LANDFILLS OR DUMP SITES? STATUS OF LANDFILL SITES IN THE FREE STATE PROVINCE, SOUTH AFRICA

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ABSTRACT

Increased waste generation and poor waste disposal strategies are a global problem. In South Africa most provinces, and the larger municipalities and metros, seems to have the waste disposal and the landfills reasonably organized. This cannot be said of the landfills in the Free State Province, which could only be called dump sites. In the Free State Province a high unemployment level exists and a lack of finances is experienced by many members of the communities, especially in rural areas. Poverty levels is shown in a study by Adventist Development and Relief Agency (ADRA SA), where it was recorded that 1.8 million (68%) of the people in the Free State Province are living in poverty and living on less than R15 per day. Data on the state of the landfill, types of waste generated which have potential to be recycled, were recorded to assess if recycling could be increased to relieve the economic burden of the poor communities. Attention was paid to the following aspects: assessing the current status of each landfill and identifying the types of waste generated in the area which ended up at the landfills. The extent of recycling and the waste handling and disposal of the waste were recorded. Non-compliance with the prescribed legislative guidelines were noted and aspects such as the state of the landfills, proper enclosure, burning of waste, recycling and products being recycled were identified and recorded. The waste disposal practices at most landfills were poor and very limited recycling was taking place. None of the landfills in the province complied with the minimum requirements for landfilling. Recommendations to improve waste disposal and identification of products with recycling potential were made. Alternative waste strategies which could be economically beneficial for the communities were recommended.

1. INTRODUCTION

Waste is generated by nearly every activity undertaken by humans in every area of the world. The improvement of the social conditions and economic growth of the population has led to increased waste generation, globally and locally which increases the waste burden. Waste is generated as a result of activities in urban, municipal and industrial sectors (Rapti-Cuputo, Sdao and Masi, 2006). In 2000, it was estimated that there would be more than 2 billion tones of municipal solid waste generated per year (Guisti, 2009). Several definitions exist for waste internationally. In South Africa there are two legally accepted definitions for waste according to the Environmental Conservation Act (ECA) and the National Water Act (1998) (Oelofse and Godfrey, 2008).

The Waste is defined under the ECA according to the nature of the waste "unwanted and superfluous" (Oelofse and Godfrey, 2008), whereas the National Water Act (1998) accesses the potential of the waste to cause pollution and protection. According to The Minimum Requirements for Waste Disposal (DWAF, 1998 and 2005) all waste is considered to be hazardous until it proven that it is not hazardous (DWAF, 1998; DWAF, 2005).

Legislation regulating waste management exists worldwide. In South Africa, waste management which comprises of handling and disposal of waste is legislated by various acts and local bylaws. The National Waste Management Strategy was developed in 1998 by the South African Government as a proactive waste management approach towards achieving integrated waste management (Fiehn, 2007). In the Constitution of the Republic of South Africa (1994) the functions of waste management was allocated to the municipalities under the Municipal Structures Act, Section 84 (RSA, 2000) (Van der Linde, Meyer and Cellarius, 2004). Disposal of waste to landfills are regulated by the Minimum Requirements for Waste Disposal by Landfill composed by the Department of Water Affairs (DWAF, 1998). The requirements are regulated and legally effected by landfill permitting conditions in Section 20(1) of the Environmental Conservation Act, 1989 (Act 73 of 1989). All these aspects and considerations which forms part of the waste hierarchy, are promulgated and recommended in the National Waste Management Strategy (NWMS) which was approved by the Cabinet on 9 November 2011 (Department of Environmental Affairs, 2011) namely:

- Waste minimization or avoidance – to reduce or eliminate waste
- Re-use – by using items of waste without re-processing it
- Re-cycling – processing material into new products
- Composting – soil enrichment through making compost
- Disposal – waste residues disposed at permitted landfill sites (DEA, 2011).

Waste management is handled in various ways. According to Onu (2000), management of solid waste in developing countries are hampered by poor waste collection practices, inadequate or various levels of service provision due to financial constraints, indiscriminate dumping, absence of environmental control systems, littering and scavenging. The lack of awareness among the general public with regards to waste and environmental awareness was identified as one of the most important aspects relating to the state of waste management provision. A study undertaken in India, indicated that uncontrolled landfilling practices and problems relating to the disposal of solid waste causes environmental and public health problems (Ray, Roychoudhury, Mukherjee, Roy and Lahiri, 2005).

Municipal solid waste is generally disposed of by landfilling (Cotman and Gotvajn, 2010).

According to Hartmann and Ahring (2006) landfilling is the most practical waste disposal method, but the positioning of landfill sites near residential areas makes it a less favourable option. This fact is reiterated by Griffith and Trois (2006) who stated that 95% of waste is landfilled. Municipal solid waste which usually ends up at landfill sites generally consists of household waste, off-cuts from parks, gardens and non-hazardous waste from industry. According to a report of the Gauteng Province, the Department of Water Affairs (1997) stated that more than 42 million m3 of waste is generated annually in South Africa with the largest amounts (42%) originating from Gauteng Province (Mpumalanga DACE, 2003). According to Bredenhann (2006) the Free State Province have a total of 87 landfill sites of which there is only 10 medium sized non-leachate generating landfill sites, 67 small non leachate generating landfill sites and eight communal landfill sites which is also non-leaching sites (Bredenhann, 2006). Figure 1, depicts The Free State Province which comprises five district municipalities and 20 local municipalities which serves a total of approximately 787 996 households. These households are mostly located in urban areas (86%) and rural areas (14%). The Thabo Mafutsenyane district is the area with the poorest service delivery (DEAT, 2007). In the Motheo District, 88% of the households received free basic solid waste disposal services compared to Thabo Mofutsanyane, where 77% were receiving services.

Figure 1: Map of the Free State Province (source Free State Department of Agriculture)

2. AIM AND OBJECTIVES

The aim of this study was to assess the current status of each landfill and objectives included recording aspects such as the structure, layout, services provided, general conditions, identification of the main types of products recycled and the presence of waste pickers (scavengers) living on the landfill sites.

3. METHODOLOGY

The waste sites (landfills) in the Xhariep, Motheo, Lejweleputswa, Thabo Mofutsanyane and the Felize Dabi district councils, local municipalities and towns were visited (Figure 1). The number of landfill sites included in each district were, Xhariep (District 16 - 15), Motheo (District 17 - 8), Lejweleputswa (District 18 - 15), Thabo Mofutsanyane (District 19 - 18) and Felize Dabi (District 20 - 14), Observations were made and data on the state of the landfill, types of waste recycled by community members, were recorded. A total of 70 landfills in the Free State Province were included in the study and the relevant data was collected and the results were recorded and analyzed and presented in graphs.

4. RESULTS AND DISCUSSION

4.1 General landfill operations

It was observed that none of the landfill sites in the five districts, had liners installed. No management of leachate and storm water was done. Compaction of waste was only done at a few of the ten medium sized non-leachate producing landfill sites and even at these landfill sites where compaction were performed, it was interrupted when equipment was not functioning or no provision was made in the budgeting process for diesel and spares to repair equipment. According to Section 10.2 of the Minimum Requirements for Waste Disposal (1998), all landfill sites must have “sufficient facilities and resources to ensure that the landfill operation can conform to both the permit conditions and the relevant minimum requirements”. Some of the factors included are the provision of trained staff, monitoring and control as well as recording of incoming waste (Van der Linde, Meyer and Cellarius, 2004).

It was observed that children were playing on the landfill sites. At one landfill pigs had a pen and was fed by children, cows were observed eating plastic bags and a large amount of animal waste, parts of dead animals, half decomposed carcasses and even some medical waste bags were observed lying around. Littering of papers was a common sight.

4.2 Fencing and access control

According to the Minimum Requirements all landfill sites must be fenced and access must be controlled. Figure 2 indicates the percentages of landfills in each district with fencing and access control. Non-compliance regarding fencing and access control was evident in all five districts. Although landfills in District 16 and District 17 were most compliant at 60% and 63% respectively, only 39% and 36% of the landfill sites in District 19 and District 20 were fenced. The absence of gates or access control (locks) on gates was also evident. Landfills in District 17 had 13% access control which was very poor. A register to record the registration number of the vehicle which entered the site was only provided at one landfill site included in this study. Although limited access control was found in all districts, no access control was found at landfill sites in District 16.

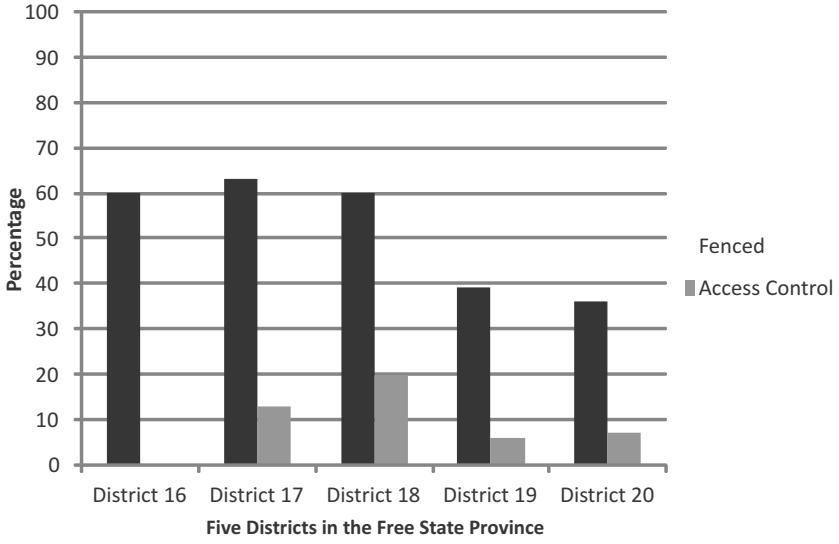

Figure 2: Fencing and access control at landfill sites in the five districts

4.3 Recycling by community members (waste pickers)

No recycling is done by community members in District 16, whereas District 18 and 20 have the largest percentages, 67% and 79% of community driven recycling is taking place (Table 1). In South Africa, different terms are used for these people and the name describes what work the person does. In Cape Town, for example, they are called “skarrelaar” (“Scutler”), or a “delwer” (digger) (Schenck and Blaauw, 2010). At the First World Conference of Waste Pickers, the term “waste pickers” was adopted to be used for persons collecting waste for recycling purposes (Women in Informal Employment, Globalizing and Organizing (WIEGO), 2011).

The main types of products which were collected for recycling were tins, glass, paper, cardboard, plastic and plastic bottles, metal, These products are similar to the mostly recycled materials identified by other studies (Matete and Trois, 2008; Schenck, Blaauw and Viljoen, 2012).

Table 1: Community recycling, burning and waste pickers living on landfill sites in the five districts

Districts	Recycling % (n)	Burning % (n)	Waste Pickers living on landfills % (n)
Xhariep District 16 (n = 15)	0 (0)	53 (8)	13 (2)
Motheo District 17 (n = 8)	25 (2)	63 (5)	25 (2)
Lejweleputswa District 18 (n = 15)	67 (10)	13 (2)	40 (6)
Thabo Mofutsanyane District 19 (n = 18)	44 (8)	17 (3)	33 (6)
Fezile Dabi District 20 (n = 14)	79 (11)	36 (5)	22 (3)

In several of the smaller towns, rusted cans and glass were collected, but were left discarded on heaps either outside the landfill site or on the road on the way to the landfill site. No plastics were collected in Districts 16 and 17 whereas in Districts 18, 19 and 20 plastic was collected for recycling at 40%, 22% and 57% of these landfills sites, respectively. Paper was collected in all districts, except District 17. Paper was collected at 27% and 43% of the land fill sites (Districts 18 and 19). Tins were collected at all district landfill sites, except the tins in District 16 were not recycled, but left to rust on heaps outside the perimeters of the landfill sites. Most tins were collected in District 20 where 43% of the landfills were recycling tins. Cardboard was only collected for recycling in Districts 17, 18 and 19.

When comparing the different types of waste collected per district, it is evident from figure 4 that landfill sites in District 16 only tins, District 17 collected paper, tins and cardboard, District 18 collected all types of waste (plastic, paper, tins, cardboard, metal and glass), landfills in District 19 collected all waste products except metal and at District 20 landfills all waste types except cardboard was collected. A similar study conducted by Schenck et al. (2012) recorded the products mostly collected at landfill sites to be paper, plastic and metals, indicating that the variety of products being recycled are definitely increasing.

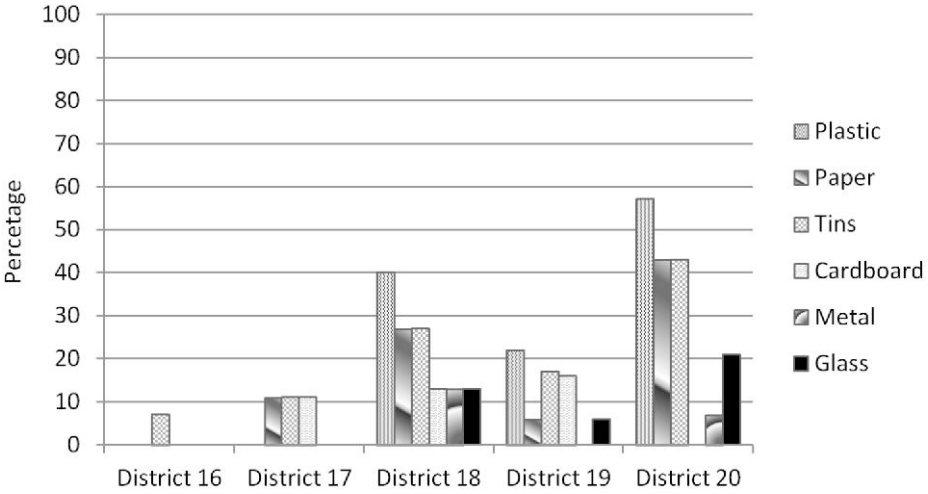

Figure 3: Types of waste collected for recycling per district

4.4 Burning of waste

In all the districts investigated a percentage of the landfill sites burn waste on site; a practice prohibited by the air pollution control legislation (Table 1). Burning of waste was performed by either the waste pickers or the municipal workers. At several landfill sites old incinerators were still being used to burn waste. This causes extensive air pollution, which is a health hazard to the poor communities living on or very close to these facilities. At 63% (5) of the landfill sites in District 17, most waste was being burnt whereas in District 18, the lowest percentage of waste burning took place at 13% (2). Figure 4 indicates that at

4.5 Waste pickers living on landfill sites

In all districts there were some community members living on the landfill sites. At 6 (40%) of the landfill sites in District 18, there were waste pickers living on the sites (Table 1). Some individuals were living under temporary structures made of cardboard boxes or black bags. One community of between 60 to 70 families were living on the edge of one of the landfill sites and the whole area behind their living structures were covered with collected waste for recycling. A stream of run-off waste water was dammed up in close proximity of the houses. A serious fly problem was also observed in the area.

5. CONCLUSION AND RECOMMENDATIONS

Should the so called “Landfill sites” in the Free State Province be classified as such or should they simply be called dump sites?

When compliance to the Minimum Requirements for Waste Disposal by Landfill (DWAF, 1998) is used as a guideline to determine the answer to this question, then all waste disposal sites in the Free State Province are dump sites. The handling and disposal of solid waste in the different municipalities in the Free State Province remain serious problems to the community and impacts negatively on the environment. Correct waste handling practices should be enforced on the landfill sites as some of the waste is dumped at the gates of the landfills due to no access control and this may be overcome by training all municipal workers on site to segregate the waste.

As very limited recycling is taking place the municipalities should assist community leaders to establish recycling forums and committees of community members who could be trained to effectively start recycling processes for financial gain of the community members. The municipalities should take a recent study done on job creation in the waste sector and the role of the waste pickers into account to identify strategies to improve the levels of recycling, and to identify the most viable products for recycling and to establish markets for the selling of the products suitable for recycling (Schenck et al., 2012).

No person should be living on a landfill or dump site. Alternative arrangements should be made to assist community members living on landfill sites to find more suitable accommodation. Municipalities must get actively involved and the housing sections should prioritize the provision of housing for all community workers. If the recycling processes can be structured by the municipalities by providing training to waste pickers it would maximize the recycling, and the waste pickers could sell their products and afford accommodation. The relevant municipality should negotiate with the recycling companies who remove the recycled products to collect on a more regular basis which would allow the waste pickers to leave the waste sites as they would not have to guard their products from being stolen.

Burning of waste on landfill sites should be prohibited. At some sites tyres were burnt and the smoke causes severe air pollution. The old incinerators which are still found on the landfill sites should be removed and the landfill sites should be cleaned up. Municipalities should adhere to the air quality legislation and if they do not comply, the inspectorate responsible for air quality monitoring should prosecute the municipalities who contravene the legislation (South Africa, 2004).

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