informal work is preferred relative to other low paying formal job opportunities. They concluded that there were persistent earnings differentials between the formal and informal employment sectors and also between the different types of informal employment. These differentials, they contended, were suggestive of complex segmentation in the South African labour market and challenge the presentation of informal employment as an undifferentiated residual with no barriers to entry or mobility. A study by Langenhoven & Dyssel (2007) argued that recycling should be used as a mechanism for sustaining the livelihoods of micro-collectors and small recycling-based entrepreneurs in impoverished communities. Langenhoven & Dyssel (2007) would argue for the non-existence of barriers to entry in the recycling industry at waste collection level.

2.8.3 Immigration

There are between 2.1 to 4.1 million immigrants residing illegally in South Africa, the majority of whom do not have more than three years of formal education and few work skills outside those of subsistence agriculture, hospitality, domestic work and informal trading (Solomon, 2005). Bloch (2006) agreed, asserting that many of the migrants to South Africa have low levels of qualifications (if any) and have

never worked prior to migrating. Solomon (2005) argued that illegal immigrants often compete with low-skilled South Africans in the job market, and contribute to local people having decreased access to employment. The presence of illegal foreign workers has a depressing effect on wages as a result of their accepting long working hours for low wages and their resistance to unionisation (Solomon, 2005).

2.8.4 Conclusions of the literature review

This literature review has confirmed that recycling in general, and waste picking in particular bring abundant social and economic benefits to society as a whole including livelihood, employment, social status, clean environment, raw material savings, income generation, poverty alleviation, promotion of conservation of natural resources and reduction of landfill space. Despite substantial research and studies done on recycling and waste management, informal waste pickers have long been unrecognised stakeholders on the fringes of the urban waste landscape. Little exploration has been conducted on the contributions of the urban poor to economic growth and environmental conservation.

The collection, sorting and packaging of recyclable materials is thus usually misunderstood or considered insignificant in the wider recycling industry. This study investigates the role played by informal waste pickers in the recycling

industry and adds value to the work done by other researchers in the field of recycling and waste management.

3. CHAPTER 3: RESEARCH QUESTIONS

This research project aims to determine the nature of the role of subsistence waste pickers in the recycling industry in South Africa. To clarify the problem statement above, four research questions were formulated.

3.1. Research Question One:

Who are the role players in the informal recycling value chain?

3.2. Research Question Two:

What are the underlying reasons for waste pickers to do this job?

3.3. Research Question Three:

What are the economics of being a waste picker?

3.4. Research Question Four:

What are the views of the different role players on the importance of waste pickers to the recycling industry in South Africa? What is the impact of waste pickers on the supply and demand of recyclable materials?

4. CHAPTER 4: RESEARCH METHODOLOGY

4.1. Introduction

This section provides details of the research method used to achieve the research objectives. The section includes the research design, survey population, sample selection, data gathering and analysis techniques to be applied.

The selection of a research design is based on how the problem is shaped, by the end result that is desired and by the questions that are being raised (Merriam, 1998). Babbie and Mouton (2003) defined research design as a set of guidelines and instructions to be followed in addressing the research problem.

The primary source of information was from the qualitative research methods – in-depth face-to-face semi-structured interviews with waste pickers and other role players in the waste generation and recycling value chain. Content and comparative analysis was then used to draw conclusions. Content analysis produces a relatively systematic and comprehensive summary or overview of the data set as a whole (Silverman, 2011).

The research was exploratory in nature, and aimed at understanding a phenomenon, which in this case, is the role of waste pickers in the recycling industry – from the perspectives of those involved (Welman & Kruger, 2001).

Qualitative research is recommended when a researcher aims to interpret a phenomenon in a specific context rather than simply establishing a link between two variables (Leedy & Ormrod, 2002). Exploratory and qualitative research is also appropriate when not enough is known about a phenomenon for standardised instruments to have been developed (Patton, 2002), and when an ambiguous problem needs to be clarified (Zikmund, 2003). A qualitative, largely exploratory approach was therefore considered most appropriate for this research study, given that very little has been done into the role of informal waste pickers in South Africa.

The research project took the form of a two-phase qualitative study, where a thorough review of the literature led to research questions being formulated and investigated. Phase I involved face-to-face semi-structured interviews with informal waste pickers whilst Phase II involved semi-structured interview with role players in the recycling industry. The underlying motivation for waste pickers to do what they do, the importance of waste pickers in recycling and the economics of waste picking, were measured by analysing and interpreting the content of the in-depth interviews.

Semi-structured interviews usually start with specific questions, but allow for the interviewee to follow his or her thoughts later on (Blumberg, Cooper & Schindler, 2008). Semi-structured interviewing technique is useful when several respondents are being interviewed, as it provides some standardisation, allowing for

comparative analysis, whilst leaving room for some spontaneity, as well as interviewer probes for clarification or elaborative purposes (Welman & Kruger, 2001). It allows for the hybrid deductive/inductive approach that is suited to case studies (Perry, 2003), but involves one source of data, the interview, rather than multiple sources. Probing techniques was then be used to obtain additional information from the respondents. The strength of qualitative interviewing is the opportunity it provides to collect and rigorously examine narrative accounts (Silverman, 2011). Silverman (2011) argued that qualitative interviewing produces accounts that offer researchers a means of examining intertwined sets findings: evidence of the nature of the phenomenon under investigation, including the contexts and situations in which it emerges, as well as insights into the cultural frames people use to make sense of these experiences. Combined, they offer important insights for theoretical understanding.

4.2. Unit of Analysis

The unit of analysis refers to the “what” of the study, what object, phenomenon, entity, process or event is the researcher interested in studying (Babbie & Mouton, 2003). Zikmund (2003) distinguished between four different units of analysis in social science, namely, individuals, groups, organisation and social artefacts. This study uses two units of analysis.

For Phase I, the unit of analysis for the study was the opinions of informal waste pickers who collect waste for recycling in the Metropolitan area of Johannesburg. For Phase II, the unit of analysis was the opinions of generators of waste, recyclers/merchants and home owners in the Metropolitan area of Johannesburg.

4.3. Population

The population of Phase I of the study consisted of all informal waste pickers who collect waste materials from the suburbs and cities of Gauteng for the recycling industry. The population of Phase II of the study consisted of all role players in the waste recycling value chain – generators of waste, recyclers/merchants and home owners in Gauteng.

4.4. Sample

The non-probability convenience sampling method was used for Phase I of the study to select waste pickers. With convenience sampling, field workers have the freedom to choose whoever they find (Blumberg *et al*., 2008). Bias in the non-probability sampling is reduced using post-stratification, which require that certain personal demographics be available for the entire population (Blumberg *et al*., 2008).

Quota sampling was used for Phase II to determine the percentage of role players to be interviewed for the study. Quota sampling is a type of purposive sampling

used to improve representativeness in a case where certain relevant characteristics describe the dimensions of the population. The risks of systematic bias in quota sampling are usually not significant (Blumberg *et al*., 2008).

At least 20 waste pickers from the Johannesburg Metropolitan area were interviewed for this study, and approximately ten other role players in the recycling industry were interviewed, namely, four recyclable waste producers/generators, three recyclers/merchants and three from households.

4.5. Interview Guidelines

Waste pickers were interviewed in places where they were found - streets, under bridges and on pavements, as they move their trolleys to and from picking up waste. Some waste pickers were interviewed in the merchants and recyclers shops – weighing their waste or collecting their wages after a day's work, and others were interviewed in landfill sites sorting waste.

Merchants and recyclers were interviewed in their offices or waste sorting sites. The original generators of waste were interviewed telephonically, whilst house owners were interviewed in their houses or telephonically. All interviews were recorded.

The questionnaire of Phase I, in Appendix I was used for the interviews of waste pickers whilst the questionnaire of Phase II, in Appendix II was used for the

interviews of waste generators, recyclers/merchants and manufacturers of goods from recyclable materials. Questions were open-ended by nature to get the maximum responses from the participants. Where interviewees could not express themselves in English, their mother tongue was used to clarify their responses to the questions asked. Pre-trial interviews showed that most waste pickers spoke Nguni languages (i.e. Zulu, Xhosa and Ndebele); English and/or Sotho languages (Tswana, Pedi and Southern Sotho). The researcher understands all the above-mentioned languages. In cases where the interviewee did not speak any of the languages stated above, the interview was not carried out.

Although the majority of waste pickers were open to being interviewed, some refused. As a token of appreciation, and taking into account that they had spared valuable work time, R20 each was given to three out of the total number of waste pickers interviewed, to buy a drink after the interview.

4.6. Data Collection

Primary data was collected using 30 in-depth face-to-face semi-structured interviews with informal waste pickers, waste generators, recyclers/merchants and manufacturers of goods from recyclable materials. Interviews were conducted with 20 subsistence waste pickers from Johannesburg – in suburbs, in downtown Johannesburg, Newtown, Alexandra and Naturena. Waste pickers were found in

streets, landfill sites or at recycle shops delivering their waste materials. The data was collected on different days between June and September 2011.

4.7. Pre-testing

Pre-testing of the interview process with waste pickers was conducted to test the ease at which waste pickers answered the questions presented in the questionnaire of Phase I. This was also done to understand the intensity of data collecting and to allow the researcher to be comfortable with the interviewing and subsequent probing techniques.

4.8. Data Analysis

According to Denscombe (2007), data analysis calls for the discovery of key components or general principles underlying the particular phenomenon so that these could be used to provide a clearer understanding. The collected data is separated into components and reduced to more manageable pieces to allow for accurate interpretation and extraction of conclusions. For this study, data was analysed across the specified sample groups in order to identify common themes.

The data collected from the interviews was analysed using content and comparative analysis techniques in order to identify common themes and categories. The interviews with waste generators, recyclers/merchants and manufacturers of goods from recyclable waste were exploratory in nature.

Exploratory studies tend towards loose structures with the objective to discover future research tasks (Blumberg *et al.*, 2008). Silverman (2011) stated that a questionnaire or an in-depth interview is more likely to obtain similar replies (reliability) regardless of who the interviewer is, provided it is conducted correctly. The final results were analyzed, discussed and interpreted to form a basis of conclusion and possible areas of future research.

4.9 Limitations of the Study

The following limitations were identified:

- Since the research used non-probability sampling, the results were not easily generalisable
- There was a possibility of interviewer bias due to the researcher's personal perceptions, assumptions and interpretation. However, the researcher tried to be as objective and neutral as possible under these circumstances
- The research was highly dependent on the quality of the answers provided by the respondents during the interviews

4.10 Validity and Reliability

Data validity in qualitative research refers to the accuracy and precision of the data in terms of the research questions being asked (Denscombe, 2007). Due to the

nature of the research, the potential bias as a result of perceptions, assumptions and interpretation existed, hence, the need for interpretive validity. This required the researcher to pay close attention to the language and perspective of the respondents during the interviews as opposed to the researcher simply interpreting the interviewees' comments.

5. CHAPTER 5: RESULTS

5.1 Introduction

This chapter describes the data gathered during the empirical phase of the research. Data gathering was facilitated by 30 semi-structured interviews with key stakeholders in the recycling industry in South Africa. Interviews were conducted with 20 subsistence waste pickers from Johannesburg – in suburbs, in downtown Johannesburg, in Newtown, in Alexandra and in Naturena. Waste pickers were found in streets, landfill sites or at recycle shops delivering their waste materials.

Interviews were also conducted with ten other role players in the recycling industry - including three owners of recycle shops; four representatives of companies that produce or buy waste materials for use in their factories; and three house owners. Interviews with each of these role players took approximately 30 minutes to complete. The data was collected on different days between June and September 2011.

The data was analysed using content and comparative analysis techniques in order to identify common themes. The interview questions were directly linked back to the three main research questions identified in Chapter 3. The results are presented separately for each of the three research questions, directly linking them back to the responses of the interview questions. The research data is presented in Tables, Figures and in narrative format.

5.2 Results of interviews from waste pickers

5.2.1 Role players in the waste picking value chain

Research Question One served to identify the role players in the waste picking value chain. The role players in the industry were established mainly through exploratory interviews with waste pickers. The literature reviews on recycling in other countries around the globe shaped the initial thoughts as to whom the key players in the recycling value chain are.

5.2.2 Underlying reasons for waste pickers to do what they do

Research Question Two served to identify themes relating to the reasons why waste pickers continue to collect waste. Respondents were asked Questions one to six as shown in the questionnaire of Phase I, Appendix I. The responses ranged from short to detailed complex conversations, and accordingly some answers were summarised.

Question 1: What motivates you to do this job?

A 100 percent of the respondents indicated that the main reason for waste picking is that they could not find alternative jobs in the economy. Table 2, below, illustrates some of the excerpts from the interviews with waste pickers on what motivates them to collect waste.

Table 2: Excerpts from waste pickers on what motivates them to collect waste

Excerpts from the interview	Respondents
"I am struggling to find a job, so this is just a piece job".	Three men, downtown Johannesburg
"There is no work, I would like to have a proper job, but there are no jobs. I am a bricklayer by trade"	Mozambican man, Jeppe street, Johannesburg
"I am trying to do some piece jobs, because there are no other jobs"	Woman, Naturena, south of Johannesburg
"It is because there is no other place where I can find employment. There is no other job"	Thabiso and a friend, downtown Johannesburg

Question 2: What do you like and dislike about this job?

The main reason why waste pickers do not like their job ranged from safety and security concerns to the physically demanding nature of the job, and from low wages to non-regulation of their industry and harassment from authorities. The majority of the respondents noted safety and security as the main concern in doing the job of waste picking. However, some waste pickers felt that the job was physically taxing, while others felt that less harassment from authorities would make it easier for them to do their work. Waste pickers maintained they travel distances of between five to thirty kilometres a day searching for waste.

It was interesting to observe that waste pickers believed the researcher would be able to assist them with jobs, industry regulation and unionisation. A number of

them wanted to be part of the National Union of Steel Workers of South Africa ("NUMSA"), mainly as they collected scrap metal (some of which is steel). They believed they should have participated in the 2011 NUMSA strike, but were unable to as they did not have any association or bargaining power with the relevant industry representative body.

All the waste pickers interviewed enjoy the fact that their wages are payable as soon as the waste is delivered to merchants. A number of them liked their job because of the flexible working hours, while one respondent noted that waste picking gave him the opportunity to exercise and to meet with other people. Table 3 illustrates some of the reasons why waste pickers like or dislike their job.

Table 3: Some of the reasons why waste pickers like or dislike their job

Excerpts from the interview	**Respondents**
"No uniforms/PPE" "No employment card (picture and employment number) for security reason because there are criminal elements who go to suburbs pretending to be waste pickers, but thieves, and are destroying a future for us dedicated waste pickers"	Two men, Newtown, Johannesburg
"I would still do this job over weekends, even if I had another day job, because it generates additional income"	Three men, northern Suburbs
"I hate carrying a heavy trolley walking up and down the hills". "The weight of waste is killing us"	Three men, Alexandra township

"Physically demanding job - but it is better that being a thief". "Some police officers harass us".	
"What I like about this job is as soon as I collect, I get cash". "I am a shoe fixer, so I like exercise, as I walk up and down collecting waste, rather than being a couch potato, I get time to stretch my legs". "There is nothing I dislike about this job, if you have the right attitude, anyone can do this job". "This job helps me to see people and socialise with them – different people and cultures"	Frank, Freedom Park, south of Johannesburg
"I like the flexible working system, I am not employed so I start and finish working as I will and wish. If I am tired, I stop. Quitting this job would depend on the salary the new job will be offering me"	Woman, Naturena, south of Johannesburg

Question 3: If you had other job options, would you quit this job?

About 50 percent of the respondents believed that they would continue to collect waste over weekends should they get a formal job, as waste picking provides them with additional income. Approximately 25 percent believed that they would stop doing this job if they get a better job offer, whilst a quarter of those interviewed believed that the salary for the formal job would determine whether to continue with

waste picking or not. Table 4 below illustrates excerpts from the interview on their views about alternative job opportunities.

Table 4: Selected views of waste pickers on alternative job options

Excerpts from the interview	Respondents
"I would still do this job over weekends, even if I had another day job, because it generates additional income"	Three men, northern Suburbs
"I would stop this waste picking job, if there were other jobs"	Mozambican man, Jeppe street, Johannesburg
"I would still do this job over weekends, even if I had another day job"	Three men, northern Suburbs
"Quitting this job would depend on the salary the new job will be offering me"	Woman, Naturena, south of Johannesburg

Figure 5, Appendix II shows waste pickers with their trolleys in Alexandra township. One of the reasons why waste pickers like their job is because they get cash on delivery, as depicted in Figure 6, Appendix II, where waste pickers queue to pick up their wages after collecting waste materials.

Question 4: Where do you pick up waste?

Waste pickers indicated they collect waste from suburbs, shops, factories, construction sites, landfill sites, households, and streets. Effectively, any place littered with waste is a target.

Question 5: What type of waste do you collect the most?

Any recyclable waste material in whatever form or shape that merchants accept in exchange for cash is a target market for waste pickers - from cardboard boxes, milk, water and Coke bottles, white paper, fax paper, tin, cans, aluminium, steel, iron, brass, copper, scrap metal, plastic, newspaper, magazines, old stoves, kettle, ward ropes, washing machines, TV, computers, and glass. Any recyclable material is picked up by waste pickers as depicted in Figure 7, Appendix II. This picture shows aluminium pots in good condition being sent to a scrap metal shop in exchange for money, in downtown Johannesburg.

The research revealed that all waste pickers knew exactly the rates of each kilogram of waste. Most waste pickers focussed their efforts on picking the types of waste that pay the most, mainly, copper, brass, aluminium, office paper, scrap metal and Coke and milk/water bottles. However, on days when these items were not available, waste pickers would collect other materials simply to ensure an income of sorts. It was also interesting to note that most waste pickers knew exactly where to find each type of waste.

Some waste pickers specialised in collecting a certain type of waste i.e. plastic, scrap metal or cardboard paper only. The rationale behind this was that they had mutual relationships with generators of specific waste materials, and thus preferred to collect waste from these waste generators as it was more convenient, and because they were guaranteed a certain amount of waste which, in turn, could

earn them a good wage on a specific day. Waste pickers revealed they would not hesitate to travel long distances to get high-paying waste as long as it could be delivered to the merchants. Only about ten percent of waste pickers interviewed picked up sorted waste from municipality-owned landfill sites.

Question 6: How many hours per day do you work? What time do you start working and when do you leave work every day?

About 75 percent of the respondents work for about twelve hours a day starting at about three or four o'clock in the early hours of the morning and finishing at about five or six o'clock in the evening. Approximately 25 percent of the respondents are flexible, working from between three and six hours. This group of waste pickers starts at about seven o'clock in the morning and finish at about one o'clock in the afternoon. Some of the excerpts from waste pickers on their working hours are illustrated in the Table 5 below:

Table 5: Working hours for waste pickers

Excerpts from interviews	Respondents
"4am in the morning we are already on the road/streets. The finish time depends on the time the waste recyclers/merchants close. They start at 7am and finish at 7pm every day. Some close at 14h30 or 16h30 on weekends"	Two men, Newtown, Johannesburg
"We start at 7 in the morning. Anytime is working time – as long as you see waste, you pick it. We work everyday... the waste collectors close at 13h00 on	Three men, Alexandra township

weekends".	
"We start working at 4am in the morning and finish at 6pm in the evening. Recyclers close at 7pm"	Three men, downtown Johannesburg

Question 7: How long have you been working as an informal waste picker?

The waste pickers interviewed noted that they had been doing this job for between one and eleven years. About 65 percent of the respondents have been working as informal waste pickers for less than six years, whilst 35 percent of the respondents have been picking up waste for an average of ten years.

Table 6: Selected views of waste pickers on how long they have been working as informal waste pickers

Excerpts from interviews	Respondents
"I have been doing this for about ten years"	Three men, downtown Johannesburg
"I have been doing this since 2005, so it is 6 years"	Mozambican man, Jeppe street, Johannesburg
"I have been doing this job since 2000...11 years".	Samuel, (under the bridge), Newtown, Johannesburg

5.2.3 The economics of waste picking

Research Question Three served to identify themes relating to the economics of waste picking. Respondents were asked Questions 8 to 14 as shown in the questionnaire of Phase I, Appendix I. The responses ranged from short to detailed complex conversations, therefore some answers were summarised".

Question 8: How much do you get paid per type of waste per day? What is the going pay rate for a weight of waste type?

Waste pickers interviewed indicated that they are paid from R1.50 – R2.50 per kilogram of scrap metal; from R2 – R3 per kilogram of white office paper; about R2 per kilogram of any other office paper; from R2.20 – R3 per kilogram of Coke plastic; from 80c to R2 per kilogram of milk bottles (plastic); from R30 – R80 per kilogram of copper; from 30c – 60c per kilogram of cardboard boxes, newspaper and magazines; from R8 – R12 per kilogram of aluminium; and from R30 – R40 per kilogram of brass. These prices differ from one merchant to the other. To validate some of these prices, the researcher delivered 5.4 kilograms of steel, of which only 5 kilograms was accounted for in terms of payment, and a total of R11.50 was paid. This amount converts to R2.30 per kilogram of steel. It was also observed from the respondents that waste pickers in Alexandra township are generally paid less than those in Naturena and downtown Johannesburg. It was interesting to observe that all waste pickers, without exception, knew exactly the price payable for each type of recyclable material. This was particularly noteworthy taking into account the fact that these impoverished and unskilled people have very low levels of education, let alone specific financial literacy skills.

Question 9: How much waste do you collect per day? How much do you make per day?

Asked how much they make in a typical day, the amounts vary from R36 to R300 depending on the type and amount of waste collected. Most waste pickers work for

two to three days collecting waste before they deliver it to merchants and recyclers. One of the waste pickers showed the researcher a receipt for R36 as his daily wages in Figure 8a, Appendix II, based on the amount of waste paper he had collected that day. Table 7 below shows views from waste pickers on what their "take home" is per day.

Table 7: Selected views of waste on their daily or monthly wages

Excerpts from interview	Respondents
"It depends, R42. Today I made R47.60".	Two men, Newtown, Johannesburg
"I make about R50-R100 in a day, I can make R1000 in two to three weeks or so".	Three men, downtown Johannesburg
"I sometimes make R120 on Mondays, some days R200 a day".	Mozambican man, Jeppe street, Johannesburg
"I make lots of money. I make R200-R300 a day".	Samuel, (under the bridge), Newtown, Johannesburg

Figure 8b, Appendix II shows the amount of waste usually collected over three days by waste pickers.

Question 10: Is this your own trolley? Where did you buy it? How much was it?

All waste pickers own the trolley they use to carry waste to merchants. The significant majority (95 percent) of trolleys were bought for R50 each. The trolleys are acquired from the merchants or other waste pickers or from retailers such as Pick 'n Pay. The remaining five percent of waste pickers had made their trolleys. It

was interesting to note that waste pickers service their trolleys regularly. A typical trolley last for about three to six months after which a new one is then acquired.

Question 11: Where do you sell your waste?

All waste pickers interviewed sell their waste to local merchants or recyclers closest to where they collected their waste. On rare occasions, waste pickers sell their waste to the merchants who pay the highest value per kilogram of waste collected.

Question 12: What skills does one need to do this job?

Most waste pickers noted that there are no specific skills required to do their job apart from physical strength and the ability to sort waste.

Question 13: How many dependants do you support with your wages? Where do you live?

Approximately 15 percent of waste pickers interviewed were from the local areas of Alexandra, Tembisa and the greater Johannesburg area. The rest were from places such as Lesotho, Zimbabwe, Mozambique, Kwazulu-Natal, Eastern Cape and Limpopo. About 90 percent of the respondents have families and a minimum of two children. They provide financial support to these families. Those who come from further afield visit their families once or twice a year depending on how much money they have made collecting waste. Those who come from outside Gauteng stay in places such as shacks, Reconstruction, and Development Project (“RDP”)

houses, apartments or on the streets. Some of the responses from the respondents are shown in Table 8 below:

Table 8: Views of selected waste pickers on whether they have dependants or not

Excerpts from interview	Respondents
"A family is there, I come from East London, Eastern Cape. That is where my family is". "I come from Natal, Empangeni". "We came to look for money here in Gauteng". "We go home once a year".	Two men, Newtown, Johannesburg
"My family is in Alexandra township. "My family is in Tembisa". "I can provide some food, meat with my earnings".	Three men, Alexandra township
"I have a family – wife and two kids in Mozambique. I sleep anywhere, mainly corner End and Bree streets. There are about 50 of us. I do not have a place to stay".	Mozambican man, Jeppe street, Johannesburg
"We stay in a shack in Jeppe. I come from Lesotho where my family is based. We go home once in a month".	Thabiso and a friend, downtown Johannesburg

Figure 9, Appendix II, shows a place under the bridge where waste pickers live.

Question 14: How many more waste pickers do you work with or know from your area?

It was very difficult for waste pickers to estimate the number of other waste pickers they knew from surrounding areas. The figures range between 500 and 2500 as recalled from the respondents in Table 9 below:

Table 9: Selected views of waste pickers on how many other waste pickers they know or work with from their neighbourhood

Excerpts from the interview	Respondents
"Plenty...yoooo....more than...too much people...even there in Braamfontein...too much...about a thousand..."	Two men, Newtown, Johannesburg
"About 500 or so".	Samuel, (under the bridge), Newtown, Johannesburg
"There are many of us who sell waste...hundreds in a day".	Woman, Naturena, south of Johannesburg
"......hahahahahahah...so many...there are far so many....more than 2500 a day".	Thabiso and a friend, downtown Johannesburg

5.3 Results of interviews from other industry players

Research Question Four served to identify themes relating to the views of the different role players on the importance of waste pickers in the recycling industry. This section is written up according to the responses of the stakeholder group, namely, recyclers and merchants; house owners and generators of recyclable materials. Respondents were asked Questions 15 to 36 (questions differ

depending on the type of role player) as shown in the questionnaire of Phase II, Appendix I. The responses ranged from short to longer detailed conversations, resulting in some answers being summarised". Pictures of the different wastes were taken to confirm the types of waste collected.

5.3.1 Recyclers and Merchants

Merchants buy waste from waste pickers in exchange for cash. Merchants act as middlemen between waste pickers and those who recycle (beneficiate) waste for internal use or for domestic or export market. On the other hand, recyclers collect waste from waste pickers, then and recycle (process) it for domestic or export market. The domestic or export market comprise original producers of recyclable materials such as plastic and paper (Nampak), and scrap metal (ArcellorMittal) and the textile industry.

Question 15: How much waste is delivered to your factory every day by informal waste pickers?

Approximately 67 percent of merchants/recyclers received all their waste from subsistence waste pickers, while the remainder 33 percent indicated that the waste pickers supplied 80 percent of their waste requirements. Without waste pickers, the merchants/recyclers' businesses would grind to a halt. According to the merchants/recyclers' perspective, there were about 20 merchants operating in Soweto, about ten in downtown Johannesburg and five in Alexandra township. A

merchant collects about 15 tonnes of different types of waste on average daily, while a recycler collects about one tonne of any specific type of waste a day.

Question 16: In your view, do informal waste pickers add value to recycling?

All merchants/recyclers unanimously agree that waste pickers add value to the recycling industry in South Africa. The reasons given are that waste pickers recycle waste that would otherwise have gone to landfill sites, thereby saving both space at landfill sites; and money that the municipality would have used to collect, sort and treat waste. “One merchant commented: “The waste pickers are very important, even in terms of recycling itself. If waste pickers do not bring waste to merchants, the land fill sites/dumps would last for only ten years”.

Question 17: How else do you collect of waste apart from waste pickers?

Other means merchants resort to in terms of collecting waste is to source it directly from the shopping centres, manufacturing companies (i.e. textile industry) and landfill sites.

Question 18: How many waste pickers deliver waste to your recycling shop daily? In your view, how many waste pickers are employed in waste recycling?

It was difficult for merchants/recyclers to estimate the number of waste pickers delivering waste to their shops over a certain period of time. They, however, agree that the number is high, sometimes up to 2000 a month. Quipped one merchant:

"We are talking about hundreds a day.....in a month approximately 2000 different people delivering waste to my recycle shop...one scrap yard".

Question 19: What type of waste do waste pickers deliver to your recycling shop?

Merchants and recyclers agree with the waste pickers on the types of waste collected and delivered to their shops as ranging from plastic, paper, and scrap metal to plastic bottles. The type of waste a merchant or recycler trades with was displayed outside their shop as shown in Figure 10, Appendix II.

Question 20: Where do you sell your waste? What do you do with waste when you receive it?

When waste is received by merchants, it is sorted, compacted, packaged properly and then delivered to original recyclable material manufacturers such as Nampak, ArcellorMittal, Scaw Metal Group and Collect-A-Can. Some of the plastic waste, Polyethylene Terephthalate ("PET') is delivered to Chinese companies who make clothes, blankets, roofing tiles buckets, chairs and bags out of it. One of the three merchants/recyclers noted that South African legislation does not allow recycled materials to be used for food packaging. Only virgin material is allowed. Figure 11, Appendix II, shows waste sorting in progress at one of the merchant's shop in Naturena, South of Johannesburg.

Question 21: How much do you pay waste pickers per waste type per kilograms?

All merchants/recyclers concurred with waste pickers on how much they pay per kilogram of waste delivered to their shops i.e. they pay from R1.50 – R2.50 per kilogram of scrap metal; from R2 – R3 per kilogram of white office paper; about R2 per kilogram of any other office paper; from R2.20 – R3 per kilogram of Coke plastic; from 80c to R2 per kilogram of milk bottles (plastic); from R30 – R80 per kilogram of Copper; from 30c – 60c per kilogram of cardboard boxes, newspaper and magazines; from R8 – R12 per kilogram of aluminium; and from R30 – R40 per kilogram of brass.

These prices vary between merchants. One merchant noted: “It also depends on the amount of waste they bring. A person who brings one tonne of waste gets a higher rate compared to a person who bring ten kilogram of waste”. However, another merchant indicated that she pays similar rates irrespective of how much waste a waste picker brings”. The rates per kilogram of waste payable to waste pickers by merchants were displayed on the window of one of the merchants as shown in Figure 12, Appendix II. Figure 13, Appendix II, shows polyprop plastic after processing, resembling “spaghetti” before being sized and sold to garden chair makers or the Chinese textile industry

5.3.2 House Owners

For this research, house owners comprise people who own or rent houses or domestic workers working in households.

Question 22: How much waste do you generate per day or week?

All homeowners interviewed noted that they usually generate a bin full of waste per week, except during month-end and when they have parties, where their municipality-size bin overflows with waste.

Question 23: What type of waste do you dump in your bin?

The type of waste generated by house owners includes food leftovers, milk bottles, plastics, magazines, newspapers, paper, juice bottles, coke bottles, food/detergent containers and packaging, glass, Coke and other fizzy drinks bottles. About 67 percent of homeowners interviewed noted that some waste pickers ask for old house appliances, old and unused kitchen and garden utensils and old pots.

Question 24: In your view, do informal waste pickers add value to recycling?

All house owners unanimously agreed that waste pickers add value to recycling because they sort waste and ensure that waste is recycled; they pick up non-degradable plastics and scrap; and house owners do not have to travel to landfill sites as waste pickers collect everything from their houses. One house owner noted that the problem with the municipality is that sometimes their employees go on strike for extended periods of time, leaving a great deal of waste being

uncollected. Waste pickers become increasingly useful in these situations, improving the local environment and inhabitants' health.

Question 25: How else do you dispose of waste apart from waste pickers?

An alternative waste disposal method is via the municipality that collects waste on a weekly basis. This was common to all house owners.

Question 26: How many waste pickers pick up waste from your dustbin weekly?

In a week, home owners see between two to five waste pickers coming to their homes to collect waste.

Question 27: What type of waste do waste pickers collect from your dustbin?

All home owners interviewed noted that waste pickers are selective when picking waste. They pick paper, newspapers, magazines, cardboard boxes, plastic, Coke bottles, and scrap metal. Waste pickers sort the waste and leave the dustbin and surrounding area very clean and tidy.

Question 28: How many waste pickers do you normally see around your neighbourhood?

The number of waste pickers seen by homeowners around their neighbourhoods ranges from ten to twenty.

5.3.3 Generators of Recyclable Materials

Producers of recyclable materials includes original producers of paper and plastic, metal (copper, brass, aluminium, tin) as well as those who use these recyclable materials internally in their manufacturing processes or those who sell to the domestic and export markets.

Question 29: How much waste do waste pickers deliver in your factory daily?

In total, the three respondents of this survey who buy scrap metal, iron and aluminium cans require about 125 000 tonnes of waste per month to use in the steel/aluminium making processes in Gauteng alone. The fourth respondent who deals with plastic and paper, did not have the exact amount of paper and plastic delivered to the company for re-use. However, all respondents noted that waste pickers deliver between 20 to 30 percent of waste directly to their factories. This is in addition to what is delivered by merchants (who gets waste from waste pickers). Table 10 below illustrate excerpts from one of the respondents.

Table 10: Views of one of the original producers of waste on how much waste is required to run their businesses

Excerpts from the interview	Respondent
"We get about 40 000 tonnes of waste scrap metal per month. We also generate a bit of waste metal internally".	Sakhile Sgudu, Scrap Purchase Manager, ArcellorMittal

Question 30: In your view, do informal waste pickers add value to recycling?

All respondents unanimously agreed that waste pickers add a lot of value to recycling in South Africa. Meshack, Managing Director of Recycling at Nampak noted "Yes, the informal pickers are very much part of the recycling industry, in that they reach where we do not necessarily reach. They form an integral part of the entire value chain".

Question 31: Where else do you collect waste apart from waste pickers?

Apart from waste pickers, the respondents indicated that they collect waste from schools, recyclers, merchants, landfill sites, factories, companies, shopping centres, retailers, banks, printers, office parks and from internally generated waste.

Question 32: How many waste pickers deliver waste to your recycling shop daily? In your view, how many waste pickers are employed in waste recycling?

It was very difficult for the respondents to determine the exact number of waste pickers delivering waste to their companies due to the fact that informal waste pickers are not regulated, and therefore not registered in any company databases. However, all respondents believe that the number of waste pickers employed in the recycling industry runs into thousands. One respondent cited an article he had read in one of the mainstream magazines suggesting that about 880 000 informal waste pickers are employed in the industry including, women and children.

Question 33: What type of waste do waste pickers deliver to your factory?

The group types of waste delivered to the respondent's factories are similar to what is delivered to merchants and recyclers, namely, ferrous metal – steel, tin and iron; plastic – milk, water and Coke bottles; paper – office paper, newspaper, cardboard boxes; and glass; and aluminium.

Question 34: Where do you sell your waste? What do you do when you receive waste?

About 50 percent of the respondents noted that once received, waste is processed into blocks or briquettes and sold to steel mills locally and internationally. The local market includes Columbus, Scaw Metal Group and ArcellorMittal. The export market includes steel mills in China, Pakistan and India. India was noted as being the biggest consumer of scrap metal. About 50 percent of the respondents use waste internally.

Question 35: At what price do you sell waste materials to the market?

All respondents interviewed noted that the prices of waste materials are determined by supply and demand forces in the market. The price at which scrap metal/steel/iron is sold to the market was quoted as between R1600 to R2700 per tonne. All the respondents felt the market to be very cyclical in nature. Sakhile Sgudu, Scrap Purchase Manager of ArcellorMittal noted, "The steel industry is very cyclical with the price set by the export market ....in most instances you find that demand is low locally whilst the demand is high outside, and they can afford to pay

high prices. The market can jump from R1900 to R2700 per tonne of scrap metal in a space of three months. Very volatile market, based on both local and export market demand".

Question 36: How much do you pay waste pickers per kilogram of waste?

Respondents pay waste pickers 50c per kilogram of steel cans, R4.50 per kilogram of loose aluminium cans (for example Red Bull cans), R1 per kilogram of tin cans, R2 per kilogram of clean white office paper, R1.60 per kilogram of light colour paper (excluding black), 20c per kilogram of newspaper, 60c per kilogram of magazine paper, 65c per kilogram of cardboard boxes, R1.50 per kilogram of thin fax paper, R2.40 per kilogram of light steel and R2.70 per kilogram of heavy steel. These rates are consistent with what merchants and recyclers pay to waste pickers. The different classifications of waste referred to by waste pickers, merchants and other role players are detailed in Tables 11 and 12, Appendix III.

6. CHAPTER 6: DISCUSSION OF RESULTS

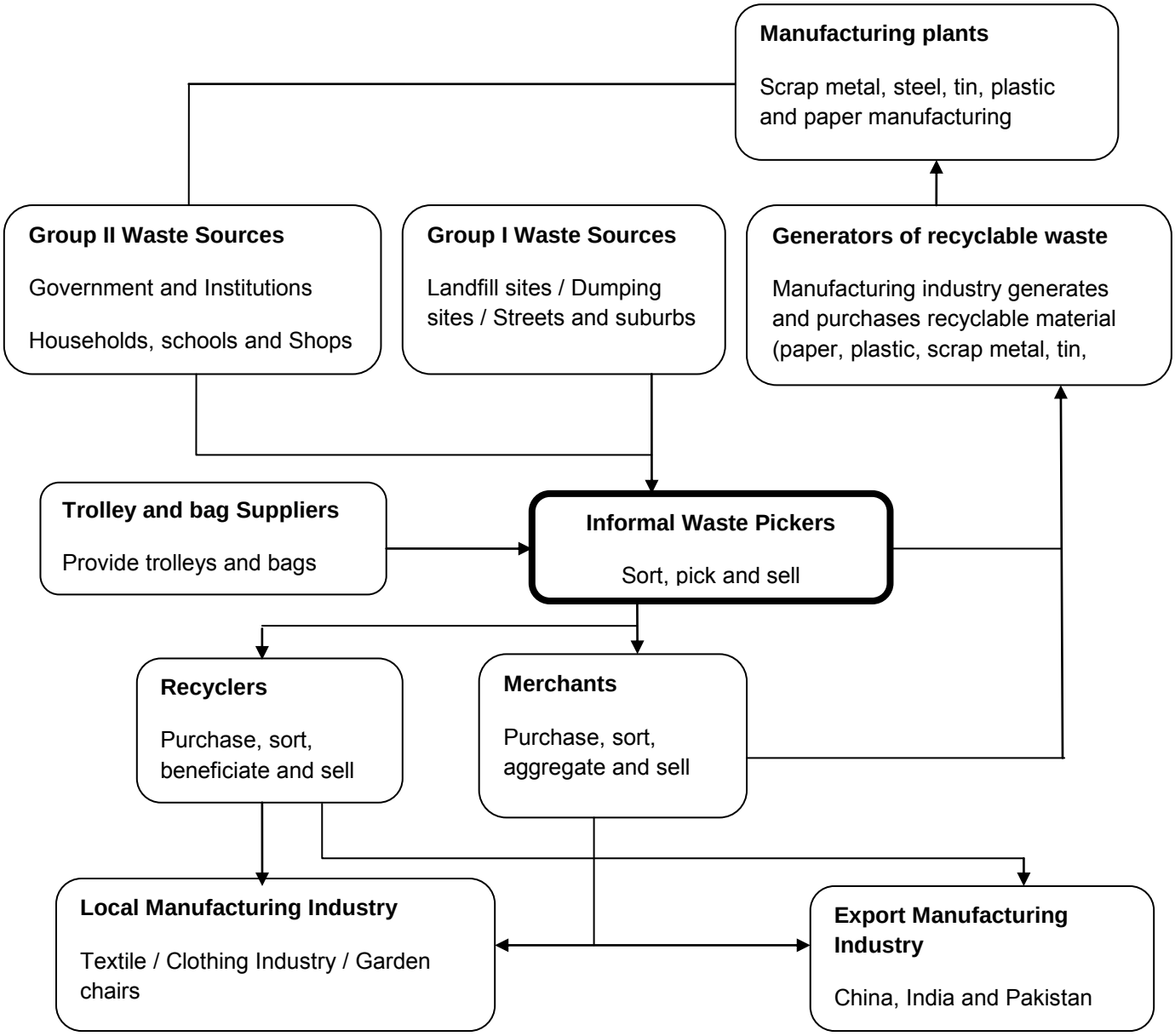
6.1 Introduction

This chapter analyses the research data presented in Chapter 5 in more detail and explores the emerging perceptions and views of all role players in the informal waste collection and recycling industry. The discussion was guided by empirical data gathered and frequently taps into the insights from the secondary data discussed in Chapter 1 and Chapter 2. The findings were drawn from the careful analysis and interpretation of data.

6.2 Research Question One: The role players in the informal recycling value chain

The question sought to identify and establish the role players in the informal recycling value chain. This question was answered through interviewing waste pickers, merchants, recyclers, original recyclable material manufacturers and home owners. To understand the role of the different stakeholders and their relationships in the generating, picking, collection, processing and final usage of recyclable materials, the informal recycling value chain in Figure 14, below was developed:

Figure 14: The informal recycling value chain developed by this study



The informal recycling value chain developed from this study is an expansion of the secondary materials value chain developed by Marchand (1988), which is shown in Chapter 1, Figure 1. Recycling (including role players identified in this value chain) is part of the Integrated Sustainable Waste Management Framework developed by,

Anschutz *et al*. (2004) in Chapter 2, Figure 2. The informal value chain developed by this study significantly complements the Integrated Sustainable Waste Management Framework. The role players are clearly identified through empirical data presented in Chapter 5 as informal waste pickers, merchants, recyclers, trolley and bag suppliers, recyclable waste generators, waste sources and the local and external manufacturing industry.

The informal value chain makes it easier to understand the generation, separation, collection, transfer and transporting, processing, packaging, re-use and recycling of recyclable materials in order to achieve sustainability in waste management. This level of clarity helps to address the challenge of ambiguous waste definition by governments around the world which could hinder the promotion of sustainable recycling and re-use (Oelofse & Godfrey, 2008).

Waste pickers buy trolleys from retailers, merchants, and recyclers. The waste pickers push and pull these trolleys over long distances, sorting and collecting waste from landfill sites, streets, suburbs, retail shops, households, government and private institutions. Some of the waste from government, private and public institutions, shops and schools is delivered directly to the manufacturing industry for production of consumer goods.

Waste pickers sell their waste to merchants, and /or recyclers and /or generators of recyclable waste. Merchants in turn sell their waste to the local and /or export

manufacturing industries or generators of recyclable materials. Generators of recyclable materials re-use the waste from merchants and waste pickers to manufacture consumer goods. Recyclers sell their processed waste to local and /or export manufacturing industries. There is a strong inter-connectedness and inter-dependence between waste pickers, merchants, recyclers and generators of recyclable materials that facilitates the entire value chain to work in a balanced way.

6.3 Research Question Two: The underlying reasons to collect waste

The main reason waste pickers continue to collect waste is that they cannot find alternative employment opportunities in the mainstream economy to support themselves. This is evident from empirical data presented in Table 2, Chapter 5. The findings of this study are consistent with the findings of the study done by Reno (2009) who concluded that most waste pickers collect waste merely as a means of survival. Gill (2007) confirmed that waste markets are increasingly physically important in an emerging capitalist economy as they provide employment to sizeable numbers of the urban poor working in the so-called unorganized sector of the economy. Reno (2009), citing Mydans (2006) and Erlanger (2007) agreed that waste picking is something done out of necessity, and the people who do it do so out of suffering from abject poverty. Thousands of people in developing country cities depend on recycling materials from waste for their livelihoods (Wilson *et al.*, 2006). It is clear from this study that the high levels

of unemployment in South Africa have resulted in an increase in the number of individuals entering the informal recycling industry.

Most waste pickers like their work as it provides instant cash on the delivery of waste to merchants and recyclers - a source of financial pride, as shown in Table 3. Waste pickers, however, dislike their working conditions due to the reasons cited below (as shown in Table 3):

Safety and security concerns

Waste pickers do not have personal protective equipment to assist them, and they endure harassment and abuse from both metro police and motorists as they move their trolleys around the streets of Johannesburg. There is fighting amongst waste pickers from different countries, with some fighting for territorial dominance on the streets in which they work. There are also criminal elements who disguise themselves as waste pickers searching for opportunities to rob households, business and shop owners. Despite these tough working conditions, waste pickers continue to brave early mornings, long hours and difficult working conditions in search of recyclable materials that generate some form of earnings with which they can support their families.

Waste pickers blamed their intolerable working conditions on the non-regulation and informal nature of the recycling industry in South Africa. Wilson *et al.* (2006) supported this view when they concluded that the less organised the informal

recycling sector is, the more vulnerable it is to exploitation. Supporting the findings of this study, (Anschütz & Scheinberg, 2006) concurred that without legitimacy, waste pickers may also be manipulated or exploited by the recycling business owners to whom they sell materials. In addition, as households are not compelled to separate their waste, waste pickers have to sort through materials which could potentially be hazardous to their health.

Physically taxing nature of the job

Waste pickers travel distances of between five and thirty kilometres a day pushing trolleys whilst searching for recyclable materials. This is supported by a study done by Gill (2007) in the city of New Delhi which showed that most waste pickers there travel on foot, covering distances of approximately five kilometres a day. They work for about ten hours on an average day, starting as early as two o'clock in the dark hours of the morning, and finishing as late as seven o'clock in the evening. Because their daily wages are determined by the amount of recyclable materials collected, they tend to collect as much waste as possible. On average, waste pickers collect about 50 kilograms of waste per day, and sometimes up to 100 kilograms depending on the type of waste collected. Therefore, on a typical day, a waste picker pulls a trolley filled with between 50 to 100 kilograms of waste (for between five to thirty kilometres), which is physically very draining. The findings of this study are in line with the findings of Gowan (2009) study in the city of San Francisco, which concluded that the informal trash collectors work up to twelve hours a day, taking in two to three loads of 50 to 100 kilograms of trash each. In

addition, Anschütz & Scheinberg (2006) found that in the best situations, waste pickers suffer ergonomic problems due to the physically taxing nature of their work. It is clear from this study that waste picking requires certain strength and physical competency.

As shown in Question 5, Chapter 5, this study found that most waste pickers collect the types of waste that pay the most, mainly, copper, brass, aluminium, office paper, scrap metal and Coke & milk/water bottles depending on the availability of these types of waste. Wilson *et al. (*2006) views were in line with the findings of this study when they found that potential profit margin is the main selection criteria used by waste pickers for targeting materials, although this depends on accessibility, convenience, ease of transporting and handling. Langenhoven & Dyssel (2007) differed with this study when they found cardboard to be by far the biggest revenue earners for waste pickers. Informal waste pickers are very skilled at identifying the types of waste with potential value.

Despite the concerns mentioned above, most waste pickers have been working for more than ten years. Table 6 presents selected views of waste pickers on how long they have been doing this work. This is supported by a study by Gill (2007) that found that most waste pickers exhibit the lowest rate of mobility towards better jobs, making it almost impossible for them to move out of their current jobs into alternative occupations.

It is evident from this study that all waste pickers continue to collect waste because they cannot find alternative employment opportunities in the mainstream economy to support themselves or their dependents.

6.4 Research Question Three: The economics of waste picking

The study found that waste pickers are paid the rates (per kilogram of a type of waste) as shown in Table 14 below:

Table 14: Rates payable to waste pickers per kilogram of each type of waste

Waste type	Minimum rate (ZAR)	Average rate (ZAR)	Maximum rate (ZAR)
Aluminium	8.00	10.00	12.00
Brass	30.00	35.00	40.00
Cardboard paper	0.30	0.40	0.60
Coke bottle (plastic)	2.20	2.60	3.00
Copper	30.00	50.00	80.00
Milk bottle (plastic)	0.80	2.00	3.00
Newspaper/magazines	0.30	0.40	0.60
Non-white office paper	1.60	2.00	2.20
Scrap metal	1.50	2.00	2.50
Water bottle (plastic)	2.20	2.60	3.00
White office paper	2.00	2.50	3.00

The study found that waste pickers who sold their waste to merchants in Alexandra township were generally paid less than those who sold their waste in Naturena or downtown Johannesburg. As shown in Table 14 above, the different types of waste

attract diverse earnings rates. This is supported by Gill (2007) who found that the different waste streams yield different returns for waste pickers. It is clear from this study that waste pickers have no alternative but to accept prices offered by recyclers and merchants.

The study further found that on a good day, a waste picker collects waste that generates a maximum of R300, based on empirical data in Table 7. On a bad day, however, this figure is significantly reduced to a low of R36, based on a daily wage receipt from a waste picker in Figure 8a. Based on a 22-day working month, a waste picker's average earnings per month are between R792 and R6600. This is partly supported by a study by Gowan (2009) that found that in San Francisco, the informal trash pickers make between US$5 (R37.50 at exchange rate of R7.50) and US$20 (R150 at exchange rate of R7.50) a day. However the maximum earnings made by waste pickers interviewed in this study are twice the maximum earnings made by waste pickers in Gowan's (2009) study. According to South Africa's Department of Labour (2011), the minimum wages for domestic worker range between R890 to R1506 per month, and for the hospitality industry, the minimum wages range between R2084 to R2385 per month. Based on this data, waste pickers do earn (in some instances) better wages than full-time domestic and hospitality industry workers. Although the waste picker wages seem low, they are not necessarily the lowest in society, and in some instances, waste pickers earn more than those employed in the formal economy. Even with these wages, it is difficult to imagine how these subsistence informal waste pickers meet the basic

needs of their families, given that the majority of waste pickers leave their families in distant villages or countries to come and work as waste pickers in the metropolitan areas.

Based on these daily wages and average rates payable per kilogram of waste, a waste picker is able to collect a minimum of 4 kilograms and a maximum of ten kilograms of aluminium; or a minimum of 1 kilogram and maximum of 8.5 kilograms of brass; or a minimum of 90 kilograms and maximum of 750 kilograms of cardboard paper; or a minimum of 15 kilograms and a maximum of 150 kilograms of Coke bottles (including water bottles); or a minimum of 1 kilogram and a maximum of a maximum of 3.75 kilograms of copper; or a minimum of 18 kilograms and a maximum of 150 kilograms of scrap metal; or a minimum of 14 kilograms and a maximum of 120 kilograms of white office paper on an average day. All waste pickers interviewed sell their waste to local merchants or recyclers closest to where they collected their waste. Despite the adverse working conditions associated with work, waste picking provides significant financial benefits for those who cannot find full time employment in the formal economy.

The significant majority (95 percent) of waste pickers use trolleys to transport waste. The trolleys are acquired from either merchants or other waste pickers or retailers such as Pick ‘n Pay, for R50 each. Trolleys are serviced regularly by waste pickers with a typical trolley lasting for about three to six months. One of the

ways waste pickers in the SADC region transport waste to recycling sites is by using trolleys or handcarts (Karani & Jewasikiewitz, 2007).

The study found that the majority of waste pickers were from places such as Lesotho, Zimbabwe, Mozambique, Kwazulu-Natal, Eastern Cape and Limpopo. The empirical data for this finding is in Table 8. About 90 percent of the respondents have families – with a minimum of two children. These waste pickers visit their families once or twice a year depending on how much money they have earned from collecting and trading waste. Very few (approximately 15 percent) of the waste pickers interviewed were from the local areas of Alexandra, Tembisa and the greater Johannesburg area. Johannesburg (Gauteng) is still a beacon of hope to migrant labourers from former homelands and neighbouring countries looking for job opportunities, even including such soul-destroying work as waste picking. These migrant workers find shelter in shacks, RDP houses, and apartments or on the streets. Informal waste recycling is clearly carried out by those who are socially, educationally and economically disadvantaged. This marginalised group of people resort to the scavenging of waste as a means of daily survival.

The study found that each waste picker knew or worked with, about 500 to 2500 other waste pickers from their neighbourhood or surrounding areas. Table 9 provides evidence of this finding. This is consistent with the study by Wilson *et al*. (2006) which found thousands of people in developing country cities depend on recycling materials from waste for their livelihoods. There are no specific skills

required to do waste picking job, although, physical strength and ability to sort waste are useful. Most waste pickers earn a sufficient amount of money from waste picking to support their families and themselves. However, long distances are travelled in order to collect enough recyclable materials to earn such a living.

6.5 Research Question Four: The role of waste pickers in recycling industry

A typical merchant collects about 15 tonnes of different types of waste a day, whilst a recycler collects a maximum of three tonnes of a specific type of waste a day (a recycler processes one type of waste, hence the figure is lower than that collected by merchants). Homeowners generate a bin full of waste per week, except during month-end and when they have parties or festivities, where the municipality-size bins overflow. In total, the producers of recyclable materials (who buy scrap metal, iron, tin and aluminium cans for internal use) require about 125 000 tonnes of waste per month in Gauteng alone. According to a 2007 study by the City of Edinburgh Council, over 50 tonnes of waste is collected in Edinburgh, Scotland everyday through street bin collections and street cleaning (Roper & Parker, 2008).

Waste pickers supply a minimum of 80 percent of all waste received by merchants and recyclers based on empirical analysis of the data from recyclers, merchants and generators of recyclable materials. They also provide between 20 and 30 percent of waste required by producers of recyclable waste.

It is important to note that about 80 percent of waste collected from waste pickers by merchants and recyclers is on-sold to producers of recyclable materials. Based on these figures (80 x 80% + 20%), informal waste pickers provide at least 84 percent of all recyclable materials through merchants, recyclers and producers of recyclable materials in Johannesburg in total. Alternative collection points or sources of waste for recyclers and merchants include shopping centres, business and landfill sites. For generators of recyclable materials, alternative waste collection points include schools, recyclers, merchants, landfill sites, factories, companies, shopping centres, retailers, banks, printers, office parks and internally generated waste. Empirical data for these findings is presented by the answers to Questions 15 to 33 in Chapter 5.

Informal waste pickers have been unrecognised stakeholders on the fringes of the urban waste landscape since the nineteenth century (Anschütz & Scheinberg, 2006). For the first time in recycling studies, research has been done on the role of informal waste pickers. Baksi & Van Long (2009), citing Gaskin (1974), Swan (1980), Martin (1982), Suslow (1986) & Tirole (1988) noted that extant literature has focused on the role of recyclers rather than that of the collectors of waste. Merchants, recyclers, homeowners and producers of recyclable materials alike agreed unanimously that informal waste pickers play an important role in the South African recycling industry. This is evidenced by the empirical data of this study which found that 84 percent of recyclable materials recycled are sourced from

waste pickers. Waste pickers collect non-degradable plastics and scrap; saving households from having to go to landfill sites as everything is collected from their houses. Waste pickers are even more important to home owners at times when the municipality does not collect their domestic waste. Waste pickers impact positively on the environment and people's health, therefore forming an integral part of the entire waste collection, sorting and recycling value chain.

Merchants estimated the number of waste pickers delivering waste to their shops daily to be around 2000. This is in line with the minimum of 500 and maximum of 2500 estimated by waste pickers themselves. House owners normally see two to four people daily, although, when travelling from their homes to the nearest highway in the mornings, they have encountered between ten to 20 waste pickers on the streets. An article read by one of the producers of recyclable materials found that approximately 880 000 people are employed as subsistence waste pickers in South Africa. This figure is higher than that estimated through a study by Medina (2008) who found that Brazil employs about 500 000 waste pickers. Worldwide, at least 15 million people make a living by recovering and recycling waste (Medina, 2008).

According to the role players in the recycling industry, the types of waste collected or delivered the most by waste pickers are similar to those mentioned by waste pickers themselves, namely, copper, brass, aluminium, office paper, scrap metal and Coke & milk/water bottles, depending on the availability of these types of

waste. The type of recyclable waste generated by house owners includes milk bottles, plastics, magazines, newspapers, paper, juice bottles, food/detergent containers and packaging, glass, and Coke or other fizzy drinks bottles.

The rates payable to waste pickers by merchants, recyclers and producers of recyclable materials are R1.50 – R2.50 per kilogram of scrap metal; from R2 – R3 per kilogram of white office paper; about R2 per kilogram of any other office paper; from R2.20 – R3 per kilogram of Coke plastic; from 80c to R2 per kilogram of milk bottles (plastic); from R30 – R80 per kilogram of Copper; from 30c – 60c per kilogram of cardboard boxes, newspaper and magazines; from R8 – R12 per kilogram of aluminium; and from R30 – R40 per kilogram of brass. These rates (shown in Table 14 above) are similar to those quoted by waste pickers themselves.

When merchants receive waste, they sort, compact, package properly and deliver it to generators of recyclable materials such as Nampak, ArcellorMittal, Scaw Metal Group, and Collect-A-Can. Some of the plastic waste Polyethylene Terephthalate is delivered to Chinese companies that make clothes, blankets, roofing tiles buckets, chairs and bags from it. South African legislation does not allow recycled materials to be used for food packaging, instead only allowing virgin materials to be used. Producers of recyclable materials process waste into blocks or briquettes, which are then either sold to steel mills locally and internationally, or used internally. The local market includes Columbus, Scaw Metal Group and

ArcellorMittal whilst the export market includes steel mills in China, Pakistan and India. India was quoted as being the biggest consumer of scrap metal.

The study found that prices of waste materials are determined by supply and demand forces in the international recyclable materials market. The price at which scrap metal/steel/iron is sold to the market was quoted as between R1600 to R2700 per tonne. For the informal recycling business model to work sustainably, waste pickers earn the lowest value in the hierarchy of recycling, which is supported by the recycling hierarchy model developed by Wilson *et al*. in Figure 3, Chapter 2. The market is very cyclical with the price set by the export market. Prices payable to waste pickers, recyclers and producers of recyclable materials are determined by the movements in the prices of recyclable materials in a very cyclical industry. This is in line with the findings of the study by Langenhoven & Dyssel (2007) which found that the prices paid to waste pickers for recyclables are determined by fluctuations in supply and demand of a specific recyclable. In most instances the demand is low locally whilst higher internationally. The study found that the recyclable materials market can jump from R1900 to R2700 per tonne of scrap metal in a space of three months. Empirical data for these findings is presented through answers to Questions 15 to 33 in Chapter 5.

Informal waste pickers bring considerable socio-economic benefits to countries around the globe, through employment and improved livelihoods. Waste picking provides work for the unskilled, provide a constant supply of secondary raw

materials to the local manufacturing industries and significantly reduces the quantity of waste to landfill sites.

7. CHAPTER 7: RESEARCH CONCLUSION

7.1 Introduction

This chapter reflects on the main research problem as outlined in Chapter 1, as well as associated research objectives. This chapter makes recommendations to the stakeholders of this research, based on the findings and finally makes recommendations for future research.

The main objective of this study was to establish the role played by subsistence waste pickers in recycling in South Africa. The extent to which the research problem has been addressed is determined by the extent to which the research questions in Chapter 3 have been answered. The results of the various phases of the research were presented in Chapter 2 (non-empirical findings), Chapter 5 (empirical findings) and Chapter 6 (empirical data analysis).

7.1.1 Research Question One Findings

The first question sought to identify and establish the role players in the informal recycling value chain. To understand the role of the different stakeholders and their relationships in the generation, picking, collection, processing and final usage of recyclable materials, the informal recycling value chain in Figure 14, Chapter 6 was developed based on empirical analysis. The informal recycling value chain developed by this study is an expansion of the secondary materials value chain

developed by Marchand (1988), which is shown in Chapter 1, Figure 1 (non-empirical analysis). Recycling (including the role players identified in this value chain) is part of the Integrated Sustainable Waste Management Framework developed by Ijgosse, Anschutz and Scheinberg (2004) in Chapter 2, Figure 2. The role players identified through empirical analysis presented in Chapter 5 are informal waste pickers, merchants, recyclers, trolley and bag suppliers, recyclable waste generators, waste sources and the local and external manufacturing industry.

7.1.2 Research Question Two Findings

Research Question Two served to identify the reasons why waste pickers continue to collect waste. The main reason that emerged is that they cannot find alternative employment opportunities in the mainstream economy to support themselves and their dependants. This is evident from empirical data presented in Table 2, Chapter 5. The findings of this study are consistent with the findings of the study done by Reno (2009) who concluded that most waste pickers collect waste merely as a means of survival. Reno (2009) citing Mydans (2006) and Erlanger (2007) claimed that waste picking is something done out of necessity, and the people doing it are victims of abject poverty. It is clear from this study that the high levels of unemployment in South Africa have resulted in the increasing number of individuals entering the informal recycling industry.

Secondary reasons why waste pickers continue to collect waste are:

i. Waste picking provides instant cash on the delivery of waste to merchants and recyclers.
ii. Waste picking provides waste collectors with the opportunity to exercise as they travel long distances daily searching for recyclable waste.

Waste pickers, however, disliked the working conditions of their job due to safety and security concerns, and the physically taxing nature of their job. Waste pickers travel distances of between five and thirty kilometres a day pushing and pulling trolleys whilst searching for recyclable materials. This is supported by a study done by Gill (2007) in New Delhi, which showed that most waste pickers there travel on foot collecting waste, covering distances of approximately five kilometres daily. Non-empirical analysis by Anschütz & Scheinberg (2006) found that in the best situations, waste pickers suffer ergonomic problems due to the physically taxing nature of their work. It is clear from this study that waste picking requires a certain strength and physical competency.

7.1.3 Research Question Three Findings

Research Question Three served to understand the economics of waste picking. Empirical analysis found that the different types of waste attract diverse earnings rates (Refer to Table 14 in Chapter 6). This is supported by Gill (2007) who found that the different waste streams yielded different returns for waste pickers.

The study further found that waste pickers generate a minimum of R36 and a maximum of R300 daily, based on a daily wage receipt from a waste picker in Figure 8a and empirical data in Table 7. Based on this empirical data and industry specific wages published by South Africa's Department of Labour (2011) as discussed in section 6.4 above, it is evident that in some instances, waste pickers earn more than those employed in the formal economy.

7.1.4 Research Question Four Findings

Research Question Four served to establish the importance of waste pickers in the recycling industry in South Africa. Waste pickers supply a minimum of 80 percent of all waste received by merchants and recyclers in Johannesburg, based on empirical analysis of the data from recyclers, merchants and generators of recyclable materials (Refer to answers to Question 15, in Chapter 5). They also provide a minimum of 20 percent of waste required by producers of recyclable waste. It is important to note that about 80 percent of waste collected from waste pickers by merchants and recyclers is on-sold to producers of recyclable materials. In total, informal waste pickers provide at least 84 percent of all recyclable materials through merchants, recyclers and producers of recyclable materials in Johannesburg.

Informal waste pickers have been unrecognised stakeholders on the fringes of the urban waste landscape since the nineteenth century (Anschütz & Scheinberg, 2006). For the first time in recycling studies, research has been done on the role of

informal waste pickers. Empirical analysis of data collected (in Chapter 5) from those interviewed found that merchants, recyclers, homeowners and producers of recyclable materials alike concurred unanimously that informal waste pickers play an important role in recycling industry in South Africa. Waste pickers, therefore, form an integral part in the entire waste collection, sorting and recycling value chain.

7.2 Recommendations and policy implications

This section draws upon what has been learnt about the role of waste pickers in the South African recycling industry in order to provide some reflective recommendations and proposals to achieve sustainability and growth in the sector. These recommendations have not been evaluated using any formal schema, but have been guided by principles of effectiveness and simplicity. These recommendations are intended to stimulate thought and discussion, without claiming to be in any way exhaustive or definitive. The recommendations are intended to guide policy makers, governments, key recycling industry players and strategists in making recycling a vibrant and sustainable industry which creates job opportunities in South Africa's macro economy:

- **Government and policymakers**

It is recommended that the government provide financial and regulatory intervention to the recycling industry. Regulation of the industry could guarantee labour rights for informal waste pickers - safety and security, unionisation,

improved working hours and legitimisation of waste picking. Regulation would improve waste and environmental management practices and create further employment.

Financial incentives to small, micro - and medium enterprises involved in the informal recycling of waste could, in turn, promote a cleaner environment; long life to landfill sites / dumping sites; ensure sustainable industry growth and eliminate or reduce the theft of precious metals such as copper and brass.

- **Waste pickers**

To legitimise their job, it is recommended that waste pickers form a union of their own or at least join existing unions or some form of association. Institutionalisation would improve their bargaining power in the work place.

- **Recyclers and merchants**

Recyclers and merchants could encourage local processing of waste by guaranteeing a portion of their waste to the local textile industry.

- **Generators of recyclable materials**

Providing waste pickers with protective clothing and better trolleys could encourage more people to collect waste. In addition, generators of recyclable materials are encouraged to keep databases of waste pickers from whom they receive waste. This could help to eradicate criminal elements within the waste pickers' ranks.

7.3 Limitations and recommendations for future research

- The study was conducted through interviews with role players around Johannesburg. The applicability of this study to the rest of South Africa is limited.
- Further research to understand the merits of formalising and regulating the informal waste recycling industry is recommended. Emphasis should be on improving the working conditions of subsistence waste pickers.
- It would be beneficial to study the role of women and children in waste picking.
- It would be useful to explore the role of foreigners in post-waste picking stages of the recycling value chain, that is, manufacturing of clothes and other products
- A study on the informal collection/picking and recycling of copper in South Africa could help reduce the rampant theft of this precious commodity.

7.4 Conclusions

This research is intended to facilitate greater understanding and knowledge of the plight of waste pickers in particular; and those at the bottom of the pyramid in general. These marginalised, exploited and vulnerable people play a significant role in society, and the positive economic, social and environmental contributions they make often go unrecognised. It is hoped that this paper will go some way in changing perceptions of waste pickers and the work they do,

and will enable them to play a more visible role in the recycling industry, and in society as a whole.

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APPENDIX I: SEMI-STRUCTURED INTERVIEW GUIDE

Introduction and background Information

Thank you for agreeing to participate in this survey, which should take about 30 minutes to complete. I am a MBA student at the University of Pretoria's Gordon Institute of Business Science (GIBS) and this research project is a requirement for successful completion of the programme.

Title of study

The role played by subsistence waste pickers in the recycling industry in South Africa

Purpose of this research

To investigate the economic role of subsistence waste pickers in the recycling industry in South Africa

Right of refusal to participate and withdrawal

Your participation in this survey is voluntary and you may refuse to answer any questions should you deem the questions unnecessary. By answering the survey questions, you indicate that you voluntarily participate in this research.

Confidentiality and anonymity

All data collected during this research will be kept strictly confidential and participants will remain anonymous. However, the data may be seen by the Ethical Review Committee and may be published in journals and elsewhere without giving your name or disclosing your identity.

Available sources of information and researcher contact details

You may seek clarification or access to a summary of the results by requesting the same from me or my research supervisor on the details provided below:

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Interview Questions

Questionnaire for Phase I

The questionnaire was applicable to waste pickers. A consent form was read to waste pickers before the interview was conducted to ensure that they answered questions voluntarily, and where possible, did not respond to questions they were uncomfortable with. The following questions were then asked by the interviewer who collated the answers at the end of the interview. The questions asked were:

Underlying reasons for waste pickers to do what they do

1. What motivates you to do this job?
2. What do you like and dislike about this job?
3. If you had other job options, would you quit this job?
4. Where do you pick up waste?
5. What type of waste do you collect the most?

6. How many hours per day do you work? What time do you start working and when do you leave work every day?
7. How long have you been working as an informal waste picker?

The macro-economics of waste picking

8. How much do you get paid per type of waste per day? What is the going pay rate for a weight of waste type?
9. How much waste do you collect per day? How much do you make per day?
10. Is this your own trolley? Where did you buy it? How much was it?
11. Where do you sell your waste?
12. What skills does one need to do this job?
13. How many dependants do you support with your wages? Where do you live?
14. How many more waste pickers do you work with or know from your area?

Questionnaire for Phase II

The questionnaire was applicable to the role players in the recycling industry in South Africa. These role players include the producers, and users of recyclable materials as well as recyclers/merchants. The questions were designed to address the following issues:

What were the views of the different role players on the importance of waste pickers to the recycling industry in South Africa? What is the impact of waste pickers on the supply and demand of recyclable materials?

Questions were asked to producers of recyclable materials, house owners/domestic workers and recyclers/merchants.

Questions to recyclers/merchants

15. How much waste is delivered in your factory every day by informal waste pickers?

16. In your view, do informal waste pickers add value to recycling?
17. How else do you collect waste apart from through waste pickers?
18. How many waste pickers deliver waste to your recycling shop daily? In your view, how many waste pickers are employed in waste recycling?
19. What type of waste do waste pickers deliver to your recycling shop?
20. Where do you sell your waste? What do you do to waste when you receive it?
21. How much do you pay waste pickers per waste type per kilogram?

Questions to house owners/domestic workers

22. How much do you pay waste pickers per waste type per kilogram?
23. How much waste do you generate per day or week?
24. What type of waste do you dump in your bin?
25. In your view, do informal waste pickers add value to recycling?
26. How else do you dispose of waste apart from waste pickers?
27. How many waste pickers pick up waste from your dustbin weekly?
28. How many waste pickers do you normally see around your neighbourhood?

Questions to producers of recyclable materials

29. How much waste do waste pickers deliver in your factory daily?
30. In your view, do informal waste pickers add value to recycling?
31. Where else do you collect waste apart from waste pickers?
32. How many waste pickers deliver waste to your recycling shop daily? In your view, how many waste pickers are employed in waste recycling?
33. What type of waste do waste pickers deliver to your factory?
34. Where do you sell your waste? What do you do with your waste when you receive it?
35. At what price do you sell waste material to the market?
36. How much do you pay waste pickers per kilogram of waste?

APPENDIX II: ADDITIONAL INFORMATION SUPPORTING INTERVIEWS

Figure 5: Waste pickers in Alexandra Township, Johannesburg, 23 July 2011

Figure 6: Waste pickers stand in the queue to collect their daily wages after a physically demanding day collecting waste, 16 July 2011

Figure 7: Aluminium pots sold as scrap, downtown Johannesburg, 16 July 2011

Figure 8a: A waste picker displays a receipt of his daily wages before he collects money from a merchant in Johannesburg, 16 July 2011

Figure 8b: My trash is someone's gold. Waste pickers pull a trolley after three days of searching and picking waste in suburbs and streets of Johannesburg, 20 July 2011

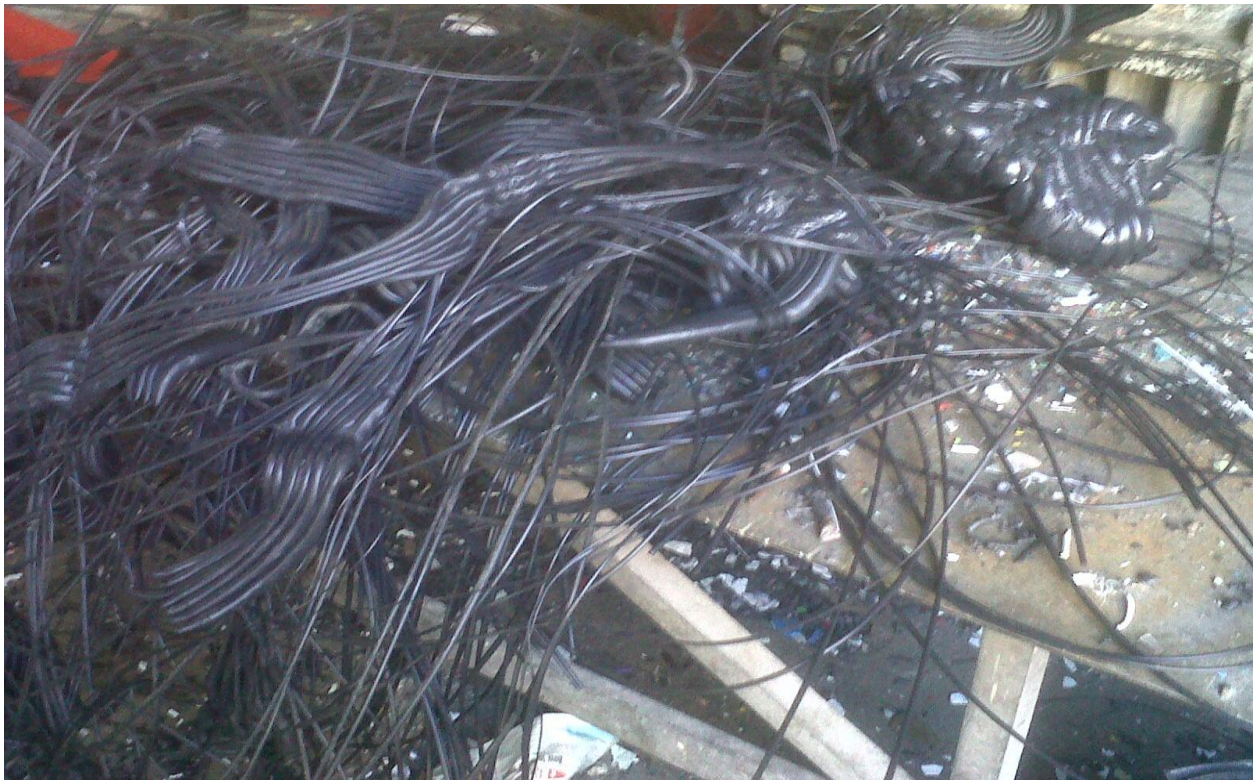
Figure 9: A place to call home for subsistence waste pickers, Newtown, Johannesburg, 23 July 2011

Figure 10: A display of the type of waste a merchant trades in Johannesburg, July 2011

Figure 11: Waste being sorted in a merchant shop in Naturena, Johannesburg, August 2011

Figure 12: Rates payable to waste pickers for a paper waste collected is displayed outside an office window of a merchant shop in Johannesburg, August 2011

Figure 13: Polyprop plastic after processing – forming "spaghetti" before sized and sold to garden chair makers or Chinese textile industry



APPENDIX III: FULL DESCRIPTIONS OF THE DIFFERENT WASTE STREAMS COLLECTED BY WASTE PICKERS

Table 11: Recyclable plastic classification

IDENTIFICATION	PRODUCTS	RECOVERED PLASTICS RECYCLED INTO PRODUCTS SUCH AS:
1 PET Polyethylene Terephthalate	• Cool drink bottles • Juice and water bottles • Jars - peanut butter, salad dressing, oils, cosmetics and some household cleaners • Some food trays	• Fibre for polyester carpet, fabric for T-shirts • Fibrefill for sleeping bags and winter coats • New PET products for both food and non-food containers • Geotextiles • Plastiwood 
2 PE-HD High Density Polyethylene	• Milk bottles • Bags • Film • Juice bottles • Household containers • Shampoo	• Refuse bins and bags • Irrigation pipes • Buckets • Garden furniture • Shopping bags 
3 PVC Polyvinyl Chloride	• Bottles • Clear trays (toiletries and food)	• Shoe soles • Door mats • Hoses • Garden Fencing • Car mats • Window frames 

	• Frozen vegetable bags • Soft squeezable bottles • Bags • Milk sachets • Consumer bags - boutique	• Refuse bin liners • Bags • Building film • Irrigation pipes • Outdoor furniture • Containers 
	• Bottles - detergents and toiletries • Bottle tops and closures • Yoghurt cups • Margarine tubs • Ice-cream containers	• Bottles and containers • Paint trays • Buckets • Garden Furniture • Crates and boxes • Ropes 
	• Cutlery, cups • Yoghurt and cottage cheese containers • Clear salad containers • Television sets • Computer casings • CD boxes • Make-up containers • Cups, bowls, plates • Trays • Clamshells, meat trays • Egg cartons • Protective packaging	• Picture frames • Cornices • Curtain rods • Seedling trays 

Table 12: Recyclable paper classification

GRADES	RECYCLED INTO
Corrugated boxes	New corrugated boxes
Newspaper and magazines	Newspaper
Office paper, newspaper, magazines, printer off cuts	Bath tissue products, kitchen and industrial paper toweling
Office paper, corrugated boxes, newspaper, carton board trims, printer off cuts	Carton board – cereal boxes, soap cartons
Newspaper, carton board trims	Moulded paper products, such as egg boxes