ATTITUDES AND BEHAVIOUR OF LOW-INCOME HOUSEHOLDS TOWARDS THE MANAGEMENT OF DOMESTIC SOLID WASTE IN TAFELSIG, MITCHELL'S PLAIN

BY

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A mini thesis submitted in partial fulfilment of the requirements for the Master of Arts degree in Development Studies in the Institute of Social Development, University of the Western Cape.

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DECEMBER 2004

ABSTRACT

Solid waste management in South Africa has been focussing on the technical issues of waste disposal with little attention paid to the social and economic aspects households. It is important to find out the impact of the attitude and perception of households on solid waste management, especially in low-income areas to be able to deal with the deplorable domestic solid waste management in such areas.

The quantity of solid waste generated in low-income areas is often assumed to be less than the solid waste generated in high-income neighbourhoods. In most of the townships of low-income in Cape Town, the residents live next to mountains of solid waste which is not the case in middle and high income areas. This clearly has a negative effect on the environment and human health.

Tafelsig is one of the low-income Cape Flats townships where the open spaces and green areas are dumping areas. The small yard that people own is often unclean. Could we blame the municipality for poor services, or are the residents of Tafelsig unaware of the impact of domestic solid waste mismanagement?

The aim of the study was to examine existing solid waste management practices and perceptions of households regarding these practices. The study area, Lost City, has an overwhelmingly impoverished population. The overall impression of the area is one of urban decay, environmental degradation and social disorganisation. The open spaces and green areas, intended for recreation, parks and gardens are dumping areas for domestic waste. This study shows that socio-economic factors have contributed to the mismanagement of domestic solid waste. Poor domestic solid waste management is also due to the lack of awareness and technical and manpower problems. The role of local authorities in waste management seems to be invisible in the area. The lack of communication between the councillors and the Lost City community is a barrier to public involvement in policymaking.

Environmental education is important for the community in Lost City. The government, local authorities and other stakeholders in environmental issues should jointly organise an aggressive campaign and environmental education for the community in low-income areas. The community in low–income areas should be involved in policy making. To increase the quality of services the municipality should consider hiring local small and medium enterprises to do some of the tasks of domestic solid waste management.

DECLARATION

I declare that: ***Attitudes and behaviour of low-income households towards the management of domestic solid waste in Tafelsig, Mitchell's Plain*** is my own original work and that all sources have been accurately reported and acknowledged. It has not been submitted before for any degree or examination in any other University in order to obtain an academic qualification

Jules Nshimirimana

Signed:_____ December 2004

THIS WORK IS DEDICATED TO

my daughter Shela Mkatu Nshimirimana

ACKNOWLEDGEMENTS

First and foremost, I would like to offer my sincere thanks to my supervisor Professor Gordon H Pirie for his continued guidance and support.

My sincere gratitude goes to Mr Wynand Louw for his assistance before I get a supervisor.

My grateful thanks go to Mrs P. Kippie and Mr L.L.A Scheepers both from Institute of Social Development, UWC, for their assistance, support and encouragement.

My grateful thanks also go to my wife Zoleka M Mkatu whose sacrifice love and support gave me strength while I was writing this thesis.

A note of thanks to my friends, especially Mr Sebastien Ndimubenshi, Mr Elie Bagona and Mr Sylvestre Lyantagaye for their moral and financial support and encouragement.

Thanks to Ms L.Teegler who translated the questionnaire from English to Afrikaans.

Thanks also to the respondents for their participation in the study. Without their cooperation in this research would not have been possible.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER ONE

WASTE AND ITS TREATMENT

"An important way of reducing the impact of our consumer society on our environment is through recycling, which we, as consumers, must help to make work."(Bunyard and Grenville, 1990)

1.1. Introduction

Human activities produce liquid, solid and gaseous waste. Solid waste can take a variety of forms and is generated by a wide range of sources during diverse social, economic, and industrial activities. The generation of solid waste is a serious problem in developing (third world) and developed countries (first world). Rapid urbanization leads to a densification of and an increase of the human population and activities in cities. This translates into the production of very large amounts of solid municipal, household and litter waste within a concentrated area. The natural environment has a limited capacity to absorb this waste. If the natural environment cannot absorb and process generated waste increases, environmental pollution and the degradation of the natural ecosystem usually follows.

In most societies, both developed and developing local governments are usually the responsible structures that must grapple with the various stages and aspects of solid waste; from the initial phase of waste collection, up till the last phase of the disposal of waste. In many developing countries the management of solid waste is poor (Raj, 2000) if compared with the developed countries. The reasons include financial limitations that lead to a lack of adequate operational budgets, and subsequent lack of technical expertise for solid waste management planning and operation. The infrastructure to collect and treat solid waste is extremely expensive. In some cases poor countries succeed in purchasing expensive machinery, but they do not have the capacity maintain it (Raj, 2000; Cairncross

and Feachem, 1996). Third World cities are faced with an inability to manage solid waste from the point of generation to the point of disposal, transforming these cities into so-called garbage cities. An example is Nairobi. Seven years ago research seems to suggest that the majority of its inhabitants had no regard for its beauty and appeared to be able to live helpless amidst a growing mountain of urban waste (Mwanthi and Nyabola, 1997). As a result, sanitary and environmental conditions are deplorable. A general lack of involvement, public awareness and information amongst inhabitants about the importance of proper urban waste management seems to be the main reason for widespread littering.

1.2. Definitions and dimensions of waste

Familiar solid waste comprises food and vegetable waste, paper and plastic, cartons, and morning newspapers. Whereas unfamiliar waste includes bottles and canes, plastic toys, old tyres, sofas, rubber tyres and even junked automobiles (Goldstein, 1969).

Waste is categorized according to the sources from which it emanates. The common categories are industrial waste, domestic waste, commercial waste, and institutional waste. Domestic waste is composed of kitchen waste, paper, packing material, old cloth, furniture and sewage, and obsolete smaller items such as broken crockery, and ash. Domestic waste is composed of two main categories of waste known as sewage and solid waste. In this dissertation, the study concerns only use of the domestic solid waste. Domestic waste probably differs according to household income. In low-income areas the existence of small workshops means that industrial waste is added to household waste (Baud and Schenk, 1994).

1.3. Waste management

The European Council defines waste management as the collection, transport, recovery and disposal of waste, including the supervision of such operations and

after-care of disposal sites (Pongrácz, 2002). In the South African context these functions have long fallen within the job description of local authorities. It is thus of utmost importance that these authorities develop the necessary managerial capacity to deal with this challenge.

For the purpose of this research (effective) waste management is operationally defined as the collection, transport, and recovery-disposal of waste. These are three related activities with the effective management of waste. They can be construed as interlocking links in a chain.

In the past waste generated by human activities was disposed of in a wide variety of ways. It was heaped and burnt, strewn around or buried (in rivers, gully or in the veld). There was no agreed uniform system of waste collection, because little or no attention and importance was attached to the proper management of waste. The collection of waste is regarded as the crucial first step in the chain of waste management. It is a labour intensive phase and therefore also the most expensive one in the waste management process (Raj, 2000)

The transport of waste differs according to cities and countries. Collection vehicles range from trailers to specialized trucks equipped with waste compacting mechanisms. These trucks are expensive and not available to many cash-strapped authorities. The latest mechanized infrastructure to collect and treat solid waste is extremely expensive, and often beyond the reach of developing governments and cities with a very narrow economic bases (Raj, 2000). As a result these poor cities turn into heap of garbage.

Currently, because of global population growth in the world, cities increasingly have to deal with an acute shortage of usable land to dispose waste. This inevitably creates the problem of where to dispose the growing volume of waste in a shrinking environment. This dilemma is faced by cities in both developing and developed countries, although the problem is bigger in the case of the latter.

1.4. Solid waste mismanagement

The mismanagement of waste has serious consequences. It impacts negatively either on people's immediate home environment or on the wider environment and ecology, or on both. The main causes and reasons for solid waste mismanagement are financial problems, poor public awareness and education, social and cultural problems and lack of community participation.

Waste management requires appropriate and up graded modern material and infrastructure which cost a lot. Developing countries are facing financial problems. Usually, municipal fees do not cover the operational costs of waste management services, and the available fund from the central budget is insufficient to finance adequate services to all segments of the population. In the developing communities solid waste services have suffered neglect and low prioritization compared to other municipal services (Baud and Schenk, 1994; Poswa, 2000). Financial problems undermine the proper management of waste especially when it requires a high level of knowledge and expertise as in the case of waste separation, (e.g. in biodegradable and non-biodegradable lots) and recycling (Ezeronye, 2000). However, finance alone is not a solution to the problem; the awareness and education are also crucial elements for waste management. Populations have to be made aware of the impact of waste mismanagement.

Illiteracy is high in developing countries and waste management education occurs mostly in informal ways. Life styles and value systems, aspirations and behaviors, and level of education can play an important role in mismanagement of solid waste. Lack of general public awareness of waste management is result of high levels of commingled waste and littering. Since people are not aware of disposal mechanisms, they simply throw all the waste together in un-segregated form. Fruits like oranges, mangoes, peas are eaten and the seeds and fruits remain litter in the streets. Banana peels, corn husks, and nutshells are scattered all over cities as residents simply throw them away any where any time (Onu, 2000). Through

the knowledge of waste management the population will be able to practice recycling. The principal driver for adopting a recycling philosophy is poverty. Waste scavengers collect recyclable materials from dumpsites and sell it to industries that prefer recycling because they want to save energy and foreign exchange for the importation of raw materials (Kaseva *et al*., 2001). The fact that people recycle waste because they are poor is not a proper recycling behavior. The communities collect recyclable materials as a mean of income to survive not because they are aware of the importance of waste recycling. The communities could be made aware to understand that waste can be transformed into useful products. That knowledge will lead the communities beyond their social and cultural behaviours.

Because waste is culturally defined and considered by households as filth and to be little value, the work of waste collector is also generally viewed as a low status job in Africa (Mwanthi and Nyabola, 1997). It is often argued that because of a social disregard for the work done by waste handlers the quality of the work delivered will be poor. The social and cultural situation of a community works hand-in-hand with community participation.

Most of the time policy makers or local authorities don't involve the local communities in designing developmental programme or projects. However, the participation of the beneficiaries, i.e. the households, in most social or public programme or projects, is now generally accepted as a prerequisite for the ultimate acceptance and sustainability of such programme or project (Midgley *et al.*, 1986). Therefore the sustained success of a waste management system cannot be achieved without a willingness of the local authority to involve beneficiaries in the initial design of system as well as willingness of the public to use it. In developed countries there is greater responsibility and participation of householders in waste management, whereas in developing countries this is not the case (Palmer Development Group, 1996).

1.5. Hazards of waste mismanagement

Poor waste management and illegal waste disposal of sometimes dangerous material exposes people to serious health problems and causes environmental degradation, which in turn has a direct bearing on human health. Waste can promote water pollution if rain-washes debris out of piles of waste and into surface and ground water (Cairncross and Feachem, 1996). The waste dumped in open street drains and waterways can cause flooding. Uncovered piles of rotting refuse and flies may play a role in the transmission of faeces and thus of faecal-oral disease. Mishandling waste provides niches for disease vectors such as mosquitoes, rodents, houseflies, and cockroaches (Mwanthi and Nyabola, 1997). Rats breeding in and around refuse near residences may promote a variety of diseases including plague, leptospiroses, flea-borne typhus, ratbite fever, and salmonellosis. Most sites used by illegal dumpers are easily accessible to people who live in the neighbourhood. Children who handle waste while playing are the most at risk and are particularly vulnerable to the associated health risks. It is a serious problem today with the existence of HIV/AIDS because some hospital waste and also drug used needles are illegally dumped. Also mismanagement of waste causes a lot of physical injuries from glass, rusted metal edges and nails. Wounds caused by such items often become infected.

1.6. An overview of global solid waste practice

Historically, people have simply covered up the refuse of life with dirt, or dumped it where it was out of sight and out of mind. Through our activities we produce more waste than ever before without having enough space to put it, and so old habits are coming back to haunt us (Switzer, 1994). The emphasis has been on waste elimination, with little thought given to controlling the generation of waste (for example the use of attitudes, behaviour, income and climatically conditions factors) during the first quarter of the twentieth century. The institution most directly connected to production of waste process is the economic institution e.g.

factories. Political institutions influence distribution of goods and services in society. Political and economic institutions are designed to increase rates of economic growth to support an increase of standard of living. Economic growth refers to an increase in the capacity of the economy to provide goods and services for final use (Cable and Cable, 1995).

Urbanisation leads to increased population densification and urban activities in cities and generates a variety of forms of solid waste. These are produced according to the population need and the state of the economy. Growth of economy leads to increase in demand. This means that industries will produce more to meet market demand.

In order to offer goods and services institutions like schools and Universities and hospitals need materials like papers, instruments and medicines. The moment these items are unusable they become refuse known as institutional waste. Commercial activities like banks, hotels, retail shops, restaurants and supermarkets generate the commercial waste.

People in their homes generate domestic solid waste composed of elements mentioned above. This category is the mixture of the waste from goods and services produced by institutions, commerce and industries.

1.6.1. Global solid waste management

In the past, dumping and burial have been the most used method to treat municipal waste because the generators were often unaware or unconcerned about the potential effects of hazardous waste. Communities in the developed world realised that dumping and burial of waste could cause many problems and they developed other techniques to treat and manage the waste. The most common techniques were landfills, incineration, composting and recycling (Cable and Cable, 1995).

1.6.2. Collection and storage of waste

The collection of solid waste involves storage at the place of generation and transport to the point of disposal. Collecting municipal waste costs three times more than disposal (Baum and Parker, 1973). The transport of refuse to disposal sites is done using vehicles ranging from tractors and trailers to compactor trucks. The collection of refuse is completed through the private contracts or the municipal services. Many countries have been using a combination of many techniques for collection and transport to the point of disposal and disposal itself. Success is possible if the producers of waste, the collectors, the equipment operators and the managers are educated or trained.

1.6.3. Incineration

Incineration has been used successfully in many European countries, and has been accepted as a disposal method. It is considered the most sanitary and economical method available as it produces minimal levels of visible emission and generates electricity as a by-product. It is also considered one of the most effective ways of dealing with hazardous wastes (Switzer, 1994). However, European countries have used incineration but most waste is treated in landfills. In broad-spectrum incineration has not been used in developed countries. For example incineration was a failure in United States of America as the government could not convince the population and policy makers that it was an effective disposal method. The incineration method was considered as a producer of gas and smoke emission because the waste was not completely burned when furnace temperatures were lowered to save on fuel consumption. These incinerators were built by inexperienced companies and could not upgrade the incineration at that time. The cities concerned with the air pollution began legislating against incineration because it was the source of pollution. The technology which could be used to increase the efficiency and reduce the pollution was available, but at a cost higher than disposal in sanitary landfill (Switzer, 1994).

1.6.4. Disposal: burial and landfills

The most common way of disposing municipal waste has been burying it, but it caused a lot of environmental problems. To avoid these problems the communities developed sanitary landfill techniques. The landfills accept whatever households dumped. The household waste ranges from food waste, paints and solvents to toxic chemicals that communities daily throw in the dirt bin. During the decomposition of waste landfill produces leachate and vents flammable methane gas that could cause health risk (Switzer, 1994). It can be an advantage if the landfills are regulated because that gas can be recovered and distributed to communities for re-use, or to generate electricity.

The practice of landfill is declining because of lack of land, and also because of more restrictive criteria used to decide where to open a landfill site. Historically, the criterion for selection of landfill was accessibility, but nowadays the health risks which can be caused by the landfill are taken into consideration. The site is accepted only after a lot of studies. Landfill is becoming very expensive because of scarcity of land and the increase of municipal waste and the long distance it must be transported to the site. That is the reason why the policy makers are proposing to encourage the use of recycling and waste recovery and composting techniques.

1.6.5. Recycling

Recycling refers to reuse of materials, a material is recycled if it is used, reused, or reclaimed. Recycling involves returning waste materials to the original process to substitute as a raw material, or to another process as input material (Polprasert, 1996; Switzer, 1994). Sometimes the word recovery is used to refer to the regeneration of valuable material that is considered to be useless for the previous owner. The recycling is done at households or at sites. Recycling could help in

reducing disposal cost or as a source of income. The recycling has been used successfully in developed countries because the education on environmental issue is advanced. For example, the United States of America, the National Environmental Protection Agency mission was to develop an environmental conscious and responsible public and inspire the individual to the sense of respect of the environment. It was its role to educate the youth and adult to increase the environmental literacy (Onu, 2000). In Sweden, the waste disposal firms have extra responsibility of educating the consumers and producers to separate the waste and handle the waste in an environmental manner (Poswa, 2000).

1.6.6. Composting

Composting is defined as: a process for making humus out of heap of decomposing wastes (Goldstein, 1969:23). Composting is one of the techniques used to treat or manage municipal wastes. The composting is also seen as a controlled treatment of garbage and other common wastes, so that hygienically safe end product is the result. Composting is then used in developed countries; it is possible where the recycling and waste sorting is applied. It is a process to be judged successful simply because it treats waste in a manner that destroys the dangerous germs and polluting agents in raw wastes. Composting is a process to return the waste into soil without polluting the environment. During composting the waste is stored in a pile with no odour, no smoke and no flies. It cost less compare with landfill. It also provides a natural resource. It is a good method because part of the waste is used for maintaining the fertility level of the soil. The composting is the alternative method to landfill and incineration

1.7. Overview of waste practice in South Africa

Like any other country, South Africa generates domestic, institutional, commercial and industrial wastes. They differ in quantity and according to area. Historically, management of domestic waste in South Africa has been limited to the safe and cost effective collection and disposal by landfill.

1.7.1. Composition and generation of waste

The quantity and composition of solid wastes vary widely from location to location depending upon, for example, food diet, socio-economic factors, weather, and water availability (Polpraset, 1996:17). South Africa has similar waste composition and waste generation to other developing countries. According to the research done in Milnerton, Cape Town, waste generated by the middle class is as follows: The quantity produced by one person per year ranges from 81kg to 520kg, the average is calculated to be 288kg. The waste composition is as follows: glass, metal waste, plastic, paper and other waste composing general wet and dry kitchen and household waste (Law, 2002). The existence of plastic is so visible that an environmental journalist ironically dubbed it the “national flower" (Yeld, 2002). Plastic waste is like decoration. To protect the environment against the threat of plastic waste, and boost recycling, an agreement on plastic management was signed between the minister of Environment and Tourism, Chairman of the Plastics Federation of South Africa and COSATU in 2002. Ever since, South African shoppers have had to pay for their plastic grocery bags and other check-out plastic packets. That agreement was for a campaign around plastic bags and raising awareness of environmental protection. South Africans are increasingly aware of waste management and how litter pollutes our living spaces (Cape Argus, 18 October, 2002).

Waste composition in South Africa is influenced by income level, geographical location and seasonal condition. In high-income places the waste is mostly

composed of paper, plastic and organic in their waste stream. In low-income areas ash and soil represents a large proportion of the waste stream because households use fire for energy and the front-end loaders tend to pick up significant amount of soil when scooping up random heaps of rubbish. Geographically, locations influence waste composition and quantity because of the variation of climate and different resources arising in that location. For example, the people of Gauteng use more coal as a source of energy than in the Western Cape (Palmer Development Group, 1996).

Table 1.1 Production of solid waste by country (millions of tons)

Country	Population (millions)	GNP per capita (in $)	Solid waste (millions of tons/year)	Solid waste (tons/capita/ year)
USA	249.22	21,039	230.1	0.92
Canada	26.52	20,222	18.1	0.68
France	56.14	17,052	30.2	0.54
Japan	123.46	23,072	53.2	0.43
United Kingdom	57.24	14,669	22.0	0.38
Germany	77.57	19,633	21.0	0.27
Chile	13.17	1,808	2.3	0.17
Brazil	150.37	2,952	22.7	0.15
Peru	21.55	1,543	3.0	0.14
South Africa	35.28	2,514	4.2	0.12
Algeria	24.96	1,957	2.6	0.10
Nigeria	108.54	262	7.7	0.07
China	1,139.06	374	76.6	0.07
Ethiopia	49.24	124	1.3	0.03

Source: Adapted from Onu, 2000

The higher the Gross National Product (GNP) of a country, the higher the production of waste (Table 1). The solid waste generated is composed mostly of

luxury goods and wastes such as paper, cardboard, glass, plastic and heavy organic materials. Developing countries produce less waste per capita than developed countries. For example, Nigeria has a population of more than 108 million and produces 7.7 million tons per year whereas Germany with a population three quarters as big (78 million) produces three times as many per year. The size of population does affect the production of solid waste but the impact is weak (Onu, 2000). The impact of GNP and population size on waste production can assist understanding that the low income areas produce less waste than high income areas. The consumption in developed countries is more less the same as in high income areas in developing countries. In developed countries the necessity becomes a luxury good in developing countries which are consumed by high income areas. In South African context these luxury goods are necessities in high income areas.

1.7.2. Storage and collection of waste

The storage and collection of solid waste in South Africa does not differ from other developing countries. In South Africa, solid waste in the household yard is stored in plastics bag or bins until the collection day. Residents in low-income who are using plastic bags are given six plastic bags per household, provision of a minimum of one refuse bag to be used on weekly basis (Otieno and Kgaogelo, 2000). In some areas, the residents dump some of the waste when refuse bags become full before the collection day; others dump demolition debris because there is no free collection service for that and because it could cost them a lot of money if they hire a truck to transport that waste. The waste is not sorted out (separated), so the plastic bag or bins will be filled with all types of domestic solid waste.

Domestic waste collection in South Africa is once a week by appropriate vehicles of the municipality or private company. The plastic bags or bins are placed in front of the yard where the waste collectors will pick up and put in truck compressor which transports them to landfills. In some places that are highly

populated the waste collection often result in a twice a week. In South Africa, the waste is collected according to category of waste in areas where the population separates the waste. For example, newspaper and garden waste are collected once a month (Tworeck, 1979). In the areas where the truck can not access especially informal settlement, Kerbside or a big container collection system is placed in a strategic place and collection is twice a week (Morkel, 2000). One of the areas where this system is used is Khayelitsha. Khayelitsha site C is situated along the northern of False Bay about 25km southeast of Cape Town, covers an area of about 3 190 ha. According to the research done by the Palmer Development Group (1996) in Khayelitsha, the findings were that the residents in formal sites do not want the skips to be placed in certain places like near the houses because infrequent collection is exacerbated by unhygienic waste such as dead animals being placed in the skips. The skips were moved from some places and relocated to other places, but then illegal dumping occurred in the place where the skips were placed previously. The services reach only about 75% of the population.

1.7.3. Landfills

Landfill is the major method of disposal of domestic waste in South Africa. Usually, the distance from site of collection to landfill is approximately 7km. The landfill method has been used for long time but with a lot of problems. In 1993, it was estimated that 12 million tons of waste were disposed in South Africa's landfill, but it is estimated that only one in ten disposal sites in South Africa is properly controlled and audited. These sites were not all issued with permits: only 20 per cent of the total landfills are classified or permitted landfills (Palmer Development Group, 1996).

1.7.4. Recycling

Steyn and Dlamini (2002) reported that recycling industries in South Africa have been characterised by notable failures. The quantity recycled was estimated to be

25 per cent of the waste generated. Although plastics' recycling was introduced for the first time in the world by South Africa 30 years ago, and the plastics recycling industry showed that it is extremely competitive sector, the industry is still underdeveloped. The main problem is the irresponsible social attitude of the community. Although plastic is always seen in the waste, the research shows that recycled plastic is estimated to account for more than 30% of actual packaging polymers used in the country.

In general the recycling in South Africa is not successful, and 3 major recycling plants have been closed down for reasons of being economically unviable (Steyn and Dlamini, 2002). It is not easy to determine the quantity collected because the waste collection for recycling is done informally and sometimes by scavengers from landfills. Also, the Green Saves scheme in Durban which attempted the formal collection of recyclable waste failed (Palmer Development Group, 1996), probably due to the same reasons. Recycling can play an important role in saving the environment; it helps to save natural resources, energy, water and money. The studies done show that 80% of the waste produced is re-usable and recyclable (Rose Foundation, 2004). It would require the participation of everybody in recycling activities from home. In low income areas recycling is not in practice.

For example in Khayelitsha, there is no formal recycling initiative operational in the area. The Fairest Cape Association was involved in attempts to establish a recycling operation. Khayelitsha Environmental Action Group was starting to educate the population about recycling and to understand that waste is part of everyday life. The community still needs to be aware of the use of waste and aware of the impact of waste poorly handled. The bins were also used for washing clothes, and were considered as a good water container.

1.7.5. Composting

The composting of municipal waste and more particularly organic waste is not practiced widely in South Africa. The composting could help in reducing dumping costs. The literature shows that the major benefits from composting are income generation and saving dumping fees. Composting makes economical and environmental sense and recycles up to 40% of the domestic waste stream (Des Ligneris, 2000). Composting is undertaken by few local authorities, but tends to be undertaken to save landfill space rather than because it is economically viable.

1.8. An overview of waste practice in the Cape Town Metropolitan Area

Cape Town, like other cities and municipalities in South Africa, faces an immediate problem of rapidly decreasing landfill space due to the mandated landfill closings and new environmental regulations which require proper design, construction and operation of landfill. The landfill space is disappearing when the quantity of waste generated is increasing.

1.8.1. Composition and generation of waste

The composition of waste in the Cape Metropolitan Area is dominated by the common categories of waste; these include paper, glass, metals, plastics and organics waste. This composition of waste appears in waste generated in the low, middle and high-income areas. Based on the records, the quantity of waste produced per annum is equal to 2.05 millions tons included wastewater treatment plant sludge estimated to be 1.80 millions tons.

The residential waste generated is estimated to be 0,73kg per capita per day in low-income to middle-income areas. In upper middle to high-income areas, the figure is 1,3kg. The population-weighted average of the residential waste

generated is estimated to be 0,83kg per capita per day. The per capita generation rates increase over time (Brantner *et al*, 2000).

1.8.2. Storage and collection of waste

In the Cape Metropolitan area, the collection of solid waste is performed largely at curbsides by means of compaction collection trucks. The waste collection is performed directly by the municipality or the private waste haulers. The mixed waste and garden refuse are collected using black bags or standard size dirt bins.

1.8.3. Landfills

Within the Cape Metropolitan area there are seven landfills. The Cape Metropolitan Council own six landfills and one is owned by EnviroServ and Wasterman (Brantner *et al*, 2000). Two of these landfills have a permit and receive general and hazardous waste for disposal whereas other landfills received only general waste for disposal. The waste collected is hauled directly to a nearby landfill site for disposal because many of existing disposal sites are relatively close to the points of waste generation.

1.8.4. Recycling

There is no aggressive recycling program in Cape Metropolitan Council. The recycling of material from residential and commercial wastes is done largely in an informal way. The recycling figures show that 485,000 tons per year of recycled or reused material. Of this, 60% is recycled industrial waste, 18% is recycled residential and commercial waste, 14% is beneficially reused waste water sludge (Brantner *et al*, 2000). The recycling of domestic and commercial waste is driven by extreme poverty. Retrieval of recyclable material from waste is unorganised

and conducted in unsafe and healthful conditions. The scavengers could be seen as only people doing the recycling.

1.8.5. Composting

The volume of composted municipal waste is approximately 41,000 tons per annum. This composting is done at three composting facilities in Cape Metropolitan areas. These facilities are located in Bellville, Parow and Mitchell's Plain. The total composted waste is estimated to be 8 per cent of the waste collected in Cape Metropolitan areas (Brantner *et al*, 2000). This percentage suggests that composting is still on a low level in Cape Metropolitan.

CHAPTER TWO

THE STUDY

2.1. Introduction

In this chapter the overall evaluation for the study is presented. When conducting an evaluation a certain sequence, described as the evaluation process, is followed (York, 1982; Grinnel, 1985). This sequence involves the following steps: site specification, formulation of research problem, research aims and objectives, discussion of research significance, sampling, data collection and analysis

2.2. Site

This research was done in Cape Town Metropolitan. The specific area that this study specifically focused on is Mitchell's Plain, a vast residential and dormitory city that grew out of apartheid ideology and subsequent planning.

2.3. Cape Town and the Cape Flats

The Cape metropolitan area is the most rapidly growing urban complex in South Africa, due mostly to a sharp escalation of in-migration over the last decade. The Cape metropolitan area consists of approximately 2, 9 million people (South Africa, 2001). Its spatial and geographical development has been influenced by topography and oceans, as well as apartheid ideology. This has led amongst other things, to very little residential integration in this area and this is still evident in the racial compartmentalization of its suburbs.

The Cape Flats refers to a flat, sandy area of approximately 40,000 ha. The Cape Flats lie along the False Bay coastline and form the buffer of the Cape Metropole. During apartheid the state used the Cape Flats as a dumping ground for African and more specifically “Coloured” people.

Cape Flats residents are from widely divergent racial, ethnic, social class and language backgrounds. The quality of life (physical, material and social) of the majority of the communities living on the Cape Flats is extremely poor. They are faced by a variety of socio-economic problems. Some of the most serious and common are unemployment, high levels of crime and public violence, substance abuse, uncontrolled and unplanned urbanization and squatting, and serious levels of overcrowding of existing housing. These elements help to create a systematic deterioration of physical infrastructure in the area. For example, they reduce the accessibility to services delivery, increase littering, cause inadequate health services and social disorganization.

Specific residential pockets within the Cape Flats area often experience a breakdown in services and normal functioning and at times display signs of normlessness or social alienation.

Workers situated far away from the important business, commercial and industrial concentrations of the Cape Metropole have to commute long distances at great expense, often with inadequate transport systems.

The Cape Flats consists of townships with a total estimated population of 1 million (South Africa, 2001). The majority consist of African and coloured people. They live mostly in three massive townships, namely Mitchell's Plain, Blue Downs/Delft and Khayelitsha. Houses are usually small and overcrowded due to a historically serious and massive housing shortage. Khayelitsha, Blue Downs and Delft are predominantly settled by African and coloured households, and have a combination of formal houses and informal houses. Some formal houses are unplanned, rapidly built and temporary structures.

Mitchell's Plain is the large "Coloured" township built on what used to be sand dunes. It is approximately 20 years old and was created to house people in middle-income groups, but it has since been extended to accommodate low-income groups. The population increased most sharply after 1994 because of unrestricted movement to Cape Town from the previous Bantustans (whose rural economies had collapsed, resulting in serious levels of unemployment).

2.4. Tafelsig

Tafelsig is one of several residential zones in Mitchell's Plain. Tafelsig is a relatively new district and caters for low-income households (see p106). The population consists of "Coloureds", who are in the majority, and "Black".

Tafelsig consists of formal and informal housing developments. Lost City is an area within Tafelsig and comprises a development of Reconstruction and Development Programme (RDP) houses. These dwellings are referred to as "4x4's", the ironic colloquialism for low-cost houses which are "just four walls and door" (Sunday Times, 20 September 1998).

The RDP housing scheme in Lost City is the research area for this study. The area is an impoverished low-income area and is littered with domestic and other solid waste, is generally unclean, and is clearly in need of an effective waste management system.

2.5. Research problem

As is the case in other developing countries, South Africa faces a problem of solid waste management, especially in low-income neighbourhoods and in the so-called informal settlement areas. Experience has shown that waste management practice in South Africa, as in most developing communities, has focussed on the technical issues of waste disposal with little or no attention paid to the social and economic aspects of households (Poswa, 2000:9). Planners did not consider these elements as an integral part of planning when designing a domestic waste management system.

Against this background, this research project problematizes the attitudes and behaviour of low-income households towards domestic waste. Given the

mountains of waste that are accumulating in our suburban landscape, it has become vitally important to discover to relatively impoverished households' thinking, attitudes and behaviour towards their domestic waste and its management.

2.6. Research aims and objectives

The proposed research sets out to investigate how households residing in a low-income neighbourhood (Tafelsig, Mitchell's Plain) view domestic solid waste and its management. The study explores the perceptions, attitudes and behaviour of these households towards the production and management of solid waste. Issues relating to the degradation of their environment and to solid waste mismanagement were also examined.

The specific objectives of the research were to:

- Examine prevailing attitudes towards and perceptions of domestic solid waste generated by households, and the existing practices regarding the storage and management of such waste by the concerned households
- Investigate the quality of solid waste management services rendered by the local authority in Tafelsig, as perceived and evaluated by the members of households
- Establish some of the main causes of solid waste mismanagement in Tafelsig
- Offer recommendations and guidelines to the community, the local authority, policy makers and other interested parties regarding improvements to existing solid waste management policies and practices in Tafelsig, as well as in comparable suburban environments.

2.7. Research significance

This study is of significance at the national level as well as the provincial/local level. At the national level, this study will assist the government, as well as agencies and NGOs that are working to improve solid waste management, to get a clearer understanding of what is actually happening in low income community. At the provincial/local level, the findings of this study will enable policy makers and implementers to gain a clearer understanding of the attitude of the low-income community towards domestic solid waste management, and to the constraints and challenges that the low-income community face.

2.8. Sampling

A sample comprising 160 respondents (approximately 10% of the estimated total population) to be interviewed from low-income community in Lost City was determined in advance. It was planned to interview 30 standard ten pupils residing in Lost City and schooling at Lost City High School but the number of standard ten pupils was very insignificant (5 pupils only) and the group was dropped. Of the remaining 130 respondents, 123 adult responded to the questionnaire. A non-probability sampling procedure called purposive sampling was utilized to select the respondents.

2.9. Data collection and instruments

The study used a blend of qualitative and quantitative data collection techniques. The quantitative mode of inquiry is related to the numerical measurement of selected variables (Neuman, 2000). Qualitative methods were used to

contextualize the interpretation of statistical data and to obtain more sensitive and socially dynamic information relating to the study (Babbie and Mouton, 1998). The questionnaires were used to solicit relevant information about respondents' perceptions, attitude and behaviour towards domestic solid waste management. Closed-ended and open-ended questions allowed respondents to express the problem under study (Neuman, 1994). The questionnaire was printed in English and Afrikaans to put respondents at ease.

A survey is very useful in eliciting a wide range of information from the study population in short period of time. All surveys aim to describe or explain the characteristics of a specific population, such as socio demographic conditions (e.g. age, sex, education, income) people's behaviour, practice, social and economic circumstances and people's attitudes and opinions (Burns, 2000). Schnetler (1989) notes the advantages of quantitative research using the survey method. The systematic nature of the procedure ensures specificity, logicality and formality in the research process. This allows for an unbiased selection of a sample of the population under investigation so that the data are representative of this group. This method will also facilitate access to the maximum amount of data while ensuring efficiency in terms of time and financial resources

For the purposes of the survey, unstructured interviews and questionnaires were used to collect information from the respondents. Hall and Hall (1996) state that social surveys designed to obtain information through questionnaires are widely recognized as a standard method of data collection. Furthermore, a survey addresses the issues of reliability of the results by the same method, which increases confidence in the finding related to the question of reliability and validity. In a survey, the samples are representative of the general population and the findings are normally statistically significant (May, 2001).

A limited number of interviews were conducted with significant actors in this field. Amongst these were the councillors representing Tafelsig in the local authority, the line manager of Cleansing Department in Mitchell's Plain, and five

waste collectors working in truck teams in Lost City. Interviews were guided by a semi-structured questionnaire. Interviews helped the researcher to capture the views of the municipal employees and the local authority about household waste management.

Primary and secondary documents from government and private sources were consulted in order to explore approaches and strategies that are used to tackle the problem of domestic solid waste management problem. Data were collected using a questionnaire that the heads of the households were required to respond too

2.10. Data Analysis

The collected data was categorized by coding, excluding the responses to open-ended questions. In this process, the raw data were transformed into numerals to facilitate counting and tabulation of the data. Second, the organized data was entered into a computer and simple frequencies were calculated to make sure that all the answers to each question fell within the coding limit. Third, simple tables and cross tabulations were constructed so as to examine the relationships between variables.

CHAPTER THREE

ATTITUDES AND BEHAVIOUR TOWARD DOMESTIC SOLID WASTE MANAGEMENT IN LOST CITY

3.1. Introduction

This chapter deals with the investigation of how low-income households in Lost City view domestic solid waste and the management of such waste. The study analysed the survey data, solid waste practices and perceptions of households. Furthermore, the study investigated the link between behaviour, practices, perception and mismanagement of domestic solid waste in Lost City. The findings are presented in a sequence that involves the following sections: demographic information, knowledge of domestic solid waste, domestic solid waste management and finally behaviour toward waste.

3.2. Survey results and interpretation

This section deals with the findings of the study in two broad ways. First, the profile of the respondents of the study is presented. Secondly, there is an analysis of the factors that influence the attitudes and behaviour of the households towards domestic solid waste management in a low-income area.

The survey results are based on the mode as an appropriate measure of central tendency for the data collected in this study. The mode shows the most typical response as an answer of the majority of respondents to a particular question. (Babbie and Mouton, 1998)

3.2.1. Demographic Information

Demographically the sample of population selected in Lost City was aged between 25 and 71 years. The majority of that population is between 41 and 55 years old. This population is still economically productive. The surveyed population is mostly married, with 15.4 per cent divorced people, which can be considered as high rate. So called “coloured” people are in the majority with very insignificant number of African and Indian people.

The population has a low level of education. More than half have less than standard seven, whereas the majority (84.6%) have attained less than standard nine. Low levels of education leads to a high rate of unemployment and fertility (Todaro, 1992). Due to a low level of education the residents of Lost City work in factories and earn low wages which is less than R4000. Lost City is indeed a low-income area.

In terms of housing, the majority of the residents in the area are the owners of the houses and have lived there for a period between ten and 13 years. The houses are very small and occupied by big families. The family size varies between one and fourteen peoples.

Table 3.1 Age of the sample population

Age group	Frequency	Percentage
25-40	48	39.0
41-55	62	50.4
56-70	12	9.8
71 and more	1	0.8
Total	**123**	**100**

The survey results demonstrate that 39 per cent of respondents are between 25 and 40 years, 50.4 per cent (the majority) are between 41 and 55 years, 9.8 per cent aged between 56 and 70 years and 0.8 per cent are 71 years and more. The result indicates that the majority of the adults (89.4%) are economically active aged, between 25 and 55 years.

In terms of gender of the sample population, the majority of respondents were female (65.9%) and only 34.1 per cent were male respondents. Women were more available at home during the times the researcher was collecting the data. The findings about gender could be a good sign for waste management. According to research, women are most involved in waste management in Hong Kong and that attitude is decisive in the success of the source separation of household waste and other recycling related activities (Chung and Poon, 1995). There is no difference between that attitude of women in Hong Kong and South Africa; women are most involved in household waste management. The men are visible in waste management at a municipal level where they are paid employees.

The findings revealed that the sample population was composed of 66.7 per cent married people, 15.4 per cent divorced people, 8.9 per cent single, and 8.1 per cent widowed people and 0.8 per cent cohabiting. The data show that the majority live as a couple or as married people.

The racial composition of the sample population reveals that the respondents were predominantly “coloured” (98.6%). Indians and Africans comprise less than 2 per cent of the population sampled

Table 3.2 Education levels of the sample population

Standard	Frequency	Percentage
None	1	0.8
Sub A- Standard3	16	13.0
Standard 4-5	21	17.1
Standard 6-7	38	30.9
Standard 8	23	18.7
Standard 9	7	5.7
Standard 10	15	12.2
Post matric	1	0.8
Diploma	1	0.8
Total	**123**	**100**

The data shows that the majority of the respondents are below standard ten level of education (86.2%).

The economic situation in Lost City does not allow the youth to continue their studies. They are required to generate and contribute income to the family. It is argued that pupils from the poor families are the first to drop out because they need to work and the first to be pushed out because they fall asleep in class as a result of malnourishment. The children from poor families are therefore more likely to drop out during early years of schooling (Todaro, 1992; Sharpley and Telfer, 2002). The fact that the majority of the youth is not properly educated contributes to the poverty situation in the Lost City area.

Table 3.3 Monthly income of the sample population

Income (In Rand)	Frequency	Percentage
Nil	23	18.7
101-1000	40	32.5
1001-2000	42	34.2
2001-3000	9	7.3
3001-4000	5	4.0
4001 and more	4	3.3
Total	**123**	**100**

Income: With regard to income levels, the majority of the respondents (85.4%) earn less than R2000 per month. The remaining 11.3 per cent earn between R2000 and R4000 and 3.3 per cent earn between R4000 and R10000 (Table 3.3). The data indicates that the Lost City community can be categorised as a low-income community.

Housing: The majority of the respondents (83.7%) are house owners, whereas those who are renting from council are 11.4 per cent and the remaining 4.9 per cent represents those renting from a landlord.

The majority of the Lost City residents have lived there between 10 and 13 years. Those who have been there for less than 10 years comprise 26 per cent and represent the people who are new in the areas, some of them renting from property owners. Based on the observation that most of the residents are staying in their own houses (which suggests that the area could be their long-term home) one would expect them to be more responsible towards the environmental quality of the area.

Table 3.4 Size of the household of the sample population in Lost City

Size of household	1-4	5-8	9-12	13 -14
Frequency	39	67	15	2
Percentage	31.7	54.4	12.3	1.6

The size of the household is between one and 14 peoples in the household. The majority of the households are occupied by five to eight people (54.8%) whereas 31.9 per cent has a size of 1 to 4 people in the household. The remaining (13.9%) represents large families where the number of family members is from 9 to 14. Lost City community has a significant proportion (13.9%) of large families and this could be attributed to the low level of education in this community. Also, the poor families tend to have a lot of children because they believe that those children will help to create income.

3.2.2. Knowledge of domestic solid waste

The results show that the residents of Lost City seemed to know the meaning of domestic solid waste. The knowledge was acquired from parents in most cases, but few of them got knowledge from the media and school. Respondents defined domestic solid waste was using an example of domestic solid waste. The definition provided was evaluated as familiar waste.

There is a contradiction between the knowledge displayed by the community and action in the community. The residents in Lost City illustrate that they know about domestic solid waste management and its impact on health and environment, but waste in the area is deplorable. Knowledge of waste should be the motor to fight the dirtiness of the area and illegal dumping. Residents could fight against the illegal dumping in the area by creating civil society focussing on the environmental issues. It can be arbitrary established that they are aware of the situations in the area but their economical condition do not allow them to be active in environmental matters.

Other reasons could be the following:

- Lack of initiative and community participation in waste management that leads the residents of Lost City not to consider cleaning even in their yard. They could avoid seeing waste scattered around them and in the street. The situation in Lost City gives impression that the community responsibility in terms of domestic waste management doe not go beyond their yards.
- The fact that the community expects every thing to be done by the Cleansing Department, the community could not border them to manage the waste around them in return blaming the Cleansing Department of being incompetent.
- There is lack of knowledge on recycling and composting. They do not know that recycling and composting is needed to prevent recoverable materials from taking up precious and decreasing landfill space.

Before the respondents were asked about their knowledge of domestic solid waste, respondents were asked to name the material that their household throws away in dirt bins. All the respondents named this stuff Vullis/rommel (in Afrikaans) that has the same meaning as rubbish in English. Then the researcher asked if they knew what domestic solid waste was and the responses are summarised as follows.

The majority of the respondents (82.1%) said that they know, 12.2 per cent were uncertain and 5.7 per cent said that they don't know the meaning of domestic solid waste. The respondents who knew what domestic solid waste was and those who were uncertain were evaluated using the definition of waste by Goldstein (1996). The respondents defines solid waste by giving examples such as old papers, cardboard, tins, food and vegetable waste, plastic, cartons and dust which in general form what Goldstein defined as familiar solid waste. In general, the researcher can conclude that the sample residents of Lost City know what domestic solid waste is.

Table 3.5 Source of information on domestic solid waste

Source of information	Frequency	Percentage
Information from school	31	25.2
Information from newspaper	1	0.8
Information from parents	75	61
Information from radio	3	2.4
Information from TV	3	2.4
Information from other sources	10	8.1
Total	**123**	**100**

With regard to the source of the information on domestic solid waste, 61 per cent of respondents said that they had information from their parents. About 25.2 per cent said from school, 8.1 per cent said from other sources and remaining groups of 2.4 per cent said from TV, 2.4 per cent said from radio and finally 0.8 per cent from newspapers. The results indicate that domestic solid waste is known from a young age, in other words the information is transmitted generation to generation. The information about domestic waste is transmitted parent to child. Nevertheless, we have to keep in our mind that this knowledge could be unused sometimes because of the circumstances in which people live. Human beings have become a creature of culture to the extent that life styles vary from one part of the world to another, from one generation to another and from one historical period to the next (Wilkinson,1973). A positive behaviour toward an environment issue could be boosted or could be a greatly influenced by the mass media because the accessibility of the mass media is growing day by day. The government and environmental groups should step up their publicity in the media to educate people about the environmental significance of domestic waste management (e.g. waste recycling and waste minimization). Good and bad examples of environmental practices in the society should be used to establish social influence and demonstrate what kinds of behaviours are friendly to the environment (Chan, 1998). In the case of this study, the results indicated little influence from the mass media (about 5.6%). A small number of respondents indicated that their source of

information was TV and radio. It is necessary to find out the reason why small number of people is informed about waste through the mass media. May be the people in Lost City cannot afford to buy a TV or there are no TV programme on environmental issues.

3.2.2.1. Impact of unmanaged domestic solid waste on health

The summarised responses given by the respondents were that unmanaged domestic waste could cause diseases. The respondents believe that with unmanaged waste the flies will collects germs and depose them on plates, cups and tables in the household, and create disease. The responses given were not from people with scientific knowledge about diseases, but informal information. There is a correlation between their responses with the fact that the water collected in unmanaged waste can breed or can be conducive to insects which have health impact. For example, the research has shown that mosquitoes breed much more efficiently in water that collects in tyres than in water that collects in depressions in the forest (United States Environmental Protection Agency, 2002). Uncontrolled dumping has significant environment and health impacts. As the waste decomposes it creates leachate, a mix of toxic and non-toxic liquids and rainwater, which may get into local water supplies and contaminate the drinking water.

3.2.2.2. Impact of unmanaged waste on environment

The respondents believe that unmanaged waste could cause pollution and could give a bad impression that the people who live in that area are dirt by nature. They were not able to elaborate their responses because of lack of knowledge about environmental issues. However, there is a correlation between the responses and the report on the impact of unmanaged waste as shown by Haan *et al* (1998), and Marsh and Grossa (1996). Unmanaged waste like illegally dumped waste causes air and water pollution. Plastic and paper blowing over fields or trapped by trees

has an unwanted visual impact. The flooding when drains are blocked by solid waste can have a major environmental impact (Marsh and Grossa, 1996; Haan *et al*, 1998). The impact of unmanaged waste on the environment could depend on how much the community is interested in environmental matters.

Table 3.6 Level of interest in environmental problems

Level of interest	Frequency	Percentage
Very interested	79	64.2
Interested	30	24.4
Slightly interested	10	8.1
Not important at all	4	3.3
Total	**123**	**100**

The results illustrated that 96.7 per cent of the respondents are interested in environmental problems, 64.2 per cent are very interested, 24.4 per cent are interested and 8.1 per cent slightly interested and 3.3 per cent is not interested at all (Table 3.6). In terms of interest in environmental problems, the results show that majority are interested in environmental problems but the environmental situation in Lost City does not portray that the population residing there is interested in the environmental issues. It is possible that they are interested in environmental problems, but because of the poverty situation in which they live, they lose the focus on it. They are focusing on how they are going to earn a living by looking for employment everyday, or being occupied by livelihood activities. It is argued that poor people become fatalistic, not because of being unable to conceive alternative behaviours, but because they have been frustrated in the realization of alternatives (Townsend, 1974). The survey results indicate that there is discrepancy between people's attitudes and their actual behaviours. Poverty may indeed be a relevant cause of domestic solid waste mismanagement in Lost City.

Regarding the importance of keeping our environment clean, the results show that almost every respondent (98.4%) believe that it is very important to keep the

environment clean. That majority elaborated their answer by saying that if the environment is not clean it brings down the standard of living, creates poor hygiene, and is unhealthy. The unclean environment reflects badly on the people who live in that area; it also creates a bad impression of the town and affects the socio-economic conditions. They added that it is important to keep their environment clean to avoid pollution.

2.2.3. Domestic solid waste management

The findings were that the majority of residents in Lost City are in possession of a dirt bin used as storage of their domestic solid waste. It is important to know that they use a plastic carry bag as a preliminary receptacle in the kitchen and when it is full, it will be dropped in the dirt bin. The dirt bins are distributed by the Cleansing Department free of charge. The majority of residents believe that one dirt bin is always enough to hold the domestic solid waste generated in their household.

In terms of waste separation, the respondents informed the researcher that they keep all kind of waste together. Waste separation is not one of the discussion items in the community. Some said that they did not think about it because they think that nothing good can be extracted from rubbish. They let all the waste generated to be collected together.

The waste collection in Lost City is once a week. Some of the respondents were not aware of how many times the domestic waste is collected in their area. They place the dirt bin on the pavement in front of the house for waste collection. The fact that some people are unaware of the waste collection day, they end by missing up to place their dirt bin for collection and opt for empting their dirt bin where they feel suitable. According to the results the majority of the respondents are satisfied with the present system of waste collection. The question is to know if they are satisfied with the fact that the waste collectors are collecting the dirt bins as scheduled by Cleansing Department or they do not know their right with

that service. It is evident that there were no complaints as concerned waste collection. In case of non-collection of waste the respondents choose from call the Cleansing department to collect it, or throw waste in an open space close to or far from their house.

Regarding storage of waste, every household has been supplied with a dirt bin from the Cleansing Department; the dirt bin is placed in the yard. Each dirt bin is made with two wheels and a handle to facilitate the process of moving the dirt bin from the yard to the track by pooling, and the dirt bin is made in such a way that the truck will lift, empty, and put it back down.

The survey results demonstrate that 55.3 per cent of the respondents keep the waste in the plastic bag in dirt bin. This percentage represents those who considered the carry bag plastics as black plastics bag which was asked. Through observation during the data collection, the black plastic bag was only seen in household where the dirt bin is stolen. About 93.5 per cent of the respondents are in possession of the dirt bins and make use of the dirt bins as required. The majority (78.9%) of the respondents received the dirt bin free of charge from the council (Cleansing Department). About 21.1per cent of the respondents claims to have paid for the dirt bin from the Council. It is not clear why the majority could say that they got the dirt bin free of charge and small group say that they paid for it, may be the 21.1 per cent considers that the price of the dirt bin has been included in the cost of housing.

The level of the capacity of the dirt bin was tested and the findings show that, 84.6 per cent of the sample population responded that the dirt bin is always enough to handle the average amount of waste generated by their households. It is important to note that the level of income for the majority in that group is low (less than R3,000 per month). That group's consumption is very small, and there is little waste produced. The second group alleged that the dirt bin is usually enough (12.1%). It means that some times they produce too much waste for the size of the dirt bin and sometimes less than the dirt bin can accommodate. Their consumption

and the kind of commodities consumed vary periodically. The kind of commodities consumed determined quantity and kind of waste generated. According to Pindyck and Rubinfeld (2001), consumers with limited incomes restrict the quantities of goods they can buy; they choose to buy combinations of goods that maximize their satisfaction. During festive seasons, holidays and parties, the households produce more waste than they usually do and that leads to the dirt bin being small to carry the waste produced.

The 3.3 per cent of Lost City residents who responded that the dirt bin is not enough are those with less than R1000 monthly income (Table 3.7). It seemed to be unrealistic but according to Allen and Thomas (1996) the activities in which poor people earn their living contribute to the existing environmental problems. This means that poor people produce too much waste during their livelihood activities such as carpentry and iron cutting. This situation can be considered as one of the causes of domestic solid waste mismanagement in Lost City.

Table 3.7 Household's income and respondents view on sufficiency of bin capacity.

	Adequacy of dirt bin capacity		
monthly household income	Always enough	Usually enough	Not enough
less than R 1000	49(39.8%)	7(5.6%)	4(3.3%)
R 1001 to 2000	39(31.7%)	5(4.1%)	0
R 2001 to 3000	10(8.1%)	0	0
R 3001 to 4000	5(4%)	0	0
R 5001 to 6000	0	2(1.6%)	0
R 6001 to 7000	0	1(0.8%)	0
R 7001 to 8000	0	0	0
R 8001 to 9000	0	0	0
R 9001 to 10000	1(0.8%)	0	0
Total	**104(84.6%)**	**15(12.1%)**	**4(3.3)**

The analysed data about the storage of waste reveal that 95.1 per cent of the sample population keep all waste (food, plastic, cloth, wood, metal, cans) in the same container and 4.9 per cent said that they do not keep all the waste in the same container.

Separation of waste on household level seemed to be very poor. According to the explanations given (verbal communication), respondents said that there is nothing good from the rubbish: “Rubbish is rubbish”. This answer shows the level of ignorance in terms of waste recycling. Other respondents continue saying that they never think about waste separation/recycling. In summary, the waste recycling is not a known practice in the area. In addition, the waste separation could not be easy if the Cleansing Department is only giving one container, at least two containers are required (one for organic waste and other one for inorganic waste).

In terms of sharing information on waste separation 91.9 per cent answered that they do not share information and7.3 per cent of respondents said that they had shared information with other people in the community and 0.8 per cent of respondents could not give the answer. According to Graaff (2003), poor people are more concerned with where their next meal will come from, and are always wondering when the Council is going to put their furniture out (for those who did not finish to pay their houses) and always praying that the family bread winners do not lose job. It is always very difficult to discuss waste with a hungry person. In reality such kind of persons are even violent when you talk about something that is not related to their needs. Those with information about waste recycling might not discuss the issue with others, probably because they fear trouble. The lack of exchange of information on waste separation among residents can affect other information like collection day, and where to place the dirt bin/plastic bag.

In terms of day of collection, the result shows that 99.2 per cent of the sample population are aware that waste collection takes place once a week in Lost City and 0.8 per cent of the sample population know that the waste collection in their

area is twice a week. It is clear that the waste collection day in Lost City is done once a week. Some people in the area are not aware on which day waste is collected. As a result, they miss the collection day and this prompts them to empty their dirt bins anywhere they presume is convenient.

Table 3.8 Respondent's view on placement of dirt bin/plastic bag for waste collection

Placement of the dirt bin	Frequency	Percentage
On pavement in front of the house	120	97.6
On the property close to pavement	2	1.6
On the property far away from pavement	1	0.8
Total	**123**	**100**

The majority of the respondents (97.6%) place their dirt bin on the pavement in front of their house, followed by 1.6 per cent who place their dirt bin on their property close to pavement and 0.8 per cent who place their dirt bin on their property far away from the pavement. If the dirt bins are placed far away from the pavement, the waste collectors cannot see them.

Table 3.9 Satisfaction with the present system of waste collection

Level of satisfaction	Frequency	Percentage
Very satisfied	53	43.1
Satisfied	57	46.3
Mixed feeling	6	4.9
Dissatisfied	4	3.3
No answer	3	2.4
Total	**123**	**100**

In terms of satisfaction with the system of waste collection used in Lost City, 43.1 per cent of the respondents are very satisfied, followed by 46.3 per cent that are satisfied, 3.3 per cent dissatisfied and 2.4 per cent who cannot tell. The majority of the respondents are satisfied with the present waste collection in the area. It is

still not clear what they mean about their satisfaction unless they are satisfied because the waste collectors arrive regularly; otherwise the presence of uncollected waste is in great quantity in the area (Figs 1, 2, 3 and 4). The fact that the open spaces are dumping areas means that waste collection services are not good. Therefore, if they are satisfied it means that they may be talking only of the collection of waste in the households.

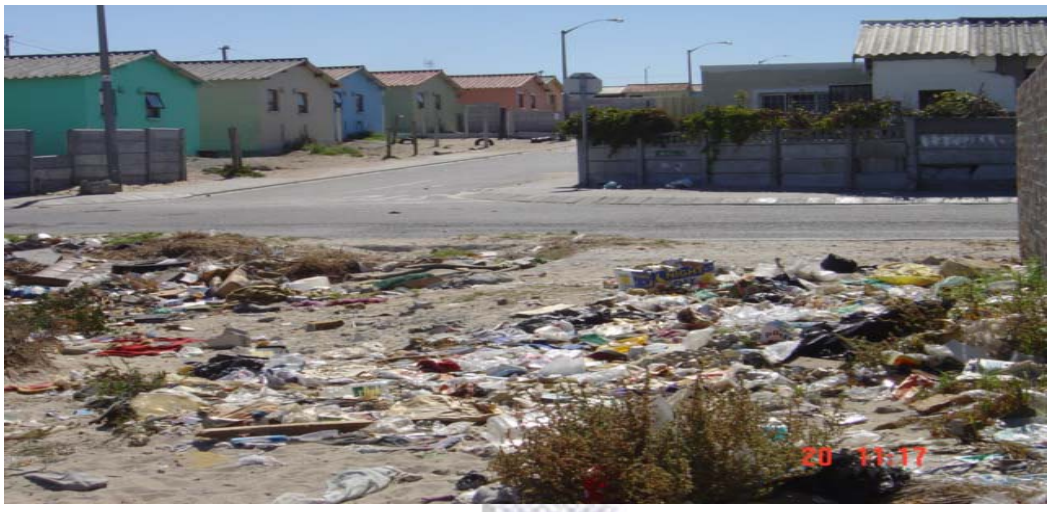

Figure 1: Waste scattered in open space near houses.

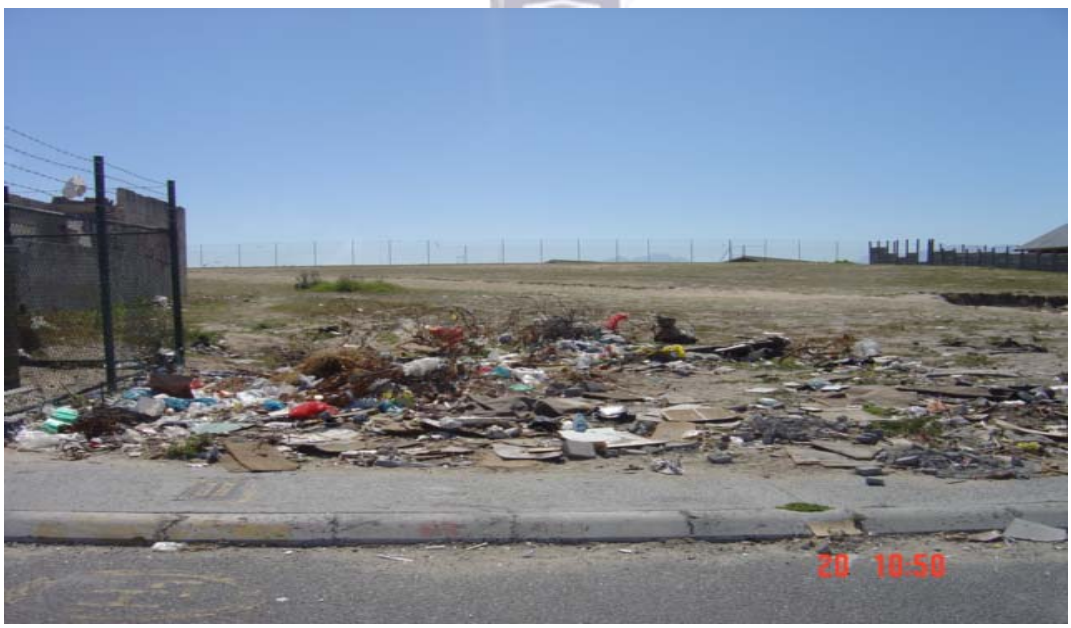

Figure 2: Waste scattered in open space

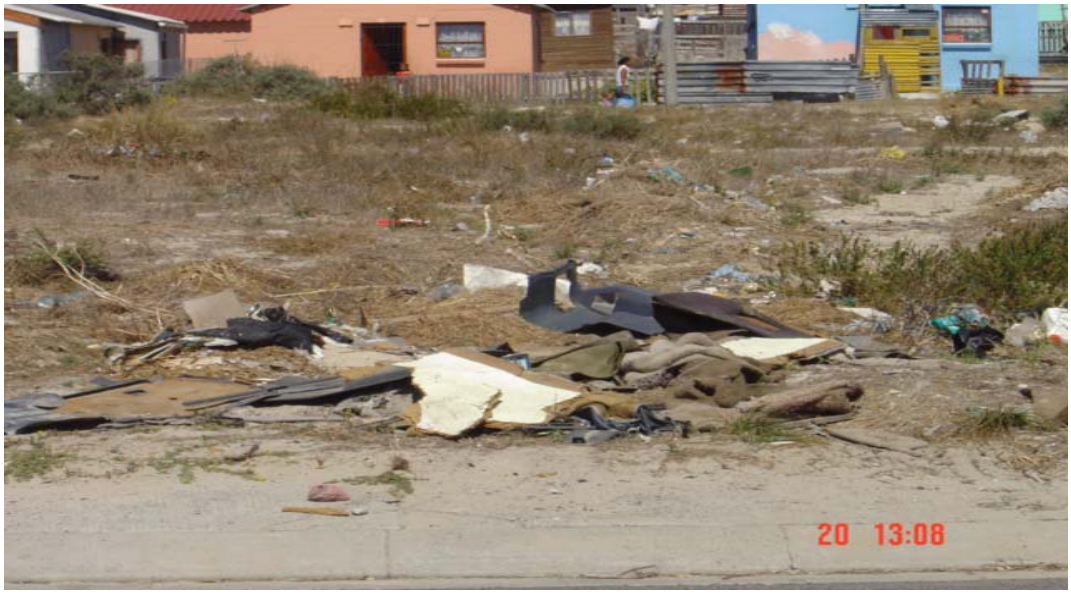

Figure 3: Waste scattered in open space near houses

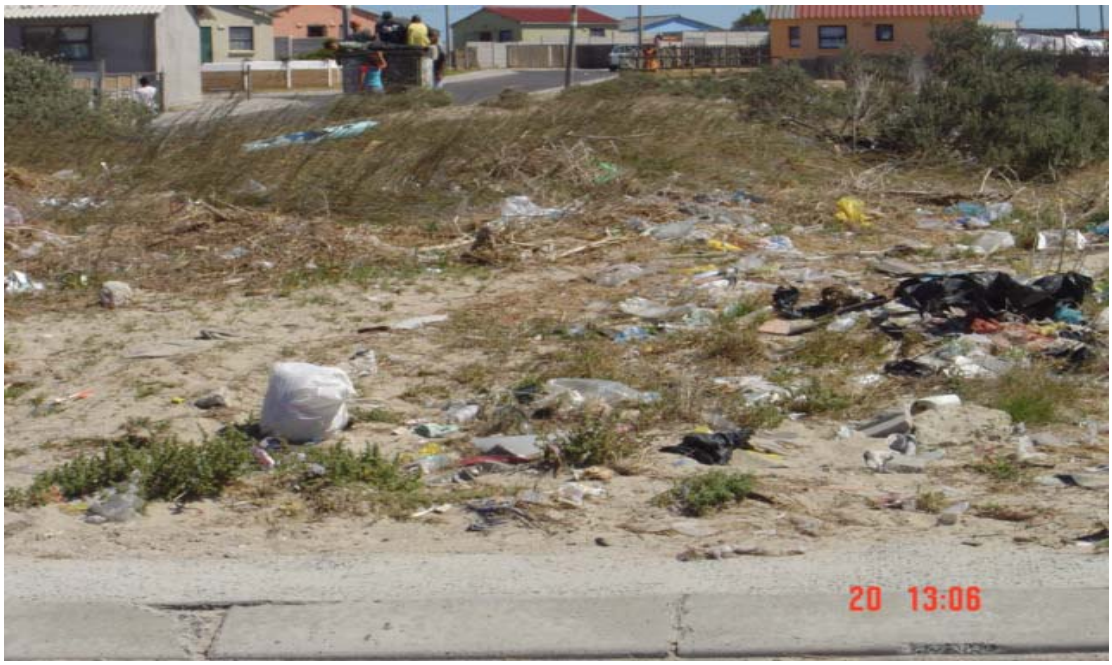

Figure 4: Waste illegally dumped in open space

Table 3.10 Respondent's view on how often household waste is not collected

	Frequency	Percentage
Very often	3	2.4
Often	1	0.8
Virtually never	11	9.0
Never	107	87.0
No answer	1	0.8
Total	**123**	**100**

About 2.4 per cent of the respondents believe that the household's waste is very often not collected and 0.8 per cent claim that waste is often not collected. Only 9 per cent of respondents remembered that waste was not collected during a strike. In normal circumstances the waste having been always collected. The majority (87%) believe that the household waste has been always collected. One person did not give any answer. In general, the waste has been always collected beside the waste, which was not placed, on the pavement by the household. In other words the waste which was not collected could be because it was not at the right place the time waste removers were there or all family members are out when the collector came. The waste collectors are not collecting the waste left in the yard. The practice of not collecting the dirt bins that are in the yards is not in Cape Town only, but it is national wide and also in other countries. That practice is due to many reasons like security, architecture style and time. For example, the waste removers in Turin are not collecting the dirt bins that are in the yards because of cultural beliefs, security considerations or architecture style that may prevent labourers from entering properties (Haan *et al,* 1998). These reasons are not far different to the case of South Africa. The waste collectors cannot collect the bin in a yard where there is a closed gate for example. Culturally, you can not enter or collect something in the premises without permission.

Table 3.11 Responses to waste non-collection

Alternative	Frequency	Percentage
Call the Cleansing Department to come collect it	56	45.5
Leave it where it is	12	9.8
Throw waste in an open space close to my house	1	0.8
Throw it in open space far away from my house	14	11.4
Nothing, it does not disturb me	4	3.3
Other alternative	36	29.2
Total	**123**	**100.0**

The results in table 3.11 indicate that 45.5 per cent of the respondents, which happen to be the high percentage, could call the Cleansing Department. The following group (9.8%) will leave the waste where it is and 12.2 per cent will opt to throw it in open space with a difference that 0.8 per cent will use an open space closer to his house whereas about 11.4 per cent could use an open space far away the house. Another group representing 3.3 per cent of respondent said that they are not disturbed if the waste is not collected. There are a significant number of people who gave different views like digging a hole in a yard and bury the waste others said that they did not think about what they could do because so far there is no such problem. The above responses suggest that the community in Lost City do not consider the illegal dumping in the area to be a problem. If they leave the waste where it is, it might be scattered on the pavement. Those who will throw waste in the open space will be contributing to dirtiness and pollution of the area. For the group which is not disturbed by waste being not collected, the environmental issue is clearly not a priority. This group will not report the people who are illegally dumping or lodge complain if the waste is not collected.

Table 3.12 Level of complains when waste is not collected

	Frequency	Percentage
Yes	10	8.1
No	113	91.9
Total	**123**	**100**

The majority of the respondents (91.9%) do not complain when the waste is not collected. The fact that they do not complain can mean:

1. They feel guilty because they did not place the dirt bin on the pavement or they do not care about the waste being collected because they can dump in open space.
2. They do not have the contact number of the Cleansing Department
3. They do not have means to call the Cleansing Department to lodge their complains

The remaining group (8.1%) said that they usually complain. This part is discussed in chapter four (Section 4.2.3.). It could be a good sign of level of concern and awareness of waste management in Lost City if residents do complain.

On the question of knowing how many times the waste was not collected in the area, the results shows that the majority (94.3%) are not aware of non-collection of waste in general. This is a result of the fact that they are not interested because the remaining percentage is aware of the period in which the waste was not collected in the entire area. They could recall that it was during the strike of the municipality workers. The strike could be something they could remember because it was also reported on media. So the fact that they could not remember that period could be an indication of how much they do not care about waste collection in the area.

3.2.4. Attitudes toward waste

The respondents were tested about their attitudes towards seeing people throwing waste on their property. The majority said that they are disturbed to see this behaviour closer to their houses. They went further saying that they are disturbed to see people throwing waste on their neighbour's property and also in the area of Tafelsig in general. The above response is uncertain because previously they

responded that some of them could dump their waste in open space near their house, or in an open space far from their house, if their waste is not collected.

Uncollected waste does make the majority feel angry. The researcher did not expect the women to respond that they did not feel angry or felt nothing if the waste is not collected. That situation became difficult to understand because the women were considered to be the most concerned with dirtiness. It appeared again when they were asked about what they would do if they see somebody dumping waste in an open area near their residence; the women said that there is nothing they can do; another group said that it is not a problem.

The majority of people in Lost City feel satisfied with waste collectors' performance and behaviour. That feeling may not be reflecting the 48 per cent of the respondents who present a very low level of concern about waste management. The fact that they present low interest about waste management is an indication of not having enough information to evaluate the waste collectors. That attitude of lack of concern about waste management could be behind the problem of mismanagement of domestic solid waste in Lost City area.

From question 29 to question 40 of the questionnaire, some respondents did not respondent to the questions, and others gave inconsistent responses. The reason may be that they were tired or that their answers were felt to be private.
Survey results show that the majority of the respondents (98.4%) seemed to be disturbed to see people throwing waste closer to their house in the street. Only 1.6 per cent is not disturbed.

It is also evident that 79.3 per cent of the respondents are disturbed to see people throwing waste close to their neighbours' property. This is the indication that they believe that unmanaged waste in their neighbourhood has an impact on them and their neighbours. The remaining group are categorised in the group of those who do not know the impact of the unmanaged domestic solid waste on their health. It is also the indication that they are ignorant about the impact of domestic solid

waste on their environment. It will be simple for such groups to dump their waste anywhere they find a space because they will not be disturbed.

The results also indicate that 87 per cent feel disturbed to see people throwing waste in the area of Tafelsig. The results indicate how much some of community in Lost City consider only managing waste in the yard and do not care about the waste outside their household. About 13 per cent of the respondents do not feel disturbed to see people throwing waste in the area of Tafelsig. They are insensitive to the dirtiness of their area.

Table 3.13 Attitudes to non-collection of waste

Level of feeling	Frequency	Percentage
Strongly angry	50	40.6
Angry	53	43.1
Not Angry	7	5.7
Normal	4	3.3
No answer	9	7.3
Total	**123**	**100**

In terms of attitudes when the waste is not collected, 43.1 per cent of respondents said that they will be angry and 40.6 per cent said that they would be very angry. The remaining group comprised of 5.7 per cent who believe that they will not be angry, 3.3 per cent who will feel that it is normal and 7.3 per cent who did not want to reveal their feelings. Nine per cent of the respondents could be judged as being insensitive to the dirtiness of their area. The question is why they are not disturbed with the fact that waste is not collected. The majority said that unmanaged waste has an impact on them and the environment. The fact that they understand and know the impact of unmanaged waste could be that they are encountering a lot of problems, which are more serious than waste management.

Table 3.14 Reaction to non-collection of waste, by gender

	Strongly angry	Angry	Not angry	Normal	No answer
Women	28	36	4	4	9
Men	22	17	3	0	0
Total	**50**	**53**	**7**	**4**	**9**

The results (Table 3.14) illustrate that the proportion of women who will not be angry is 3.3 per cent and those who will feel normal are 3.3 per cent. In an African context, women are considered most neat. Some researchers argue that women take a personally protective and biocentered view toward nature, and that another reason is to expect gender differences in certain reported environmental behaviours which are due to existing of patterns in the household division of labour (Steel, 1995). In the African context, it is generally considered that women are in charge of day-to-day domestic activities, including the cleaning. When the household is dirty, that dirtiness will be attributed to the woman living there.

Table 3.15 Reaction to broken container and scattered waste

Action to be taken	Frequency	Percentage
Organise another container	120	97.6
It is not my job	3	2.4
Total	**123**	**100**

In terms of the action the household could take if they find the container is broken and waste is scatted around, the majority (97.6%) responded that they would organise another container whereas 2.4% said that it is not their job. The second group (2.4%) could be lacking of environmental issues skills or they are preoccupied with physiological needs and forget about other problems (Table, 3.15). According to Maslow's theory, lower needs have to be satisfied before higher order needs can begin to exert their influence (Stanton & Spiro, 1999; Cronje *et al* 2000).

On the question of attitudes to illegal dumping, 43.9 per cent responded that they would call the Cleansing Department and report the person who will be dumping

in open space area nearby their residences, only 29.3 per cent said that there is nothing they can do. About 5.7 per cent of respondents believe that it is not a problem for them and 6.5 per cent said that they have nothing to say. They have nothing to say because they are afraid to be attacked by those who will be reported. The last group that is 14.6 per cent would not answer for personal reasons. Overall, the majority does not have solution. It is possible that they have been seeing people dumping illegally and have not taken action against them.

Table 3.16 Reaction to waste dumping, by gender

	Report him or her	Nothing that I can do	It is not a problem for me	Other responses	No answer
Men	35	22	7	6	11
Women	19	14	0	2	7
Total	54	36	7	8	18

The women seemed not to be ready to take any action against illegal dumping (29/ 123 which represents 23.6%) (Table 3.16). The cause of high percentage of women who would not react to waste illegal dumping might be the fact that they were the most available at home the time the researcher was collecting data or because they are powerless and afraid of the people who dump in open space areas. It is a serious problem because women are more concerned with dirtiness than men but the responses women gave shows that they are not interested in protecting the open spaces used as dumping areas. The women could play an important role because they are at home most of the time. The community in Lost City could be seen as careless about domestic waste management.

Table 3.17 Exchange of information about domestic solid waste in Lost City

Yes or No	**Frequency**	**Percentage**
Yes	32	26
No	91	74
Total	**123**	**100**

The majority of the respondents (74%) do not discuss domestic solid waste; only 26 per cent of the respondents said that they spoke about the domestic solid waste management issue. The domestic solid waste management awareness campaign has a very low profile in Lost City.

Table 3.18 Community concern about waste management

Level of concern	**Frequency**	**Percentage**
High level concern	29	23.5
Average level of concern	35	28.5
Very low level of concern	26	21.1
No concern	33	26.9
Total	**123**	**100**

According to the survey in Lost City, about 52 per cent of the respondents are concern about waste management whereas 21.1 per cent and 26.9 per cent of respondents respectively show very low level of concern and no concern towards waste management. The results indicate that nearly a half of the community is not concerned with waste management (Table 3.18). The number of the people who are concerned is enough to influence the remaining group. They could influence others through meetings, discussions, or creation of a community organisation. That half of the community could share feelings and form a community organisation focussing on the problem of waste management in the area. According to research done, the civil society or non-profit sector improved lives of communities by offering services the public sectors did not offer. In many countries, developed and developing neighbourhood organisations were regarded as an effective device for overcoming apathy and defeatism (Jacobs, 1997; Salamon *at el,* 1999; Twelvetrees, 1976). The community organisations' programs are based on the significance of the local community as the context of social problems, and local organisations and resources as the primary vehicle for their solution (Spergel, 1972). Despite showing concern, the community is not taking the initiative to improve the domestic waste management situation in Lost City.

This leads the researcher to conclude that the community's behaviour is one cause of unmanaged waste in Lost City.

In terms of waste collectors' performance, the results demonstrated that majority of respondents (87%) are satisfied with waste collectors' performance, 9.8 per cent is not satisfied and 3.2 per cent cannot tell. It means that the respondents are may be concerned with only the fact that waste collectors are always collecting the waste as planned by the Cleansing Department, and also collect all bins which are placed at the place of collection. The study went further on the evaluation of the behaviour of waste collectors. The majority of the respondents (88.4%) are satisfied, 10 per cent are not satisfied and 1.6 per cent cannot tell.

3.3. Conclusion

This empirical study examined how households in Lost City view domestic solid waste and management of the waste. Using the data collected from a survey, the link between income of the household, knowledge of domestic waste, level of education, and attitude of the household was explored empirically. Findings suggest that the level of household income is indeed correlated with life style of the household. The level of income is a determinant of level of education and the level of education is an ingredient in the level of understanding, actualisation, and actual behaviour. In addition, the level of environmental concern and knowledge on environmental issues is not the priority in low-income area. It is important to understand the effect of the poverty on attitude and behaviour. Poverty contributed to the domestic solid waste mismanagement.

CHAPTER FOUR

DOMESTIC SOLID WASTE COLLECTION IN LOST CITY

4.1 Introduction

People have been dealing with refuse by simply dumping it in some out of the way spot. Because of urbanisation and industrialisation, waste management has become a serious issue. The local authority (municipality and district council) is the responsible structure that must grapple with during the various stages and aspects of solid waste collection and waste disposal. Many methods of waste management have been utilised, and studies continue in search of the best method. It has been argued that the success of any waste program depends greatly on public acceptance: the communities and people concerned should be made aware of the waste management programs to be implemented, their process, and advantages and drawbacks. For example, the feasibility of waste recycling depends not only on technical aspects but also on social, cultural, public health, and institutional considerations (Polprasert, 1996).

The South African constitution gives individuals the right to an environment that is not harmful to personal health or well being. People have a right to have the environment protected for the benefit of present and future generations. This raises a wide range of questions about waste management.

With above information in mind, and in broad terms, this section of the study examined the waste management services provided in Lost City, Mitchell's Plain. This chapter reports result of the interviews with municipal Cleansing Department officers, refuse removers and councillors.

4.2. Interview results and interpretation

This section analyses and presents the results of the interview with councillors, the line manager of the Cleansing Department, and waste collectors working in truck teams in Lost City.

4.2.1. Domestic solid waste collection services

The Lost City, like other areas in Mitchell's Plain, receives the following services: refuse/ waste storage, refuse collection and dead animal collection. Services not available in Lost City are garden waste collection, street sweeping, and construction debris collection.

4.2.2. Refuse/ waste storage

The Cleansing Department distributes dirt bins free of charge to the community of Lost City. If dirt bins are stolen, the community reports their problem through a call centre. New dirt bins are not available everyday at the Cleansing Department. The Cleansing Department orders bins and delivers them to community as soon as they are available. If the dirt bin is broken and it is reparable, the Cleansing Department has it repaired by an outsourced company. If the bin is irreparable, the Department orders a new one. That exercise takes some days: during that time they are waiting for new dirt bins, waste will be dumped any where on the street.

4.2.3. Refuse Collection

Domestic waste generated and stored in the household is collected once a week on Tuesdays. The waste collectors place the dirt bin onto the truck that empties it automatically. The workers do not handle dirt bins, which are not placed on the

pavement in front of houses. The workers are very fast in pulling and placing the dirt bin onto the truck because of the large number of houses where they have to collect the waste (1200 houses per 5 persons per day) and this can lead to some waste being left behind. If the dirt bin is broken or is too full, waste collectors do not sweep the waste that has tipped out. The waste from illegal dumping is collected if there is a report from the community. The report must be processed through the call centre and transmitted to the department, following the bureaucratic system until it reaches the team that will collect the waste. Service is not immediate. The Cleansing Department indicated that most of the complaints or the reports they got from Lost City residents during the previous three months were about settlement of their debt

4.2.4. Garden waste

Gardening also produces significant amounts of waste; however, little attention has been paid to disposal management. As a result the garden waste is collected together with domestic waste. There is no programme in the existing system of waste management that deals with garden waste in Lost City as in other low-income community areas. The community produces garden waste and stores it in the dirt bin, which contains the other waste collected in the house and kitchen. According to minutes of meetings, the garden collection service was abolished from June 2002 (Cape Town Metropolitan Council, 2002). It was proposed and accepted that the garden waste be treated as domestic waste. It was seen to be a way in which the residents were going to top up their normal domestic service, acquiring an additional container or making use of the drop-off facilities.

The idea could be good in terms of reducing the cost, but the question is if there is communication between the customer and the service provider. It was provided that the residents could use the drop-off facilities, are there these facilities available?

The minutes indicated that 18 drop-off sites are spread across the metropolitan area. In addition, the Cape Town Metropolitan Council owns six disposal sites

available to residents willing to take their waste there. The question is whether the poor will be able to afford to transport their waste to these sites. It is may be difficult for poor residents to hire transport to take the waste to these disposal sites. If garden waste is not collected, the following day it will be dumped where the community it find convenient. This practice is suggested to be only applicable in middle and high-income level community. It is not applicable in low-income community because the waste management is not their priority and more they cannot afford to transport the waste to the disposal site or to the drop-off facilities.

4.2.5. Additional waste collection services offered

According to the definition of waste management, street sweeping is not one of the activities included in solid waste management, but it is included in solid waste management service offered by the Cape Town Metropolitan Council.

4.2.5.1. Street sweeping

Street sweeping in Lost City takes place once every six to eight weeks. Street sweeping needs to be done more frequently because beside the mess made by refuse removers, dogs searching for food make a lot of mess, especially in households where dirt bins have been stolen and households place refuse in thin plastic carry bags. The infrequency of street sweeping could also be contributing to the uncleanness of the area. According to a minute of a meeting, the street sweeping service was abolished in April 2002 and implementation of that practice was from the 1st September 2002 (Cape Town Metropolitan Council, 2002). The community should deal with the sweeping of their streets said a Cleansing Department officer. The Cleansing Department is facing the problem of shortage of manpower; vehicles will not be able to render service everywhere unless the community is charged for that service. In high-income areas where the service is continuously rendered, the households pay a tariff every month. Low-income communities need service too but they cannot afford the fees. Unfortunately, the

decision to terminate the service has been considered by the Council Executive committee and Sub council (Council Executive committee and Sub council accept public participation). It is debatable that the community from low-income area did participate in that process.

The suggestion is that the community residents deserve an explanation to why the service is terminated. Municipality, Cleansing Department and other institutions (Councils, NGOs) operating in these areas have to come with a project/program to educate the community on that regard. The residents in low-income areas must participate for that policy to be successful. The community is invited to contribute to the empowerment of their area. However, it seems that the community in Lost City is careless on the issue of an impoverished area. It also indicates the lack of involvement of Lost City residents in environmental issues. The residents do not see it as a serious problem to let waste scatter in the streets in front of their houses or next to the dirt bin in their yard (Figs5; 6 and 7).

Figure 5: Waste scattered in front of houses

Figure 6: Waste lying next to a dirt bin.

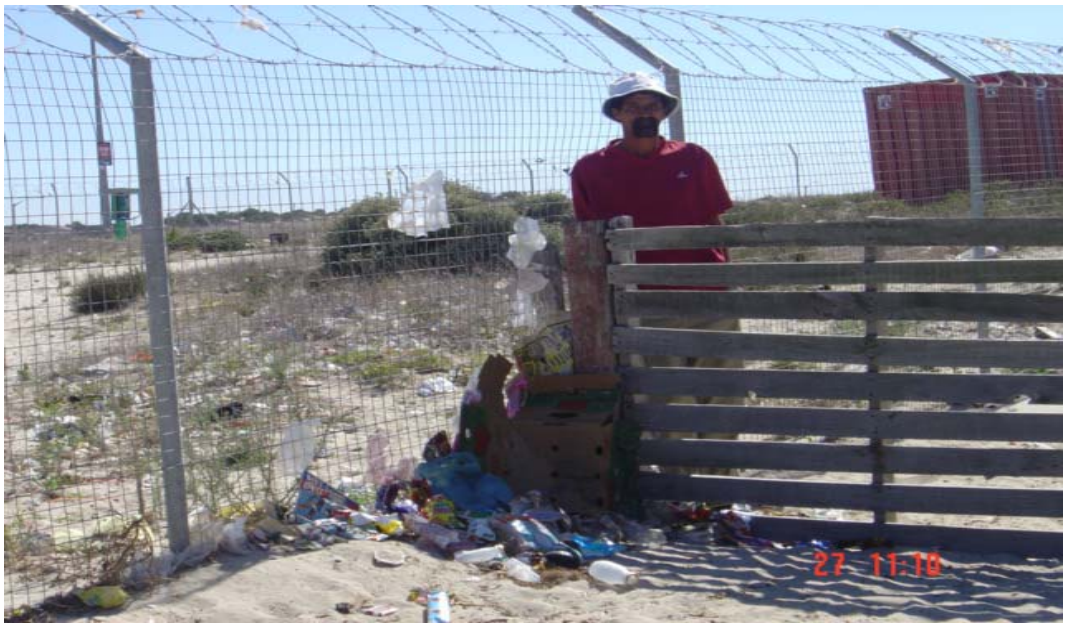

Figure 7: Waste at the entrance of a yard.

4.2.5.2. Dead animal collection

The municipality hire a specialised private company to collect dead animals. The reason is to protect residents being contaminated by diseases. The community has to contact that company if there is a dead dog, cat or other animals on the street or anyway near their houses.

The issue is whether the whole community is informed about that company and has contact details for the contracting company. An individual from the community might or might not phone that company because of their bad experience from calling the Cleansing Department for illegal dumping, or because of the lack of means of communications, for example telephone at home or being far from the public phone. Also the Cleansing Department's responses to the individuals' reports could stop these members of the community calling the Company. The faster the responses from the Cleansing Department, the more consistent will be the contacts between the Department, the NGOs and others institutions in the areas. The residents who call will be encouraged by the brief time it takes to respond to problem reported to any institutions operating in that area. The Cleansing Department's waste collection services could be evaluated as a poor service by anyone visiting Lost City but for the problem to be solved, we should first know why the service is poor. What are the causes of poor service?

4.2.6. Additional waste collection needed

The Cleansing Department did not mention the collection of construction debris, which seemed to be the category of waste that is dumped most. It is important that construction debris could be collected regularly because it is obvious that the community from Lost City produce a lot of waste of that nature. One reason is that people in Lost City are trying to extend their small (RDP) houses is to create space for children who are becoming too big to share the same room with the parents. The construction debris is dumped in open spaces even in recreation areas (Figs 7, 8 and 9).

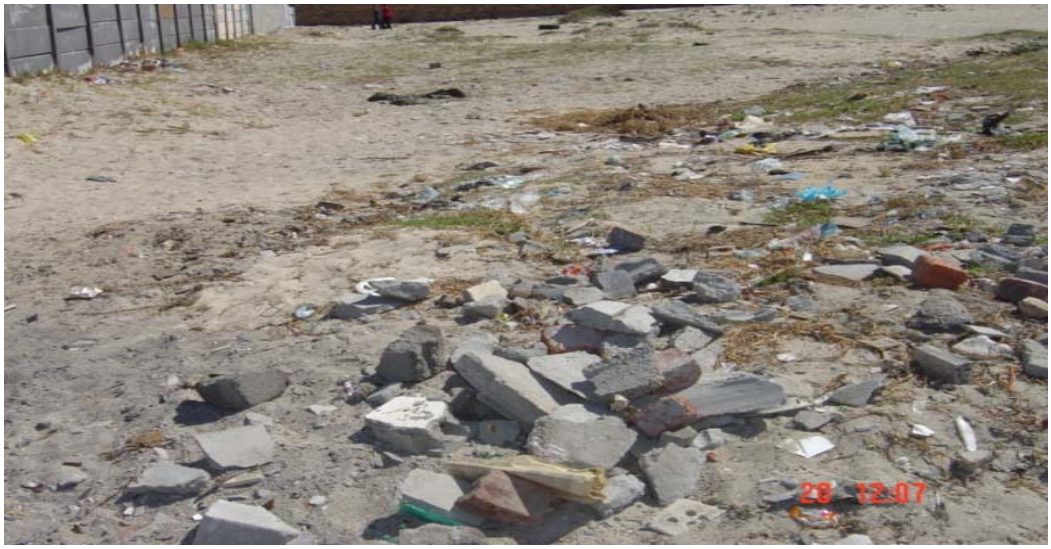

Figure 8: Construction debris in an open space

Figure 9: Construction debris in a recreation area

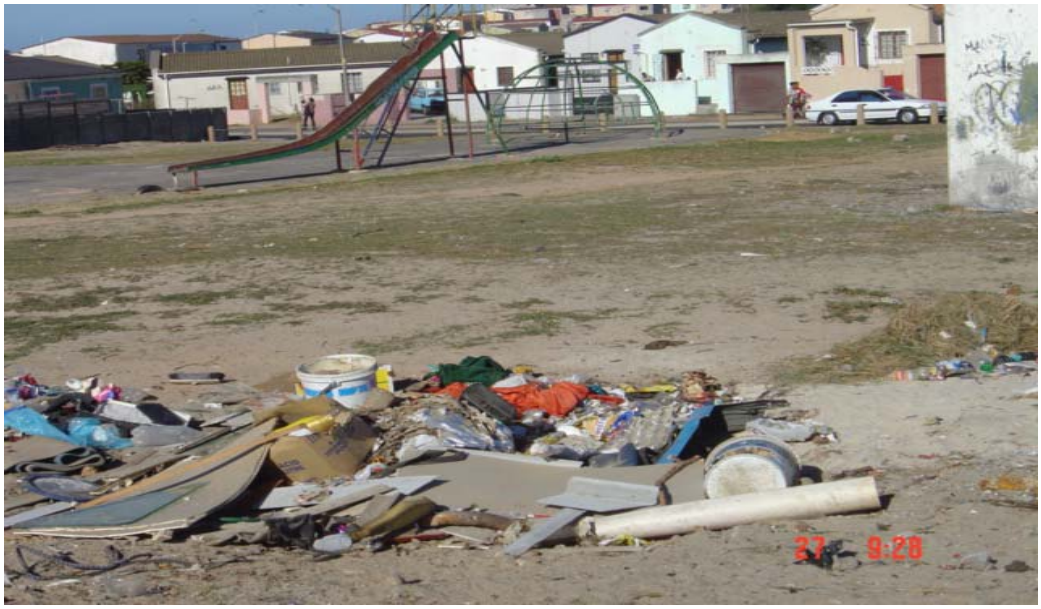

Figure 9: Mixture of waste in a recreation area

The residents of Lost City are ignorant or unaware of importance of the recreation area in their community. By polluting recreational areas, it is possible that youth could take to drugs or gangsterism because of lack of sport or cultural activities venues. Drug abuse and gangsterism in youths are potential threats to the health of the whole nation.

4.3. Problem encountered in Cleansing Department

The Cleansing Department is facing many problems in rendering the waste collection service. The major problems identified are the following:

4.3.1. Manpower shortage

The Cleansing Department is facing a shortage of manpower. The staff is not enough at all levels, from supervisor to junior workers, one department officer said. For example, there are five workers and a driver to collect waste for 1200 houses a day. Using the above example and taking into consideration of 8 hours

per day determined by labour law, the five workers collect one hundred and fifty dirt bins in a hour, which is equal to approximately collecting and empting 3 dirt bins each minute or exactly 5 dirt bins in 2 minutes. If the truck's capacity can not contain the waste from the 1200 households, we have to take into consideration the time the truck takes to empty the waste to the transfer plant or to the landfill. The team of refuse removers works as fast as possible for them to finish and go home. In that manner, it is difficult for refuse removers to take care about waste which falls from dirt bins that are too full or broken. The driver of the compactor truck does not stop the truck; he drives at a certain speed and the workers runs behind it pulling the dirt bin to the truck. The whole team is not quality work oriented but they are only focussing on finishing the job and collecting their salaries at the end of the month. In other words, the work is too much for the small number of workers, which results in improper operation.

4.3.2. Absenteeism

Absenteeism is a major problem. The following table was given to the researcher by the Cleansing Department to explain the extent to which absenteeism is a serious problem.

Table 4.1 Absenteeism in Cleansing Department West Ridge branch, 2003

	Day 1	Day 2	Day 3	Day 4
Number of workers per day	33	33	30	33
Number of workers reporting at work per day	11 (33%)	19 (50%)	15 (50%)	14 (42%)

Situation of absenteeism during year 2003 provided by a Cleansing Department officer, personal notes

Approximately 50 per cent of the workers are absent daily. The Cleansing Department conducted a study on the workers absence behaviour (Table 4.1) showing that level of absenteeism has a big impact on the production of services. According to the theory of production possibilities, the production can increase if

the resources and/or production techniques improve (Mohr *at el*, 1996). For the case of the Cleansing Department, the shortage of manpower is already recognised in addition to absenteeism. With the shortage of manpower and absenteeism the production of services will decrease. In case the workers decrease, the Cleansing Department could use the overtime to maintain the production quantitatively not qualitatively. If half of the workers are absent and absenteeism is repeated for four days a week, how will the workers maintain good production? It might not be even possible for the overtime workers because they may not cope with the number of hours to work a day. The quality of the service will decrease because of the two problems mentioned above.

4.3.3. Technical problems

Technically, the Cleansing Department is short of vehicles and technicians for maintenance. For example, if the community report about illegal dumping they have to wait until the vehicle is available. Meanwhile, waste accumulated in that place because other people will use the same place to dump their waste until the Cleansing Department releases a vehicle. "The Cleansing Department program to collect the waste from the illegal dump is once a month but the last two months the collection took place once because the facility (vehicle, only one) was not available", said a Department officer.

4.3.4. Bureaucratic problems

A common bureaucratic problem is that reports take too long because of the chain the order must take to reach the person who will execute the task. The community report through the call centres and the report will be transmitted to different department dealing with that matter. The person who works at the call centre takes notes and reports to the department concerned, and after that department will respond to the caller by rendering the services. The question is how long it takes to get a response. It is not automatic that the caller will get the responses

immediately because the receiver of the call cannot give an answer to the problem and it will depend on the availability of the means to render the service. Taking into consideration the problem of availability of vehicles, the response to a complaint about illegally dumped waste may take some days.

4.4. The role of councillors and other institutions in improving the quality of waste collection in Lost City

According to the councillors interviewed there are no NGOs operating in Lost City area. Only councillors are there to assist the community that they represent. The councillors are responsible for contacting the Cleansing Department in case of complaints from the residents of Lost City.

The councillors play the role of intermediary between Cleansing Department and the community by organising meeting with the community and report the community's needs to the Cleansing Department. The councillors have many platforms where they could present the problems the community is facing like Council meeting, Subcouncil meeting and forum meeting.

In Council meetings, the councillors share the situation of the areas they represent and strategise how to improve the situation.

In sub-council meetings, other stakeholders, like the Cleansing Department are invited to attend and respond to some of the cases presented in the meeting.

The forum meeting takes place every month, it is open to the community members, and representation of other stakeholders is invited to attend the meeting and respond to questions from the community members.

The councillors interviewed agreed that Lost City is very dirty, however, they present excuses by saying that the community in Lost City is "not environmental friendly" and continued that Lost City's residents are not participating in meetings

organised by the councillors. They have to understand that the participation in meetings by the community in low-income areas is low. According to Gray-Donald (2001), poverty and a variety of social factors are barriers to attending meetings. He added that clear and open process involves every body who shows interest and those who are facing these barriers above mentioned. In the case of councillors in Lost City there is a lack of good communication between the councillors and the community. Beside communication, there is also lack of strategy of how to involve the community in the daily life of their area. There is no proper link between councillors and the Cleansing Department. The Cleansing Department officer said: "we have very informal relationship with councillors; they normally call me when they need me only". In other words, there is no consultation between the two offices whereas they are supposed to work hand in hand on environmental matters. The failure of the councillors is the failure of the sustainable developments. According to the Rio de Janeiro UNESCO conference, cities and local authorities were recognised as being particularly important to the implementation of its agenda. It argued that:

> "Local authorities construct, operate and maintain economic, social and environmental infrastructures, oversee planning processes, establish local environmental policies and regulations, and assist in implementing national and sub-national environmental policies. As the level of governance closest to the people, they play a vital role in educating, mobilising and responding to the public in order to promote sustainable development" (Walmsley and Botten, 1994:7)

It is important to note that if councillors are not able to organise, mobilise and educate the community, which trusted and delegated them as representatives, who else will do so?

4.5. Summary, conclusion and recommendations

All the role players in the Lost City area accepted that the area is not clean. The community is uncooperative with the councillors and Cleansing Department. The community in Lost City participates only when there is an incentive or other kind of profit. The community does not report the people who dump their waste illegally although they have a toll free to do so. That behaviour reduces the efficiency of the law enforcement in the area. The Cleansing Department also has problems which range from the staff to vehicles. The department has a shortage of workers and vehicles. For example, there is only one vehicle to collect the illegal dumped waste. If the vehicle is under repair services the waste is not collected. The bureaucratic problem is also an additional matter; the services are delayed because the orders have to pass through many people to be signed.

Construction debris is the waste that is most often dumped illegally in the area but there are no plans in place to collect the waste of such nature. The collection of construction debris is not mentioned in the kind of services rendered by the Cleansing Department. So the population of Lost City being unable to hire a truck to collect construction debris take the last option that is illegal dumping. Considering the frequency of extension of houses and construction of small workshop in the area the collection of construction debris by the Cleansing Department is needed.

The councilor's condemned the community for not participating in meetings. They continue saying that the community in Lost City participates if there is incentive or other kind of benefit. For an area where the community is poor, it is evident that the participation will be better if there are promise incentives. It is a bad strategy for the meeting organiser to create that attitude of attending meetings if there is incentive. That practice gives the impression to participants that the outcome of the meeting is the profit for the organisers. If a meeting is advertised and the attendance is poor that can be the sign of lack of awareness. The fact that the meeting achieves nothing can also lead to the disillusionment on the part of

households. This situation indicates that even the councillors lack skills concerning domestic solid waste. Domestic solid waste management could be profitable if the project is well presented. For example waste recycling is one way of generating income. So, the argument of saying that the community is not attending the meeting because there is no benefit could be considered as not valid. It is clear that poverty is one of the barriers of attending meetings.

It was argued that the time the councillors occupy their posts could be a barrier to creativity because some leave the post when they just began to get experience. The population elects the councillors without consideration of their qualifications or their knowledge, but because of their personalities. Some skills and knowledge should be important criteria for employing these councillors or organise short courses for them to learn skills which will help them to deliver needed services. The lack of positive contribution from the councillors could have been the result of lack of skills to communicate with the community. The councillors should consult other successful projects that are dealing with the environmental problem in other areas around.

It is also argued that the Cleansing Department is not taking the councillors in consideration, as they agree that Lost City is unclean. They were supposed to consult each other even strategise to work out how the situation could be improved. The Cleansing Department seemed not to be visiting or communicating with the Lost City residents. There is a poor communication between the community and the Cleansing department that creates the attitude of undermining the existence and importance of Cleansing Department.

It was demonstrated that absenteeism contributes to the poor environmental situation in Lost City because the Cleansing Department is already experiencing the problem of shortage of manpower. The environmental situation in the area could be alleviating if the waste collectors could be more environmental oriented than money oriented. For that matter the Cleansing Department should be invited to train the refuse removers on environmental issues and if possible to issue

awards for those with outstanding performance on environmental improvement in the area.

Author suggested that employing or contracting people who are members of the Lost City community could lead to the improvement of the environment because the community will earn money at the same time keeping their place clean. That strategy should empower that community to report the illegal dumping. The Cleansing Department should increase the frequency of communication with the community through community radios, newsletters, churches and schools to increase the awareness of solid waste management and the environment in general. An integrated program on the domestic solid waste management in the low-income neighbourhood is necessary considering the sociological and economical situation of the community. The community in low-income areas should not be compared with high-income areas because of their sociological and economic differences. The awareness campaign in high-income areas may be easier than in low-income areas.

The councillors' recommendations are that there must be a special program to educate the Lost City community in environmental issues, especially waste management. In addition, the Department of Environment in collaboration with Cape Town Unicity and the Education Department should organise a joint project of awareness training in Lost City. Councillors need to be creative, to consult or be trained to deliver good services in all sectors. Central and local government must take the lead in developing waste management programs and in educating the public to reduce waste in order to manage that resource. South Africa needs an increase in human, financial and organisational resources to enable civil society, and community based organisations in particular, to participate in environmental management and policymaking.

CHAPTER FIVE

SUMMARY, EVALUATION AND RECOMMENDATIONS

5.1. Summary of findings

From the results of the surveys, it is clear that the level of household income determines lifestyle, consumption patterns, cultural behaviour and level of education. Socio-economic factors such as the demographics of the community, the level of environmental awareness and waste generation, and community participation in environmental activities are influenced by the education level, size of populations and income of households. Furthermore, the findings of the study suggest that domestic solid waste management appears to be the mainly influenced by the level of income of the household. Economic status therefore plays a significant role in domestic solid waste generation and management.

The results of the study provide an understanding of the determinants of domestic solid waste management in low-income households. The findings indicate the extent to which socio-economic conditions influence household domestic solid waste management. The findings indicate that poverty causes a lack of focus on the environment, and livelihood activities in low-income areas contribute to littering.

5.2. Evaluation of the study

General findings of this study suggested attitudes and behaviour of the household towards domestic solid waste management; one can assume that communities have the potential to play an important role in assisting with the management of domestic solid waste management. The role played by the communities should not be ignored at times of policy formulation.

In general, it seems reasonable to assume that the results of this study will help policy makers consider the socio-economic conditions of the people residing in each area. Aspects like level of education, size of the household, attitudes, behaviour and level of income serve as important ingredients in the overall exercise of setting the policy. Moreover, this work contributes positively to our understanding of the extent to which the socio-economic conditions of the target area exert an influence on the patterns in domestic solid waste management policy making.

In terms of strengths, and in view of the fact that this survey was conducted in an area, which is similar to many areas in South Africa, there us a probability that Lost City (as a low-income area) is representative of the low-income areas in Western Cape and across South Africa. The findings will therefore be of use for informing decision making in other similar areas.

In terms of limitations and weaknesses, this study was ambitious in terms of what it attempted to cover. It means that certain issues were not dealt with in great depth, for example the concept of behaviour and attitudes. An important aspect not fully explored was the respondents' reasons for some of their answers provided in the questionnaire. The reason for this limitation is that in many instances the respondents of the study were not willing to provide the answers, which reveal their practices and behaviour.

5.3. Recommendations

The recommendations of this study are divided into two sections. The first section deals with the practical measures that can be adopted by local authorities and national government to solve the problem of domestic solid waste management in low-income areas. The second section suggests new avenues for future studies.

5.3.1 Local Government measures

On local level, the Cape Metropolitan Council should consider that the inclusion of the communities' participation is one of the ways possible for managing the domestic solid waste efficiently and effectively. The municipality should use a participation approach involving consumers, planners and policy makers at all levels.

The municipality should consider empowering the councillors with skills on community development just after they are appointed. This would improve service delivery on local level.

The municipality should consider encouraging, developing and campaigning to implement sustainable community projects through education and awareness. To achieve the ideals of sustainability association charged with fostering a strong sense of community and building partnership and consensus among key stakeholders.

The municipality should consider hiring small and medium enterprises from the areas to do some of the tasks of domestic solid waste management. This system will improve services delivery because of the competition between the contractors who will maintain the standard to avoid lost of contract; the contractors will keep good quality of services to maintain their contracts. The quality of the services will increase because the contractors are also the consumers of the services.

The national government should consider working jointly to avoid duplication of service delivery. For example, the municipality, environmental department and education department could together run a project using their specialist skills.

The government should increase subsidies for services rendered in low-income areas as the communities in these areas cannot afford to pay fees/tariffs, which could improve the services rendered in these areas.

Additionally, the adoption of new technology may prove useful to complement the domestic solid waste management. Concurrent with the adoption of new technology, simple by-laws should be formulated and enforced appropriately by the municipality to ensure that illegal dumping is stopped.

Overall, all the relevant authorities should consider involving and engaging the stakeholders and members of the community in the entire exercise of setting the domestic solid waste management.

5.3.2. Environmental education program

According to Jensen and Schnack (1997), changing environmental behaviour is much more complex than the traditional model of knowledge acquisition, change in awareness and attitudes action. Traditional education and information campaigns rarely engage values, and deeper questioning of a person's role in society are often necessary to change behaviour.

At national level, the government should consider fostering a clear awareness of and concern about economic, social, political and ecological interdependencies in urban areas. It should provide every person with opportunities to acquire the knowledge, values, attitude, commitment and skills needed to protect and improve the environment. Government should create new patterns of behaviour of individuals, groups and society as a whole towards the environment.

At local level, municipalities should consider establishing an effective education program contextualising the needs of the target groups, and their social setting. That education should be understandable and work within the country's education system. However, education programs on their own are not a universal solution to domestic solid waste management. Public awareness through media should be used to increase awareness campaign to minimize waste, reduce illegal dumping and increase waste recycling behaviour.

Together with local authority efforts to educate the public, national government should also start looking at ways to increase public awareness of the importance of living in a clean environment, possibly through aggressive media advertising. Such efforts could include advertisements in the printed and electronic media.

5.4. Avenues for future research

According to Shillinglaw and Thomas (1998), research is conducted partly so that new problems are discovered. Research is also conducted so that new ideas, new products and new processes can be put into use.

In terms of future research efforts, the following avenues can provide a useful point of departure:

- There is a need to carry out a study comparing household attitudes and behaviours toward domestic solid waste in low, middle and high-income areas.
- There is also a need to conduct a comparative study about waste generated by low, middle and high income households.

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APPENDIX 1: THE QUESTIONNAIRE (ENGLISH)

SECTION A: DEMOGRAPHIC INFORMATION

1. Age:…….
2. Gender

Female	
Male	

3. Marital status

Married	
Single	
Widow	
Divorce	
Cohabitation	

4. Population group

Indian	
African	
White	
Coloured	

5 Occupation----------

6 Highest standard attended

None	
Sub A-Standard3	
Standard 4-5	
Standard 6-7	
Standard 8	
Standard 9	
Standard 10	
Post matric	
Diploma	
Degree	

Others, specify…….

INCOME

7. What is the income of your household?

Income	Weekly	Monthly	Fortnightly
Less than R1000			
R1001 to 2000			
R2001 to 3000			
R3001 to 4000			
R4001 to 5000			
R5001 to 6000			
R6001 to 7000			
R7001 to 8000			
R8001 to 9000			
R9001 to 10000			

HOUSING

8. a.Are you a

Home owner	
Renter	

b. If renting from whom are you renting?

Council	
Private landlord	

9. How long have you been living in this house?

……..

10. How many people live in this house usually?

Family member…….

Boarders…….

SECTION B: KNOWELEDGE OF DOMESTIC SOLID WASTE

11. What do you call the material/items that your household throws away in the black bin?

……

……

12. a. Do you know what domestic solid waste is?

Yes	
No	
Uncertain	

b. If Yes: Please explain what you mean by it

……

……

……

c. How did you come to know the meaning of domestic solid waste?

Information from School	
Information from newspaper	
Information from parents	
Information from radio	
Information from TV	
Other source	

If other source, Please give details…….

13. What impact if any does unmanaged domestic solid waste has on your **health**?

……

……

14. What, if any, impact does unmanaged waste have on **environment in** Tafelsig?

.....…….

……

15. To what extent you are interested in environmental problems?

Very interested	
Interested	
Slightly interested	
Not interested at all	

Why, please motivate ……

……

……

16. How important do you think is to keep the **environment** clean?

Very important	
Important	
Slightly important	
Not important at all	

Why, please motivate ……

……

……

SECTION C: DOMESTIC SOLID WASTE MANAGEMENT

17. a. Where do you keep the household waste on your property?

Keep it in a dirt bin (without a plastic bag)	
Keep it in a plastic black bag	
Keep it in a plastic bag in dirt bin	

Other……...

b. If other, please explain what you use

……

……

c. If dirt bin, who supplied you with it?

Council for free	
Council, I paid for it	
Bought it myself	

Other, please explain……

18. Does the council provide you with black bags?

Yes	
No	

b. If yes are they free?

Yes	
No	

If yes, how often:

……

19. If you are using a dirt bin, is one dirt bin enough to handle the average amount of dirt generated by this household?

Always enough	
Usually enough	
Not enough	

WASTE SEPARATION

20. a. Do you keep all kind of waste (food, plastic, cloth, wood, metal, cans etc) in the same container?

Yes	
No	

b. If, yes why do you do it?

……

……

c. If no, please explain in detail how you separate your household's waste

……

……

……

d. If no, how did you come to know of the separation of waste?

……

……

……

21. Have you told others in this area also to consider separating their waste?

Yes	
No	

WASTE COLLECTION

22. How many times is your waste collected in your street?

Once a week	
Twice a week	
Once every 2 weeks	
Once a month	

Other, please explain:

……

……

b. Where do you put your dirt bin /bag for waste collection?

On pavement in front of the house	
On the property close to pavement	
On the property far away from pavement	
Somewhere else	

c. If other, where……...

……

23. How satisfied are you with the present system of waste collection?

Very satisfied	
Satisfied	
Mixed feeling	
Dissatisfied	
Very dissatisfied	

Please motivate fully:

……

……

24. How often does it happen that your household's waste is not collected?

Very often	
Often	
Virtually never	
Never	

25. a. Do you usually complain when it is not collected?

Yes	
No	

b. If no why don't you?

……

……

……

c. If yes, what was the outcome of your complain?

……

……

……

26. Do you know whether non-collection of waste in Tafelsig is general problem?

Yes	
No	

27. If Yes are you aware of the community of Tafelsig taking action about it?

……

……

28. What do you do when the waste is not collected from your own house?

Call the Cleansing Department to come to collect it	
Leave it where it is	
Throw the waste in a open space close to my house	
Throw it in open space far away from my house	
Nothing, It does not disturb me	

SECTION D: ATTITUDES TOWARD WASTE

29. Are you disturbed when you see people throwing waste on your property?

Yes	
No	

30. Are you disturbed when you see people throwing waste close to your house in the street?

Yes	
No	

31. Are you disturbed to see people throwing waste on your neighbours' property?

Yes	
No	

32. Are you disturbed to see people throwing waste in the area of Tafelsig?

Yes	
No	

33. If you see people do it what do, you usually do.

……

……

……

34. How could you feel if you find that the waste is not collected?

Strongly angry	
Angry	
Not angry	
Normal	

35. What would you do if you find the container is broken and waste is strewn about?

Organise another container	
Live it the way it is	
It is not my job	

36. What would you do if you see somebody dumping waste in an open area in nearby your residence?

Report him or her	
Nothing that I can do	
It is not a problem for me	

37. Do you discuss domestic solid waste management with other members of the community?

Yes	
No	

38. In your opinion, how concerned is your community about waste management?

High level of concern	
Average level of concern	
Very low level of concern	
No concern	

39. Are you satisfied of the behaviour of waste collectors?

Yes	
No	

40 Are you satisfied with waste collectors' performance?

Yes	
No	

41. Any other comment:

……

……

……

……

……

……

Thank you very much for your co-operation.

APPENDIX 2: THE QUESTIONNAIRE (AFRIKAANS)

AFDELING A: DEMOGRAFIESE INLIGTING

1. Ouderdom ……..

2. Geslag

Vroulik	
Manlik	

3. Huwelikstaat

Getroud	
Ongetroud	
Weduwee	
Geskei	
Saamleef	

4. Bevolkingsgroep

Indiër	
Swart	
Wit	
Kleurling	

5. Beroep……..

6. Hoogste Kwalifikasie

Geen	
Sub A-Standard 3	
Standard 4-5	
Standard 6-7	
Standard 8	
Standard 9	
Standard 10	
Na skoolse - opleiding	
Diploma	
Graad	

Spesifiseer Diploma/Graad asb……

……..

INKOMSTE

7. Wat is die totale inkomste na alle afrekkings (m.aw almal se gesamenklike inkomste) van die huishouding

Inkomste	Weekliks	Maandliks	Twee-Weekliks
Minder as R1000			
R1001 tot 2000			
R2001 tot 3000			
R3001 tot 4000			
R4001 tot 5000			
R5001 tot 6000			
R6001 tot 7000			
R7001 tot 8000			
R8001 tot 9000			
R9001 tot 10000			

BEHUISING

8. a. Is jy n huiseinaar of huurder?

Huiseienaar	
Huurder	

b. Indien jy huurder is, van wie huur jy?

Raad (Council)	
Privaat	

9. Hoe lank woon jy in hierdie huis?

……

……

10. Hoeveel mense(uitsluitende jy) woon tans in die huis?

Familielede……

Loseerders……

AFDELING B: KENNIS VAN HUISHOUDELIKE AFVAL/VULLIS.

11. Wat noem jy die items wat jou huishouding weggooi ?

……

……

……

12. a. Weet jy wat huishoudelike afval/vullis is?

Ja	
Nee	
Onseker	

b. Indien ja: verduidelik wat jy as huishoudelike afval sal klassifiseer

……

...……

c. Waar het jy die inligting/informasie gekry om hierdie klassifiseering te maak?

Inligting verkry by die skool	
Inligting uit koerante	
Inligting verkry van ouers	
Inligting vanaf die radio	
Inligting vanaf die televisie	
Ander bronne	

Indien ander bronne, verskaf besonderhede ……

……..……

……..……

As huishoudelike afval nie in n verantwoordelike en beheerde manier behartig word nie-wat sal die nagevolge wees?

13. Indien enige, op jou gesondheid?

……

……

14. Wat dink jy sal die nagevolge wees of Tafelsig as n geheel?

……

……

15. Stey jy belang in jou omegewing of enige omgewings probleme wat bestaan ?

Baie geintereseerd	
Geintereseerd	
Geedeeltelik geintereseerd	
Glad nie geintereseerd	

16. Hoe belangrik dink jy is dit om jou omgewing skoon te hou?

Baie belangrik	
Belangrik	
Gedeeltelik belangrik	
Glad nie belangrik nie	

Verduidelik asb volledig hoekom u so voel ……

……

……

AFDELING C: HUISHOUDELIKE AFVAL/VULLIS BESTUUR

17. a. Waar in jou huishouding word huishoudelike afval geberg?

In'n vullisdrom (sonder plastiek sak)	
Hou dit in'n plastiek sak sonder drom	
Hou dit in'n plastiek sak in die vullisdrom	
Ander houer/manier	

b. Indien ander verduidelik asb wat gebruik word ……

……

……

c. Indien jy van'n vullisdrom gebruik maak meld wie dit verskaf het

Die raad teen geen koste	
Die raad, en ek het betaal daarvoor	
Self aangekoop	

Ander, verskaf besonderhede……

……..

18. Verskaf die Raad swartsakke?

Ja	
Nee	

b. Indien ja, is dit gratis

Ja	
Nee	

19. As jy wel n vullisdrom gebruik , is een drom genoeg om al die huishoedelike afval te berg?

Altyd groot genoeg	
Gewoonlik groot genoeg	
Nie groot genoeg nie	

SORTING VAN ROMMEL

20. **a.** Hou jy alle tipe vullis (Kos, plastiek,klere.hout,metaal,blikke ens.) in dieselfde vullisdrom ?

Ja	
Nee	

b. Indien ja, hoekom doen jy dit? ……
……
……

c. Indien nee, verduidelik ten volle hoe jy jou huishoudelike afval/vallis sorteer

……
……

d.. Hoe het jy te hore gekom om jou huishoudelike afval/vullis te sorteer?

……..……..
……
. …….....
……
……

21. Raai jy under mense aan in jou omgewing om ook hul huishoudelike afval to sorter en volgens kategorie te berg?

……
……

AFHAAL/KOLLEKTEER VAN VULLIS

22. Hoe gereeld word afval/vullis in jou straat gekollekteer?

Een keer per week	
Twee keer per week	
Een keer elke twee weke	
Een kee per maand	
Ander	

Indien ander, spesifiseer asb……
……..……
……..……

b. Waar word die vullisdrom/sak geplaas vir kollektering?

Op die sypaadjie voor huis	
Op die werf naby sypaadjie	
Op die werf ver van sypaadjie	
Ander plek	

c. Indien ander waar……...

.....

..... ……

……

……...

23. Hoe tevrede is jy met die vullisverwydering sisteem?

Hoogs tevrede	
Tevrede	
Gemengde gevoelens	
Ontevrede	
Baie ontevrede	

Motiveer jou antwoord asb so volledig moontlik

……

……

24. Hoe gereeld gebeur dit dat die afval/vullis nie gekollekteer word nie?

Baie gereeld	
Gereeld	
Byna nooit	
Nooit	

25. a. Dien jy'n klag in waneer die afval/vullis nie verwyder word nie?

Ja	
Nee	

b. Indien nee, hoekom nie? ……...

……

……

c. Indien ja, wat was die reaksie op jou klag?

……..……

…….……..

26. Weet jy of nie verwydering ran vullis 'n algemene probleem in Tafelsig is?

Ja	
Nee	

27. Indien ja, is jy bewus dat indien die afval/vullis nie verwyder word nie, die Tafelsig gemeenskap daaroor kapsie kan maak?

Ja	
Nee	

28. Wat doen jy as die vullis **voor jou huis** nie gekollekteer word nie?

Stel die skoonmaak afdeling van Raad (Council) in kennis	
Los dit waar dit is	
Gooi dit op oop velde naby die huis	
Gooi dit in oop velde ver van die huis	
Ignoreer dit want dit pla my nie	

AFDELING E: GEDRAG TEENOOR AFVAL/VULLIS

29. Voel jy geïrriteerd wanneer mense rommel op jou werf strooi?

Ja	
Nee	

30. Voel jy geïrriteerd wanneer mense rommel in die strate naby jou huis strooi?

Ja	
Nee	

31. Voel jy geïrriteerd wanneer bure rommel op hul werf strooi?

Ja	
Nee	

32. Voel jy geïriteerd wanneer mense rommel in Tafelsig strooi?

Ja	
Nee	

33. Wat doen jy wanneer jy sien dat mense rommel strooi?

……

……

34. Hoe voel jy wanneer vullis nie gekollekter word nie?

Baie omgekrap	
Omgekrap	
Glad nie omgekrap nie	
Dis pla my nie	

35. Wat sal jou reaksie wees as jy vind dat jou huis se vullisdrom stukkend is en die rommel lê verstrooid?

Reëlings tref vir'n ander vullisblik	
Los dit net so	
Dit is nie my probleem nie	

36. Hoe tree jy op wanneer persone rommel strooi in oop vlaktes naby wonings?

Raporteer hom/haar	
Niks wat ek kan doen nie	
Dit is nie'n probleem vir my nie	

37. Gesels jy ooit met persone in die gemeenskap aangaande die behoorlike bestuur (management) van huishoudelike afval in Tafelsig.

Ja	
Nee	

38. Volgens jou kennis hoe bekommerd is mense in jou gemeenskap oor afval/vullis kontrole/bestuur

Hoogs bekommerd	
Redelik bekommerd	
Min bekommerd	
Gladnie bekommerd	

39. Oor die algemeen, is ju tevrede met die gedrag van die werkers van die Raad wat die vullis van jou huis kom kollekteer.

Ja	
Nee	

40. Is jy tevrede met die kwaliteit diens wat gelewer word deur die vullisverwyderaars?

Ja	
Nee	

41 Indien jy enige ander of verdere opmerkings wil maak oor vullis verwydering in Tafelsig spesifiek of in die algemeen maak asb van hierdie ruimte gebruik!

……

……

…..……

BAIE DANKIE VIR U SAMEWERKING.

APPENDIX 3. COVER LETTER FOR QUESTIONNAIRE

APPENDIX 4. PERMISSION LETTER FROM THE WESTERN CAPE EDUCATION DEPARTMENT.

APPENDIX 5. SITE'S MAP