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The socio-economic differences between landfill and street waste pickers in the Free State province of South Africa

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ABSTRACT

Waste picking is an important survival strategy of many people throughout the developing world. South Africa has a sizeable waste picker population who ply their trade on municipal landfill sites as well as on the streets of cities and towns. This study lifts the lid on this neglected area of research by analysing and comparing landfill and street waste pickers side by side in a socio-economic context. Samples of waste pickers were drawn from the three main municipalities of Mangaung, Matjhabeng and Metsimaholo in the Free State province of South Africa and a questionnaire-based survey was conducted. Among the findings was that waste picking offers a financial lifeline when, due to inadequate schooling and grinding poverty, individuals would be hard pressed to find employment in the formal economy. The study lays an important foundation for further comparative and qualitative research into this important segment of South Africa's informal economy.

KEYWORDS

Informal economy; recyclable waste; waste picking; street waste pickers; landfill waste pickers; waste management system

1. Introduction

The production of solid waste and the management thereof are of growing interest to both academics and development practitioners (Pelling, 1999). For example, it is estimated that urban areas in Asia produce about 760 000 tonnes or 2.7 million cubic metres of municipal solid waste per day. By 2025, these figures could rise to a staggering 1.8 million tonnes or 5.2 million cubic metres of waste per day (UN-HABITAT, 2010). Not surprisingly, perhaps, there is a worldwide shift in thinking away from the need to simply get rid of waste before it becomes a health hazard towards the importance of reducing waste's environmental impact (UN-HABITAT, 2010).

Since the 1990s, solid waste management has been a key agenda item in discussions on viable urban development in the developing world. South Africa has been an important participant in this ongoing conversation. In May 2015, South Africa's Minister of Environmental Affairs, Edna Molewa, stated:

The waste sector is currently valued at about ZAR50 billion a year. Waste has value – both a social and an economic value. Reducing, recovering or minimising waste provides opportunities for socio-economic development; new jobs and businesses; maximising resource recovery for downstream manufacturing growth; and reducing the reliance on declining natural resources. (SANEWS, 2015)

The expanding role of the informal economy in waste management has become a key discussion point. In many cities throughout the developing world, municipal solid waste is often viewed as a natural resource that provides a livelihood for the poor and disadvantaged segments of the urban population (Nzeadibe & Mbah, 2015). It is difficult to obtain reliable figures on the extent of informal recovery or recycling of waste that is occurring (Rogerson, 2001). Nevertheless, it is estimated that at least 5000 informal entrepreneurs are involved in scavenging from Calcutta's main garbage dump. Similarly, the waste produced at Manila's Smokey Mountain provides a livelihood to 25 000 people, while a further 60 000 are dependent on such waste to satisfy their basic needs (Rogerson, 2001). Despite the benefits they deliver to the environment and to communities at large, informal waste recyclers are usually overlooked when policies are formulated. This marginalisation means that the potential of the informal and organised recycling industry is not being properly harnessed (Gutberlet, 2008).

Approximately 15 million waste pickers operate on the streets and landfill sites in the developing world, with South Africa's waste picker population standing at between 45 000 (Langenhoven & Dyssel, 2007) and 88 000 (Reyneke, 2012). This should be seen in the light of an unemployment rate in South Africa of 24.3% in the fourth quarter of 2014 (Statistics South Africa, 2015), although the expanded rate for the period is estimated to be 34.6%. Given such a difficult job market (both at the formal and informal levels), the collection and sale of waste offers otherwise unemployed individuals an opportunity to generate some income (Rogerson, 2001; Fiehn & Ball, 2005; Masocha, 2006; Viljoen et al., 2012) and earn a modest living (Medina, 2008).

Waste pickers are individuals whose survival largely depends on collecting, sorting and selling recyclable waste (Benjamin, 2007; Gill, 2007; Chvatal, 2010). They can perform these activities either on the streets or on landfill sites. As with many other pursuits in the informal economy, waste picking is readily accessible, with few barriers to entry. For example, the activity is unregulated and requires no special skills. However, it is labour intensive and typically conducted on a small scale only (Naidoo, 1994; Wilson et al., 2006; Viljoen et al., 2012). In addition, waste pickers are dependent on an extended network of travelling waste buyers and dealers, second-hand traders and recycling businesses (Rogerson, 2001; Wilson et al., 2006).

A number of international and South African studies have been conducted into the socio-economic circumstances of waste pickers operating in cities and towns. Why some individuals choose the streets while others opt for the landfill sites has not yet been explored fully, although some general trends have emerged:

- Gender: it would seem that women prefer to collect waste on landfill sites because they are more likely to be victims of crime on the streets. The street trolleys are also heavy and difficult to push (Gutberlet & Baeder, 2008; Chvatal, 2010; Dhakai, 2012).
- Age: although the literature reveals that the waste collection business attracts both young and old (McLean, 2000; Benson & Vanqa-Mgijima, 2010; Sentime, 2011),

older people are generally less capable of walking long distances with laden trolleys. As a result, they might find a landfill site an easier environment in which to ply their trade.

- Social interaction: according to Reyneke (2012), a landfill site is potentially more than simply a 'space' in which work is performed; it can also be a 'place' where waste pickers live and socialise. Thus, a greater sense of community might prevail on landfill sites than on the streets.
- Income potential: the literature emphasises that waste pickers not only face uncertain returns but they ultimately earn very little (Wilson et al., 2006; Visser & Theron, 2009; Tangri, 2010; Schenck & Blaauw, 2011b). There are indications that landfill waste pickers (LWPs) earn more than street waste pickers (SWPs) because the former have easier access to more recyclable waste (Mashego, 2012). However, the study by Mamphitha (2011) revealed that SWPs value the fact that they can earn cash on a daily basis by delivering their recyclable waste to buyback centres (BBCs). In contrast, LWPs might only sell their waste on a weekly or monthly basis depending on when the representatives from the BBCs visit the landfill sites (Viljoen et al., 2012).

Most of the previous studies conducted in South Africa focused on either LWPs or SWPs. This study makes a unique contribution to the literature in this field because it offers the first-ever comparison of the socio-economic dynamics of LWPs and SWPs in the same geographical area. This comparison was staged in the three major municipalities of the Free State province in South Africa, namely Mangaung (Bloemfontein), Matjhabeng (Welkom) and Metsimaholo (Sasolburg).¹ The Free State province was chosen as the location for the survey because it faces the spectre of rising unemployment in the face of a steady decline in the performance of mining and other industries that have been the traditional cornerstones of the provincial economy.

2. Research methodology

Regarding the collection of data, the authors evaluated a number of potential techniques. It was decided that, given the unique characteristics of the research population, a face-to-face survey approach would be the most feasible. Face-to-face surveys can be particularly effective when the literacy levels of the respondents in a research population are low – as is the case with the waste pickers (Babbie & Mouton, 2011).

The research was conducted in two complementary phases.

2.1 Reconnaissance phase

The research team first visited the three municipalities and met with the relevant stakeholders in the respective waste management sections in order to brief them on the purpose and scope of the planned research exercise. This step enabled the research team to observe the activity on the landfill sites in preparation for the practical fieldwork.

The reconnaissance process was key to the research team being able to secure the necessary trust and buy-in from the various stakeholders. It also laid the groundwork

¹Bloemfontein, Welkom and Sasolburg are the main cities in the three local municipalities and formed the basis of the study.

for the fieldworkers in that they broadly knew what to expect and who would be allowed to enter the landfill sites. Furthermore, the research team used the opportunity to determine the prevalence of SWPs in the cities and towns in question with a view to preparing a sampling framework.

2.2 Data collection phase

The survey instrument used by Schenck & Blaauw (2011b) formed the basis of the design of the structured questionnaire used to collect the data. Each questionnaire was accompanied by a consent form which provided background on the study and asked the respondent for his/her permission to participate in it. Thus, participation was voluntary. Respondents were also told that they could terminate the interview at any time.

Because waste picking is not officially recognised as an occupation, the total number of waste pickers in South Africa can only be estimated. The population of the study was regarded as all the waste pickers on the streets and landfill sites in the identified municipalities. The nine landfill sites in question were as follows:

- Mangaung municipality: the northern and southern landfill sites of Bloemfontein, as well as the landfill site at Botshabelo.
- Matjhabeng municipality: the landfill sites at Welkom, Odendaalsrus, Allanridge and Hennenman.
- Metsimaholo municipality: the landfill sites at Sasolburg, Deneysville and Oranjeville.

The fieldworkers were instructed to interview as many waste pickers as possible. A non-probability sampling framework formed the basis of the sampling method employed. The fieldworkers used the respondent-assisted sampling method of snowball sampling in conjunction with availability and convenience sampling. This enabled all of the available and willing waste pickers to participate in the research project. Only a few 'refused' or indicated that they did not 'have the time' to complete the questionnaires because they were busy working. This process ensured that the vast majority of the research population was covered, rendering the results representative of the population.

A total of 410 questionnaires were completed on the landfill sites, and 52 questionnaires were completed on the streets, mostly in Bloemfontein.

3. Results: comparing landfill waste pickers and street waste pickers in the Free State province of South Africa

3.1 Demographic characteristics

The LWP sample of 410 individuals comprised 198 female respondents and 212 male respondents, representing a gender split of 48.3% female and 51.7% male. The SWP sample of 52 individuals comprised only seven female respondents and 45 male respondents, reflecting a gender split of 13% female and 87% male. This imbalance can be explained by the fact that women waste collectors are particularly vulnerable on the streets and also find pushing the street trolleys physically challenging (Seager & Tamasane, 2010). Street waste picking therefore involves some self-selection on gender grounds, as

labour economic theory attests (McConnell et al., 2010). Although the survey results and literature reveal not unexpected gender-based patterns, it would be very interesting to probe these more thoroughly in future qualitative studies on SWPs and LWPs.

Almost 90% of the LWPs surveyed were South Africans, while 9% were from Lesotho. Two LWPs were from Botswana and one was from Zimbabwe. All 52 SWPs stated that they were South Africans. These proportions do not reflect the norm in other informal labour markets. For example, in the day labour market, the percentage of immigrant workers is increasing all the time (Blaauw, 2010). Why waste picking in these municipalities bucks the normal trend would be an interesting area for further research.

Regarding age distribution, 42% of the LWPs were under 35, with the average age being just over 40. The average age of the SWPs was 39, with the youngest respondent being 16 and the oldest 72. Clearly, waste picking has no age limits and has arisen out of the need to find a source of income where other jobs are scarce.

3.2 Education levels

Figure 1 shows that the LWPs had generally attained higher levels of school education than their counterparts on the streets.

Among the LWPs, 54% had obtained some secondary level education, covering Grade 8 to Grade 12, with only 5.1% having completed Grade 12. Among the SWPs, 35.8% reported having had some secondary level education. Just over one in five SWPs (21.2%) had ended their schooling somewhere between Grade 8 and Grade 10, and only 5.8% had completed Grade 12. Among the respondents as a whole, 42.6% of LWPs and 44.2% of SWPs had obtained only some primary education.

These findings on the educational levels of waste pickers are similar to those that emerged in other studies in South Africa. For example, McLean (2000), Sentime (2011) and Schenck & Blaauw (2011a) concluded that SWPs in South Africa have very low levels of education, which leaves them with few marketable skills and little prospect of being able to compete for formal employment. The formal labour market in South

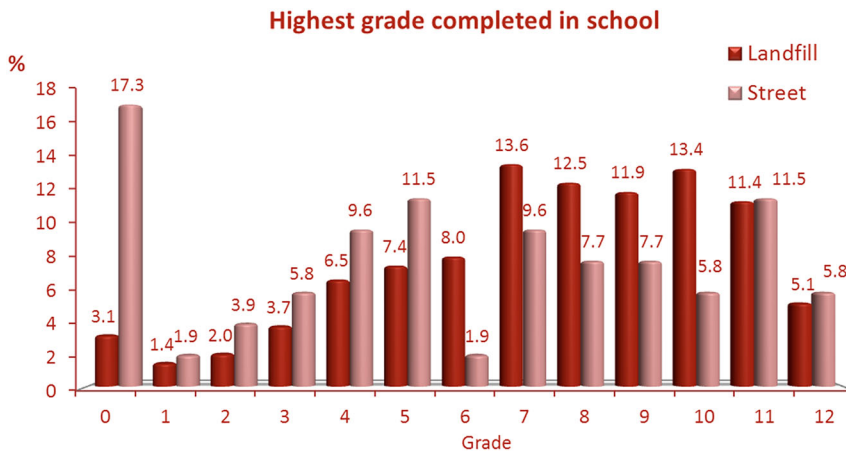


Figure 1 Highest grades in school completed by landfill and street waste pickers. Source: Survey data (2012).

Africa has fewer and fewer opportunities for people with rudimentary schooling. This becomes evident when waste pickers' schooling levels are compared with those of individuals in formal employment.

The share of those individuals in formal employment in the South Africa labour market who lacked any form of school education declined from 8.1% in 1995 to 2.4% in 2013 – reflecting the growing demand among employers for educated/skilled workers. The highest increase in the share of employment (more than 40%) during this period was among those who had completed Grade 12 (Festus et al., 2015). With less than 6% of the waste pickers at this level, most are forced into the lower tier of the informal economy. The structural shift in the South African labour market is also characterised by a growing demand for people with post-Matric qualifications. This group accounted for an increase in the share of employment from 14.1% in 1995 to 19.8% in 2013 (Festus et al., 2015). None of the waste pickers surveyed fell into this category.

Table 1 presents a summary of the reasons given by waste pickers for not completing their schooling. The answers given to this open-ended question were thematically organised and provide an important context for understanding the socio-economic dynamics of both LWPs and SWPs.

The reasons most frequently given by the LWPs and SWPs for not attending school or not completing Grade 12 were related to finances. The plight of some of the respondents was exacerbated by family problems, such as the illness or death of one or both parents, which often left the family without a breadwinner and increased their poverty. This meant no money for school, or the respondents had to go to work to support their parents and/or other family members. More SWPs (32.6%) than LWPs (16.5%) cited family issues as the reason for leaving school. Family issues might partially account for the pronounced difference between LWPs (3.1%) and SWPs (17.3%) not having any formal schooling at all. This possible link should be thoroughly probed in a future qualitative research study.

Another important reason given by waste pickers for not completing their education was that some had grown up or had worked on farms in rural areas with no schools nearby. Four LWPs and one SWP mentioned that they did not like going to school and left as a result, or were unhappy at home and ran away. Very few waste pickers, however, left school early by choice. They were largely compelled to leave due to poverty. Because they had been unable to extract themselves from the cycle of poverty (Chambers, 1983; Schenck et al., 2010), their personal development had been stunted and their employment prospects significantly dimmed. For example, over half the respondents in each group (namely 56% of the LWPs and 53.8% of the SWPs) had never had any previous jobs. As confirmed by Wilson et al. (2006), there is an undeniable link between poor education and an inability to find formal employment.

3.3 Income patterns and dependants

In analysing the income patterns of waste pickers, the researchers thought it important to take into account the frequency with which the pickers sold their waste. Most of the SWPs (85.4%) sold the recyclable waste they had collected to BBCs on a daily basis. The other 14.6% stored the waste and sold it only once a week. The LWPs sold their waste at more varied intervals, which gave rise to more diverse income patterns. The mean,

Table 1. Reasons for waste pickers leaving school early or not attending school.

Thematic analysis of reasons for leaving school	Landfill waste pickers		Street waste pickers	
	Total	%	Total	%
Theme 1: Financial difficulties				
Money/financial problems	168.0	46.3	15.0	35.0
One or both parents died, no money for school	41.0	11.3	9.0	21.0
Poverty	20.0	5.5		
Failed Grade 12 and did not have money to go back			1.0	2.3
Had to go and work (have to support grandmother)	18.0	5.0		
Parents did not work	1.0	0.3		
Total	248.0	68.3	25.0	58.3
Theme 2: School and context related				
Worked on farm – did not go to school	16.0	4.4	1.0	2.3
School stopped at Grade 8	1.0	0.3		
No school/school closed	10.0	2.8		
School too far (lived in rural area)	8.0	2.2		
Failed Grade 12			1.0	2.3
Total	35.0	9.6	2.0	4.6
Theme 3: Family related				
Had to herd cattle for father			1.0	2.3
Had a child to support			1.0	2.3
Domestic problems	17.0	4.7	8.0	18.6
Parents did not want me to go to school, took me out	15.0	4.1		
Parents became too old or sick to support me	7.0	1.9		
Got married, pregnant	21.0	5.8		
No food			1.0	2.3
No one to care for me			2.0	4.7
Went to stay with my uncle, had to change school, did not go back			1.0	2.3
Total	60.0	16.5	14.0	32.6
Theme 4: Behavioural issues				
Parents moved from farm to farm	5.0	1.4		
Just left school	4.0	1.1		
Ran away from home			1.0	2.3
Grew up in a flat and not accepted in community	1.0	0.3		
Did not need to go to school	1.0	0.3		
Total	11.0	3.0	1.0	2.3
Theme 5: Health related				
Health problems/too sick to attend school	4.0	1.1		
Mental disability	1.0	0.3		
Total	5.0	1.4		
Theme 6: Age related				
I became too old for school	3.0	0.8		
Theme 7: Other reasons				
Still in school			1.0	2.3
Farmer did not allow me to go to school	1.0	0.3		
Total	1.0	0.3	1.0	2.3
Grand total	363.0	100.0	43.0	100.0

Source: Survey data (2012).

minimum and maximum incomes earned by SWPs and LWPs, respectively, during the different time intervals are presented in Table 2.

From Table 2 it is clear that only half of the LWPs sold their waste on a daily basis while 22% sold it once a week. The remaining 26.8% sold their waste after longer intervals, with two LWPs selling it only every three months. One of the reasons why some of the LWPs sold waste less often is that they could store it on the landfill site until they had accumulated sufficient quantities to sell. Another reason is that the BBCs did not collect the waste on all landfill sites on a daily basis. At some of the smaller landfill sites where there was little waste, it was not cost-effective for the BBC representatives to pay frequent visits.

Table 2. Mean, minimum and maximum income earned by the street and landfill waste pickers.

Income earning period	f	%	Income (South African Rand, ZAR) ^a		
			Mean	Minimum	Maximum
Street waste pickers					
Day	35	85.4	58.30	10	250
Week	6	14.6	215.80	140	350
Total	41	100			
Landfill waste pickers					
Day	204	50.6	404.23	6	3 000
Week	91	22.6	435.42	20	2 000
Two weeks	45	11.2	459.33	60	1 700
Three weeks	4	1.0	771.25	175	2 500
Month	46	11.4	763.80	20	3 000
Two months	11	2.7	916.36	150	2 200
Three months	2	0.5	1 475.00	950	2 000
Total	403	100			

Source: Survey data (2012).

Notes: ^aThe US\$/ZAR exchange rate was 1US\$/ZAR10.8750 on 19 February 2014 (Reuters, 2014).

In fact, they might have come as infrequently as once every three months. The SWPs, in most cases, had no storage facilities for the collected waste and had to sell it more often.

Table 2 also shows that the mean daily income of the SWPs was much lower than that of the LWPs. The average income of the 85.4% of SWPs who sold their waste on a daily basis was only ZAR58.30 – significantly less than the ZAR404.23 reported to be earned by those LWPs who also sold their waste on a daily basis. This could be attributed to the fact that waste was more plentiful on landfill sites, and was more concentrated. LWPs did not need to travel too far to find recyclable waste; nor did they need to carry heavy loads over long distances, as the SWPs did.

The mean weekly incomes also differed substantially between the two groups, with the SWPs earning ZAR215.80 and the LWPs earning ZAR435.42. However, the small difference between the LWPs' mean daily and weekly incomes could be due to some respondents not having understood the question properly.² Alternatively, it might be that the landfill sites were busier on some days than on others, and the LWPs who earned their income on a particular day collected on those days only. It might also be that the LWPs who earned their income from a week's waste collection worked fewer hours per day. These apparent anomalies in the figures lend themselves to further investigation.

To compare the incomes of all the male and female waste pickers in the study, it was necessary to adjust the income earned by the LWPs in the different selling periods (other than daily and weekly) to weekly income figures. The mean daily, weekly and adjusted weekly incomes (in South African Rand) for SWPs and LWPs according to gender are shown in Figure 2.³

Figure 2 shows that the difference between the mean incomes earned per day and per week, respectively, was larger for the LWPs than for the SWPs, and also larger for males than for females. Furthermore, the adjusted weekly incomes of the LWPs who derived their incomes over longer time intervals were much lower than the mean incomes

²Collecting reliable income-related data is often difficult in a study of this nature because, apart from possible misunderstandings on the part of the respondents, the latter could be reluctant to share sensitive information about their earning capabilities. While the data should therefore be viewed with circumspection, they do reflect general income trends among the waste picking fraternity.

³The US\$/ZAR exchange rate was US\$1/ZAR10.8750 on 19 February 2014 (Reuters 2014).

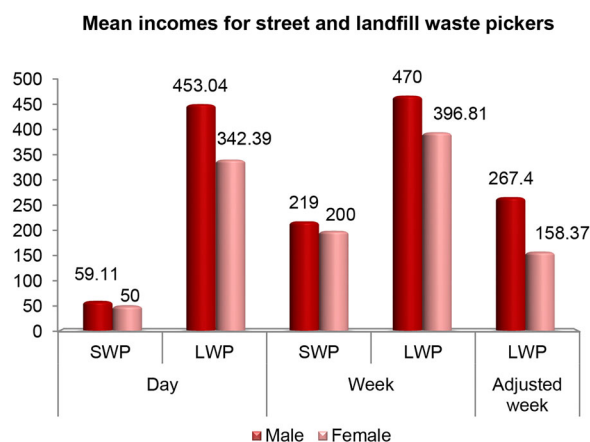


Figure 2. Average income earned by street and landfill waste pickers according to gender.

Source: Survey data (2012).

Notes: LWP = landfill waste picker, SWP = street waste picker.

earned by the LWPs who sold their waste on a weekly basis. The gender-related income differences were smaller among the SWPs than among the LWPs, which might be attributed to the smaller female component in the SWP group. Only 13.5% of the SWPs surveyed were female, whereas almost half of the LWPs (48.3%) were females. Females' lower earning capability might also be due to the physical exertion involved in street waste picking, making females less well equipped for such an activity compared with their male counterparts. Consequently, females tend to collect less waste. Also illuminating was the comment made by the female SWPs and LWPs that, because of family obligations, they could not start too early in the morning or work the same long hours as the male SWPs and LWPs. This helps to explain the lower incomes generated by the female waste pickers.

The income earned from waste picking activities was the only source of income for the majority of SWPs and LWPs surveyed. As indicated in [Table 3](#), only a few waste pickers reported having additional sources of income. This additional income mainly took the form of social grants, with child support grants constituting the largest additional source of income – received by 23.7% of the LWPs and 9.6% of the SWPs. The second largest additional source of income was old age grants.

Table 3. Number of responses in terms of additional sources of income for waste pickers.

Source of income	Own additional income		Other family members' income	
	LWPs (f)	SWPs (f)	LWPs (f)	SWPs (f)
Another job	7	2	22	2
Child support grant	97	5	5	
Disability grant	10	2	17	1
Old age grant	14	3		
Pension from a previous job	6	1		
Other grant (not mentioned above)	1			
Financial assistance from relatives or friends?	1	1		

Source: Survey data (2012).

More LWPs than SWPs had other household members who contributed to the household income. However, the reported lack of additional sources of income for the majority of waste pickers serves to reinforce the importance of their work as a way of sustaining themselves and their dependants.

3.4 Dependants

Figure 3 shows that only 13.7% of the SWPs had no dependants, while 70.6% of the SWPs had up to four dependants. Among the LWPs, 72.4% had up to four dependants. The largest number of people that an SWP had to look after was 23. On average, the income of each LWP supported four people (mean value of 3.6) and the income of each SWP supported three people (mean value of 2.6).

The similarity between the SWP and LWP groups in terms of the number of dependants might at first glance seem curious. How could roughly 70% of SWPs (who had much lower incomes than LWPs) support up to four dependants, as was the case with LWPs? As asserted by Viljoen et al. (2015), a plethora of economic and social barriers as well as an increasingly competitive labour market in South Africa have conspired to force SWPs into the lower tier of the informal economy where they become trapped, responsible for a network of dependants who are similarly detached from mainstream economic activity.

3.5 Length of time working as waste pickers

Figures 4 and 5 show data for answers to the question about the length of time that the LWPs and SWPs, respectively, had spent in their line of work.

On average, the LWPs in the Free State province had been involved in waste picking for 6.8 years, with the median being five years. One of the LWPs had been in waste picking for 55 years, having started when he was nine years old. The SWPs told a different story (see Figure 5).

On average, the SWPs had been collecting waste for two and a half years, with the median being two years. The longest period spent collecting waste on the streets was 12 years. The differences between Figures 4 and 5 are significant, and should be the subject of more intense investigation – as part of a focused qualitative research

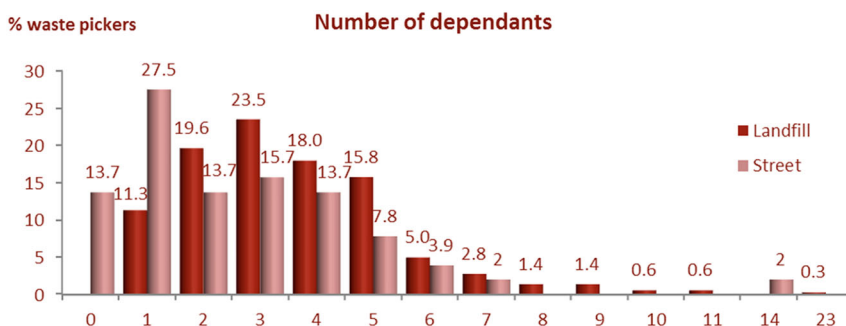


Figure 3. Number of people who depend on a waste picker's income.

Source: Survey data (2012).

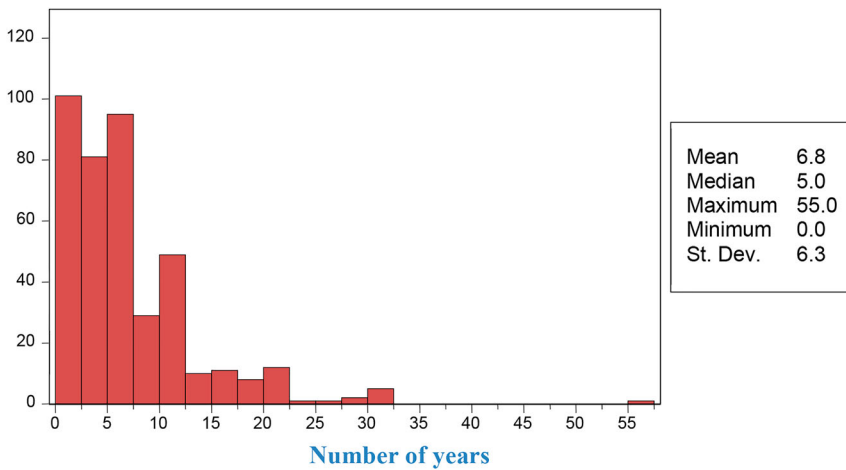


Figure 4. Number of years working as landfill waste pickers. Source: Survey data (2012).

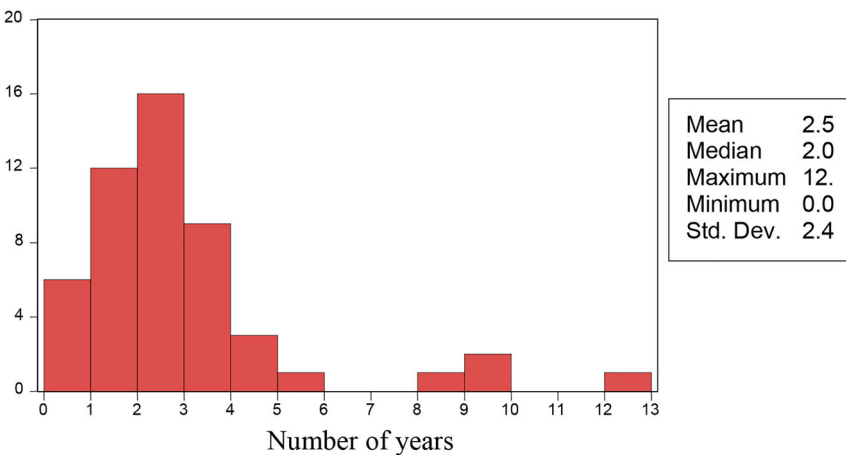


Figure 5. Number of years working as street waste pickers. Source: Survey data (2012).

agenda – particularly because the literature suggests that street waste picking has been in evidence for much longer than landfill waste picking (Downs & Medina, 2000:35).

3.6 Hours of work

Most of the LWPs indicated that they started work between 7 a.m. and 8 a.m., although three respondents started at 6 a.m. and one respondent started as early as 4 a.m. The earliest finishing time reported was 2 p.m., but most respondents said they finished at about 5 p.m. Working hours also differed from landfill site to landfill site. For example, in the study conducted by Samson (2012), it was revealed that pickers working on the Marie Louise landfill site in Johannesburg collected waste in shifts.

It is evident that on a given day the SWPs started earlier with their waste collection activities than the LWPs. Of the SWPs, 29% indicated that they were up and busy collecting waste by 5 a.m., with some already on the streets by 2 a.m. By 7 a.m., 87% of the SWPs were already working, and by lunchtime a third had finished for the day. Some finished later in the afternoon but 98% of the SWPs had completed their rounds by 5 p.m. A key reason for the SWPs' early start was that they had to get to the bins put out on the streets by residents before the waste removal trucks arrived. SWPs also had to contend with more competition for less waste, in contrast to the more regular supply of waste on the landfill sites.

3.7 Perceptions and experiences of waste picking

The authors believed it was necessary to explore, in some detail, the respondents' own perceptions and experiences of waste picking, including why they chose this type of informal economic pursuit from a range of options. Such options would include day labouring, which is characterised by (mostly) men standing at street corners offering their labour to prospective employers on a piecemeal basis.

According to 177 LWPs (43.4%), the reason for going into waste picking was that it was the '... only option' available to them to earn a living. A further 39 LWPs (9.5%) stated that they '... couldn't find another job', while the rest of the group explained that '... work is very scarce'. The responses from the SWPs were virtually the same, with 49% saying that waste picking was the '... only option for income'.

The waste pickers' comments confirmed what has been previously suggested – that they were literally forced into the informal economy by their socio-economic circumstances and the limited demand for unskilled labour in the formal economy (compare Wilson et al., 2006).

The broader informal economy, although commonly regarded as the catchment area for those who lack the skills to be considered for positions in the formal economy, reflects an interesting duality (Heintz & Posel, 2008). The informal economy accommodates both upper-tier and lower-tier activities, which Maloney (2004:1159) associates with 'voluntary entry' and 'involuntary entry', respectively. Individuals who willingly seek self-employment and have the capital and skills to choose their entrepreneurial path and engage in upper-tier activities are regarded as voluntary entrants in the informal economy. In contrast, individuals who are unable to overcome the barriers to entry presented by the formal labour market and must resign themselves to performing lower-tier work are seen as involuntary (and disadvantaged) entrants in the informal economy (Günther & Launov, 2012:89). Few job seekers would happily settle for lower-tier work because it does not generate sufficient income to cover basic needs, let alone contribute to a meaningful existence. Yet it is in the lower-tier work category of the informal economy that waste pickers find themselves. Operating at this level becomes part of a survival strategy (Yu, 2012).

Those seeking to operate in the informal economy are often confronted by perceived barriers to entry, such as no or inadequate start-up capital and business skills, and a tepid or excessively competitive market environment (Bali et al., 2012). The only real perceived barrier to entering the waste picking field is fear of being exposed to crime, as no start-up capital or special skills are required.

Concerns about their health and their unpleasant working conditions were evident in the answers provided by the LWPs as they were exposed to dust and dirt and even medical and hazardous waste on a daily basis (Wilson et al., 2006). From the SWPs' answers it was evident that exposure to criminal elements on the streets was perceived to be a greater problem than exposure to dirt and hazardous waste. This is in line with the findings of Schenck & Blaauw's (2011b) study in which SWPs in Pretoria voiced their concerns about being the target of criminal activities and being exposed to traffic risks, such as being hit by a car.

Interestingly, some of the waste pickers from both groups spoke about the positive aspects of their work, offering comments such as '... I am my own boss', '... able to give my children an education', '... it started as fun and now it is my job ...', '... good income ...' and '... can work at my own pace'. This highlights the fact that it is not only push factors but also pull factors which influence people's decision to go into waste picking. Delving more deeply into waste pickers' motivations for, and perceptions about, their line of work would make for a fascinating future research study.

4. Conclusions

In developing countries, particularly those wrestling with a difficult economic climate and high unemployment, waste picking provides opportunities to many individuals who would otherwise have almost no prospect of supporting themselves and their dependants. Although earlier studies have been conducted in South Africa into the characteristics, habits and motivations of LWPs and SWPs, respectively, such investigations have largely been mutually exclusive. This particular study has advanced the research process by undertaking a systematic analysis of both LWPs and SWPs in three municipalities in South Africa's Free State province, and producing a comparison of the groups' socio-economic circumstances.

Because the research team could interview only 52 SWPs as against 410 LWPs, the results merely expose broad trends in terms of the differences between the two groups. However, it is in these findings that the true value of this study lies. Because it was the first time that a geographical, same time-period comparison of the socio-economic conditions of SWPs and LWPs had been performed, it was possible to identify key areas for future, more focused research. Without this study, these research agenda items would not have been revealed.

The following key findings provide an important foundation for further research into the role of informal recyclers in South Africa's waste economy:

- There are more female LWPs than SWPs, evidently because of women's concerns about being exposed to crime on the streets and the physically demanding nature of street waste picking. It would also appear that landfill sites offer more opportunities for social interaction and group support, and therefore constitute a more viable working environment for women.
- LWPs earn much more than SWPs, which is partly attributable to the former having easier access to greater volumes of waste and being able to store it pending visits from the BBCs. SWPs, on the other hand, usually need to dispense with their loads at the end of each day, relying on their own mobility to get to the buyers. It is

interesting, but not necessarily significant, that the LWPs generally have a better track record in terms of schooling than the SWPs.

- LWPs remain in their jobs longer than the SWPs. However, it is not clear where the waste pickers go after leaving the landfill sites or streets. For example, do the SWPs move to landfill sites or leave waste picking altogether? Do they take up another form of informal activity (armed with some start-up cash and experience gained while waste picking)? Do they find jobs in the formal sector?

The results of this study have unleashed interesting opportunities for further qualitative research to be conducted into LWPs and SWPs, which will enable more detailed comparisons to be made between the two groups – both in the Free State province and in other parts of South Africa. Although the results show that the LWPs are in many respects better off than the SWPs, waste picking is not, for either group, a completely negative experience. Despite the hard work and exposure to various risks and hazards, waste picking offers a means to make a living and often encourages a sense of independence and self-sufficiency. These aspects are often overlooked when people contemplate the life of waste pickers, as are the multi-dimensional linkages that exist between waste sellers and buyers.

Any country wishing to create a more formalised, integrated and sustainable waste management system (Wilson et al., 2006; Chvatal, 2010) needs to put waste pickers – both on the landfills and the streets – at the centre of the process. In this way, waste pickers will be brought in from the fringes of society and given the opportunity to voice their concerns and aspirations, while also providing policy-makers with valuable insights into the workings of the informal economy.

Of course, this will be only be achieved if reliable data are available on aspects such as the volumes of waste generated relative to the amounts collected by waste pickers, and the impact of formal waste collection on human settlements and the environment. Solid waste data in many cities are largely unreliable and seldom offer an expansive picture of the inner workings of the waste sector (UN-HABITAT, 2010). Without a focused and well-financed research agenda devoted to these issues, it will be difficult to formulate transparent and effective strategies for recognising and rewarding the waste picking community who make such an important contribution to society.

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