Understanding the South African Waste Sector: The Economic and Employment Opportunities it Provides

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ABSTRACT

The results of the South African Waste Sector Survey (for 2012) show that the formal waste sector employs a minimum of 29,833 people. The majority of these employees are situated within large enterprises (77.5% of private waste sector employees) and metropolitan municipalities (64.9% of public sector employees). The minimum financial value of the formal waste sector (public and private) is R15.3 billion, or 0.51% of GDP. The majority of this revenue is situated within large enterprises (88.0% of private sector revenue) and metropolitan municipalities (80.4% of public sector revenue). An estimated 62.0% of the total revenue generated from waste activities, was done so by companies which had been in the industry for more than 25 years. Young waste companies (less than five years) contributed a minimum of R188 million into the economy in 2012. This new understanding of the South African waste sector creates the opportunity for dialogue between the public and private sectors, identifies opportunities for investment in alternatives to landfilling, and creates a baseline for further investment in waste research, development and innovation.

1. INTRODUCTION

Moving waste up the hierarchy away from landfilling towards waste prevention, reuse, recycling and recovery creates environmental, social and economic opportunities for a country, particularly for developing countries, where significant opportunities for alternatives to landfilling still exist. The waste sector is recognised globally as an economic sector that can significantly contribute towards local social and economic development. South Africa is no different. The opportunities provided by the waste sector are being driven by, amongst others, issues of carbon economics, resource scarcity, commodity prices, globalisation, climate change and tightening regulation (DST, 2014).

In South Africa, an estimated 90% of all waste (or ~75% of MSW) generated is still landfilled, and obvious opportunities for recycling and recovery are present. The South African government has identified the waste sector as a sector that can contribute towards local economic growth and job creation. The national Green Economy Accord (EDD, 2011) recognises the role that the waste sector, specifically waste reuse, recycling and recovery, can play in South Africa's transition towards a Green Economy. The policy framework to move waste up the waste management hierarchy away from landfilling towards waste reuse, recycling and recovery has been provided by government through the promulgation of the National Environmental Management: Waste Act (RSA, 2009). This creates the enabling policy environment for job creation as new projects are implemented by business and industry, new markets become available, new business opportunities recognised, and as new innovations (technological and social) are introduced to the waste sector (EEA, 2011; Treasury, 2011; DST, 2012).

Recognising these economic opportunities, the South African government has set the target of 69,000 new jobs and 2,600 new small and medium enterprises (SMEs) and cooperatives to be created in waste service delivery and recycling, by 2016 (DEA, 2011). This translates into 23% of the expected 300,000 new jobs from the Green Economy, and 1.4% of the five million jobs necessary to alleviate current unemployment levels in the country. The waste sector is, therefore, potentially a meaningful contributor to the economy if it is supported and stimulated by government and the private sector.

To understand the potential of the waste sector, one must first understand the sector. However, the South African waste sector has been a poorly understood sector, since it is not recognised by government as a distinct economic sector. Furthermore, South Africa, like most countries on the African continent, has very little accurate and reliable waste information, both in terms of waste quantities (tonnages) as well as organisational information. This makes the collection of formal economic data for the waste sector very difficult to collate and report on. Recognising these limitations, the Department of Science and Technology initiated the first Waste Sector Survey for South Africa (organisational), on the back of the second national waste baseline study (quantities) (DEA, 2012). The aim being to improve the level of understanding of the organisational, employment, financial, and innovation aspects of the public and private waste sector in South Africa. This paper presents the main findings of this Waste Sector Survey.

2. METHOD

2.1 Defining the waste sector

Since the South African waste sector is not an established economic sector, it had not been previously defined. The first step in undertaking the waste sector survey was therefore to define the sector. Furthermore, the South African waste sector is known to include both formal and informal sub-sectors, each of which play an important role in the management of waste in the country. This waste sector survey was specifically targeted at the formal waste sector and was directed at all organisations (public and private) active in the management of waste in South Africa.

For the purposes of this study, the formal waste sector was defined as including waste handlers (private and municipalities), waste equipment providers, waste consulting/engineering companies, waste research and development organisations, and waste and resources sector associations. Where 'waste handlers' included any organisations undertaking city cleansing, waste collection and transport, storage and transfer, sorting and separation of recyclables, reprocessing or recovery of recyclables, treatment, and disposal (landfilling).

The sizes of the private waste sector organisations used as the units of reporting were based on the National Small Business definition of enterprise size, (National Small Business Amendment Act, 2003). Evaluated against the results obtained from the waste sector survey, the units were aligned with the Manufacturing sector, and the Electricity, Gas and Water sector (Table 1).

Table 1. Adopted definition of enterprise size for the waste sector (total revenue)

	Waste revenue [Rm]
Large enterprises	> 51
Medium enterprises	13 – 51
Small enterprises	5 – 13
Very small enterprises	0.2 – 5
Micro enterprises	< 0.2

The units of reporting adopted for the public waste sector were based on the Municipal Infrastructure Investment Framework (MIIF) categories (CoGTA, 2009) (Table 2).

Table 2. Municipal Infrastructure Investment Framework (MIIF) categories

MIIF category	Description
A	Metropolitan municipalities (metros)
B1	Secondary cities, local municipalities with the largest budgets
B2	Local municipalities with a large town as core
B3	Local municipalities with small towns, with relatively small population and significant proportion of urban population but with no large town as core
B4	Local municipalities which are mainly rural with communal tenure and with, at most, one or two small towns in their area
C	District municipalities

2.2 Sampling

To obtain an accurate a picture of the South African waste sector as possible, no sampling was done. The intention was to include all, or as many, public and private waste organisations in South Africa. At the request of DST, the results were not to be extrapolated to give a potential size of the sector, but rather to present the actual results obtained as at least a minimum size of the sector. Statisticians consulted on the participation rates, advised that as long as a good distribution in company and municipality size was obtained, and that respondents included the large private waste companies and metropolitan municipalities, there was a high probability that the results were representative of the South African waste sector.

The spread of participating companies and municipalities (by revenue and by employee number), and the inclusion of the top five waste companies and six of the eight metros, would suggest that the results (percentages) presented in this report, are representative of the South African waste sector. The absolute numbers presented in the final report, e.g. total number of people employed, number of higher degrees and diplomas, total waste sector revenue, spend on waste research and development (R&D), and spend on waste human capital development (HCD), represents a minimum number / size / value for the sector.

2.3 Data collection

Given the potentially large number of municipalities and private waste companies (>500) and their geographic distribution across the country, self-administered questionnaires were deemed the most appropriate means of collecting data on the South African waste sector. A questionnaire was prepared which would address all of the information requirements of DST.

Following piloting of the questionnaire and minor amendments, the final questionnaire was distributed via email on 15 April 2013 to private companies (addressed to the Chief Executive Officer) and 16 April 2013 to local and metropolitan municipalities (addressed to the Municipal Manager). A hardcopy of the questionnaire, including covering letter from DST, was also mailed to every local and metropolitan municipality during the week of the 15-19 April 2013, given the lack of email access in many of the municipalities. Email addresses used were obtained from the database compiled for this project.

Data from all of the returned questionnaires were captured in Microsoft Excel spreadsheets. Data was verified for consistency and accuracy following complete capturing. Where fields had been omitted by the respondent, an effort was made to source this missing information, either from the respondent directly, or from data already publicly available.

The results were collated and presented for the year 2012.

3. RESULTS

Selected results are presented here according to each of the major sections included in the questionnaire – waste sector and technologies, basic organizational status, employee status, financial status, and technological and non-technological innovation status. For the full set of results the reader is referred to the final Waste Sector Survey – 2012 report (DST, 2013).

3.1 Waste sector and technologies

In terms of services rendered, the results (Figure 1) reflect the constitutional mandate of municipalities with respect to waste management, i.e. city cleansing, waste collection and disposal. Some municipalities indicated that recycling is being undertaken within their municipality; however, the municipalities often indicated that these activities were being undertaken by private companies or individuals. In the absence of knowing this for all municipal respondents, the data was retained within the graph, to highlight at least the awareness that some municipalities have (approximately 20-30% of municipal respondents) that recycling activities are taking place within their municipality. Figure 1 also shows the complimentary relationship between the private and public sectors. Where services are low for municipalities, the private sector is responding to these areas of opportunity.

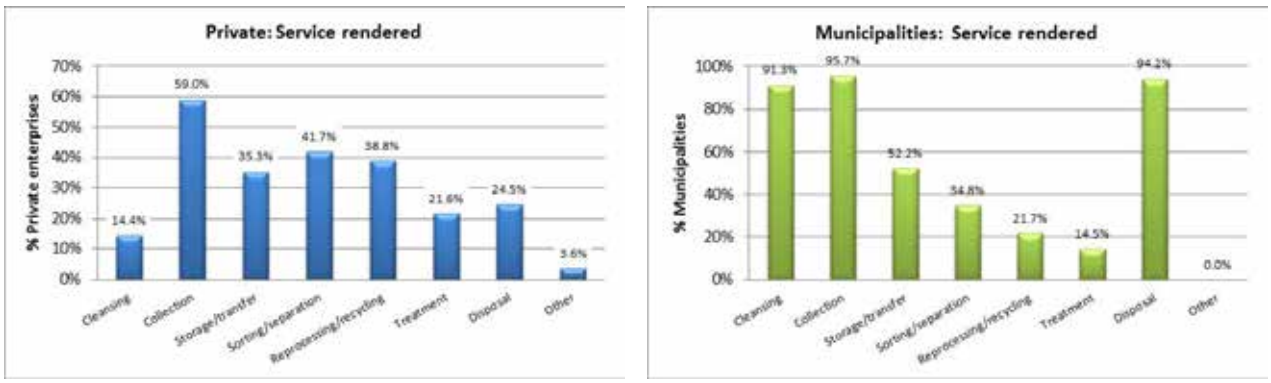

Figure 1. Services rendered by private and public enterprises along the waste value chain

It terms of waste type handled, the results (Figure 2) show the full spectrum of waste types handled by the private and public sectors. As with services rendered, some municipalities indicated that recyclables were being handled within their municipality, however, municipalities often indicated that these activities were being undertaken by private companies or individuals. Figure 2 also shows the complimentary relationship between the private and public sectors with regards to the types of waste handled. Where certain wastes have not been handled by municipalities, the private sector has identified these waste streams as areas of opportunity and is responding to them.

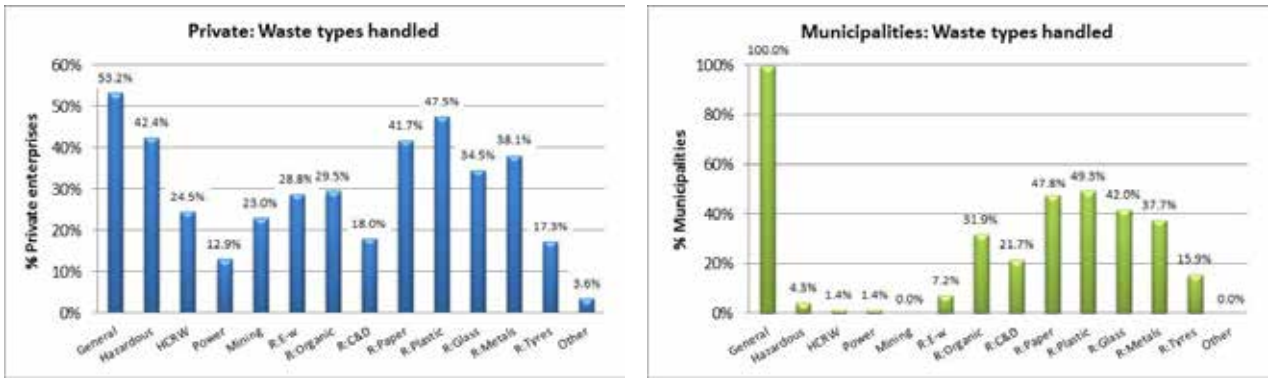

Figure 2. Types of waste handled by private and public enterprises

The lowest number of responses received from respondents related to the handling of power generation waste (12.9%), tyres (17.3%), construction and demolition waste (18.0%) and mining waste (23.0%) (Figure 2). This is not surprising, since although power generation waste and mining waste make up two of the largest waste streams in South Africa (by volume), and construction and demolition waste (R: C&D) makes up a considerable volume of general waste to landfills (20% by mass), there is currently little recycling and recovery of these waste streams (DEA, 2012).

3.2 Basic organisational status

In terms of private waste enterprises, the results (Figure 3) show that the majority of companies have their waste operations within the three main economic hubs of South Africa, namely Gauteng, KwaZulu-Natal and the Western Cape, where the bulk of the general and hazardous waste is being generated (DWAF, 2001; DEA, 2012).

While the majority (56.1%) of private sector respondents have only a regional footprint (SA(s), some provinces), and some 38.1% of respondents have a national footprint (SA(n), all provinces), the footprint of the services rendered by private companies in South Africa, does extend up into Africa and also into the rest of the world. The nature of the relationships with Europe, Asia, America and Australasia has not been investigated further, however the likelihood is that this represents the movement of recyclables into the global waste economy.

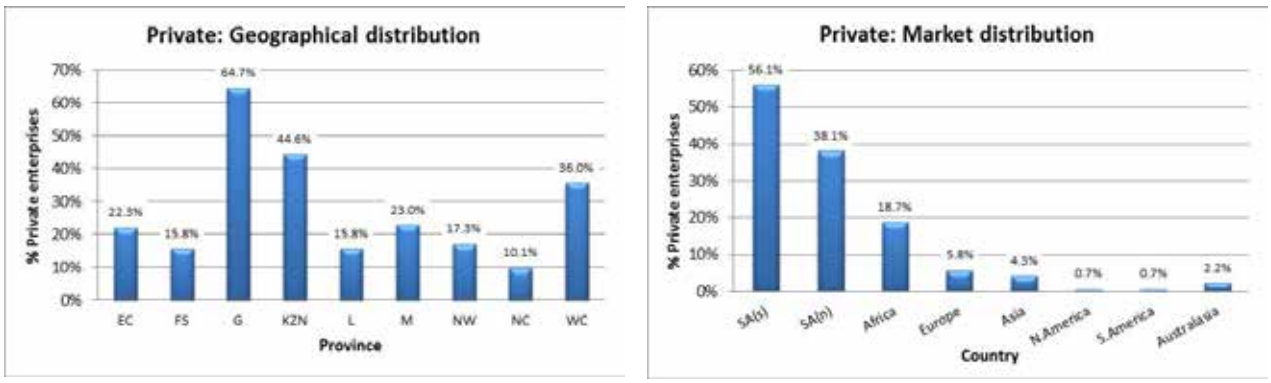

Figure 3. Geographic footprint of private waste enterprises and their market for waste goods and services

3.3 Employment status

The study by the Department of Environmental Affairs (DEA) on macroeconomic trends, targets and economic instruments (DEA, 2009) presented a figure of 29,505 people employed in the South African waste sector. With 20,505 people employed in the public sector and 9,000 employed in the private sector (Table 3).

Data obtained from the waste sector survey (DST, 2013) indicates a minimum of 29,833 employed in the formal waste sector (public and private) as at 2012 (Table 3). An estimated 2-3 times this number are believed to earn a living from the informal waste sector, largely through recycling activities (DEA, 2009; WIEGO, 2009), however no official statistics on the South African informal waste sector currently exist.

Table 3: Minimum number of people employed in the formal waste sector

Waste sector	Number of waste employees	
	2009	2012
Private	9,000	9,741
Public	20,505	20,092
Total	29,505	29,833

The results (Figure 4) show that the majority of persons employed in the waste sector, are employed within large private waste companies or within large metropolitan municipalities. An estimated 77.5% of people employed in the private waste sector, are currently employed within 'Large' enterprises. Approximately 64.9% of waste employees in municipalities are employed within Category A, metropolitan municipalities.

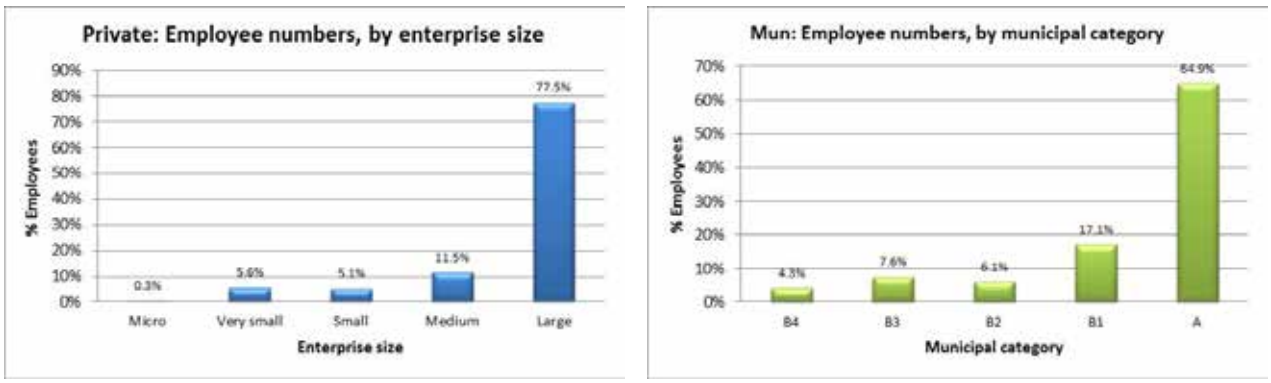

Figure 4. Percentage of waste employees by enterprise size (private) and by municipal category (public)

However, while most of the people are employed within large companies, the private waste sector is shown to be made up of companies varying considerably in size (financial and employees), from 1 person (self-owned) up to nearly 1,000 persons. An estimated 35.1% of private waste companies employ less than 10 staff members, indicating the receptive environment within the private waste sector for the establishment of small-, medium- and micro- enterprises (SMMEs).

The skill level of persons employed within the public and private waste sectors was also assessed. Participants were asked to assign their waste management staff into one of three skill categories – 'skilled' (waste technical specialists, e.g. qualified engineers, scientists, waste professionals), 'un/semi-skilled' (waste labour, e.g. drivers, operators, spotters), and 'other' (e.g. support services such as management, finance, admin). The results (Figure 5) show that the majority of persons employed within the waste sector are unskilled (70-80%) highlighting the importance of the waste sector in absorbing relatively unskilled persons within the economy.

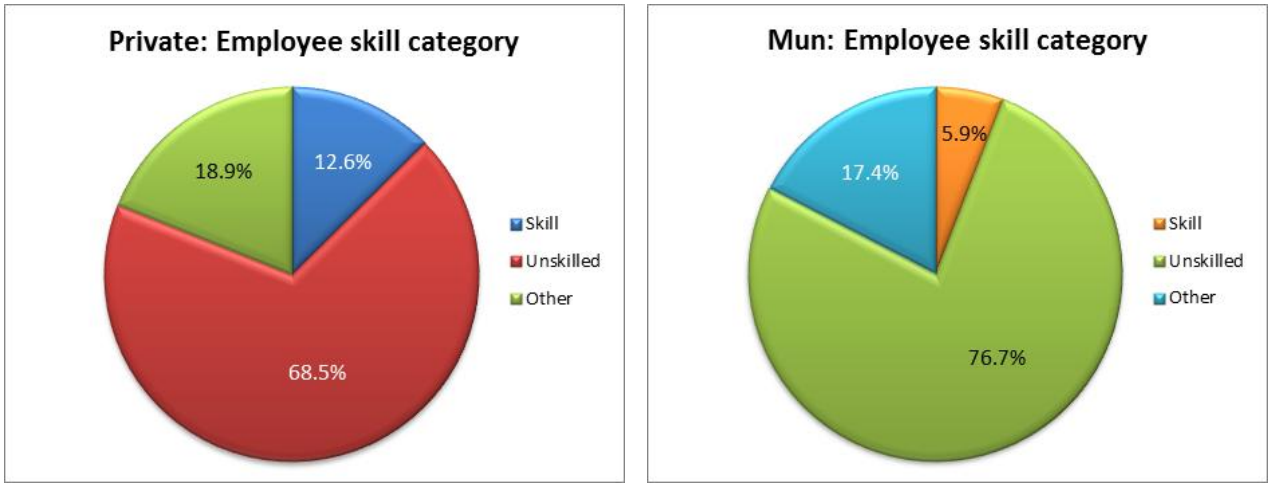

Figure 5. Status of employees by skill category for the private and public sectors

The results also reflect a positive transformation of the South African waste sector in terms of Broad-Based Black Economic Empowerment (BBBEE), race and gender. For what has always been a male-dominated industry, the waste sector appears to also be transforming with respect to gender, with 37.8% of private sector employees and 32.1% of municipal employees being female (Figure 6).

The majority of private enterprises (67.7%) and municipalities (78.3%) indicated that they were planning to recruit more staff, which is encouraging in terms of job creation in the sector. However, it should be noted that recruitment within municipalities may simply be to fill currently vacant positions. Of the 4.5% of private enterprises that indicated they were planning on reducing their number of staff in the next three years, 50.0% are active in the sorting and reprocessing of recyclables, and 33.3% are in waste collection and storage. This envisaged reduction in staff may hint at the strain that the South African recycling sector is currently under with regards to increasing electricity, transport and labour costs, or it may also reflect a move towards system automation.

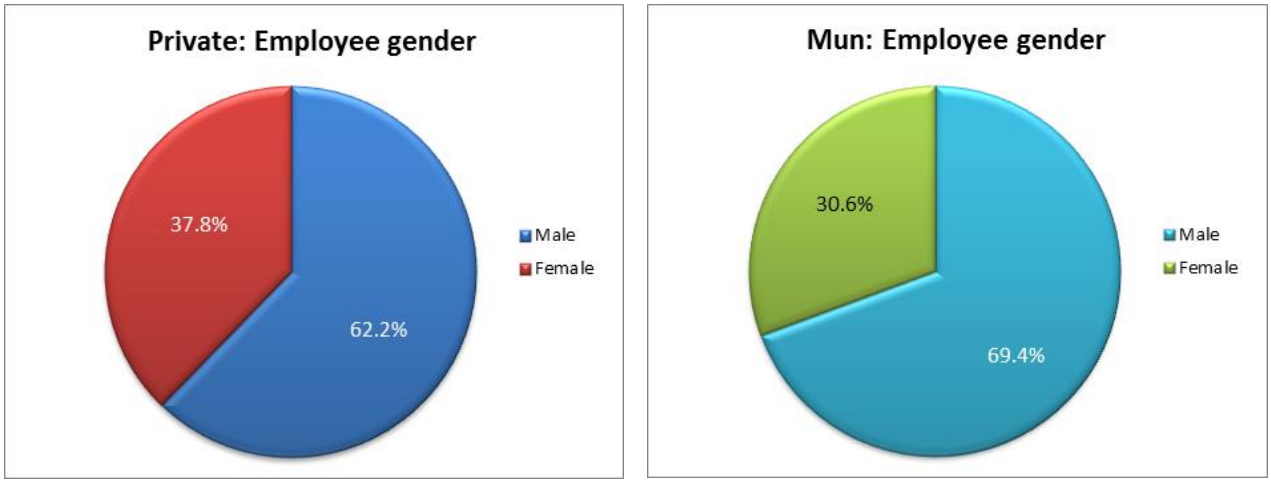

Figure 6. Status of employees by gender for the private and public sectors

3.4 Financial status

The results (Table 4) indicate a minimum financial value of the formal South African waste sector (public and private) of R15.3 billion per annum or 0.51% of GDP (as at 2012). At an average South African Rand to US Dollar exchange rate for 2012 of 8.2:1, this equates to a minimum financial value of US$1.87 billion for the year. With support and investment in their local waste economies, Australia, North America and Europe have been able to grow their waste sectors to 1-2% of GDP suggesting that the South African waste sector has the potential for further growth (DST 2013, DST 2014). The results (Table 4) also show that the ratio between the public : private sector value has shifted from 70:30 (in 2009) to 54:46 (in 2012), highlighting the growth of the private waste sector. This is very encouraging for job creation and enterprise development.

Table 4. Minimum financial value of the formal waste sector (public and private)

	Financial value [R]	
	(2009)	(2012)
Private	3,000,000,000	6,961,644,605
Public	7,000,000,000	8,323,879,000
Total	10,000,000,000	15,285,523,605

As with the employment figures, the financial results show that more than 80% of the waste revenue (for 2012) is generated by large private waste enterprises and by metropolitan municipalities (Type A) (Figure 7). With 88.0% of reported private sector waste revenue residing in large waste enterprises, and 80.4% of public sector waste revenue residing in metropolitan municipalities.

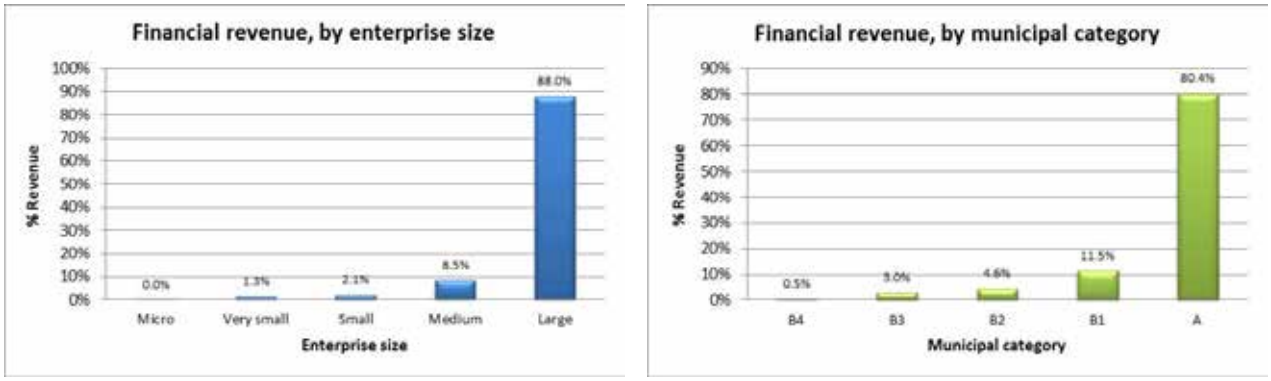

Figure 7. Waste revenue by enterprise size and municipal category

However, the results do reflect a private waste sector made up of a few large companies, with annual revenues in excess of R50 million per annum, and a large number of small companies, with annual revenues of less than R5million per annum. An estimated 48.7% of private sector respondents have an annual revenue of <R5 million per annum, again highlighting the receptive environment within the private waste sector for the establishment of small-, medium- and micro- enterprises (SMMEs).

3.5 Spend on R&D and HCD

The spend on waste research and development (R&D) and human capital development (HCD) is however disappointingly low (Tables 5 and 6).

The minimum estimated spend on waste R&D by the private and public waste sectors is R50.2 million per annum or 0.33% the value of the sector (Table 5). While South Africa strives for an overall national R&D investment of 1% of GDP, the waste sector has been unable to achieve anywhere near 1% of the sector value.

Table 5. Minimum spend on waste R&D as a percentage of sector value (2012)

Waste Sector	Sector value [R]	Waste R&D [R]	Waste R&D as % of sector value
Private	6,961,644,605	37,251,663	0.54%
Public	8,323,879,000	12,996,567	0.16%
Total	15,285,523,605	50,248,230	0.33%

The estimated spend on waste related HCD within the private and public waste sectors is higher, at R428.5 million per annum or 2.80% the value of the sector (Table 6).

Table 6. Minimum spend on waste HCD as a percentage of sector value (2012)

Waste Sector	Sector value [R]	Waste HCD [R]	Waste HCD as % of sector value
Private	6,961,644,605	84,396,037	1.21%
Public	8,323,879,000	344,166,234	4.13%
Total	15,285,523,605	428,562,271	2.80%

The results suggest that municipalities are spending roughly four times the amount of money on HCD, as opposed to the private sector. Reflecting back on the employee section and the large percentage of unskilled employees in municipalities, this might suggest that municipalities have identified the skill issue as an obstacle to service delivery and have begun to invest heavily in HCD; municipalities are investing in HCD, but this is not reflecting in a change in skill level, i.e. migrating from 'unskilled' to 'skilled', or in obtaining a degree or diploma (implies very low level of basic training – NQF levels 1-4); there is a high migration of employees through municipalities, with the result that the investment in HCD is not reflecting in the skills level at municipalities (retention); the private sector is able to attract more highly skilled persons to start with, resulting in less of a need for HCD spend; and finally, that municipalities act as a 'training ground' for young professionals who then move into the private waste sector once trained.

3.6 Innovation status

The results of the innovation status are not presented here. However, it is noted that the discussion on investment in waste R&D and HCD and skills levels within the South African waste sector, does have a direct bearing on waste innovation in the sector, both technological as well as social innovation.

4. CONCLUSIONS

The results of this waste sector survey present a minimum picture of the formal South African waste sector (public and private) for 2012. Since the study captured the majority of large private companies and metropolitan municipalities, as well as a good distribution across organisations (financial and employee size), the authors are confident that the results are representative of the formal waste sector. The aim of the survey was to understand the broad waste sector, not only traditional waste collection and disposal companies. However, it must be highlighted that many organisations have a very narrow definition of the waste sector, and although actively participating in waste recycling or equipment service provision to the sector, did not see themselves as being a role-player in the waste sector.

This first national waste sector survey shows that the formal waste sector employs a minimum of 29,833 people (as at 2012). The majority of these employees are situated within large enterprises (77.5% of private waste sector employees) and metropolitan municipalities (64.9% of public sector employees). An estimated 2-3 times this number are believed to earn a living from the informal waste sector, largely through recycling activities, however no official statistics on the South African informal waste sector currently exist.

The sector has shown positive transformation over the past two decades (since 1994). The strong commitment by national and provincial government to the management of waste over the past 10 years appears to have stimulated the waste sector, with many new enterprises starting up waste activities. This high level support and commitment by national and provincial government must be continued if the country is to see the waste sector grow.

Waste-related employment within municipalities appears to have levelled-off at around ±20,000 persons. The public sector could absorb another ±5,000 employees, if current vacant positions in municipalities were filled. However, if South Africa is to get anywhere close to achieving Goal 3 of the National Waste Management Strategy, to grow the contribution of the waste sector to the green economy by creating 69,000 new jobs and 2,600 additional SMEs and cooperatives participating in waste service delivery and recycling by 2016, Government will have to look towards the private waste sector (and/or the informal sector).

The minimum financial value of the formal waste sector is R15.3 billion, or 0.51% of GDP (as at 2012). The majority of this revenue is situated within large enterprises (88.0% of private sector revenue) and metropolitan municipalities (80.4% of public sector revenue). It was also found that 62.0% of the total revenue generated from waste activities in 2012, was done so by companies which had been in the industry for more than 25 years. Companies which started up waste activities in the past 5 years contributed a minimum of R188 million into the economy in 2012.

Spend on waste research and development (R&D) and human capital development (HCD) remains low for the waste sector. Results show that the spend on waste R&D for 2012 was approximately 0.33% of the value of the sector. Spend on waste HCD equates to approximately 2.8% of the value of the sector. The public sector showed a four times greater spend on HCD than the private sector, yet still shows a greater percentage of unskilled employees. This investment in HCD is therefore still to manifest in an actual change in employee skill levels.

As a country, we need to identify the opportunities for growth in the private waste sector, e.g. improving current levels of waste service delivery; capturing all waste within the sector (i.e. avoiding illegal dumping); improving the design and operation of landfills (in line with regulations) (adjusting true landfill costs); and by introducing alternative waste management options that divert waste away from landfilling towards waste minimisation, reuse, recycling and recovery. To do this, we will have to find ways that – support the sector (economic, financial and policy), that encourage the sector, that promote a move away from landfilling to alternative waste management options, and that strengthen ties between the private and public sectors to facilitate the transfer of innovation and skills. The development of a national waste research, development and innovation roadmap for South Africa is one mechanism aimed at achieving these objectives.

ACKNOWLEDGEMENTS

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