

RESEARCH TOPIC

**THE ROLE OF ENVIRONMENTAL GOVERNANCE IN MUNICIPAL WASTE MANAGEMENT:
NEWCASTLE (KZN) AS CASE STUDY**

BY

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DECLARATION

I, Hoitsimolimo Masange hereby declare that this extensive mini-dissertation for the programme in Governance and Political Transformation at the University of the Free State in Bloemfontein is my own original work and has not been submitted by me or any other individual at this or any other university. I also declare that all reference materials, used for this study have been properly acknowledged.

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ACRONYMS

HIV	Human Immunodeficiency Virus
AIDS	Acquired Immune Deficiency Syndrome
DEAT	Department of Environmental Affairs and Tourism
NLM	Newcastle Local Municipality
ECA	Environmental Conservation Act
EG	Environmental Governance
SACA	South African Constitution Act
RSA	Republic of South Africa
MEC	Member of the Executive Council
WMA	Waste Management Act
IDP	Integrated Development Plan
NWMSISA	National Waste Management Strategy Implementation South Africa
NEMA	National Environmental Management Act
WISGTI	Waste Information System Guideline on Technical Implementation
NWIS	National Waste Information System
NWMS	National Waste Management Strategy.
IWMP	Integrated Waste Management Plan
WMO	Waste Management Officers
LGMSA	Local Government Municipal Systems Act
MSA	Municipal Structures Act.
PWMSA	Pollution and Waste Management

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CHAPTER 1

RESEARCH INTRODUCTION

1.1 Introduction

The study focuses on the role of Environmental Governance in municipal waste management in the Newcastle Local Municipality which is situated in the north-western corner of KwaZulu Natal. This chapter introduces the research. Regarding the problem identified in this community, the research proposal outlines the role of environmental governance in municipal waste management, the causes of municipal waste, consequences, and possible solutions. Reasons why the researcher found it essential to carry out a study on this topic are provided, statements of the problem, the aims and objectives, and the methods used to collect data or information. Finally, the research design is presented, giving the layout of the whole research. Mouton (2001:4) states that “a research proposal is a document that outlines your thinking about the research problem. The research proposal is a project planning document and embodies your thinking about the study as you envisage it at the beginning of the project”.

The project plan is a social science research. Mouton and Marais (1990:7) state that “social science research can be defined as a collaborative human activity in which social reality is studied objectively with the aim of gaining a valid understanding of it”.

The study encompasses the definition of municipal solid waste and environment governance, as well as the reasons why the researcher found it imperative to investigate and assess the implementation of waste management guidelines in the Newcastle Municipality. Challenges and control measures are discussed and the aim and objectives of the study are focused on what ways of eradicating these waste management challenges should be achieved.

The study further discusses the theoretical context of municipal waste and environmental governance, specifically the causes, consequences and possible solutions regarding municipal solid waste. The role played by environmental governance in the issue of solid waste is particularly addressed. Information would be collected on different selected focus areas suspected of being a threat to the environment. Research methods, their functions, and appropriate research designs were selected in order to acquire the data required. Since regulations and laws that govern the way people should operate are major component in

people's lives, the researcher explored the extent to which local municipalities implement policies on conservation of the environment.

The study presents research results and analysis of the data collected on the role of environmental governance in municipal waste management in the Newcastle Local Municipality. These results are used to draw conclusions and make recommendations. This discussion focuses mainly on the research findings, the recommendations regarding effective environmental governance, and the methodology and research results on how to overcome the problems which were initially identified.

1.1.1 Causes of poor waste management

Discussion of the causes of poor waste management brings to light the negative impact of municipal waste on our environment and informs those governing the environment of the gaps encountered in the implementation of environment policies. Poor municipal waste management is a result of several factors: poor implementation of environmental policies, lack of financial resources, lack of environmental literacy (that is, a low level of public awareness and hence low public support of programmes on how to eliminate waste at source), as well as lack of trained personnel. Waste management problems are thus caused by lack of the infrastructural capacity required for efficient management and processing of solid waste, as well as poor education in the benefits of proper municipal waste management.

Other causes are a result of lack of capacity to handle and manage waste before it is deposited in landfills. Therefore, the researcher looks at the negative effects of poor municipal solid waste management from economic, social, cultural, and political perspectives. The rapid industrial growth of the Newcastle Local Municipality (NLM) during the past few years has produced significant environmental side effects, with waste collection proving to be one of the most significant problems currently facing the Newcastle Local Municipality (NLM). Problems of waste collection are of major concern in Madadeni, in the eastern parts of the municipality, as well as other neighbourhoods of Newcastle.

It is also recognised that there is a lack of awareness campaigns to educate the community on how waste/litter has to be managed in order to keep the environment healthy for everyone. There are many open spaces used as Illegal dumping sites which threaten the environment as well as the health of people living adjacent to these spaces. The disposal of unscreened waste

negatively impacts the environment, storm drainage, and landfills. It is essential that waste is screened before it is deposited in landfill, otherwise the landfills become full within a short space of time. This screening directs much of the waste to recycling companies, where it may be reduced or recovered.

1.1.2 Consequences

It is very important to discuss possible consequences of waste on our environment. Municipal solid waste impacts negatively on the environment as well as human health. If residents do not have the proper places to dispose waste, they resort, for example, to dumping waste in storm drains as well as in open spaces. These heaps of solid waste cause blockages and retention of dirty water which, in turn, may become breeding areas for mosquitoes and hence spread malaria to the residents of the area. Waste left uncollected in municipality bins for long periods of time cause land pollution as well as air pollution if it is burnt – again, leading to the outbreak of diseases. Furthermore, if waste is not managed properly, the economy of the area may decline as waste is aesthetically unattractive and may cause residents to move away.

During the rainy season, uncollected waste may cause many problems as it can easily be washed away and, mixed with excreta, can be deposited in wells, boreholes and streams, thereby contaminating drinking or washing water. If proper treatment is not carried out in the landfill, leachate can contaminate groundwater. Lack of public awareness campaigns on how to manage waste at source may thus lead to serious environmental degradation and health risk. It is discovered that waste management programmes have not yielded the anticipated results, recommendations to improve the effectiveness of waste management programmes will be put forward.

Pollution of the environment has huge impact. This impact can be social, economic, political, religious, cultural or historical. It is certainly true that prevention is better than cure. Barrows (1979:2) states that “pollution is an economic problem partly because it reduces the value of some of the resources that society has at its disposal”. The question must be asked: what action is being taken by municipality, land use agencies, technical control or environmental management departments. The researcher has observed that land pollution caused by municipal solid waste reduces the value of our resources and has great impact on the health of people. Regarding economic conditions, Barrows (1979:42) states that, “this means that the

impact of pollution cost is felt not only through an increase in the firm's fixed cost, which would leave his short-run output choice unaffected as long as the decline in profit did not drive him immediately out of business".

1.1.3 The role of environmental governance in managing municipal solid waste:

In this section the researcher looks at the production of municipal waste and the role played by environmental governance in trying to harmonise the environment. Governance is considered as the processes through which power and authority are exercised between and within institutions of the state and civil society concerning the allocation of resources (Cloete, 2000:13). Governance can also mean taking decisions which affect the rights of other people and exercising discretion in answer to requests or petitions.

Environmental governance focuses on integrating environmental, social and economic considerations into development and land use planning processes and structure. These require the assessment of environmental impact at policy, planning, programme and project stages. Environmental governance is also concerned with the integration of the different approaches to environmental management, all of which attempt to address pollution control and waste management.

Environmental governance needs particularly to ensure effective and efficient delivery of waste services at local level, as well as re-addressing the imbalances in waste collection services of the past. The purpose of environmental governance is to set out strategies to achieve appropriate standards in each community with regard to the processing of waste. Municipal bylaws set out service standards for separating, compacting and storing solid waste, managing and directing solid waste disposal, and controlling litter. It is also the responsibility of environmental governance to ensure that awareness of waste and anti-littering campaigns are linked to recycling infrastructure and to the extension of waste services. Environmental governance has the responsibility to develop implementable IWMPs which must include outcomes, priorities, objectives, targets and implementation, as well as financing arrangements. According to RSA (Republic of South Africa), 2008 NEMA, Waste Act No 59 of 2008 Goal four, the objectives of environmental governance are:

- ❖ To develop public participation mechanisms and processes that are fair, transparent and effective and which will promote the participation of marginalised sectors of society.
- ❖ To ensure communication strategies in all spheres of government to address public participation needs.
- ❖ To monitor adherence to norms and standards in the delivery of waste services.

RSA (Republic of South Africa) NEMA, Waste Management Act (Act No. 59 of 2008:24) focuses on local government, it state that, “municipality must exercise its executive authority to deliver waste management services, including waste removal, waste storage and waste disposal services in a manner that does not conflict with national and provincial norms and standards”.

All municipalities need to carry out responsibilities which include waste collection, waste storage and waste disposal in accordance with national and provincial norms and standards. According to this policy, municipalities’ responsibilities are clearly stated. Furthermore, RSA (Republic of South Africa) NEMA, Waste Management Act (Act No. 59 of 2008:24) state that, the municipality has to set “local standards for the separation, compacting and storage of solid waste that is collected as part of the municipal service or that is disposed of at a municipal waste disposal facility”. Included in these responsibilities has to be the management of solid waste that is disposed of by the municipality.

Since the eastern part of the Newcastle municipality borders on many open spaces which have become illegal dumping sites, thereby producing many problems for the whole community, the researcher considered it imperative to evaluate the effectiveness of environmental governance regarding the management of municipal solid waste.

1.2 Research Problem

This is the state of environmental governance with regard to the Newcastle Local Municipality. Research problems are identified in order for the researcher to carry out a study on the causes and consequences, as well as the possible solutions which can be employed to eradicate the problem. Mouton (2001:137) asserts that “research problems are usually formulated in order to address real-life problems: problems in the social and physical world”. The research problem may be stated thus: The limitation of poor municipal solid waste management can never be over-exaggerated, as its consequent land and air pollution makes the area unattractive, unhealthy and harmful to the lives of people. The problem refers to the role of environmental

governance in municipal solid waste management in the Newcastle Local Municipality. In order to manage the research problem, the researcher subdivided it into sub-problems as follows:

What are the causes of poor municipal solid waste management in the Newcastle Local Municipality?

- What are the consequences of poor municipal solid waste management?
- What makes law enforcement practically impossible in the Newcastle Local Municipality?
- Are there any laid down bylaws which govern the environment in the Newcastle Local Municipality?
- Are waste management guidelines applied properly?
- Does the municipality communicate its waste removal programme to its residents effectively?
- Are there any successful aspects to this problem?
- Is Environmental governance sufficient with regard to monitoring the implementation of the environmental laws?

South Africa is currently experiencing a process of transformation and the great need to redress past imbalances – processes which are not easily experienced by most South Africans. According to Human (1998:23), states that, “transformation requires extraordinary effort and insight and it is unnatural, goes against the grain of the creatures of habit”. Transformation also implies effecting change in a particular area. Newcastle experience a problem in transforming from an existing habit of dumping waste without regard for the impact they are causing to the environment and the health of everyone in the community. This study hence assesses the role played by environmental governance in addressing past imbalances and enforcement of bylaws in order to create a healthy environment.

1.3 Research aim and Objectives

1.3.1 Aim:

The aim of the study is to assess the role of environmental governance in municipal waste management in the Newcastle Local Municipality.

1.3.2 Research objectives

In order to achieve the above aim the following objectives are pursued:

❖ Literature review

- A literature review of South African legislation will be carried out, together with the environmental policies determined by the municipality. The view will enable the researcher to identify possible loopholes and evaluate different policies of waste management.
- A literature review of locally based laws will be carried out in order to determine how the Newcastle Local Municipality governs municipal waste management, and to assess what extent the municipality has devised solutions to waste management problems.
- A literature review of various books will be used to provide the researcher with information on the state of waste management and how the Newcastle Local Municipality implements waste management guidelines.
- A literature review of different sources on municipal waste management will be carried out to accumulate information on how effectively the municipality should be implementing environmental policy.
- A literature review will be carried out on what other authors, journals, and articles have contributed regarding the implementation of environmental policies. It is hoped that this will stimulate further new ideas.
- A literature review of different sources will help the researcher learn from others, and be able to compare and replicate, as well as integrate, information on how environmental policies have to be implemented.

❖ Research Methodology

The methodology used to assess the effectiveness with which the Newcastle Local Municipality implements waste management guidelines and context based laws in order to address waste management issues is as follows:

- The researcher will use the qualitative sampling method in order to deepen understanding about the role of environmental governance, as well as ways of keeping the environment clean.
- A research design of ethnography will be used in which the researcher will select the people who will be interviewed. An interview guide will be provided, as well as an audio tape if allowed, to enable the researcher to acquire the information which will show the effectiveness of environmental governance in the Newcastle Local Municipality.

- The documenting of events, recording what people actually say, observing specific behaviours, and examining written documents will be carried out.
- A narrative method will be used, allowing participants to tell about their own experiences of waste management programmes.
- A desk top methodology will explore the policies of the Newcastle Local Municipality to determine whether they are in line with National Environmental laws.
- Observation and interviews will be conducted in order to investigate whether the Newcastle Local Municipality promotes access to waste management information and carries out public consultation during the waste management processes

❖ **Data collection**

In order to formulate methods of collecting relevant information on the effectiveness of the implementation of waste management guidelines in the Newcastle Local Municipality, the following objectives will be pursued:

- To use the sampling method to will enable the researcher to collect information from relevant and reliable participants.
- To use data collection to draw a conclusion regarding the collection of municipal waste in the Newcastle Local Municipality. This will enable the researcher to propose recommendations which may help stabilise the waste management problems in the Newcastle Municipality.

❖ **Data analysis**

Data analysis will provide insight to the research problem, as well as a check on the challenges encountered by the Newcastle Local Municipality as it tries to implement waste management guidelines. Data analysis will be carried out in order to search for patterns within the problems researched. The following objectives will be pursued:

- To use a qualitative analysis this focuses on patterns and relationships.
- To examine, sort, categorise, evaluate, compare, synthesise and contemplate the coded data, as well as review raw and recorded data.
- To explore the local authority standards of waste management and compare these with the National waste management standards.

- To apply different analysis strategies in order to find out whether environmental governance, together with waste management, play their role in keeping the environment healthy.
- To use the successive approximation method of qualitative data analysis and semiotic mode of analysis which focus on discourse and conversation analysis through interview analysis.
- To draw conclusions on what should be done to correct the state of waste management in the Newcastle Local Municipality.
- To identify the 'gaps' and how they can be addressed.
- To look at future strategies the Newcastle Local Municipality could adopt in order to improve the management of waste management in its locality.

1.4 Research justification

The researchers' interest lies in the role of environmental governance in the Newcastle Local Municipality, particularly that of the municipal waste management department. The researcher has observed many areas in the Newcastle Local Municipality which indicate waste not being collected for final disposal in landfills. However, the researcher is more interested in intensively researching the causes, consequences and possible solutions regarding waste problems in the Newcastle Local Municipality.

The researchers' interest was aroused by the solid waste which was seen in unlawful dumping sites or which had simply been dumped in any conveniently vacant space. Dumping of solid waste in vacant spaces has many consequences on the environment, as well as on people's health. Such dumping is usually carried out by people who ignore the stipulated regulations. Policies, regulations, strategies and plans must be used in order to maintain a sound environment that is not harmful to the lives of people.

Another reason why the researcher chose to pursue this study is the extent to which these unauthorised dumping activities – namely, the dumping in any vacant space of solid waste from industrial activity, or in the form of illegal dumping sites, or from informal settlements, or even from households – pollute the environment. The researcher was interested to find out whether there are policies designed to counteract such problems. Policy must state clearly how such issues should be solved if and when they surface.

The researcher's major interest in this study is to determine the impact of littering and municipal waste pollution in Newcastle Local Municipality and the role played by environmental governance. Baumol and Oates (1988:47) state that "the lack of services in many poor residential areas results in pollution and poor environmental health". Therefore, more research needs to be carried out on environmental governance and waste management in order to establish the root causes of such problems and hence perhaps appropriate preventative measures.

This study will enable the researcher to establish whether policies are being implemented correctly. It has been observed that emerging settlements, such as Siyahlala-la and H39, produce large quantities of waste which is not collected by the municipality. According to Arthar and Vohora (1995:1), "human activity and consequent developments have brought about the spectre of an overwhelming degradation of all facets of the natural environment: physical, chemical, biological and social". The researcher is interested in answers to the following questions: what were the criteria regarding the distribution of land to the areas in which these human activities are taking place; and how long does it take for governance to amend policies? With regard to the use of land by different land polluters, there should some indication of how the issue of polluting the environment is going to be worked out. The South African Constitution, the Environmental Management Act, 1998, as well as the Waste Management Act, 2008, include policies which show all provinces and municipalities how to manage the ways in which waste should be removed. Newcastle faces many challenges regarding waste collection – there should be ways in which the situation can be corrected in order to provide people with a sound environment.

The study is important in so far as it could help South African local governments to improve their implementation of environmental policies. The impact of the study could be felt in diverse areas of society, as un-removed waste and illegal dumping sites affect people in many different localities. The study may also help municipalities curtail the amount of toxic waste in the atmosphere, thus even saving lives of people.

By conducting this study, the researcher sought to explore the legislation regarding environmental preservation and the processes thereof as they apply to local government. The researcher wishes to expose the dangers of un-removed waste to society and the environment. For this reason, the researcher focused on the role of environmental governance and the implementation of waste removal guidelines in the Newcastle Local Municipality in addressing

waste removal issues: A study in the effectiveness of local environmental governance. Everyone is entitled to a healthy environment regardless of where they live. Pollution has proved to have many effects on the environment –economic, political, historical, and social – and the researcher wishes to increase her knowledge on this particular aspect of air pollution. Some of the problems of land pollution caused by illegally dumped waste have failed to be eradicated due to a lack of funds. It has also been the case that politicians have promised to eradicate land pollution in order to gain campaign votes, but have failed to fulfil their promises.

It is clear therefore that a healthy life for everyone in a community depends on strict implementation of the laws and regulations and that these have to be adhered to by all. The environment in which we live undergoes regular transitions caused by population growth, a factor which impacts greatly on the environment. This study of governance and political transformation is hence based on the role of environmental governance and the implementation of waste removal guidelines in the Newcastle Local Municipality. The researcher has observed deterioration of the environment caused by un-removed waste, as well as illegally dumped waste. The researcher wishes to gain a deeper understanding of the environment and activities which take place in the environment and their impact on the ecosystem, human health, plants, and animals. Apart from what has been highlighted as the driving forces of this study, the researcher seeks to understand what actually is meant by waste and exactly why it is a threat to human lives as well as the environment.

1.5 Study and outline of research area

This study was carried out in the Newcastle Local Municipality (NLM), situated in the northwest corner of KwaZulu-Natal and bordering the Free State and Mpumalanga provinces. The Newcastle Local Municipality is part of three municipalities which make up the Amajuba district Municipality. According to the RSA (Republic of South Africa) Newcastle Local Municipality Integrated Developmental Plan, it covers an area of 1854 square kilometres with a population estimated to be 363 237 people spread evenly over thirty-one wards, with eighty percent residing in the eastern side of Newcastle.

The researcher's aim is to assess the role played by environmental governance in municipal waste management in the Newcastle Local Municipality and whether people are properly serviced in terms of waste management laws in these thirty one wards. The Newcastle IDP was prepared according to the requirements of the RSA (Republic of South Africa) Municipal

Systems Act and associated regulations, and serves as the strategic guide for public sector investments and development. Its main objective is “to co-ordinate the activities of various service delivery agencies within Newcastle Local Municipality’s area of jurisdiction”.

The maps and images clearly outline the areas in which the study was completed. Figure 1.1 shows the Newcastle Local Municipality, while the second map shows the Newcastle Environmental Framework, on which environmental governance bases its laws. It goes on to show the western and eastern side of NLM. Waste management problems are mostly found in the eastern side – namely, Madadeni, Osizweni, Siyahlala-la, H39, Dry Cut and Blaawbosch. The main purpose of these maps is to show the study coverage, that is the areas in which field observation and interviews were conducted in order to collect the information needed to evaluate the role of environmental governance.

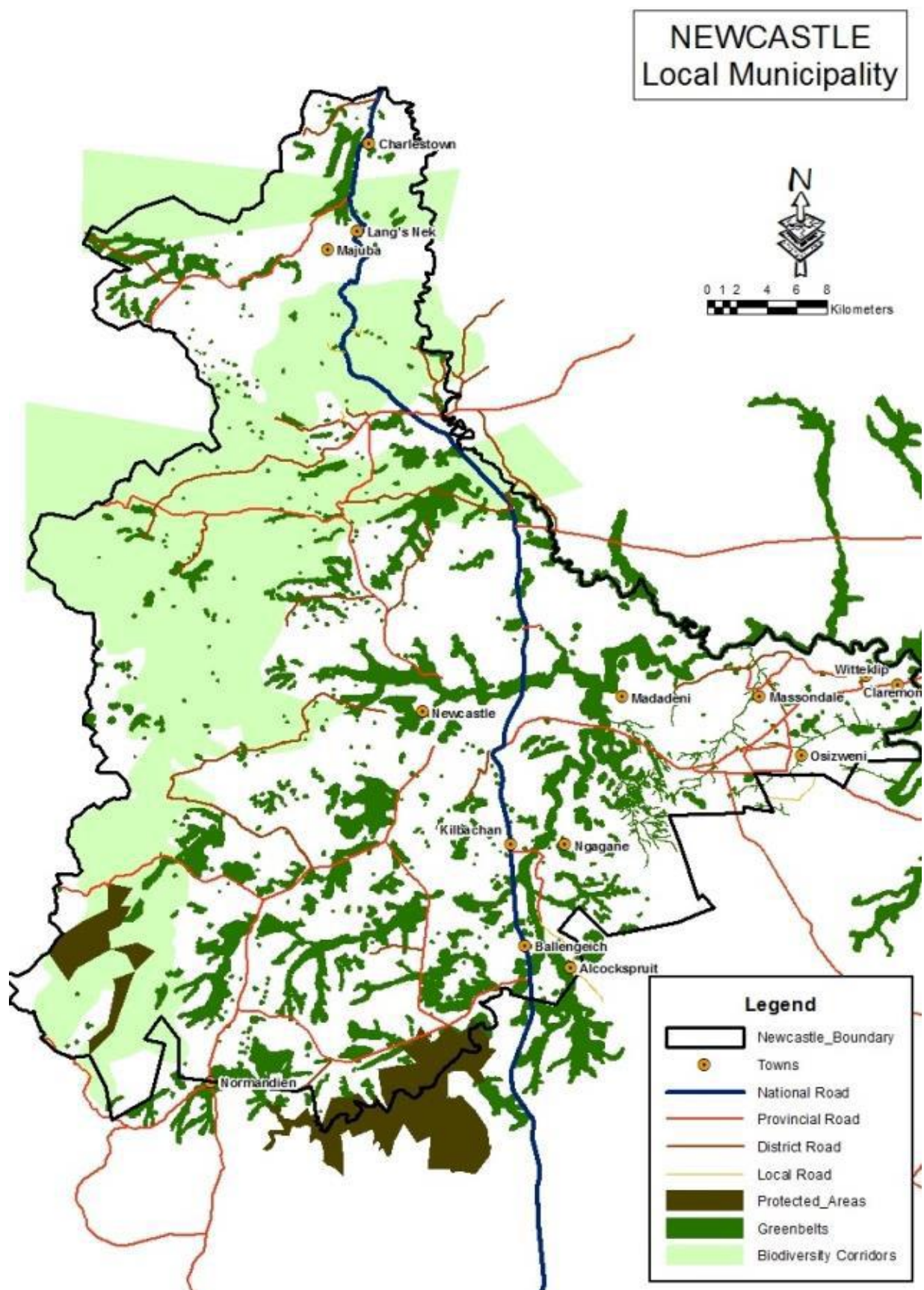


Image 1.1 shows Newcastle Local Municipality



Image 1.2 shows the Newcastle Environmental Management Framework

The following images show how waste is illegally deposited on land. An aerial map of the focus areas of the research is also included. The pictures were taken in the eastern part of the city – the location – where illegal dumping sites are unmanaged. The residents of these informal settlements litter or illegally dump their domestic waste on the land thereby causing land pollution and putting their own lives in danger. Litter, as can be seen in the images provided, makes the places unattractive and is likely to cause drainage blockages. The litter is often burned, without consideration of the smoke produced which in the end results in increased air pollution of the area. The images provide a background to the type of area studied.



Image 1.3 shows a skip container which is not properly used by residents or could indicate neglect by the waste management department of Madadeni in the eastern part of the NLM

1.6 Ethical considerations

The researcher carried out the research in such a way that the lives of the participants, as well as the researcher, were in no way adversely affected. According to Neuman, (2011:143) the researcher has to balance the two values, that is, the pursuit of scientific knowledge and the rights of those being studied or of others in society. The researcher did not exploit the research participants and honoured all guarantees of privacy and confidentiality. The researcher evaluated the research in progress in order to remove any undesirable consequences to the research subjects. This was only effective because the researcher used the appropriate research designs and methods. The researcher respected the opinions of the participants and

never humiliated them in any way. In the study, the researcher used appropriate techniques, methods and designs in order to achieve fruitful and accurate results.

1.7 Research Design

The researcher chose and used research designs which enable the collection of data in the identified areas. Mouton (2001:55) asserts that “a research design is a plan or blueprint of how you intend conducting the research”. According to Babbie and Mouton (2001:159), research design is, “a plan of action that includes the techniques that will be employed in the implementation or execution of the research”. Therefore, research designs are formulated from the research problems identified – they are a guide to the selection and appropriate approach. Research designs focus the logic of the research and are tailored to address different kinds of questions, (Mouton 2001:56). The researcher therefore utilised ethnographic design to collect data. The strategies of inquiry in the study were therefore narrative, phenomenological and ethnographic design

According to Mouton (2001:148) ethnographic designs are, “studies that are usually qualitative in nature which aim to provide an in-depth description of a group of people or community”. Accordingly, the researcher spent long periods of time on the research sites. Data was collected by means of observations, interviews and document analysis. Data was collected from the Newcastle, Siyahlala-la, H39, Dry Cut, Madadeni and Osizweni communities. The researcher spent two months altogether in the selected communities. The researcher set aside April and May for the ethnographic observations in the selected communities. The qualitative requirements of objectivity, dependability and conformability were taken into consideration.

- **Validity and reliability of principles implemented**

The study reflects the two principles of reliability and validity. When a study is said to be reliable, it has to show consistency or dependability through its use of interviews, participation, photographs and documents. If it is valid, the study will show truthfulness. Validity refers to the extent the research answers its question and whether research instruments used by the researcher perform the functions they are supposed to perform (Leedy and Ormrod, 2009). According to Neuman (2011:237), “validity refers to its truthfulness or the fit between a construct and data”. Neuman (2011:456) further states that, “validity in field research comes from your analysis of data as accurate representations of the social world in the field”.

In order to ensure that the research instruments (questionnaires and interview guides) provided valid data, the researcher first piloted their use in order to ascertain whether the question posed yielded the desired responses. With regards to the interviews and questionnaire responses the researcher ensured that documentary evidence was consulted – for example, if interviewees spoke of people who were suffering or had suffered from ailments that were related to municipal waste problems. The researcher also ensured that the questionnaire or interview guides were available in IsiZulu, in order that there was no inaccessibility for IsiZulu-speaking respondents. The researcher also ensured that no leading questions were asked and that the questions were not ambiguous.

In addition to validity, the study's success depends on its reliability. The researcher's observations regarding the field being studied need to be internally or externally consistent. Neuman (2011:455) asserts that "reliability in the field research depends on your insight, awareness, suspicions and questions". In order to fulfil the requisite of reliability, the researcher used the following techniques: interviews, photographs, document studies and participation from people in the field.

1.8 Study outline

In line with its objectives, the study is divided into the following five chapters:

CHAPTER 1 consists of a general introduction, including discussion of the causes and consequences of municipal solid waste, and the role of environmental governance in managing municipal solid waste. It also outlines the status of waste and environmental governance, the research problem, the research aim and the research objectives. Reasons for carrying out the study are given, and the study area, ethical considerations and the research design are outlined.

CHAPTER 2 describes the theoretical foundation of the study. The issue of municipal solid waste is reviewed, and its causes, consequences and possible solutions are examined. This chapter also includes discussions on municipal solid waste and the role of environmental governance, as well as a preliminary overview of policy and planning in environmental governance as implemented in the Newcastle Local Municipality.

A place-specific methodology for assessing the role of environmental governance in the municipal solid waste management in the Newcastle Local Municipality is formulated in **CHAPTER 3**. Against the background of the assessment of social and environmental challenges pertaining to the NLM case, this methodology includes a qualitative approach of collecting data on the role of environmental governance in municipal solid waste, the sampling method of interviewing participants and a fieldwork procedure through which the latter are applied to the case study.

The research results of this study are presented and discussed in **CHAPTER 4**. The results obtained from the application of objective indicators to the NLM are considered first. Data analysis in this chapter will be presented as follows: data collected through field observation, interviews, documented data, audio visual data, text and images analysis, open-ended questions, and emerging data in order to develop themes from the data.

CHAPTER 5 contains the study's synthesis, in which the social sustainability, methodology and research results are critically evaluated and recommendations are made for future application.

CHAPTER 2

Municipal waste and environmental governance: theoretical context of the research

2.1 Introduction

Everyone is entitled to live in an environment which is not harmful to health. However, the presence of human life in the environment may result in human activities which impact negatively on it, in the form of land, air and waste pollution. This study will consider municipal solid waste management and environmental governance.

In recent times, waste has been observed to be a major environmental threat. Waste causes the environment to be untidy, unattractive and may place people's lives at risk. It has also been observed that waste disposal in landfills may cause many problems in a community. This study considers the role of environmental governance in municipal solid waste management in the Newcastle Local Municipality, which includes the dangers of uncollected waste and leachate from landfills, as well as the alternatives of minimising waste at source and hence depositing relatively little waste in landfills. At the same time, the study assesses the implementation of general waste management guidelines.

The Newcastle Local Municipality is situated in the north-western corner of KwaZulu Natal and is one of three local municipalities of the administrative district of Amajuba. The municipality is experiencing illegal pollution of land, air and water, as well as solid waste disposal challenges, all of which leave the health of residents at risk.

In this chapter, the researcher focuses on municipal waste and environmental governance in the Newcastle Local Municipality. The following are discussed: municipal waste, causes and consequences, and solutions to the problems.

2.2 Municipal solid waste: An overview of relevant issues

The researcher's focal point is the role of environmental governance in municipal solid waste management in the Newcastle Local Municipality. There are four categories of solid waste, namely municipal, organic, plastic and electronic waste. The researcher focuses on municipal solid waste. Municipal solid waste consists of everyday items, such as product packaging,

furniture, empty bottles and cans, grass clippings, pieces of metal, batteries, paint, appliances, newspapers, and leftover food. Municipal waste is further divided into general and hazardous waste, as well as solid and liquid waste. This research focuses on general municipal solid waste which encompasses domestic, building and demolition, business and inert waste. General waste is seen as waste that does not pose an immediate hazard or threat to health or to the environment.

According to Oelofse and Godfrey, (2008:244) in the United States Journal of Science, 104, solid waste is defined as “[A]ny garbage, refuse, sludge from a waste treatment plant, water supply treatment plant, or air pollution control facility and other discarded material, including solid, liquid, semi solid or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations and from community activities”. The Environmental Protection Agency (EPA) views solid waste as “any discarded material”. Ademir S.F. Araujo (2012:2) defines solid waste as that which is produced after waste water treatment and its characteristics are influenced by anthropogenic activities.

The researcher focuses on municipal solid waste which consists of general and domestic solid waste generated by businesses, households, schools and hospitals – for example, items such as empty bottles and cans, leftovers, furniture, newspapers, packaging, clothing, appliances, etc. Municipal solid waste according to Worku, Y and Muchie, M, 2012 consists of “everyday items such as product packaging, empty bottles and cans, grass clippings, furniture, clothing, leftover food, newspapers, appliances, paint, batteries, pieces of metal.”

The RSA (Republic of South Africa) Resource Conservation and Recovery Act (RCRA of 1976) defines solid waste as “any garbage or refuse, sludge from a waste treatment plant, water supply treatment plant, or air pollution facility and other discarded material, including solid, liquid, semi-solid, or contained gaseous material resulting from industrial, commercial, etc”. on the other hand, solid waste can be considered as any liquid, solid, or contained gas that is discarded or stored prior to discarding. Oelofse and Godfrey (2008), South African journal of Science; 104, in the European Court of Justice, stated that waste “in European Union legislation implies discarded”. In the same journal, defines waste as “any substance which constitutes a scrap material or an effluent or other unwanted surplus substance arising from the application of any process and any substance or article which requires to be disposed of as being broken, thrown out, contaminated or otherwise spoiled and anything which is discarded or otherwise dealt with as if were waste shall be presumed to be waste unless the contrary is proved”. Waste

can be viewed as an insufficient use of valuable natural resources when potentially re-usable materials, such as paper, plastic, organic waste, glass and metal are disposed of to landfills". Material such as, solid, liquid or gas that are unwanted and/or unvalued and discarded or discharged are considered as waste. South Africa, in the Environmental Conservation Act (ECA), (2003), defines waste according to its "unwanted or superfluous nature".

Waste is also understood as any substance which can or cannot be reduced, re-used, recycled and recovered. RSA (Republic of South Africa) NEMA: Waste Act (Act No. 59 of 2008:16) defines waste as, "any substance, whether or not that substance can be reduced, re-used, recycled and recovered:

- a. That is surplus, unwanted, rejected, discarded, abandoned or disposed of.
- b. Which the generator has no further use of for the purpose of production.
- c. That must be treated or disposed of.

2.2.1 Causes of municipal solid waste

There are many factors that contribute to the problem of municipal solid waste in this municipality. The following key factors or causes have been identified:

- ❖ The Newcastle Local Municipality is a continually growing municipality in terms of population and economy, and this result in large volumes of waste being generated as a function of rapid growth of industrialisation. According to Thanh N. P cited in Araujo A.S.F (2012:101), "the rapid population growth and expanding urbanisation in developing countries have caused the increase of the waste generation and the variety of waste composition". However, the accumulation of uncollected waste could also be a result of lack of financial resources, inadequate managerial skills and a low level of public awareness – all of which lead to serious environmental degradation and health risk.
- ❖ Lack of adherence to the Newcastle Local Municipal bylaws and regulations.
- ❖ Lack of vigorous enforcement of municipal bylaws which results in many illegal dumping sites of municipal solid waste which may be seen in the open spaces of the eastern parts of the municipality.
- ❖ Poor educational awareness campaigns about the benefits of a healthy environment and the reduction of solid waste at source.
- ❖ Newcastle's failure to provide residents with enough trash cans to provide for waste disposal and discarded recyclable packaging material.

- ❖ It has been observed that management of areas varies according to the income of people residing in those areas. Zurbrugg (2), cited in Araujo A.S.F (2012:8), states that “the poor in the society suffer most from the unfavourable conditions deriving from disorganised waste management”. Thus, failure of waste management is usually caused by inadequate financial resources and improper distribution of resources, and lack of support and public awareness.

2.2.2 Consequences of municipal solid waste

This section discusses the consequences of general municipal solid waste on the Newcastle Local Municipality. The researcher discusses the natural environmental impact caused by waste, the health hazard it constitutes, as well as how the local authorities manage waste.

- ❖ The appearance of the environment is very important in all the cities. Dumped waste causes the environment to become aesthetically unattractive. In addition, many other serious problems may be caused – heaps of waste can become mosquito breeding areas and hence result in outbreaks of diseases like malaria.
- ❖ Waste which has been blown into storm drains may cause serious blockages and can pollute the water in the rivers which supply the municipality with drinking water.
- ❖ The accumulation of uncollected waste could be a result of poor control, lack of financial resources, inadequate managerial skills, and poor public awareness. Twardowska Irena, Allen Herbert E, Antonius A, and Ketterup F and William Lacy J (2004:5) state that, “disposal of solid waste and hazardous waste in or on the land without careful planning and management can present a danger to human health and the environment”. Poor waste management impacts the community and the environment, negatively influencing economical issues, educational, corruption, service delivery, poverty, crime and unemployment.
- ❖ Waste which is illegally (or legally) dumped has undesirable and/or superfluous by-products, both from what it emits and from its residue.
- ❖ Uncollected waste may have an adverse impact on the environment and the lives of people. Illegal dumping sites may create problems such as contaminated air, or suitable breeding habitats for mosquitoes which may then spread malaria. Uncollected waste has an adverse impact on the environment as a result of waste easily mixing with excreta, being washed away by rain water, and ending up in wells and rivers which provide communities with drinking water. Such contaminated water may lead to diseases such

as cholera and diarrhoea. Waste washed down drains may cause blockages which provide suitable habitats for flies and mosquitoes to breed in.

- ❖ According Armitage, N. (2007:151), the Urban Water Journal, Vol. 4, No. 3, states that, “there is a potential health hazard to humans associated with, for example, the putrefying contents of bottles and tins, or pathogenic organisms attached to discarded hypodermic needles”. Twardowska, etal, (2004:4) state that “hazardous waste means a solid waste or combination of solid waste, which because of its quantity, concentration, or physical, chemical or infectious characteristics may cause, or significantly contribute to an increase in mortality or an increase in serious irreversible, incapacitating reversible illness”.
- ❖ Litter or waste washed away by heavy rains may be deposited in the rivers leading to suffocation of aquatic fauna.
- ❖ Stealing may be resorted to, in order to obtain materials suitable for sale to recycling companies.
- ❖ The cleaning up of waste which has been lying around for several days may cost the municipality a large amount of money for labour and often for overtime. Most landfills receive mixed waste, including non-biodegradable waste, which causes them to fill quickly and attract waste pickers to the landfill area.
- ❖ According to Skinner, J. H. cited in Twardowska, etal (2004:1094), “open dumping of waste on the land without adequate controls can result in serious public health, and safety problems and severe adverse environmental impacts”. People removing waste from the environment need to be well educated on the dangers of handling such waste, such as the outbreak of diseases.
- ❖ A waste-filled environment is unattractive, which may negatively affect the economy of that particular area.

2.2.3 Possible Solutions to the problems of municipal waste

This section discusses possible solutions to the municipal solid waste problems identified above. These solutions will help eradicate the impact of solid waste and the illegal dumping sites in the eastern area of the municipality. Essentially, these involve an assessment of how well the environmental governance of this municipality is functioning. The Department of Environmental Affairs and Tourism and the White Paper on Integrated Pollution and Waste Management for South Africa outlines the essential requirements for effective environmental governance which has to be adopted by all municipalities, including the NLM. The requirements

state that “in order to achieve and meet the developmental needs of our people, sustainable development is essential”.

The policies state clearly that every individual has the right to live in an environment which is not harmful to his health or well being. Environmental governance at the local level is expected to compile and implement general waste management plans, provide general waste collection services and manage waste disposal facilities within their areas, as well as to enforce appropriate waste minimisation and recycling initiatives. Most environmental policies require that:

- ❖ Municipal by-laws are reinforced vigorously with a commitment to ensure compliance.
- ❖ In order to have a healthy environment, health environment awareness campaigns and socioeconomic incentives should be provided to municipal solid waste workers.
- ❖ Effective implementation of policies on environmental management, especially waste management, is vital to help solve or eradicate the problem identified.
- ❖ Relevant people with suitable qualifications should be employed.
- ❖ Togetherness in communities should be identified and incentives should be considered for those helping to solve the situation so that they may be motivated to continue working for the betterment of their areas.
- ❖ Vigorous implementation of waste management guidelines in the Newcastle Local Municipality should be carried out in order to help eradicate the issue of waste collection.
- ❖ Awareness campaigns should encourage residents to practise composting in order to reduce the volumes of solid waste deposited in landfills
- ❖ Municipalities should introduce innovative ways of reducing waste (trash, debris, flotsam, jetsam, floatables, gross pollutants or rubbish) in all areas of the community. Examples could be planning controls which will restrict waste generation in the environment, source controls established by means of education, and enforcement of awareness programmes.
- ❖ Municipalities should provide the community with separate bin bags of different colours – for re-usable items, recyclable items, and items that can be deposited in landfills. Community members should be encouraged to work cooperatively so that the collection of waste can be successful. Waste deposited in catchment areas would be reduced, as would pollution of the air we breathe.

- ❖ Landfills should have a collection system for leachate, a liner system, and systems for the control of landfill gas and groundwater monitoring.
- ❖ Communities should work hand in hand with municipalities in trying to minimise waste reaching drainage systems.
- ❖ Municipalities should run awareness programmes, such as education campaigns which target household waste disposal; they should improve enforcement of anti-litter legislation, and should upgrade cleaning and waste collection operations.
- ❖ Municipal bylaws should clearly stipulate how solid waste should be packed, sorted, collected and disposed.
- ❖ People should practise source reduction of solid waste, such as leftover food and garden refuse.

According to the South African National Department of Environmental Affairs and Tourism (DEAT) (4), “the disposal and combustion of municipal solid waste is conducted by the use of landfills, the conversion of non-recyclable waste materials into useable heat, electricity or fuel, combustion and transfer stations”. Composting and pre-treatment of municipal waste before landfill significantly reduces the volume of solid waste.

Street waste-pickers should be allowed to pick through waste waiting to be disposed. Gerdes and Gunsilius (2010:5) cited in Schenck and Blaauw, 2011, view street waste-pickers as contributing importantly to the national economy. According to them, “street waste pickers are entrepreneurs who add value merely by collecting and then transforming waste into tradable commodities”. This activity actually prevents many people who are jobless from starvation. Accordingly, Araujo A.S.F., (2012:9) state that “waste often provides a livelihood through collection, reusing and/or recycling for the poorest members in the society”.

The starting point with regard to waste management is monitoring the correct implementation of environment policies. To redress waste management problems, it is important for a waste management department to ensure compliance by enforcing vigorously and with commitment the municipal bylaws relating to collection, disposal and management of waste. It has been observed that reduction of waste at source is the best way of maintaining a healthy environment. However, residents need awareness campaigns and socioeconomic incentives to be provided by civic society and governmental organisations in order to maintain such a healthy environment.

With the help of educational campaigns, residents can be encouraged to implement composting, which is a form of aerobic treatment suitable for treating organic waste. Composting and pre-treatment of municipal solid waste before disposal in landfills significantly reduces the volume of solid waste and contributes to overall environmental sanitation (Worku and Muchie, 2012). Awareness campaigns in all parts of the municipality would encourage generators to control the waste at source and deposit the waste in landfills, not in open dumps. Above all, there should be adherence to municipal by laws and regulations on proper waste management.

2.3 Municipal solid wastes and the role of environmental governance

This study will discuss the environment, as well as environmental governance and its importance to people. An environment is defined by the White Paper as the “biosphere in which people and other organisms live. It consists of renewable and non renewable natural resources such as air, water, land and forms of life”. According to the RSA (Republic of South Africa) White Paper on Environmental Management Policy, 1997, an environment refers “to the conditions and influences under which any individual or thing exists, lives or develops”. The conditions and influences in the environment referred to are mostly renewable and non renewable resources such as air, water, land and all forms of life. Also, in an environment, there are many political, economic, and social factors that contribute to the lives of people in the area. RSA (Republic of South Africa) NEMA: Waste Act (Act 107 of 1998:8), defines environment as “the surroundings within which humans exist and are made up of (i) land, water and atmosphere of the earth and (ii) micro organisms, plants and animal life”.

However, according to RSA (Republic of South Africa) NEMA Waste Act No. 107 1998, co-operative environmental governance offers a systematic plan both interdepartmentally and with external entities of the state through the process of decision making. Chhotary, V and Stoker, G, cited by Bevir, M (2011:3), state that “governance theory is about the practice of collective decision-making”. Therefore, governance focuses on the rules of collective decision making. Sindane and Nambalirwa (2012:700) view governance “as the process of decision making and the process by which decisions are implemented”. Local governments are mainly the implementers of drawn-up national and provincial policies, as well as municipality bylaws. Local governments have to serve the interests of their communities. All the activities and the decisions taken have to suit the needs of the people living in or occupying the area.

However, governance according to Chhotary, V and Stoker, G, cited by Bevir, M (2011:4), is viewed as “arrangements (which) generally involve rights for some to have a say”. Therefore, municipalities are seen to be offering good governance if their decisions are taken collectively by a collection of individuals. Richardson, (2008:4) defines good governance as “participation based on freedom of speech and capacity for constructive engagement, the rule of law that is fair and impartiality enforced, efficiency and effectiveness whereby real needs are met by making the best use of available resources, accountability”. Good governance has to provide effective ways of coping with the limitations of human cognition and understanding – Mohamed,C and Pillay, P (2013)(32)(4) in the journal on Assessing South Africa’s food security strategy, the extent to which government responds to the needs of its people.

Environmental governance mainly focuses on integrating environmental, social and economic considerations into development and land use planning processes and structure, which requires the assessment of environmental impacts at policy, planning, programme and project levels (White Paper, 1998). Also, environmental governance is more concerned with integrating different approaches to environmental management in trying to address pollution control and waste management. There should be municipal bylaws which state clearly how municipal solid waste should be packaged, sorted, collected and disposed of in landfills. These would help residents practise source reduction of solid wastes such as garden refuse and food leftovers.

Good governance, according to section 24 of the South African’s Constitution, has the responsibility to respond to public needs and encourage public participation in environmental governance by providing for the mutual exchange of views and concerns between government and people, and monitoring and regulating actions that impact on the environment. Environmental governance is central to the decisions concerning conditions in and influences on the environment. Environmental management plans are drawn up according to environmental governance which allows for environmental management to implement the laws.

Environmental governance is more concerned with integrating different approaches to environmental management in trying to address problems of pollution and waste management. This highlights the importance and the positive contribution made by the environmental governance on municipal waste and what policies say about the management of municipal waste, especially in NLM. The role of environmental governance at local level is to draw up the laws that will govern the management of waste, using the constitution as well as national and provincial environmental policies.

Environmental governance (EG) needs to draw up a detailed plan on the process of the decision making with which the environment has to be managed. In South Africa, there exists a confusing variety of policies and arrangements. For example, the South African Constitution, which provides the foundation for environmental regulations and policy in South Africa, and NEMA's White Paper on Environmental Management, Integrated Pollution and Waste Management provide guidelines to be followed in order for people to live in a sound environment. Environmental governance will focus on selected policies which manage and monitor the implementation of waste management. This will enable EG to assess the laws drawn up, as to whether they serve the needs of the people or not.

With regard to local government, RSA (Republic of South Africa) NEMA: Waste Act (Act 59 of 2008:24) states that "a municipality must exercise its executive authority to deliver waste management services, including waste removal, waste storage and waste disposal services in a manner that does not conflict with the national and provincial norms and standards". All municipalities need to play their part in performing duties which include waste collection, waste storage and waste disposal, in accordance with the many considerations of national and provincial norms and standards. According to this policy, the municipality's responsibilities are clearly stated and the role of EG in the NLM will be to check whether waste management officers and municipal representatives carry out their duties properly. In NEMA: Waste Act 59 of 2008:24), the municipality has to set "local standards for the separation, compacting and storage of solid waste that is collected as part of the municipal service or that is disposed of at a municipal waste disposal facility". Amongst these local standards, the municipality has to include the management and direction of solid waste which it disposes of.

In order to have a clean environment, it is imperative for EG to draw up laws which enable it to monitor the implementation of existing waste management laws or regulations. Regulatory policies function as monitors of the implementation of public policies. Marc et al (2000:5) supports the above statement, stating that "regulation is any attempt by the government to control behaviour of citizens, corporations, or sub-government". NEMA's guidelines were drawn up to include principles regarding the approach to waste management. The main purpose of RSA: NEMA was to redress the environmental injustices in South Africa.

Agenda 21 was adopted in the conference held at the United Nations in 1992 and in South African's Constitution Act 108 of 1996. J.H. Skinner, cited in Twardowska, Irena, Allen Herbert

E, Antonius, A.F., Ketterup and Lacy, J. William (2004:1094), states that Agenda 21 deals explicitly with solid waste management in two chapters: chapter 20 on the environmentally sound management of hazardous waste, and chapter 21 on the environmentally sound management of solid wastes". This study will focus on chapter 21, the environmentally sound management of solid wastes. It is the role of EG to ensure that this is adopted in the bylaws for the NLM. In this regard, at the Polokwane Conference in 2001, there was an agreement that a policy of zero waste would be implemented all over the country.

The major role of EG is to maintain a healthy environment which is not harmful to anyone, as stated in the constitution and other environmental policies. The Constitution of the Republic of South Africa (Act no. 108 of 1996) in section 24 in the Bill of Rights states that "everyone has the right to: an environment that is not harmful to their health or well-being and have the environment protected, for the benefit of present and future generations". Section 24 states that "Everyone has the right a) To an environment that is not harmful to their health or well-being; and b) To have the environment protected for the benefit of present and future generations, through reasonable legislative and other measures that i) Prevent pollution and ecological degradation; ii) Promote conservation; and iii) Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development."

The National Environmental Management Act (NEMA) (Act no. 107 of 1998) is in line with the South African Constitution, as it sees everyone living in an environment which is harmful, and makes clear that everyone is entitled to an environment which is not harmful to their health or well-being. It gives us the environmental principles that form the legal foundation for sustainable Environmental Management. Act 107 of 1998 (4)(a)(iv) states that "sustainable development requires the consideration of relevant factors including that waste is avoided or where it cannot be altogether avoided, minimised and re-used or recycled where possible and otherwise disposed of in a responsible manner".

EG should have the people in mind when environmental laws are drawn up. The White Paper on Environment Management Policy, 1997 views sustainable development as the combination of social, economic and environmental factors where the needs of people need to be met. One of the principles in RSA: NEMA: (Act 107 1998:10) states that "Environmental Management must place people and their needs at the fore front of its concern and serve their physical, psychological, developmental, cultural and social interests equitably." In this, the EG has to

have a monitoring tool which enables them to evaluate whether the needs of people are met, as environmental management implements the environmental laws.

The implementation of laws can have challenges. The EG is there to check all those challenges and be able to address them. RSA: NEMA, (1998:41) in section 28 talks about the duty of care – the challenges of municipalities enforcing principles and implementing what has to be done. It is with regard to this section that municipalities need to show their accountability regarding how much waste goes to disposal and how much to recycling. According to RSA: IP&WM, (2000), the duty of care is the second principle stated clearly as “any institution that generates waste is always accountable for the management and disposal of this waste and will be penalized appropriately for any and every transgression committed”.

Integrated Pollution and Waste Management for South Africa (IP&WM), 2000 is part of government’s policies necessarily adopted by EG which strive to meet the goals of Agenda 21. This policy addresses the legislative gaps, and clarifies and allocates responsibilities within government for pollution and waste management. Regarding this policy, government has a number of aims to be achieved in a stipulated period. The White Paper on Integrated Pollution and Waste Management (2000) was introduced as a guiding policy on pollution prevention, waste minimisation, impact management and remediation. According to RSA: IP&WM, (2000:12), government aims to “encourage the management and minimisation of the impact of unavoidable waste from its generation to its final disposal”. IP&WM also emanates from the South African Constitution (Act No.108 of 1996:7) in chapter 2, the Bill of Rights, as it provides a number of rights which people have regarding the environment.

This policy “targets at minimising waste generation and pollution at source and promotes a hierarchy of waste management practices, namely reduction of waste at source, re-use and recycling with safe disposal as last resort”. This policy clearly favours fewer waste disposal landfills. The dangers of waste which is not managed are highlighted in IP&WM, (2000:22) which states that “waste disposal sites, especially those containing hazardous, medical, and veterinarian waste, may result in land pollution problems.” Such problems might emanate from inadequate management of waste disposal sites, leachate, illegal waste disposal sites, a lack of suitable hazardous waste disposal sites, and poor town planning. The policy address the management of the waste handling process from generation to final disposal, and considers waste avoidance, minimisation and prevention, recycling and re-use treatment and handling, and storage and final disposal.

The Specific Environmental Management Act includes the National Environmental Management Act: Waste Management Act No.59 of 2008, which is also in line with the RSA Constitution and with the NEMA (Act 107 of 1998). The NEM: Waste Act (Act 59 of 2008:18) has been drawn up in order “to protect health and the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development”. In this policy, waste generation has to be avoided, or waste reduced, by means of re-use, recycling, recovering, and treatment of waste disposal as some of the ways of protecting the environment.

Service delivery is a major requisite of EG in order for people to live in a sound and healthy environment. In chapter 2 of RSA (Republic of South Africa): NEMA: Waste Act (Act No.59 of 2008:24), it is stated that “a municipality must exercise its executive authority to deliver waste management services, including waste removal, waste storage and waste disposal services in a manner that does not conflict with section 7 of this Act.” Municipalities are given a mandate to set the standards for separation, compacting and storage of solid waste, as well as standards for the management of solid waste. According to RSA (Republic of South Africa): IP&WM, (2000:47), “both municipalities and provincial governments will play an important role in implementing national strategies addressing waste and pollution management”. According to this policy, municipalities are encouraged to develop their own legislation and implementing strategies, as well as to provide waste management services and to manage waste disposal facilities. It also proposes many other functions for municipalities, such as compiling and implementing general waste management plans with the assistance of provincial government.

In drawing up municipal bylaws, EG must adopt the norms and standards of the Constitution, as well as those of other environmental policies. RSA (Republic of South Africa), NEMA: Waste Act (Act No.59 of 2008:22) provides us with norms and standards which states that the “Minister must set national norms and standards for the (a) classification of waste, (c) storage, treatment and disposal of waste, including the planning and operation of waste treatment and waste disposal facilities”. At the provincial level, the MEC is responsible for the implementation of national waste management strategies according to national norms and standards. This section also sets out the planning of waste services, as well as minimisation of waste and the specific waste management measures which need to be followed in order to arrive at zero waste in the country. Section 9 concerns local government – in RSA (Republic of South Africa): NEMA Waste Act (Act 59 Of 2008:22) it states that “a municipality must exercise its executive authority to deliver waste management services, including waste removal, waste storage and waste

disposal services in a manner that does not conflict with the national and provincial norms and standards”.

EG should insist that municipalities perform their duties, including waste collection, waste storage and waste disposal, according to the many considerations contained in the national and provincial norms and standards. According to this policy, the municipality’s responsibilities are clearly stated. In RSA (Republic of South Africa) NEMA: Waste Act (Act No. 59 of 2008:24), the “municipality has to set (a) local standards for the separation, compacting and storage of solids waste that is collected as part of the municipal service or that is disposed of at a municipal waste disposal facility”. Amongst these local standards, the municipality has to include the management of solid waste that is disposed of by the municipality.

In order to achieve the norms and standards set out in the policy above, municipalities are required to have a waste management officer who will account for municipal activities regarding the environment. RSA (Republic of South Africa) NEMA Waste (Act No. 59 of 2008:26), states that “each municipality authorised to carry out waste management services by the municipal structure act, 1998 (Act no. 117 of 1998) must designate in writing a waste management officer from its administration to be responsible for co-ordinating matters pertaining to waste management in that municipality”. In addition, municipalities also need to submit an integrated waste management plan to the MEC for approval. Certain other general duties discussed in RSA (Republic of South Africa) NEMA: Waste Act (Act No.59 of 2008:32) involve waste management officers needing to carry out effective implementation of policy by taking all reasonable measures to avoid the generation of waste, and to minimise the toxicity and amounts of waste that are generated. In all the strategies that they are implementing, waste management officers have to plan ways of reducing, re-using, recycling and recovering waste, so as to dispose of smaller quantities of waste in landfills.

It is the role of EG to categorise types of waste before disposing of these in their appropriate places. RSA (Republic of South Africa) NEMA: Waste Act (Act No. 59 Of 2008:28) (12)(a)(ii) states that “an assessment of the quantities and types of waste that are generated in the area, (iii) a description of the services that are provided or that are available for the collection, minimisation, re-use, recycling and recovering, treatment and disposal of waste”. Additionally, the municipalities have to, (b)(iii), “identify and address the negative impact of poor waste management practices on health and the environment and (iv) provide for the implementation of waste minimisation, re-use, recycle and recovering targets and initiatives”.

One of the major ways of waste minimisation to be considered by EG is source reduction of waste, so that little waste is deposited in the final disposal area. RSA: NEM: WMA (Act no.59 2008:32), proposes to “avoid generation of waste and where such generation cannot be avoided to minimise the toxicity and amounts that are generated”. Apart from these, other measures given are to re-use, recover, recycle and reduce waste. If waste has been classified as hazardous and has to be disposed of, the policy states that it has to be treated. RSA (Republic of South Africa) NEM: WMA (Act no.59 2008:32): “where waste must be treated and disposed of, ensure that the waste is treated and disposed of in an environmentally sound manner”. This has to be done in such a way that it would not endanger health or the environment or cause a nuisance through noise, odour or visual impact.

This policy also requires any person who is in a position of storing waste to be certain that containers are not leaking, do not corrode, and that waste in the containers is not blown into the environment. Municipalities must provide containers in which waste is placed before it is collected. RSA (Republic of South Africa) NEM: WMA (Act No. 59 2008:38), states that “any person who generates general waste that is collected by the municipality must place the waste in a container approved, designated or provided by the municipality for that purpose and in a location approved or authorised by the municipality”. Since there are many risks encountered in the collection of waste, this policy clearly states that waste has to be collected by an authorised person and authorised by the law.

According to all the environmental policies, including the SA Constitution, everyone has the right to live in a sound environment – therefore, the collection of waste has to be carried out equally effectively in all municipality areas. RSA (Republic of South Africa) NEM: WMA (Act no.59 2008:32) states that the “municipality has the right to limit the provision of general waste collection services if there is a failure to comply with reasonable conditions set for the provision of such services, but where the municipality takes action to limit the provision of services, the limitation must not pose a risk to health or the environment; and (d) the right of a municipality to differentiate between categories of users and geographical areas when setting service standards and levels of service for the provision of municipal services”.

RSA (Republic of South Africa) NEM: WMA (Act no.59 2008:32), states that “any person engaged in the transportation of waste must take all reasonable steps to prevent any spillage of waste or littering from a vehicle used to transport waste”. This Act supports zero waste in the whole nation, that different types of waste need to be transported to different appropriate areas,

and that no waste should be disposed of on any land or body of water in such a way that it may cause pollution of the environment or be harmful to the health and well-being of people living in that area.

Environmental Governance needs to include educational awareness programmes in its IDP. This will enable waste management departments on behalf of municipalities to achieve what has been discussed above. According to RSA (Republic of South Africa) NEM: WMA (Act no.59 2008:54), “a waste management officer may establish a programme for the public recognition of significant achievements in the area of waste avoidance, minimisation or other forms of waste management”.

Managing waste needs someone with the required permission and who is certificated to do so. Therefore, EG's monitoring should check that those engaged in the collection and disposal of waste have a licence to perform those duties. RSA (Republic of South Africa) NEM: WMA (Act no.59 2008:56), “A person who requires a waste management licence for a waste management activity which involves the treatment of waste by incineration must submit, together with any documentation or information contemplated in subsection (2), information on – (a) the types of waste that will be incinerated;(b) the existence of any incinerators in the jurisdiction of the licensing authority which are authorised to incinerate waste which is substantially similar to that waste; and (c) alternative environmentally sound methods, if any, that could be used to treat that waste”.

In order for the three spheres of government – national, provincial and local – to know how much waste is recycled, re-used, recovered and disposed of, records must be kept of all the areas of waste handling. Strategies are set out according to the National Waste Management Strategy Implementation South Africa. The RSA (Republic of South Africa) Waste Information System guidelines on technical implementation, (2006), were drawn up in order to correct discourse regarding the environment. Information regarding collection of waste is very important to all three spheres of government. The information collected assists in the development of national policies and strategies. In addition, the information helps environmental governance evaluate the implementation of policies and/or laws by giving it an indication of whether to amend what has been drawn up or continue with the current bylaws.

These guidelines clearly state the purpose of strategies which have been drawn up. RSA (Republic of South Africa) National Waste Management Strategy Implementation: Waste

Information System Guideline on technical implementation, (2006:2) states that they “assist with the identification of problem waste streams or waste streams that occur in large quantities”. Once again, the information helps to monitor the effectiveness of waste management policies and strategies. Once again, this promotes recycling, re-use and recovery of waste, and minimises disposal of waste in landfills. The RSA (Republic of South Africa) Waste Information System Guideline on technical implementation, (2006:3) states that the information collected helps local government in “planning, waste collection, landfill management implementation and enforcing appropriate waste minimisation and recycling initiatives”. Information collected helps in drawing up policies and strategies such as RSA (Republic of South Africa) NEM: WMA (Act No. 59 of 2008).

According to RSA (Republic of South Africa) NEM: WMA (Act No. 59 2008:68), “The Minister must establish a national waste information system for the recording, collection, management and analysis of data and information that must include (a) data on the quantity and type or classification of waste generated, stored, transported, treated, transformed, reduced, re-used, recycled, recovered and disposed of”. This has to be adopted and EG has to include it in its plan. In addition, the waste information system must have or provide information on the levels and extent of waste management services provided by municipalities, as well as information on compliance with this Act.

It is only by means of recorded data that an evaluation can be made on the state of waste in an area. RSA (Republic of South Africa) NEM: WMA (Act no.59 2008:70) states that “The objective of the National Waste Information System is to (a) store, verify, analyse, evaluate and provide data and information for the protection of the environment and management of waste;(b) provide information for the development and implementation of any integrated waste management plan required in terms of this Act”. Apart from these objectives, the National Waste Information system has objectives to provide information to organs of state and the public, to provide education and raise awareness, and to plan for waste minimisation.

Apart from the policies mentioned above, many other regulatory frameworks, plans and strategies have emerged, and are still emerging, which will help in the maintenance of the environment. According to RSA (Republic of South Africa) National Waste Management Strategy (NWMS) and Integrated Waste Management Plan (IWMP), municipalities have to develop and integrate IWMP into IDPs, as well as identify their roles in the recycling economy. Despite introduction of the different policies, it was observed that most legislative frameworks

were not well implemented in all spheres of government and that this led to Guidelines for the designation of Waste Management Officers (WMO). The WMOs are responsible for a number of functions such as “co ordination of all functions or powers assigned by the Act to the respective principal”. Their significance for the public will be that they attempt to address all waste management problems, as well as coordinate their activities with other waste management activities in the manner set out in the national waste management strategy.

The policies discussed above need to be implemented by local government and it is the role of EG to see that they are implemented vigorously in order to meet national and provincial norms and standards. The following policies and/or acts are also discussed – the RSA (Republic of South Africa) Local Government: Municipal Structures Acts (Act No. 117 of 1998); the RSA Local Government: Municipal Systems Act, (Act No.32 of 2000); and the RSA Local Government: Municipal Finance Management Act and Regulations (Act 56 of 2003). These provide a framework for planning, budgeting, service delivery and reporting.

Municipalities are the most important structures with regard to solid waste management since they are the ones providing service delivery to the people. Local government has the obligation to fulfil the needs of the people by keeping the environment free from harmful effects. According to the Constitution of the Republic of South Africa (No. 108 of 1996), all have the right to an environment which is not harmful to their health or well being and an environment that is protected. Local government is required to set standards for the separation, compacting and storage of municipal solid wastes, and is responsible for all the stages which waste undergoes from generation to final disposal.

According to the RSA (Republic of South Africa) Municipal Structures Act (Act No. 117 of 1998), all municipalities should strive to meet the objectives set in the Constitution Section 152. The functions of local government are provided by the RSA (Republic of South Africa) Municipal Structures Act (Act No. 117 of 1998:34) which states that they have powers regarding “solid waste disposal sites, as it relates to the determination of a waste disposal strategy, the regulations of waste disposal and the establishment, operation and control of waste disposal sites, bulk waste transfer facilities and waste disposal facilities”.

2.4 A preliminary overview of environmental governance in the Newcastle Local Municipality

This section provides information regarding the manner in which environmental governance functions in the Newcastle Local Municipality. According to RSA Integrated Pollution and Waste Management for South Africa, (2000:40) goal 4, the objectives for Environmental Governance state that it is meant to:

- Establish multi-sectoral advisory structures in all spheres of government to enable all interested and affected parties to participate in environmental governance.
- Develop public participation mechanisms and processes that are fair, transparent and effective and will promote the participation of marginalised sectors of society.
- Allocate government resources to build institutional capacity in national, provincial and local government spheres for effective management of participation in environmental governance.
- Ensure that communication strategies in all spheres of government address public participation needs.

In order to achieve the above objectives, Environmental Governance should ensure that the norms, standards, legislation, administration, and enforcement of all aspects of governance are dealt with. The Newcastle Local Municipality should adhere to national policy on environmental management. As it falls in the third sphere of government, the Newcastle Local Municipality should involve the public in waste management decisions and should monitor all waste disposal sites, irrespective whether they are legal or illegal dumps. However, implementation of the bylaws in the NLM is incomplete:

- The state of the environment in many parts of the NLM is deteriorating, with many dump sites turning into disease breeding areas.
- The monitoring tool used is not effective. Environmental campaigns on reduction of waste at source do not access all parts of the NLM and hence the NLM authority is unable to meet the demands of the public.
- There is little compliance regarding implementation of waste management plans, indicating weak policy enforcement.
- The NLM experiences uncontrolled discharges of effluent in the area, air pollution associated with industrial development, and solid waste disposal challenges which produce harmful materials which are known to be toxic to human beings or destructive to the environment

- There is a need for law enforcement, especially regarding illegal dumping sites which cause a whole place to look unattractive.
- The bylaws should include a special section for newly established settlements regarding the waste they produce, in order to avoid the growth of illegal dump sites all around the NLM.
- Lastly, the NLM needs to upgrade waste collection vehicles in order to be able to service the collection of all waste, whether from legal or illegal dumps.

As a developing area, the Newcastle Local Municipality does not have comprehensive legislation dedicated to waste management and minimisation of waste. Although the municipality uses national as well as provincial policies, it is very important that it introduces bylaws to support waste management programmes and targets. These should stipulate how municipal solid waste is sorted, packed, collected and disposed of to landfill sites. As the situation currently stands, waste is managed poorly and landfills are inappropriately sited, designed, managed and operated. Furthermore, the municipality simply does not have the funding to maintain a healthy and disease free environment and lack of knowledge is another serious challenge which it has not overcome.

The NLM Environmental governance lacks adherence to municipal bylaws and regulations on proper waste management. It is not providing its customers with sufficient refuse bins and there are many illegal dumping sites within the municipality, especially in high density areas such as Madadeni section 1-7, H39, Siyahlalala and Blaaubosch. But even if waste were being adequately collected, it is clear that there has been little consideration of the possibilities of re-use or recycling.

In order to implement control measures effectively, there should be co-operative environmental governance. RSA (Republic of South Africa) NEMA offers a systematic plan on cooperative environmental governance, both interdepartmentally and with external entities of the state, by means of a decision making process which is further described in RSA (Republic of South Africa) NEMA 1998.

Olowu and Sako, in Cloete (2005:1), views governance as, “a system of values, policies and institutions by which a society manages its economic, political and social affairs through interaction within and among the state, civil society and private sectors”. As the basis of all

policies which are implemented in all spheres, the aims of the Republic of South Africa's Constitution (Act 108 of 1996) in section 196(4) state the necessity to:

- Promote and maintain a high standard of professional ethics.
- Provide services impartially, fairly, equitably and without bias.
- Respond to people's needs and encourage participation in policy making.
- Be accountable and transparent by providing the public with timely, accessible, and accruable information.

The RSA (Republic of South Africa) Constitution of South Africa (Act 108 of 1996) in chapter 3 section 41 states that the "three spheres of the government are distinctive, interdependent and interrelated". RSA (Republic of South Africa) Waste Management Strategy and IP&WM lays down the responsibilities of the three spheres of government concerning solid waste as being to promote proper coordination and cooperation. In chapter 7 of the RSA Constitution section 151(3), it is stated that "a municipality has the right to govern, on its own initiative, the local government affairs of its community, subject to national and provincial legislation as provided for in the constitution".

In addition to these policies, the RSA (Republic of South Africa) Municipal Demarcation Act (Act 27 of 1998), the Municipal Finance Management Act (Act 56 of 2003), and the RSA (Republic of South Africa) Municipal Systems Act (Act 32 of 2000) focus on transformation, growth, consolidation of a democratic developmental local government, and the importance of community participation.

2.5 Conclusion

The primary aim of this chapter was to research in depth what exactly municipal solid waste is and the role played by environmental governance in the NLM. Causes, consequences and solutions to municipal waste were discussed. Municipal waste and the role of governance were also discussed in terms of the laws governing functionality of environmental governance. The chapter also discussed a preliminary overview of environmental governance in the NLM which focused on the current state of environmental governance, in particular the way waste is managed.

Different environmental policies, outlined in this chapter, reveal the importance of a clean environment to every citizen. The IDP and the EMF policies regarding waste in the environment,

together with the national and provincial policies on waste management, were consulted. Information was also acquired from different authors and journals, which provided further views on how waste should be handled from source to the last point of disposal.

The next chapter focuses on the methods used to collect data on the role of environmental governance regarding waste management in the NLM. The main focus is to assess whether environmental governance has drawn up practicable laws which can be implemented in order for people to live in a healthier environment.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Introduction

Chapter two discussed municipal solid waste in the context of environmental governance, in particular, its causes, consequences and solutions to problems. The previous chapter also discussed a preliminary overview of environmental governance in the Newcastle Local Municipality. Finally, chapter two reviewed the relevant literature. Chapter three deals with the following: research methodology, research design, sampling, data collection techniques and strategies, data collection and data analysis.

Collection of data is an essential factor of research. Hence, it is essential to use appropriate research designs, as well as proper methods, to access the relevant data or information. The researcher identified, selected, and adopted relevant research designs and methodologies in order to access information regarding the emerging problems of waste removal in the Newcastle Municipality. The researcher used a qualitative study based on constructivist assumptions and the ethnographic strategy of inquiry and field observation which relies on the principles of the interpretive social science approach.

3.2 Research Design

This section discusses research design. Research designs provide a layout of the research – they show all the steps which will be taken in the collection of data. Mouton (2001:55) states that “a research design is a plan or blueprint of how you intend conducting the research”. According to Babbie and Mouton (2001:159), defines research design as, “a plan of action that includes the techniques that will be employed in the implementation or execution of the research”. Research designs are thus formulated or originate from the research problems encountered. Accordingly, Berg (1998:27) describes research design as a plan for how the study will be conducted, and Blanche and Durrhheim (1999:29) explain a research design as a strategic framework for action that serves as a bridge between research questions and the execution or implementation of research. Research designs have their main focus on the logic of the research and are tailored to address different kinds of questions (Mouton 2001:56).

The researcher hence used selected research designs in order to describe the procedures to be followed in conducting the research. The research design indicates the general plan of how the study will be carried out, its set up, what happens to the subject, and what methods will be used to collect data. The research design thus specifies a plan for generating empirical evidence that will be used to answer the research questions. In this study, the researcher uses the qualitative research design.

The researcher utilised ethnographic design to collect the data. The strategies of inquiry in this study were narrative, phenomenological and ethnographic design. According to Mouton (2001:148), ethnographic designs are “studies that are usually qualitative in nature which aim to provide an in-depth description of groups of people or a community”. The researcher collected data through observations, interviews and document analysis, from the communities of Newcastle, Siyahlala-la, H39 and Madadeni (section 1-7), and Lista Farm, and in particular from municipality officials, administrators and councillors.

As data is collected, theory is developed, known as grounded theory. Neuman (2011:175) states that in grounded theory, “we build specific observations to broader concepts that organize observational data and then continue to build principles or themes that connect the concepts”. Maps, images, and recorded data in the form of audio and videotapes were interpreted. The qualitative requirements of objectivity, dependability and conformability were taken into consideration.

3.3 Research Methodology:

This section discusses the methodology used in carrying out the research. The selected research methodology enabled the researcher to collect relevant, valid and reliable information and to achieve the aims and objectives of the study. According to Babbie and Mouton (2001:647), research methodology consists of “the methods, techniques and procedures that are employed in the process of implementing the research design or research plan, as well as underlying principles and assumptions that underlie their use”. Leedy and Armrod (2005:206) support this, stating that “the choice of a method of a study is mostly determined by the nature of the study.” This study therefore used the qualitative approach.

3.3.1 Qualitative Approach

The researcher used a qualitative research methodology in order to be able to collect data through observation, images, and interviews. In the qualitative research approach, a study relies on interpretive principles, often generates new hypotheses, and logic arises from on-going practice. Such a study follows a non-linear path in which the researcher – in order to access the relevant information from the focus group – moves ‘backwards’, ‘forwards’, and ‘sideways’ before ‘advancing’.

The researcher used a qualitative research approach in this study because the knowledge claim of such an approach is based on constructivist assumptions. This method was selected because it enabled the researcher to gain in-depth insight to the problem being researched. The qualitative approach uses natural settings and provides an interpretative understanding of the phenomenon or event. In a qualitative study, data is in the form of words, which can also be presented in the form of maps, photographs or diagrams. According to Neuman (2011:177), “qualitative studies give data meaning, translate them, or make them understandable”. The researcher assessed the relevant policy guidelines and context-based laws as to whether they were being implemented correctly or not. Neuman (2011:101) states that the interpretive social science approach “emphasises conducting a very close detailed reading of text to acquire a profound, deep understanding”. Making use of this approach, the researcher observed how waste was managed in different sections of Newcastle from the management of waste at source, to the collection of waste, to the final point of disposal.

The qualitative research approach is employed in many different academic disciplines – traditionally, it is used in the social sciences, but it is also used in market research and other contexts (McMillan and Schumacher, 2006). Qualitative researchers aim to gather an in-depth understanding of human behavior and the reasons that govern such behavior. A qualitative approach method investigates why and how decisions are made, not just what, where and when the decisions are made. Hence, smaller, but focused, samples are more often used than large samples. In the conventional view, qualitative methods produce information only on the particular cases studied, and any more general conclusions are only propositions (or informed assertions).

The researcher used a narrative method to allow participants to talk about their own experiences of the waste management programmes in their areas. Use was thus made of

semi-structured interviews. MacMillan and Schumacher (2006:10) describe qualitative research as “methods based on interpretive/constructivist epistemology and numerical data”. According to MacMillan and Schumacher (2006), in qualitative methods, the researcher would seek to know and explain by testing specific theories that provide broad generalisation, thereby performing a function of a basic research as it works to describe the researched phenomenon.

A qualitative paradigm gives the researcher the potential to supplement and re-orient current understanding of the complexity of waste management, (MacMillan and Schumacher 2006). The aim was to provide a description of waste management programmes and a description of their impact on the environment. Apart from this description, the researcher initially observed whether the deposit of waste in landfills was screened or not – the researcher used the interpretive approach. Neuman (2011:102) states that “the interpretive approach is a systematic analysis of socially meaningful action through the detailed observation of people in natural settings in order to arrive at understandings and interpretations of how people create and maintain their social worlds”.

In the focus areas selected, the researcher observed and interviewed sampled participants and recorded data or information about the collection of waste in different areas in Newcastle Municipality. Purposive sampling was used in this study, as it enabled the researcher to produce knowledge and strategies relevant to the problems identified. The researcher used basic research to support or refute theories about how the social world operates. According to Neuman (2011:26), “basic research builds a foundation for knowledge and broad understanding that has an impact on many issues, policy areas, or areas of study. It is also the main source of the tool-methods, theories, and ideas that researchers use”.

The researcher also used applied research in the form of evaluation. Evaluation research enabled the researcher to gain answers to the problem questions which were asked and to deduce meaning from the observations and interviews. According to Neuman (2011:29), “in an evaluation research study, we measure the effectiveness of a program, policy, or way of doing something”. In this study, the researcher used the ethnographic field research technique. Neuman (2011:423) states that “ethnographers describe the explicit and tacit cultural knowledge that members use. They used detailed descriptions and careful analysis to disassemble and reassemble the events”. The researcher also used interviews as a way of collecting information. According to Saunders, Lewis and Thornhill (2000:242), “the use of interviews can help the researcher to gather valid and reliable data that is relevant to the research questions and

objectives". Not everyone in the area of study was interviewed – the researcher sampled people to represent the whole area of study. Maykut and Morehouse (2001:56) suggest that in order to have an acceptable sample for a research study, people should be selected randomly from the targeted population. The specific research design used in this study was an ethnographic study which included field interviews. Neuman (2011:449) states that "the field interview involves asking questions, listening, expressing interest, and recording what was said".

3.3.2 Qualitative data techniques:

- Interviews and
- Observational techniques (fieldwork and participant observation)

Interview schedules were used as tools to collect data. The researcher used the semi-structured interviews because they provided a direct personal contact with the participants who were asked questions. Interviews gave the researcher an opportunity to evaluate the role of governance through the responses given by the interviewee. They also provided the researcher with an opportunity to investigate subjective human experiences (Boikhutso 2005:7).

Interviews are considered to be the most prominent information collecting tool in qualitative research (Greeff 2002:291). Greeff goes on to provide different types of interviews: "the structured interview, the counselling interview, diary interview, ethnographic interview, survey interview, informal/ unstructured interview and the conversation interview". Harvey and Brown (2001:144) give the advantages of using interviews when carrying out a study. They state that "Interviews are flexible and can be used for many different types of situations, interviewing is the only technique that provides a two way communication".

Interviews also provide the interviewer with an opportunity to learn about the problems and challenges faced by the communities in which a study is being conducted. As such, interviews helped the researcher to acquire information on the problems faced by residents, directed by the laws drawn up by environmental governance. Harvey and Brown (2001:144) declare that "interviewing is a data collecting technique that has the advantage of being more flexible than a survey and is particularly well suited for the studies of interaction and behaviour". Healey (1991:206) shares the same view that interviewers have more control over who answers the questions, as compared to a questionnaire which may be passed from one respondent to another.

3.4 Semi-structured interviews

Interviews are divided into three categories:

3.4.1 An interview between the researcher and the Waste Management department in the Newcastle Local Municipality

Firstly, an interview guide regarding waste management in the Newcastle Local Municipality was drawn up. The researcher interviewed the Waste Management Officer, as the implementer of laws, to gain information on how the environment is governed in this local municipality. This enabled the researcher to evaluate the role of environmental governance in Newcastle. The semi-structured questions and the closed question all focused on the governance of municipal waste in Newcastle Local Municipality. These questions were intended to find out about the formulation of waste management bylaws and how effectively they were being implemented in the Newcastle Local Municipality. These made it easier for the researcher to evaluate the leading factors which contribute to waste management problems.

3.4.2 An interview between the researcher and the resident representatives

Secondly, the researcher drew up an interview guide for community representatives, including community leaders such as councillors, but also including non-official members of the community. This entailed semi-structured and closed question regarding the issue of waste management was well governed. These questions also helped the researcher to determining gaps in the process of implementing waste management bylaws in the Newcastle Local Municipality

In this session, the researcher interviewed residents in order to find out why their environment was littered with un-removed. They were asked to confirm whether domestic litter was dumped onto streets and the nearest open spaces, and whether storm drains were clogged with dumped litter and probably therefore blocked. The answers also informed the researcher whether awareness campaigns on how waste should be managed at source and enforcement programmes had been carried out in these areas. The researcher also wished to find out whether any sections were treated differently from other sections in the Newcastle Local Municipality.

3.4.3 An interview between the researcher and the landfill monitors.

Thirdly, an interview guide was drawn up using semi-structured questions and closed questions regarding the handling of waste in the landfill site. These questions aimed to find out about the procedures of handling waste in the landfill site and whether they were properly followed in the best interest of the local municipality,

It was very important for the researcher to collect data from the landfill site, as it gave the researcher a clear picture of what was deposited there and what was not. By interviewing landfill site monitors, the researcher gained information on the day to day activities in the sites, the risks being encountered, and the measures taken for protection from hazardous waste deposited there. Waste should be screened before is deposited in landfills and only biodegradable waste should be deposited in landfills. The researcher considered it imperative to interview people working in the landfills in order to establish the amount of waste deposited, as well as the type of waste deposited.

These interviewing schedules were used to collect data as a tool to assess the implementation of waste management guidelines in the Newcastle Local Municipality. They were separated according to the level of the people to be interviewed. The researcher used a narrative approach – a strategy of inquiry in which the researcher studies the lives of individuals and asks individuals to provide stories about their lives. In their semi-structured interviews, the respondents were given a chance to explain themselves as much as possible to the interviewer. The method employed was a face-to-face interview. Respondents had the opportunity to observe their surroundings and to use non verbal communication. By using this method, the researcher was able to make important observations and effectively ask complicated questions. The use of the narrative inquiry, in which there are open ended questions, enabled the researcher to develop themes from the data given.

3.4.4 Preparations and conducting of interviews

- The researcher created and selected three categories to be interviewed.
- The interview guides were piloted in order to find out whether the questions constructed would collect the correct data needed.
- Interviews were conducted in the selected parts of the Newcastle Local Municipality

- Responses were recorded from different interviewees in order to assess accurately the state of environmental governance in Newcastle Local Municipality

3.5 Sampling

This section discusses methods of sampling employed in the study. Sampling provides the researcher with a means of deciding how to select the people, settings, events or social processes which are to be observed. The researcher used a qualitative sampling method in order to deepen the understanding of the focus area. According to MGT 761 (2013:66), sampling refers to a process of selection/choosing or decoding where people use settings, events, attitudes or social process to observe. The sampling method gave the researcher an opportunity to open up new theoretical insights and deepen the understanding of complex situations.

Sampling is used to select representative samples that closely reproduce or represent features of interest in a larger collection of cases. A non-probability sampling technique – purposive sampling – was used when collecting data. The purposive sampling method was used in order to locate cases relevant to the situation. According to Neuman, Lawrence (2011:268), “we use purposive sampling to identify particular types of cases for in-depth investigation to gain a deeper understanding of types”.

In the study, the researcher selected the Waste management officer as the officer who is in charge of the implementation of environmental laws which have been drawn up according to environmental governance. Councillors were also chosen, since they are the representatives of the community members and the ones who are responsible for service delivery in communities. The researcher also selected members of the community, especially those who lived close by the focus areas of study and were mostly likely to be affected by waste deposited in the skips which were not attended by waste collectors. Landfill monitors were also selected as they were the final handlers of waste. Sampling influences research design, measurement and data collection strategies.

3.6 Field observations and image analysis

Field observation is one of the most widely used tools to collect data in a qualitative research because qualitative research aims to gather in-depth understanding of human behaviour and

the reasons that govern the behaviour. Field studies give the researcher an opportunity to observe how things happen in the focus area and how people behaved in connection with the issues of waste management. According to Neuman (2011) a field research is “a type of qualitative research in which a researcher directly observes the people being studied in a natural setting for an extended period”. The researcher visited several places for observation purposes.

Information was compiled in the form of images taken of parts of eastern Newcastle Local Municipality which are considered to be experiencing problems of waste management. The images below were taken in Madadeni, H39, and Siyhlala-la, as well as of the landfill where waste is finally deposited.

3.6.1 Entry into the field

The researcher selected Newcastle Local Municipality to carry out a study on the role of environmental governance in municipal waste. The researcher applied to the Newcastle Local Municipality for permission to assess the role of environmental governance in how waste was governed in the municipality.

3.7 Desk Top Study

This aspect of the study focused on the methods of collecting data which were employed, namely field observations, interviews, documented data, audio visual data, text and images analysis, open-ended questions, and emerging data in order to develop themes from the data. The researcher assessed the role of environmental governance regarding municipal waste in the Newcastle Local Municipality. The RSA (Republic of South Africa) South African constitution as well as RSA (Republic of South Africa) NEMA and many other related policies were used during the measuring and comparing process. This was done in order to find out whether the Newcastle bylaws were in line with national policies. Field observations were some of the essential methods of collecting data used, since they could give the researcher the exact situation of the environment, how residents treated the issue of waste and how the people interacted with the environment.

The researcher used documented data and text to analyse what others had said regarding the issue of waste in Newcastle and other areas. The conclusions of former research could help to

inform the researcher on how waste management could cause people to live in a non-harmful environment. In the next chapter, the researcher discusses the principles of reliability and validity, as they are demonstrated in the study. When a study is said to be reliable, it shows consistency or dependability through the use of interviews, participation, and photographs (images). According to Neuman (2011:237), “validity refers to its truthfulness or fit between a construct and data”. The data thus has to be valid and meaningful to the researcher and research participants. Neuman (2011:456) further supports this, stating that “validity in field research comes from your analysis of data as accurate representations of the social world in the field”.

In order to ensure that the research instrument (the interview guides) provided valid data, the researcher first piloted their use to ascertain whether the questions posed yielded the desired responses. With regards to the responses to interview questions, the researcher ensured that documentary evidence would be consulted if, for example, interviewees spoke of people who were suffering or had suffered from ailments related to water pollution or leachate from landfills. The researcher also ensured that the interview guides were available in IsiZulu, to ensure that they were not inaccessible to IsiZulu-speaking respondents. The researcher also made sure that leading questions were not asked and that questions were not ambiguous.

Apart from being valid, the study’s success also depended on its reliability. The researcher’s observations on persons or the field being studied needed to be internally or externally consistent. Neuman (2011:455) asserts that “reliability in the field research depends on your insight, awareness, suspicions and questions”. The researcher used the following data collection techniques: interviews, photographs, document studies and participation from people in the field being researched. Collected data was analysed by comparing the chosen communities. The researcher also used the data collected to analyse the effectiveness of waste management in the Newcastle Local Municipality.

3.8 Data Processing

In this section the researcher discusses about how data was captured and processed. Furthermore the researcher would discuss measurements used to ensure that the research is valid and reliable. According to Neuman, (2011:208), state that, “reliability and validity are ideas that help to establish the truthfulness, credibility or believability of findings”. Furthermore other criteria of judging data collected were used such as credibility, transferability, dependability as

well as confirmability. Guba proposes four criteria that he believes should be considered by qualitative researchers in pursuit of a trustworthy study”.

3.8.1 How data was captured and processed

In this section of the study, the researcher discusses about how data was captured and processed. The methods of collecting data in the study were: interviews and observational techniques (fieldwork and participant observation) –namely field observations, field interviews, documented data, audio visual data, text and image analysis, mixture of open-ended and closed questions, and emerging data in order to develop relevant themes from the data. Field observation is an active process that includes non-verbal cues – facial expressions, gestures, tone of voice, body movements and other un-verbalised social interactions that suggest the subtle meanings of language, (McMillam and Schumacher (2011:355).

Observations are important because they provide a researcher with opportunities to see and listen to what is taking place naturally in the research site and hence the researcher hopes to obtain a richer understanding of the phenomenon being studied. The researcher used interviews to collect data, as they involved asking questions, listening, expressing interest, and recording what was said and involved a mutual sharing of experiences. According to Harvey and Brown (2001:1440), “interviews provide the interviewer with an opportunity to learn about the problems and challenges faced by the organisation in which a study is being conducted”. Saunders, Lewis and Thornhill, (2000:242), state that “the use of interviews can help the researcher to gather valid and reliable data that is relevant to the research questions and objectives”. Interviews are very important because they are a direct personal contact with the participants who are asked questions.

The researcher captured data through observation of areas unaffected by waste. Images of such areas were taken as a way of validating the process of observing and to authenticate the data collected. The field study on the collection of waste in the selected areas of study was carried out. Documented data of different policies on environmental conservation at national and local level were studied and evaluated. Interviews were used for sampled people, the interview questions being on the role of environmental governance regarding municipal waste in the Newcastle Local Municipality. Collected data was analysed by comparing and integrating it with what was supposed to happen. Text and images were analysed to give a true picture of what the environment looked like and whether the laws were being implemented properly.

Data collected was recorded in the form of field notes, with images included. The researcher compared the effectiveness of the implementation of waste management guidelines and relevant context-based laws in the Newcastle Local Municipality in terms of the South African constitution, as well as NEMA. Data analysis was characterised by objectivity so that the research results would be acceptable. The researcher ensured that the data collection process was not biased. No leading questions were asked. Care was taken to ensure that numbers or statistics were utilised to interpret the state of the selected communities in terms of effectiveness of their waste management programmes. The researcher also ensured that data solicited was relevant and applicable to the research topic. Credibility of collected data was assured by getting residents to provide their own views about litter washed away by storm water into the drainage system. An ethnographic methodological and phenomenological approach was used to better understand the research phenomenon.

3.8.2 Validity

In this section, the researcher discusses ways of collecting valid data. A study needs to be reliable in order to achieve valid results. According to Lincoln and Guba 2011, validity refers to, “the degree to which a study accurately reflects or assesses the specific concept that the researcher is attempting to measure”. Neuman 2011 views validity as, “the truthfulness”. The researcher in this study used a range of data sources and employed multiple measurement methods to achieve the aims and objectives set for the study. Validity refers to whether the research answers its question, and whether research instruments used by the researcher perform the functions they are supposed to perform (Leedy and Ormrod, 2009). The researcher in this study used a range of data sources and employed multiple measurement methods to achieve the aims and objectives set for the study. To ensure that the research instruments (questionnaires and interview guides) provided valid data, the researcher had to first pilot their use to ascertain whether the questions posed would yield the desired responses. The researcher kept eye contact with and connected with the voice of the interviewee to elicit more valid information. With regards to the interview and questionnaire responses, the researcher ensured that documentary evidence was consulted. The researcher also made sure that no leading questions were asked and that no questions were ambiguous.

3.8.3 Reliability

Apart from being valid, the study's success also depends on its reliability. However, reliability is more concerned with accuracy of data collected and that if the research yield same results when repeated and consistency. The researcher's observations on the person or the field being studied need to be internally or externally consistent. Neuman (2011:455) asserts that "reliability in the field research depends on your insight, awareness, suspicious and questions". In this study, the data collected was reliable since the following aspects were used to collect data in the field: audio recorded and hand recorded notes, in-depth interviews, photographs, document studies, and participation from people in the field being researched, as well as consistent field observations. The researcher repeatedly visited the same study areas to observe collection of waste and how residents treated the issue of disposal of waste in their area.

3.8.4 Credibility

Credibility involves establishing that the results of qualitative research are credible or believable from the perspective of the participant in the research. Lincoln and Guba, (2011), views credibility as a measure which is meant to establish the results of the research as believable. Is the data collected trustworthy? Credibility of the collected data was assured by getting residents to provide their own views about the litter washed away by rain water into storm drains. That result can be accepted with high belief – it is convincing, trustworthy and reliable. From this perspective, the purpose of qualitative research is to describe or understand the phenomena of interest from the participants' eyes; the participants are the only ones who can legitimately judge the credibility of the results. The researcher used interviews, participation of people interviewed, and images as ways of validating and showing how reliable the data collected was to the reader.

3.8.5 Transferability

Transferability refers to the degree to which the results of qualitative research can be generalized, changed, moved or transferred to other contexts or settings (Lincoln and Guba 2011). From a qualitative perspective, transferability is primarily the responsibility of the one doing the generalizing. In this qualitative research, the researcher enhanced transferability by thoroughly describing the research context and the assumptions that were central to the research. The person who wishes to 'transfer' the results to a different context is then

responsible for judging how sensible the transfer is. However the results which were captured can be used in some parts of the eastern side of Newcastle local Municipality.

3.8.6 Dependability

Dependability emphasises the need for the researcher to account for the ever changing context within which research occurs. Lincoln and Guba, (2011), states that, “dependability ensures that the research findings are consistent and could be repeated”. The idea of dependability, on the other hand, emphasises the need for the researcher to account as well as report to enable the researcher to understand the steps used to collect data and their effectiveness. The researcher is responsible for describing the changes that occur in the setting and how these changes affect the way the researcher approaches the study. The researcher therefore used interviews and field observation methods over a certain period of time in order to yield valid and reliable results.

3.8.7 Confirmability

Qualitative research assumes that each researcher brings a unique perspective to the study. Confirmability refers to the degree to which results can be confirmed or corroborated by others. In other words, confirmability is a way of proving whether the data collected is true or valid. According to Lincoln and Guba, (2011), “confirmability questions how the research findings are supported by the data collected”. There are a number of strategies for enhancing confirmability. The researcher documented the procedures for checking and re-checking the data throughout the study. Another researcher can take a "devil's advocate" role with respect to the results, and this process can be documented. The researcher actively searched for and described negative instances that contradicted prior observations. After the study, the researcher conducted a data audit that examined the data collection and analysis procedures and made judgements about the potential for bias or distortion.

3.9 Data Analysis

After collection of data, the researcher uses qualitative analysis in which the researcher looks for patterns and relationships in the collected data. According to Neuman (2011:417), “data analysis is a search for patterns in data. Data analysis involves examining, sorting, categorising, evaluating, comparing, synthesizing and contemplating the coded data as well as reviewing the

raw and recorded data”. This analysis can only be carried out by means of one of the following strategies of analysing data provided by Neuman (2011):

- ❖ Ideal type: Max Weber’s Ideal Type: (a) contrast contexts and (b) analogies
- ❖ Successive approximation
- ❖ The illustrative method
- ❖ Domain and scheme analysis
- ❖ Analytic comparison: (a) method of agreement and (b) method of difference
- ❖ Narrative analysis
- ❖ Path dependency
- ❖ Periodization
- ❖ Historical contingency

From the listed strategies of analysing data, the researcher uses the successive approximation of analysing data. According to Neuman (2011:519), “successive approximation is a method of qualitative data analysis that repeatedly moves back and forth between the empirical data and the abstract concepts, theories, or models, adjusting theory and refining data collection each time”.

The researcher also analyses the data by the phase of the mode of analysis. The importance of this is that it reflects what has been collected and the large part played by environmental governance in municipal waste management in order to keep the environment healthy for everyone. According to Leedy (2005:248), “whatever the researcher does with data in order to prepare it for either inspection or interpretation will affect the meaning of such data”. The researcher uses the semiotic mode of analysis, which focuses on discourse and conversation analysis through analysing the interviews carried out in the field, as this will enable the researcher to understand and relate the subjective understandings and actions of those studied.

Discourse analysis emanates from both content and conversation analysis, but its focus is well-defined units of interaction. In conversational analysis, the researcher is immersed in the situation in order to reveal the background of practices taking place in the focus area of study. In conversational analysis, meanings are shaped in the context of the exchange. According to Johann Mouton (2001:168-169), “discourse analysis is an analysis of language beyond the sentence”. In this mode of analysis, data is collected through face-to-face interview methods in

a natural field setting. Data analysis is characterised by objectivity, so that the research results will be acceptable. The researcher ensured that the data collection process was not biased and that no leading questions were asked.

This stage also gives the researcher an opportunity to be able to evaluate the aim and objectives of the study, as well as a true picture of the standing of municipal waste management in the Newcastle Local Municipality established by means of field study and so mostly in the form of notes. Data collected is presented in the form of maps, photographs, diagrams, and tables, and an analysis is given in each case. According to Neuman (2011:445), field notes can contain maps, diagrams, photographs, interviews, tape recordings, videotapes, memos, objects from the field, notes jotted in the field and detailed notes written from the field". In this chapter, the researcher analyses data collected through participant observation and through semi-structured interviews.

4 Conclusion

This chapter considered the research methodology, research designs and qualitative data collection techniques, for example interviews and observational techniques. The selected ways of collecting data were appropriate for the area of study, as much information relating to the role of environmental governance and the problems faced by waste management were identified. The researcher visited focus areas for field observation; each area was visited several times in order to produce valid and reliable data for presentation.

Interviews went well with participants positively participating in the questions asked. The information gained will be used to help improve the situation of the Newcastle Local Municipality situation regarding its waste management challenges. Most information regarding these problems emanated from the residents themselves. They spoke of the illegal dumping sites leading to land pollution and blockage of drains caused by litter being washed into the drainage system. Purposive sampling, a non-probability sampling technique, was used. People living near to the focus areas were the most targeted for the purpose of the interviews.

The following chapter restates the research objectives and presents and interprets the data collected through interviews and through observation. The chapter enables the researcher to identify gaps in the implementation of environmental bylaws and whether they have been drawn up and implemented properly.

CHAPTER 4

RESEARCH RESULTS AND ANALYSIS

4.1 Introduction

Through the use of an ethnographic research method, the previous chapter looked at the methods of collecting data for this research. The research examines the role of environmental governance, with regard to the management of municipal waste, in the Newcastle Local Municipality. The researcher collected data through interviews and through the use of a qualitative observational technique. These methods were utilised with the aim of gaining the most accurate picture possible of the role of governance in the municipal waste in the Newcastle Local Municipality.

This chapter will focus on analysing the data which was collected through interviews and field observations. The role of environmental governance will be kept in mind while analysing and discussing the data. The outline of the area of the study will be discussed and the areas visited for field observation will be identified. As environmental governance is responsible for rules and regulations governing the environment, its work will be assessed by looking at the performance of environmental management and by looking at the people affected. Finally an overall analysis will be reached on the role of environmental governance in municipal waste management in the Newcastle Local Municipality.

The aim of this study is to assess the role of environmental governance in municipal solid waste in the NLM. The following methods of collecting data were used: field observation and images analysis, semi-structured interviews (closed and open ended questions), documented data and emerging data.

- In field observation and image analysis the researcher collected data and visited the relevant areas. Field images were recorded as a way of validating the data collected. Qualitative observation was carried out in Madadeni (the eastern area of the Newcastle Local Municipality) and in other nearby settlements, as well as in the schools around Madadeni.
- Semi-structured interviews (utilising closed and open ended questions) were completed with a waste management representative, residents and with the landfill site monitors. This was done to gain important insight into how waste is managed and to find out

whether the Newcastle Local Municipality's Environmental Governance has standardised environmental waste laws which are fairly and consistently implemented.

- Documented data provides information on what other researchers say about the issue of waste in the Newcastle Local Municipality.

Finally the researcher will discuss the emerging data:

4.2 Field observations and image analysis

4.2.1 Wards observations 1

The researcher visited various wards to observe how waste was currently managed. The images recorded serve as evidence of the exploration of the focus field. Image 4.1 shows one of the municipal skip containers in Madadeni, Section 5. It can clearly be seen how the waste is being burnt instead of collected and deposited in a landfill, thereby causing air pollution in the surrounding environment. It was reported that residents burnt municipal solid waste in the skip container because it was overflowing and there was no space for further waste. Residents of Madadeni location dump their unscreened waste with the hope that the municipality waste removers will attend to the situation, but unfortunately the end result is increased pollution as the waste is burned so that more waste can be accommodated.



Image 4.1: Dumping site: skip container with waste causing land pollution as well as air pollution.

Image 4.2 and image 4.3 were recorded in ward 31 of Madadeni. It was reported that this municipality skip container is overflowing with waste matter most of the time and has caused many problems in this area. The area has now become unattractive and unhealthy due to the dispersed waste. All sorts of waste can be seen to be deposited in this skip, indicating that residents do not sort out their waste before disposal. This clearly indicates that the residents have not received any educational awareness campaigns on the reduction and screening of waste at its source. Waste can be seen in the nearby storm drainage system, where it is blocking the flow of water.

It can be observed that this dumped waste is not well managed and that this dumping site creates a multitude of problems. Areas such as this are breeding grounds for mosquitoes which could result in the increased transmission of malaria to people living in this area. This depicts how disposal of waste in or on land without careful planning and management can present a danger to human health and to the environment. According to the researcher's observation, the municipality responsible for providing waste management services and managing waste disposal is not fulfilling its obligation.

Image 4.2 shows residents opting to burn waste in the skip container because waste has not been collected over a long period and this is the only way the residents feel they can reduce the amount of waste in and around the skip container.



Image 4.2: Waste disposal in the storm drainage

Image 4.3 is a true reflection of the dysfunction of Newcastle Environmental governance. It can be seen that skip containers are not attended to and they are therefore causing health hazards. Recyclable and non recyclable wastes are not screened and the environment in totality is not taken care of. According to environmental rights in section 24 of the constitution, EGs are responsible for developing and implementing environmental policy in order to live in a healthy environment. The EG is also responsible for monitoring and regulating actions that impact on the environment. These images provided show that community members' health and well being are not protected.

4.2.2 Ward observation 2

The researcher visited the focus areas where data was collected. The areas had the same problem of uncollected waste in and around the municipal skip containers. Images 4.3 and image 4.4 show us the state of the areas on the second visit. Waste is clearly not a priority in the eastern areas of this municipality. There is also a lack of educational awareness on separation of waste because biodegradable and non-biodegradable wastes are deposited in one skip container.



Image 4.3: Waste disposal in and around the skip container

NEMA: Waste Act (Act no. 59 of 2008) part 2 of chapter 4 outlines the duties of waste management as “to manage waste in such a manner that it will not endanger health or the environment or cause a nuisance through noise, odour or visual impacts”. Thus environment health hazards linked to the uncontrolled burning of plastics and the harmful pollutants released are well-evidenced and they include cancer, respiratory illness, damage to the reproductive system and mental debris. Image 4.4 shows burning waste, causing air pollution which is not good for the environment or community members. People living in this area are put at risk as such waste might lead to disease, allow vermin to breed, pollute drinking water and reduce air quality.



Image 4.4: Waste not collected for a long period and affected storm drainage system.

In order to gain valid and consistent data the researcher visited the same focus areas on more than one occasion. The first and second visits were before the rainy season, and the third visit was after the area had received rain. On the third visit the storm drain was observed to be full of waste, blocking the drainage as shown on image 4.5. As waste is not screened when deposited, bio-degradable and non-bio-degradable waste is mixed - which worsens the situation. Waste which could be recycled, reused, or recovered, as well as waste which can be used for compost is mixed with non recyclable waste. This shows that the residents are not well educated on how to manage waste at its source.

4.2.3 Ward Observation: 3 and 4

Image 4.5, image 4.6 and image 4.7 show skip containers which are full of (and overflowing with) waste. Waste in the skip container is not sorted at source, showing that the residents lack knowledge on how to reduce waste at source. RSA (Republic of South Africa) NEMA: Waste Act (Act no. 59 of 2008:25) states that:

(a) municipalities need to set standards for the separation, compacting and storage of solid waste that is collected as part of the municipal service or that is disposed of at a municipal disposal facility,

(b) a municipality must set local standards for the management of solid waste that is disposed of by the municipality. Waste disposal facilities owned by the municipality must adhere to requirements in respect of the avoidance and minimisation of the generation of waste and the re-use, recycling and recovery of solid waste.



Image 4.5: Waste in and around the skip container in section 7 Madadeni

The laws that govern the environment also require the generators of waste collected by the municipality to place the waste in a container approved, designated or provided by the municipality for that purpose and in a location approved or authorised by the municipality (NEMA:Waste Act no. 59 of 2008) in chapter 5(5)(22).

Image 4.6 and image 4.7 show a storm drainage system blocked by waste. This site has developed into a breeding area for mosquitoes which could potentially transmit malaria. People living in this area complain about water in the storm drainage system and smells from stagnant dirty water.



Image 4.6: Storm drainage with waste disposal in section 6 Madadeni



Image 4.7: Storm drainage which is still polluted with waste in Madadeni ward 31

After a week the storm drainage system looked the same and remained full of stagnant water.

4.2.4 Ward observation 5 and 6

Image 4.8 indicates that waste management in this area is ineffective. These municipal skip containers are continually full of waste and are overflowing into the storm drainage system which is causing drain blockages. Water in this drainage system is supposed to be free flowing but is now blocked with municipal solid waste, resulting in a mosquito breeding ground. This can result in an outbreak of diseases such as malaria and cholera.



Image4.8: Waste disposal in ward 31

The areas shown in image 4.8, image 4.9 and image 4.10 were visited several times and the scene shown in the photographs was consistent over these times. The residents in these areas are at risk of contaminating diseases which emanate from these areas where waste is deposited and not collected. These images show the recyclable and non-recyclable materials deposited together, reflecting that source reduction is not applied due to lack of knowledge. The residents have not been educated through awareness campaigns on the treatment of waste at source.



Image 4.9: Section 4 Madadeni



Image 4.10: An open space where residents in section 5 deposit their waste

4.2.5 Illegal dumping site at Syahlala-la informal settlement

Siyahlala-la is an informal settlement where the researcher collected empirical data. This area is not provided with the necessary waste collection equipment and services which are provided to other parts of the city and this can be observed by its neglected state. Waste is dispersed throughout the area. Image 4.11 shows the poor state the residents are living in. This is in stark

contrast with what the South African Constitution and the National Environmental Management Acts stipulate, as they state that everyone is entitled to an environment which is healthy and not harmful to their lives.



Image 4.11: Siyahlala-la where waste is dispersed throughout the area

4.2.6 Waste management in schools

Schools produce large amounts of waste, much of which is various assortments of paper and containers of water learners take to (or use at) school. The researcher sampled schools X and Z in the Madadeni location and observed how waste is produced and managed. The researcher discovered that much waste came from papers from classes as well as waste from the kitchen where learners' food is cooked. Image 4.12 shows the mini landfill which is full of waste and not properly managed – waste is burned as it is not collected by the municipality. It is in close proximity to the classrooms, putting the health of learners in danger and making the environment unattractive. Air pollution may cause diseases, one of which is tuberculosis.



Image 4.12: Mini landfill outside the classrooms

In one of the schools visited by the researcher, nutritional food is cooked for learners. Solid waste was deposited next to the kitchen area where school learners' food is prepared. Image 4.13 shows the kitchen at school X in Madadeni where waste is littered. An area where food is prepared needs to be clean at all times. This image gives the impression that the kitchen itself may not be clean and therefore the food prepared might not be safe to be consumed. Papers (which should have been collected for recycling so that the school might earn some petty cash) have been dumped.



Image 4.13: Waste deposited in front of the school kitchen

Image 4.14 shows waste from the school kitchen in the form of empty food tins. The tins were collected with the intention of being taken to a recycling company in the industrial area. However, they have remained outside the kitchen as unsightly waste.



Image 4.14: Waste from the school kitchen waiting to be taken for recycling

4.2.7 Landfill site observation

❖ Entry of waste trucks to the landfill site

The researcher visited the landfill site several times in order to collect data and to observe the extent to which environmental governance is implemented. Environmental governance requires laws to direct the day to day running of the landfill site and to determine the amount of waste which is handled and treated in its last stage. It was observed that environmental governance regarding the landfill demands that landfill workers act as gate-monitors, giving directions to the waste delivering trucks and checking the type of waste to be deposited. All trucks entering the landfill were weighed at the bridge office and the amount of waste to be deposited was recorded as well as the area where the waste had been collected.



Image 4.15: Waste delivery truck at the weigh bridge office

Image 4.15 shows a waste truck at the weigh bridge office. All waste, except for clinical waste, is accepted at this specific landfill. Due to a lack of waste awareness educational campaigns, the waste is mixed. It is not separated before it is deposited in the landfill.



Image 4.16: A waste collecting truck at the weigh bridge centre

Image 4.15 shows a waste truck at the weigh bridge office. All waste, except for clinical waste, is accepted at this specific landfill. Due to a lack of waste awareness educational campaigns, the waste is mixed. It is not separated before it is deposited in the landfill.

❖ **Area where waste is deposited in the landfill**



4.17: Waste for different recycling companies

❖ **Waste treatment in the landfill**

Waste is sorted into categories according to the requirements of different recycling companies. Image 4.17 shows different forms of waste in the landfill. Recycling companies include Mpilonhle (a recycling company which collects waste such as plastics for recycling) and Mpulusi (a recycling company for materials such as steel, copper, iron and aluminium). This mix of different kinds of waste in the landfill is caused by a lack of educating residents on how to manage waste at source. Residents are not educated on how to separate waste before it gets sent to its final disposal.

Image 4.18 shows bags loaded with recyclable waste which was not supposed to be deposited in the landfill. This will obviously cause the landfill to fill up within a much shorter period of time.

Therefore, it stands to reason that the recycling companies play a pivotal role in the effective functioning of landfills by reducing waste to be compacted.



Image 4.18: Screened waste waiting to be collected for recycling



Image 4.19: Front end loader

Image 4.19 shows the disposal area. A waste truck can be seen off loading waste, a front end loader can be seen compacting waste to the ground, and a private truck can be seen disposing of waste. The researcher observed that the front end loader was compacting waste which the recyclers had already screened.

As a result, people have been seen visiting the landfill to collect recyclable waste deposited. Representatives of recycling companies such as Mpilonhle recycling company have been seen

in the landfill picking up plastic for recycling. Mpulusi recycling company's representatives were also on site picking up waste such as steel, copper, iron and aluminium. An image below shows pickers at the landfill screening waste for recycling.

Image 4.20 shows builders' rubble in the landfill which is used in the final stage of compacting waste. The environmental governance structure has set the management waste laws of the landfill in place as the landfill accepts all unscreened waste except for clinical waste. This is very important in order to reduce unnecessary accidents and contamination of diseases by the recycling companies' representatives who are seen screening waste in the landfill.



Image 4.20: Builder's rubble in the landfill site

Steps preventing the pollution of surface and groundwater have been taken into consideration. Image 4.21 shows a manmade dam where leachate is collected and rain water is siphoned out through the storm water drainage systems.



Image 4.21: Dam where leachate and rain water are collected to prevent the pollution of surface and groundwater

4.3 Overall observational analysis

4.3.1 Analysis of field observations and images

An overall analysis of the field observation and the images taken on site by the researcher is as follows:

- There is great need for vigorous enforcement of environmental laws in all parts of the Newcastle Local Municipality, especially the eastern side.
- Environmental governance needs to review laws before implementation.
- There is a need to have a well structured department of waste management which will constantly check the progress of managing waste in all parts of the municipality.
- Storm drainage systems in most parts of areas visited are no longer effectively fulfilling their purpose as they are blocked by waste. This is mostly deposited by residents through ignorance, but for some it is part of a political war.
- Some waste is not collected on time. It has however been shown that waste can be a source of income for some individuals, as they sort through waste to identify and collect what they feel they can take for recycling.

In the western area of this municipality, waste is collected according to scheduled days. Despite their waste being collected efficiently, they do not make an effort to separate their waste according to national and provincial waste management laws. This therefore encourages

individual sorters to open the western bin bags to sort and collect recyclable materials. Image 4.23 shows a trolley with various items of waste collected from the dust bins awaiting collection in the western side of the municipality.

Gerdes and Gunsilius (2010:5) state that “street waste pickers are entrepreneurs who add value merely by collecting and then transforming waste into tradable commodities”. The added advantage of these gleaners is that they make the environment cleaner by reducing the amount of waste that goes to the landfills. They make their small income from recycling the materials and do not get money for doing the job itself. Blaaw 2010 states that “waste picker’s form the basis of waste collection services at no cost to local authorities, central government and residents”.

Image 4.22 shows waste which is recyclable. Through their actions, the gleaners are helping to reduce the amount of waste to be deposited in the landfill – especially waste that can be recycled. Due to the high rate of unemployment, there are a large number of waste pickers (especially among the non working class) in Newcastle. They carry out this service simply in order to put food on the table. According to Schenck and Blaauw 2010; Chvatal 2010; and Samson 2010, “waste pickers are variously referred to in literature as reclaimers, waste pickers, garbage pickers, recyclers, scavengers and waste salvagers”.



Image 4.22 shows a gleaner’s trolley filled with recyclable scrap metal waste

Gleaners who collect scrap metal and deliver it to scrap dealers provide a valuable service to society by reducing the amount of waste. Metal is not bio-degradable and it is therefore advantageous to recycle scrap metal to prevent accumulation in landfill sites and waste dumps, where it damages the environment. Dumped scrap metal also rusts and deteriorates which is unattractive and is a health hazard.

❖ **Problems emanating from metal collection**

Criminals steal items such as copper telephone wire and steel manhole covers to sell as scrap metal when they are actually in use and not scrap metal. Gleaners however collect genuine scrap, which reduces waste in landfills and helps waste management keep the environment clean and healthy. Gleaners also indirectly reduce the number of criminals in the environment as they make money through picking recyclable waste. Waste pickers are viewed as small-scale, self-employed agents, characteristically encountered in the urban informal sector. As such they have found a way of supporting themselves, and at the same time they make an important contribution to environmental sustainability by reducing the amount of waste that goes to landfills and by providing material for recycling processes.

The activities performed by waste pickers decrease the challenges felt by environmental governance and waste management departments in the maintenance of the environment.

4.3.2 Observational Analysis on waste management in schools

Data collected through observation gave a clear indication of the levels of importance attached to the role of environmental governance in municipal waste in the Newcastle Local Municipality. In the western area of Newcastle, waste is collected efficiently and the environmental governance's governing laws are followed. In contrast, in the eastern area of Newcastle (Madadeni and surrounding informal settlements), waste is treated differently and the laws are not observed.

The constitution of the Republic of SA (Act no. 108 of 1996) section 24 of the Bill of Rights states that: (a) everyone has the right to an environment that is not harmful to their health or well being and (b) to have the environment protected for the benefit of present and future generations, through reasonable legislative and other measures that prevent pollution and

ecological degradation. The EG, together with waste management, is responsible for the well being of society and has to make it a point that the laws are enforced vigorously.

Environmental governance has to re-address the issue of waste management in the focus area. The inefficiency in the eastern areas gives an inaccurate impression of the Newcastle Local Municipality as a whole. Educational awareness campaigns are needed to educate communities on how to prevent and reduce waste at source as a way of controlling the amount of waste deposited in the landfills. Waste needs to be separated into biodegradable and non-biodegradable waste before it is deposited in the landfill site. This will mean that landfills will not become full so quickly.

In some areas residents deliberately do not use the skip container, leaving their waste outside the skip container, which was observed to be a political related issue in which the residents were rebelling against the ward councillor.

School X is not serviced by the municipality, but it is doing well in its effort to collect empty food tins for recycling.



Image 4.23: Collected empty fish tins ready for recycling

4.3.3 Analysis on landfill site observation

- No thorough checking of trucks entering with waste was observed.
- Apart from clinical waste, all kinds of waste are deposited in the landfill. This is mainly due to a lack of educational awareness campaigns which will enlighten residents on how they should manage waste at source. For example, image 4.16 shows garden waste mixed with plastic papers and other sorts of waste.
- Image 4.18 shows biodegradable and non biodegradable waste mixed. This means that all waste is directed to the landfill site.
- Recycling companies are seen to be playing an important role in the sorting of waste. By identifying recyclable waste they reduce the amount of waste to be compacted in the landfill. This will positively contribute to the maintenance of the landfill and prevent it filling in a short space of time.
- Leachate is siphoned off so that it will not contaminate ground or surface water.

4.4 Semi-structured interview results (Closed and open ended questions) and Audio visual data

The researcher used semi-structured interviews to interview community representatives, community leaders (such as councillors), municipality representatives, and landfill monitors. In this way, data was collected on the management of waste in the Newcastle Local Municipality. Leedy (2005:184), states that, “the interview related to qualitative research studies tends to have a formal and emotional and a neutral feeling”. Greeff (2002:298) supports the aforementioned view that qualitative research typically employs unstructured interviews.

The researcher collected data on the role of environmental governance in municipal waste management in the Newcastle Local Municipality in order to evaluate the implementation of the laws that govern the environment. National Waste Management Strategy Implementation South Africa provides a Waste Information System guideline on technical implementation (October 2006). It gives reasons as to why it is important to collect data on waste in section 1.3. In section 1.3.1, the National Department of Environment Affairs and Tourism (DEAT) is defined as the lead agent for the environment with the purpose of providing leadership and guidance to enable other national departments, provincial environmental departments and municipalities to meet their executive obligations in respect of the environment:

- a. Assist government with the development of national policies and strategies on waste management.
- b. Assist with the identification of problematic waste streams or waste streams that occur in large quantities.
- c. Develop the capacity within government around integrated waste management.
- d. Monitor the effectiveness of waste management policies and strategies.
- e. Support research regarding the most appropriate storage, collection, transport, treatment and disposal methods for each waste stream.
- f. Support the diversion of waste from landfill thereby promoting waste re-use, recycling and waste exchange opportunities.

The interviews assisted the researcher to collect data which explains gaps in the role played by environmental governance in municipal waste management in the Newcastle Local Municipality.

4.4.1 Interview with the waste management officer

The waste management department is the one which is concerned with the implementation of environmental laws drawn up by environmental governance. The researcher's intention was to find out whether the laws drawn up were practicably implemented in this municipality. Therefore, the researcher interviewed the municipality waste management officer to get accurate information on how waste is governed in the Newcastle Local Municipality. Environmental governance is more concerned with the formulation of rules or laws on how to govern the environment in order to keep it healthy and not harmful to everyone. The Constitution of South Africa, 1996 provides the foundation for environmental regulation and policy in SA, that is, the right to environmental protection and to live in an environment that is not harmful to health. This interview guide helped the researcher to collect data/empirical material on the role of environmental governance in municipal waste management in the Newcastle Local Municipality.

❖ Overall analysis

The data collected uncovered insights into the role of environmental governance in the NLM. The following insights into the way environmental governance and management contribute to the current state of the municipal waste in NLM were gained:

- 1 Structures are still using outdated bylaws which could be the cause of not being able to monitor all the areas. They are supposed to have a schedule which will accommodate all parts of the Newcastle Local Municipality.
- 2 The increase in population means an increase in people seeking job vacancies in factories, and this has a tremendous impact on the amount of waste produced.
- 3 Community residents also contribute to the problem as they deposit waste outside of the skip containers – causing land pollution and air pollution.
- 4 While the waste management department claims to have covered all the areas, there are areas like section 7, Soul city, Maaskraal and Lista Farm where the researcher observed numerous skip containers which had not been attended to for more than three weeks.
- 5 The separating of waste at source needs to be implemented with immediate effect, as well as composting of waste (for example food leftovers and garden waste).
- 6 The department is claiming regular awareness campaigns in all the areas. This was found to be only partly correct.
- 7 According to the bylaws, waste has to be checked when it arrives at the landfill, but it was observed that the truck is checked only in order to eliminate hazardous waste from entering the landfill.
- 8 The researcher observed a discrepancy between that which is reported by structures and that which occurs in the focus area. In the west, waste is collected on the stipulated days, while in the east they do not always follow the schedule.
- 9 Awareness campaigns need to be spread all over the Newcastle Municipality in order to decrease waste problems.

4.4.2 Interview with community representatives (councillors)

The researcher conducted interviews in different parts of the NLM in order to assess the implementation of environmental waste management laws. The interviews helped to gain insight into the role played by environmental governance in determining the laws that enable everyone to live in a healthy environment. The researcher interviewed community representatives, such as councillors, as they are the leaders who govern service delivery in communities. They are the “eyes” of the community. The effectiveness of the imposed laws was established, and whether or not the communities were given educational awareness on how to govern the environment they are living in. The researcher wanted to find out more about waste collection in the different wards since the researcher had observed waste which was neglected in most parts of the

eastern side of NLM. Most waste is deposited in unlawful areas which might cause blockages of storm drainage systems. The interview questions analysis is as follows:

Question 1 analysis: Environmental governance and waste management of municipal waste

- The municipality does collect waste in some parts of the NLM, though it is not done efficiently on the predetermined day of the week.
- Most skip containers overflow with waste which has not been collected, causing much damage to the environment.
- Heaps of uncollected waste can become a breeding ground for mosquitoes which contributes to possible outbreaks of malaria.
- Uncollected waste also becomes aesthetically unattractive.
- Lastly, in some informal settlements waste is rarely collected showing that these are not covered in the schedules set for the collection of waste in the Newcastle Local Municipality.

Question 2 analysis: Environmental governance and waste management of municipal waste

- Environmental governance viewed skip containers as an essential way of controlling waste in communities.
- Although some parts have skip containers, waste is rarely collected. This results in many environmental challenges for people living near areas where there are skip containers. The negative effects of degrading waste in the skip containers, as well as blockages in the storm drainage systems, form part of these environmental challenges.
- Other parts of the Newcastle Local Municipality do not have skip containers at all, meaning that waste in these areas is not managed. These areas do not have waste collection services due to their location status. Waste in these areas is thrown into the nearby forest or onto illegal dumping areas.
- According to National Environmental Management: Waste Act, 2008 (Act No. 59 Of 2008:38), waste storage areas on site must be designed and operated in such a way as to prevent the unauthorised or accidental release of any polluting substances (gaseous, liquid or solid) into the soil, air, surface water and ground water.

Question 3 analysis: Environmental governance and waste management of municipal waste

- Waste is not screened in all parts of the Newcastle Local Municipality. This means that waste that is degradable and waste that is non-degradable is deposited into the same landfill. Environmental governance needs to state clearly in the laws that govern the environment that waste has to be screened at source as a way of reducing the amount of waste deposited in the landfill. This will prevent the landfill becoming full within a short space of time.
- According to NEMA: Waste Act No. 59 of 2008:24) municipalities may, amongst other things, set local standards for the separation, compacting and storage of solid waste that is collected as part of municipal service or that is disposed of at a municipal waste disposal facility.

Question 4 analysis: Environmental governance and waste management of municipal waste

- Awareness campaigns need to be well spread in this local municipality so that sources of waste may be able to screen waste before it is deposited in the landfills.
- Environmental governance has not played its part in trying to govern the environment. NEMA Act No. 107 of 1998 states that one of its principal aims in environmental management is to place people's needs at the forefront while providing a programme of sustainable development. They do this by offering community well being and empowering them through environmental education, raising environmental awareness, sharing of knowledge and experience.
- In chapter 3 of the NEMA: Waste Act (Act No. 59 of 2008:28) it states that an integrated waste management plan within the domain of the Department, Provincial department or municipality must set out how that department or municipality intends to provide for the implementation of waste minimisation, re-use, recycling and recovering targets and initiatives.

Question 5 analysis: Environmental governance and waste management of municipal waste

- It is only those who are exercising the principle of “one home one garden” who are using waste as manure.
- Some residents are indirectly using maize cobs as manure in their gardens. They still need to be educated on how to manage waste at source.

Question 6 analysis: Environmental governance and waste management of municipal waste

- In almost all parts of the Newcastle Local Municipality, they have suggested composting of waste as a way of reducing the amount of waste at source. This has to be more emphasised by environmental governance. The waste management department has to make a thorough follow up to make sure that this is done in all parts of the municipality.
- After educational awareness campaigns have been carried out in all parts of the municipality, environmental governance has to enforce the environmental laws vigorously.

Question 7 analysis: Environmental governance and waste management of municipal waste

Most respondents suggested composting and mini landfills. Environmental governance needs to enforce the laws set up vigorously and address the issues that concern residents.

- The Newcastle Local Municipality needs to, through its environmental governance, align its bylaws with the national and provincial laws in order to maintain a healthy environment that is not harmful to the lives of people.
- According to the White Paper on Integrated Pollution and Waste Management for South Africa, a policy on pollution prevention, waste minimisation impact management and remediation, 2000:28), waste is considered as a source of pollution which needs to be addressed and to be considered:
 - (1) Waste avoidance, minimisation and prevention.
 - (2) Recycling and re-use.
 - (3) Treatment and handling of waste.
 - (4) Storage and final disposal of waste.

Question 8 analysis: Environmental governance and waste management of municipal waste

- As a result of late collection, waste is dispersed by wind which causes the area to become aesthetically unattractive. This particularly unsightly form of land pollution leads to economic problems in the area.
- Burning waste in the municipality skip containers pollutes the ambient air. There is a need for more effective communication by environmental governance and waste management departments with regards to the formulation of the laws that govern the environment. They need to communicate with the community who may encounter transport problems themselves, so that residents will know when they need to take their waste out for collection. The laws used to govern the environment need to be vigorously enforced in order to have a healthy environment.

Question 9 analysis: Environmental governance and waste management of municipal waste

Environmental governance must act as a governor of the environment in order to ensure a healthy and safe environment for everyone. Unfortunately, most residents see their environment as unclean.

- Most residents have declared their environment unhealthy due to the waste which is seen in most parts of their areas – waste which has been produced by them. According to the South African constitution, (1996): National Environmental Management Act, (1998): White Paper on IP&WM, (2000): NEMA Waste Act, (2008), as well as Waste regulations, everyone has the right to have an environment that is not harmful to his or her health and to have the environment protected for the benefit of the present and future generations through reasonable legislative and other measures.
- The National Environmental Management: Waste Act (Act 59 of 2008), has been drawn up in order to “protect health and the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development”.

Question 10 analysis: Environmental governance and waste management of municipal waste

- Service delivery is not effective in this municipality. Much still needs to be done by environmental governance if the situation is to be brought under control. There is a lack of awareness campaigns which results in problems with managing waste in Newcastle. The EG has to re-address the waste management issue – especially ways of minimising waste at source.
- According to the NEMA, Waste Act (Act 59 of 2008:22) on Norms and standards, it states that a municipality must exercise its executive authority to deliver waste management services, including waste removal, waste storage and waste disposal services in a manner that does not conflict with section 7 or 8 of this Act. Furthermore, in situations where the municipality (as governors) are not properly performing their duties in the collection of waste, there should be corrective measures taken. Residents also have to work with environmental governance as well, as the waste management department is trying to keep the environment clean at all times.

Question 11 analysis: Environmental governance and waste management of municipal waste

- There is a lack of environmental monitoring in most areas of this municipality. Environmental Governance has to draw up and enforce bylaws that will make sure there is no observable waste in the environment. There should be ways of educating residents on how to reduce waste at source.

❖ Overall analysis on environmental governance and waste management of municipal waste in Newcastle Local Municipality

As community representatives on the issue of Waste management, Councillors viewed waste management as a major issue which needs to be attended to by the department. Most parts of the eastern side of the NLM are still experiencing a waste management problem which suggests an ineffective system. There is poor collection of waste and the residents themselves contribute to the problem by dumping waste in illegal places. Waste is not sorted before it is deposited. Environmental governance needs to include laws on the screening of waste:

1. The bylaws drawn up to govern the environment must benefit all the residents in this municipality.
2. Environmental governance has to monitor the waste management department on the implementation of the bylaws set to govern the area.
3. Trucks used to collect waste need to be replaced, as they are old and they can no longer manage to cover all the areas required.
4. Educational awareness campaigns on how to reduce waste at source are an important element in solving this waste problem.
5. Vigorous implementation of laws is needed.

4.4.3 Interview with community members

The researcher identified areas which were relevant to conduct the interviews in. Residents living closer to the focus areas were interviewed, as they were the most affected by the poor management of waste. The researcher conducted interviews in different parts of the NLM in order to assess the implementation of environmental waste management laws. These laws should reflect the role of environmental governance in demarcating the boundaries that will enable everyone to live in a healthy environment which is in no way harmful to its residents. Community representatives living near the legal and illegal dumping sites were targeted for interviews. The researcher aimed to find out the effectiveness of the imposed laws and whether or not the communities were made aware of how to govern the environment they are living in. The researcher also noted waste deposited in unlawful areas which might cause blockages of storm drainage systems. The interview questions analysis is as follows:

Question 1 analysis: Environmental governance and waste management of municipal waste

- The municipality does collect waste in some parts of the NLM, though it is not consistently done on the set days of the week.
- Most skip containers are overflowing with waste which was not collected – causing much damage to the environment.
- Heaps of uncollected waste can become breeding areas for mosquitoes, potentially leading to an outbreak of malaria. The uncollected waste also causes the environment to become aesthetically unattractive.

- In some informal settlements waste is rarely collected. These areas are not covered in the schedules set for the collection of waste in the Newcastle Local Municipality.

Question 2 analysis: Environmental governance and waste management of municipal waste

Environmental governance considers skip containers an essential way of controlling waste in communities.

- Some parts have skip containers, but the waste is rarely collected. This results in many environmental challenges for people living in the area – these residents suffer the negative effects of degrading waste in the skip containers, as well as in the storm drainage systems.
- Other parts of Newcastle Local Municipality do not have skip containers and it is clear that these areas are not managed. These areas do not have allocation of waste collection due to their location status. Waste in these areas is thrown into the nearby forests or illegal dumping areas.

According to the National Environmental Management: Waste Act, 2008 (Act No. 59 Of 2008) in schedule 3 section 11.5, waste storage areas on site must be designed and operated in such a way so as to prevent the unauthorised or accidental release of any pollution substances (gaseous, liquid or solid) into the soil, air, surface water and ground water.

Question 3 analysis: Environmental governance and waste management of municipal waste

- Waste is not screened in all the parts of the Newcastle Local Municipality. This means waste that is degradable and waste that is non-degradable is deposited in the same landfill.
- Environmental governance needs to state clearly in the laws that govern the environment that waste has to be screened at source as a way of reducing the amount of waste deposited in the landfill. This will prevent the landfill becoming full in such short periods of time

According to NEMA: Waste Act No. 59 of 2008:24) municipalities may, amongst other things, set local standards for the separation, compacting and storage of solid waste that is collected as part of municipal service or that is disposed of at a municipal waste disposal facility.

Question 4 analysis: Environmental governance and waste management of municipal waste

- Awareness campaigns need to be well spread in this local municipality, so that sources of waste may be able to screen waste before it is deposited into the landfill.
- Environmental governance has not been effective in governing the environment. NEMA Act No. 107 of 1998 reflects one of its principles on environmental management as placing people's needs at the fore front while providing a sustainable development programme. This is done by ensuring community well being and empowering the community through environmental education, raising environmental awareness, and the sharing of knowledge and experience.

In chapter 3 of the NEMA: Waste Act (Act No. 59 of 2008:28) it is stated that an integrated waste management plan for the Department, Provincial department or municipality must set out how that Department or municipality intends to provide for the implementation of waste minimisation, re-use, recycling and recovering targets and initiatives.

Question 5 analysis: Environmental governance and waste management of municipal waste

- Educational awareness campaigns on how to deal with waste at source until it reaches its final disposal in the landfill are a vital beginning in dealing with the problem.
- It is only those who are exercising the principle of "one home one garden" who are using waste as manure.
- Some are indirectly using maize cobs as manure in their gardens. They still require further education on how to manage waste at source.

Question 6 analysis: Environmental governance and waste management of municipal waste

- In most parts of the Newcastle Local Municipality composting of waste is suggested as a way of reducing the amount of waste at source. This has to be more emphasised by environmental governance in its bylaws, and the waste management department has to make thorough follow ups to verify that this is done in all parts of the municipality.
- After educational awareness campaigns have been carried out in all parts of the municipality, environmental governance has to enforce the environmental laws vigorously.

Question 7 analysis: Environmental governance and waste management of municipal waste

- Most respondents suggested composting and mini landfills. The environmental governance need to enforce the laws drawn up vigorously and address the issues that concern residents.
- The Newcastle Local Municipality needs to, through its environmental governance, align its bylaws with the national and provincial laws in order to maintain a healthy environment that is not harmful to the lives of people.
- According to the RSA (Republic of South Africa). 2000. White Paper on Integrated Pollution and Waste Management for South Africa, a policy on Pollution prevention, waste minimisation impact management and remediation, (2000:28), waste is considered to be a source of pollution which needs to be addressed and to be considered:
 - (1) Waste avoidance, minimisation and prevention.
 - (2) Recycling and re-use.
 - (3) Treatment and handling of waste.
 - (4) Storage and final disposal of waste.

Question 8 analysis: Environmental governance and waste management of municipal waste

- Late collection results in waste becoming dispersed by wind. The area then becomes aesthetically unattractive and the land pollution leads to economical problems in the whole area.
- Burning waste in the municipality skip containers pollutes the ambient air. There is need for effective communication by environmental governance and the waste management

department with regards to the scheduling of dates for collection. These structures must communicate with the community who are also encountering transport problems so that residents will know when they need to take their waste out for collection.

- The laws used to govern the environment need to be vigorously enforced in order to have a healthy environment.

Question 9 analysis: Environmental governance and waste management of municipal waste

Environmental governance must act as governor of the environment in order to ensure a healthy and safe environment for everyone. Unfortunately, most residents see their environment as unclean.

- Most residents have declared their environment unhealthy due to the waste which is seen in most parts of their areas – waste which has been produced by them. According to the South African constitution, (1996): National Environmental Management Act, (1998): White Paper on IP&WM, (2000): NEMA Waste Act, (2008), as well as Waste regulations, everyone has the right to have an environment that is not harmful to his or her health and to have the environment protected for the benefit of the present and future generations through reasonable legislative and other measures.
- The National Environmental Management: Waste Act (Act 59 of 2008), has been drawn up in order to “protect health and the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development”.

Question 10 analysis: Environmental governance and waste management of municipal waste

- Service delivery is not ideal in this municipality. Much still needs to be done by environmental governance to put effective structures in place.
- A lack of awareness campaigns results in many problems regarding the management of waste in Newcastle.
- The EG has to re-address the waste management issue - especially ways of minimising waste at source.
- According to the NEMA, Waste Act (Act No. 59 of 2008:22) on Norms and standards states that, -a municipality must exercise its executive authority to deliver waste

management services, including waste removal, waste storage and waste disposal services in a manner that does not conflict with section 7 or 8 of this Act.

- Furthermore it is stated that where the municipality is not properly performing its duties in the collection of waste there should be corrective measures taken.
- Residents also have to cooperate with environmental governance and the waste management department in trying to keep the environment clean at all times.

Question 11 analysis: Environmental governance and waste management of municipal waste

- There is a lack of environmental monitoring in most areas of this municipality.
- Environmental Governance has to draw up and enforce bylaws that will make sure that there is no waste in the environment.
- There should be programmes to educate residents on how to reduce waste at source.

❖ Overall analysis on environmental governance and waste management of municipal waste in Newcastle Local Municipality

As community representatives on the issue of Waste management, Councillors viewed waste management as a major issue which needs to be attended to by the waste management department. Most parts of the eastern side of the NLM are still experiencing a waste management problem which suggests an ineffective system. There is poor collection of waste and the residents themselves contribute to the problem by dumping waste in illegal places. Waste is not sorted before it is deposited. Environmental governance needs to include laws on the screening of waste:

1. The bylaws drawn up to govern the environment must benefit all the residents in this municipality.
2. Environment governance has to monitor the waste management department on the implementation of the bylaws set to govern the area.
3. Trucks used to collect waste need to be replaced as they are old and they can no longer manage to cover all the areas required.
4. Educational awareness campaigns on how to reduce waste at source are an important element in solving this waste problem.
5. Vigorous implementation of laws is needed.

4.4.4 Interview with landfill site monitors

Finally, the researcher interviewed the landfill site monitors. It should be noted that waste disposal should be monitored and it is the responsibility of environmental governance to lay down the rules that govern the day to day duties of landfill monitors. Waste needs to be screened before it is deposited into landfill sites. Only biodegradable waste should be deposited. The researcher found it imperative to interview people working in the landfill site to find out whether the landfill site laws are being implemented, where they are being monitored and whether there are any challenges faced by landfill site workers. This will help the researcher to gain information on whether the current laws adequately serve the situation in the landfill site. The researcher will also gain data on the amount of waste deposited in the landfills site and on the type of waste deposited there. The analysis on their responses is as follows:

❖ Overall analysis: Environmental governance on landfill issue:

- Waste deposited in the landfill sites is not sorted. Waste like garden refuse and food leftovers are found in the landfill sites.
- Biodegradable and non-biodegradable waste is found together in the landfill. According to RSA (Republic of South Africa) NEMA: Waste Act, 2008 (Act No. 59 of 2008:22) of waste management, waste generators must ensure that their waste is assessed in accordance with the standards for assessment of waste for Landfill Disposal set in terms of section 7(1) of the Act prior to the disposal of the waste to landfill site.
- It is a challenge to enforce the principles laid down by law without having recycling representatives in the landfill site.
- According to the responses, the landfill site receives appropriate treatment. Of special importance is the treatment of Leachate as it is the most difficult to deal with when preventing contamination of soil and ground water.

The National Environmental Management: Waste Act (Act 59 of 2008), has been drawn in order, “to protect health and the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development”.

4.5 Conclusion

This chapter focused on analysing the data collected in the previous chapter. Data was collected using field observational techniques as well as interviews. These were described in the previous chapter and then analysed using qualitative analysis. Maps and images were provided in order to validate the data collected. These images show the actual state of the environment in most parts of the eastern areas of the Newcastle Local Municipality. This chapter integrated the data collected with the required roles of environmental governance. Most importantly, the data collected was assessed to find out whether implementation was aligned to the national and provincial environmental laws. Apart from the IDP and the EMF, the Newcastle Local Municipality does not have environmental laws drawn up.

The analysis revealed that waste management needs serious attention by environment governance which stipulates the laws that govern the day to day management of waste. The environmental laws currently used are not vigorously implemented. Educational awareness campaigns are not carried out in all areas and waste is deposited in landfill sites without screening. A large volume of waste is generated by schools and instead of collecting recyclable waste, they are seen burning it. Field observational interviews were also carried out in different parts of the eastern areas of the NLM. Responses from the community representatives, community members, and landfill site monitors reveal that there is much that needs to be done to advance waste management.

The following chapter will focus on the study's synthesis. An overview of research findings on waste management, Newcastle Environmental Governance, and recommendations for effective environmental governance in NLM will be expressed. The researcher will also examine the critical overview of the study methodology and research results, as well as the recommendations for future research. This will help the EG improve its service delivery to the residents of Newcastle Local Municipality.

CHAPTER 5

RECOMMENDATIONS AND CONCLUSION

5.1 Introduction

In the previous chapter, the researcher considered a qualitative analysis of the data which was collected using qualitative approaches and techniques. Chapter 5 focuses on an overview of the research findings, on findings on waste, on management, on findings on the environmental governance of Newcastle, and finally on recommendations for effective environmental governance in the NLM. The chapter will further present a critical overview of the study methodology and research results, and recommendations for future research.

5.2 Overview of research findings

Identification of the research problem enabled the researcher to identify methods of collecting relevant data and ways of analysing data collected. Finally, it enabled the researcher to present the following research findings:

- Inadequate facilities and lack of trained personnel leads to incompetence in removing waste in the identified areas.
- Due to insufficient financing there is an inadequate regulatory programme for monitoring waste management.
- There are few skip containers distributed and this inadequate infrastructure leads to a lack of capacity to handle/manage solid waste.
- Awareness campaigns on waste management at source are not properly carried out.
- In addition, environmental governance does not draw up its environmental laws, but instead uses the provincial and national environmental laws to manage waste in the NLM.

5.2.1 Research findings on waste management

- ❖ Waste management is the department which is most concerned with implementation of laws drawn up by environmental governance in order for everyone to live in an environment which is healthy and not harmful to anyone. Hence, it has been

identified that poor management of waste has an adverse impact on the environment and public health, particularly in townships such as Madadeni and other surrounding areas. Among a multitude of problems, solid waste management appears to be the most prominent in recent years.

The following findings on waste management were identified:

- ❖ Lack of trained personnel to operate waste management systems. It has been observed that the collection of waste is mostly carried out by uneducated workers who simply mix all sorts of waste as they are collecting it.
- ❖ The Newcastle Local Municipality's waste management fails because of inadequate financial resources. Many strikes have been caused by issues such as the municipality not being able to pay its workers. As a result, workers are carrying out their work ineffectively because there is little incentive to motivate them to clean up waste properly or re-using and recycling waste
- ❖ There is a lack of administrative and institutional management, improper distribution of resources and infrastructure, and, mostly, a lack of community support and public awareness. More attention requires to be given to the eastern areas in terms of waste management, since these areas have a higher population which results in larger quantities of waste being generated. The study has established that these areas are currently allocated older waste trucks which were not performing their duties adequately because of breakdowns.
- ❖ The waste management department of the municipality has started campaigns in certain areas of the municipality on re-using and recycling waste in order to generate a definite economic advantage to the municipality, as well as to minimise the associated socio-environmental problems produced by haphazard waste disposal.
- ❖ Disposal sites are poorly located, constructed, and operated, and consequently create environmental problems. An example is the municipal skip containers which are mostly placed adjacent to storm water drains. Because these containers are often overflowing as they are infrequently emptied, residents often deposit their waste in the storm drains and create a series of knock-on problems.

- ❖ Solid waste may be seen in large heaps on any piece of unused land, around buildings and in open market places. The images in chapter 4 taken during field observation clearly show the number of open spaces in the location areas which have been turned into illegal dumping sites.

Solid waste management strategy:

- ❖ As the economies of developing countries expand, various waste streams grow in volume and complexity. In the case of the NLM, municipal resources which are actually earmarked for waste management do not keep pace with the generation of waste – this is especially true of the collection of waste in the eastern part of the municipality. Trucks are now too old and too few of them are allocated for these areas.
- ❖ Indicates that the implementation of environmental management has a direct contribution to environmental protection. Educational awareness campaigns have not been carried out in all parts of the municipality, and as a result most residents do not sort their waste before they deposit it.
- ❖ Solid waste is mostly directed to landfills and tailings dams, although much of it is recyclable.
- ❖ The policy on Waste management facilitates implementation of the following hierarchy of objectives which serves to minimise the adverse impacts of the inevitable process of waste generation:
 - ◆ Waste minimisation;
 - ◆ Waste avoidance;
 - ◆ Recycling and re-use;
 - ◆ Treatment and handling;
 - ◆ Storage and final disposal.
- ❖ Poor standards of waste collection and disposal services lead to a high level of public disenchantment with the performance of local authorities and waste contractors, as well as to a culture of non-payment.
- ❖ It has been established that the collection, disposal and processing of waste produced by businesses and households are regulated by legislative policies set out and enforced by the Municipality of Newcastle.
- ❖ The infrastructural capacity required for efficient management and processing of solid waste is lacking.

- ❖ There is poor awareness of the benefits of proper waste management.
- ❖ There is a lack of socio-economic incentives to stakeholders relevant to the waste management chain.
- ❖ There is a failure to adequately utilise modern waste management and processing technology.
- ❖ There is a failure to enforce municipal bylaws vigorously.
- ❖ There is an absence of an integrated waste management system in the NLM.
- ❖ A review of the literature shows that in cities as big as the NLM, modern waste treatment technologies such as composting, incineration, landfills, recycling and composting should be used for solid waste management.
- ❖ In the NLM, the management of solid waste involves collection, transportation, and processing, as well as disposal, management and monitoring of waste materials.

According to the South African National Department of Environmental Affairs and Tourism (4) the disposal and combustion of municipal solid waste is conducted by the use of landfills, the conversion of non-recyclable waste materials into useable heat, electricity or fuel, combustion and transfer stations.

- ❖ Environmental hazards arise from the decomposition of solid waste in over saturated conditions and the dumping of solid waste in illegal landfills often causes sludge.
- ❖ The law calls for sustainable waste management and hence proposes strategies such as waste segregation/sorting which allow reduction, recycling, recovery and re-use.
- ❖ Re-using and recycling of waste can provide a definite economic advantage and minimise associated socio-environmental problems caused by haphazard waste disposal.
- ❖ The law advocates the involvement of waste generators to enable waste segregation or even sustainable waste management.

5.2.2 Research findings on environmental governance in the Newcastle Local Municipality

Environmental governance is most concerned with drawing up environmental laws. These laws can have a great impact on the environment and the people living in the environment. The following findings on Newcastle Environmental governance were established:

- ❖ According to the Newcastle IDP, the functionality and effectiveness of the ward committees remains a major challenge in the NLM.
- ❖ The NLM development strategy has formulated development goals that seek to address the challenges currently facing the institution and reposition the area in a development path as follows:
 - a) To achieve environmental sustainability.
 - b) To be an example of service and governance excellence.

According to the Environmental Management Framework for NLM, 2014:

- ❖ The EMF will integrate policies and frameworks, and align different government mandates in a way that will streamline decision-making to improve cooperative governance and guide future development in an environmentally responsible manner. This was drawn up because the municipality was facing pollution issues to which land pollution due to poor management of waste also contributed.
- ❖ Uncontrolled discharges of effluent in the area, air pollution associated with industrial development, and solid waste disposal challenges produce harmful materials known to be toxic to humans or destructive to the environment. These and other environmental issues have the potential to impact on the health and well-being of local communities and cause significant and unsustainable damage to the environment.
- ❖ The EMF is necessary in order to avoid undesirable environmental outcomes in city growth.

According to the Newcastle Municipality Integrated Development Plan (2014/15 (IDP):82)

- ❖ A backlog of 25,6% which affects mainly the informal and rural settlements.
- ❖ Illegal dumped waste blocks up storm water drains/manholes which in turn result in damages to road infrastructure as water builds up in low points and causes flooding.
- ❖ Vehicles used for the clearing of illegal waste are old and have high maintenance costs.

5.3 Recommendations for effective environmental governance in the Newcastle Local Municipality

After a critical analysis of the research findings, the researcher makes the following recommendations:

According to the essential requirements for effective environmental governance:

- Government has to give effect to people's environmental rights contained in the Bill of Rights.
- To achieve this and to meet the development needs of our people, sustainable development is essential.
- The Newcastle Environmental Governance must ensure that national norms, standards, legislation, administration enforcement and all other aspects of environmental governance are dealt with uniformly across departments and in all spheres of government.
- There must be an effective environmental management within the framework of cooperative governance and concurrent competences by:
 - ❖ Ensuring clarity regarding environmental jurisdiction.
 - ❖ Eliminating duplication of functions in different spheres of government.
 - ❖ Providing for executive and administrative capacity in all spheres of government.

EMF's key aim is to promote co-operative environmental governance, which implies that the process of developing an EMF must be a combined effort of public institutions in conjunction with the private sector.

- ❖ Clear governance structure and mechanisms must be put in place to facilitate the required involvement of potentially interested and affected parties.

According to the RSA (Republic of South Africa) National Waste Management Strategy Nov, (2011), the waste management hierarchy provides a systematic and hierarchical approach to the integration of waste management, addressing in turn waste avoidance, reduction, re-use, recycling, recovery, treatment, and safe disposal as a last resort.

- ✓ In order for an integrated waste management system to perform efficiently, all relevant stakeholders of the waste chain must play a mutually collaborative role in the collection, disposal processing and management of waste
- ✓ The production of products that can be recyclable must be encouraged.
- ✓ Any discussion of solid waste management policies for the future must refer to Agenda 21, adopted at the United Nations Conference on Environment and Development in 1992.

- ✓ Solid waste management systems must meet the needs of the present without compromising the ability of future generations to meet their needs.
- ✓ Environmental governance should introduce environmental principles such as the 'polluter pays principle' (ppp) – with regard to waste management, polluters should pay in relation to the amount of pollution generated.

5.4 A critical overview of the study methodology

The researcher used different ways of collecting data on waste management in different areas of NLM.

- Participatory observation (field work) enabled the researcher to move around and check the situation of illegal dumps on the eastern side of the NLM.
- Field observation enabled the researcher to take images which validate the research problem on waste management in the eastern side of the NLM.
- Interviews were used in order to gain the views of residents residing near to illegal waste dumps.
- Interviews also enabled the researcher to interview residents' representatives who are responsible for service delivery in the different wards in Madadeni location, in order to establish whether the waste in their areas is managed according to the stipulated environmental laws.

❖ Challenges to the study methodology

- Some of the interviewees were not free to give information, especially in areas or wards run by political rivals.
- Some interviewees were not interested in being interviewed.
- Qualitative research needs considerable time to be allocated to field observation as well as interviews.
- It was difficult to find some of the residents at home, particularly those living near illegal dumping sites or municipal skip containers, as they spend most of their time at different work places.
- Qualitative research takes a great deal of time, as the researcher needed to visit a single place several times in order to have reliable and valid data. Therefore, time was a challenge.

5.5 A critical overview of the research results

- Observational results reflected that there is an environmental policy gap. Most parts of the Newcastle Municipality's east side have many illegal dumping areas as well as municipal skip containers positioned close to storm drains, which cause problems of waste spilling into the storm drains and blocking the storm water drainage system.
- Results reflected that there is severe land pollution, as waste is seen flying all around the illegal dumping sites, as well as in areas where there are municipal skip containers which are not regularly emptied. Residents, especially in the location, appear not to mind where they throw their waste – much waste is to be seen in the streets as well.
- Decomposition takes place in the skip containers, as waste is not screened. In addition, air pollution is caused when residents burn waste in the municipal skip containers in order to open up space for further waste.
- Lack of educational awareness campaigns on disposal of waste cause residents to mix rather than sort waste at source before disposal.
- Residents complain of stagnant water in the storm drains during summer causing mosquitoes to breed which in turn may introduce malaria to the community.
- Landfill sites have become trading areas as recyclers visit them in order to sort through the waste searching for any waste that is recyclable.
- Interview results reflected that there is need for educational awareness campaigns on reduction of waste at source.
- There is significant lack of co-operation from residents regarding municipal bylaws.
- There is no enforcement of bylaws.

5.6 Overall Conclusion

This research has shown that waste management is still laden with challenges which cause many environmental health problems, mainly due to ineffective implementation of environmental laws. The research has confirmed the following factors as the limitations to the effectiveness of waste management:

- Lack of NLM environmental laws.
- Lack of educational awareness campaigns aimed at residents on the reduction of waste at source, before it is taken to its final disposal site.

- Use of old vehicles to collect waste in the eastern part of the municipality.
- Lack of co-operation from residents regarding management waste.

Despite the above limitations, the research revealed that the issue of waste is a worldwide one which needs to be addressed in order to have a healthy and clean environment for everyone. The NLM needs to use the provincial and national environmental laws more effectively, in order to come up with their own laws which would be more easily followed by residents. The laws to be drawn up have to clarify the need to maintain open spaces, as well as municipal skip containers, because these are the areas of most concern and are places where heaps of waste are to be found. The environmental laws, as well as the South African constitution, state clearly that everyone has the constitutional right to have an environment that is not harmful to health and to have the environment protected for the benefits of present and future generations.

Finally, the research's aims and objectives were achieved by means of reading and acquiring information on how waste is managed and how it should be managed. Proper methodologies were used to collect data on the causes of poor waste management in the environment. The research findings gave a clear picture that the underlying problems are with environmental governance which needs to draw up proper environmental laws that will govern the environment.

6. Annexure A

1 Does the department of waste management have bylaws which govern the management of waste in all areas of Newcastle?

Respondent: *yes we do, however the current by-laws are outdated and we are in the process of promulgating new by-laws*

2 Newcastle Local Municipality's population is growing tremendously, how does this affect the issue of waste management in this municipality? Why?

Respondent: *as the population grows and as disposal income increases, there is a corresponding increase in volumes of waste, which then decreases the life span of the waste disposal site*

3 Are there any activities introduced to the resident as way of promoting waste reduction at source?

Respondent: 1 *awareness campaigns are conducted continuously, recycling is encouraged. The Newcastle Local Municipality is facilitating the establishment of a buy-back centre recyclables*

4 Collection of waste in the eastern side of Newcastle Local Municipality leaves a lot to be done since municipality bins and storm drains have been found full of waste not collected for weeks. What could be the cause of such since it is known that waste should be collected weekly

Respondent: 1: *In the formalised areas, the Newcastle Municipality renders a weekly bag service. In the rural areas we are busy with initiatives to render a weekly service. Our skip containers are serviced weekly, however, this service is misused by members of the public for example, people empty waste next to the bin and not into the bin. Household waste is emptied into the bin whereas we render a curb side service.*

Businesses are using the containers for business waste. After hours Bakkies and trucks are dumping building rubble.

5 Controlling of solid waste does not rest upon the waste management department. Has the department taken into account to educate residents on how to control waste at source?

Respondent: *1 regular cleaning campaign are conducted. As well as awareness programmes.*

➤ **If yes, which areas have been covered and not cover?**

Respondent 1: *Both east and west areas have been covered*

6 Which is the most way of controlling waste have you introduced to the Newcastle residents?

Respondent: *separation at source.
Garden waste should be composted*

7 The issue of waste management needs cooperation from the residents also, are there any health education on environmental awareness offered the people of Newcastle.

Respondent: *1 yes regular awareness and cleaning campaigns are conducted*

8 What measures are taken to control the waste disposal in landfills?

Respondent: *1 our landfill site is classified as a general landfill site and we do not allow hazardous waste into our landfill site. Waste is compacted daily and cover material is spread over the compacted waste storm water and leachate is managed.*

9 Waste is not managed uniformly in all the parts of Newcastle Local Municipality. What could be the cause of such a situation?

Respondent: *there is no difference in service rendered either in the east or the west*

➤ **Which parts of the municipality are giving the department a hiccup?**

Response: 1 *additional capital funding for the purchase of pole litter bins, bulk refuse containers and vehicles and as well as an establishment of a material recycling facility would be greatly appreciated.*

➤ **How do you intend to remediate the situation?**

Respondent: 1 *the above mentioned form part of the IDP from which our capital budget is derived.*

10 Do you think blockages of storm drainages in some parts of the eastern part of Newcastle Local Municipality are caused by

- Lack of discipline in the area?
- Municipality's behaviour towards residents?
- Ward leaders' behaviour or the way they manage?
- Poor schooling of residents?

Respondent: all of the above

➤ **An interview between the researcher and the resident representatives (councillors and member of community)**

The researcher conducted interviews in different parts of the NLM in order to assess the implementation of environmental waste management laws which reflects the role played by environmental governance in drawing up laws which enable everyone to live in a healthy environment. The researcher interviewed community representatives such as councillors and ordinary members of the community. This was done in order to find out the effectiveness of the imposed laws and whether or not communities were given educational awareness on how to govern the environment they are living in. The researcher also observed waste deposited in unlawful areas which might cause blockages of storm drainages. The interview questions and responses were as follows:

1 Do you have an allocation for waste collection in this area?

Respondent 1: date 17/02/2015: (ward 16) *the areas is not fully covered under municipality but EPWPs are managing the situation in this area.*

Respondent 2: date 09/02/2015: (ward 27) waste in this area is collected every Monday

Respondent 3: date 09/02/2015: (ward 31) waste is collected every Monday

Respondent4: date 14/02/2015: ward 25 (Siyahlala-la) yes waste is collected every week on Wednesday

➤ Yes waste is collected every week on Wednesday

Respondent.5: date 13/02/2015<>section 3: their chicken waste is not collected by municipality.

1b How is collection of waste in this area?

Respondent 1: ward 31: not reliable in collection of waste from the municipality skip containers.

Respondent2: H39: no provision of collection of waste is offered to this community since it's an informal settlement

Respondent 3: H39: municipality skip container available but waste is rarely collected.

2 Do you have municipality waste skip containers in this area?

Respondent 1 not provided yet and this actual affects the health living as waste is at times seen flying around.

Respondent 2 (ward 31) yes they are provided but they are rarely emptied and it is used by all the households in the area which leaves it full and most waste flown to the nearby storm drainage.

Respondent 3

Respondent 4: no skip containers

➤ No skip containers

Respondent 5: *waste produced here is in the form of manure hence they sell it to farmers. Some buy chicken waste to mix it with stockfeed.*

2b The municipality waste skip containers are always full of waste for weeks before collection of waste to the landfill. Why? Who is responsible for the collection of waste in this area?

Respondent 1: *municipality is the one responsible but they rarely come to collect waste.*

Respondent 2: *no reliability in collection of waste in this area, no skip containers but have devised some mini-landfills at homes.*

Respondent 3: *no skip containers use the nearby forest to deposit waste*

3 Is waste screened before its final disposal in the landfills?

Respondent 1: *no it is not screened*

Respondent 2 (ward 31): *waste not screened before disposal.*

Respondent 3: *waste not screened*

Respondent 4: *waste is not screened before disposal*

➤ *Waste is not screened before disposal*

3b Respondent 1: *no screening of waste before disposal to the landfill or skip containers.*

Respondent 2: *no screening of waste is done*

Respondent 3: *no screening of waste though biodegradable waste is used for composting*

4 Have you ever received health educational awareness campaigns on how to manage waste at source?

Respondent 1: *we have never been offered educational awareness lessons*

Respondent 2: (ward 31) *they only received awareness campaigns from the Department of Agriculture on how to make compost heaps. Under the principle of one home one garden*

Respondent 3: *the area has never received educational awareness campaigns*

Respondent 4: *they received awareness on cleanliness with did not touch the issue of separating waste at source*

Respondent 5: *no educational awareness's*

4b Respondent 1: *no educational awareness campaigns have been offered to this community.*

Respondent 2: *no educational awareness*

Respondent 3: *nothing at all*

5 Which of the following means of controlling waste at source do you use in this area?

- **composting**
- **recycling**
- **recovering**
- **re-use**

Respondent 1:*none*

Respondent 2: (ward 31) *none of the above*

Respondent 3:

Respondent 4: *cow dung is used for manure*

- *Composting maize remains*

Respondent 5: *composting*

5b: Respondent 1: *none*

Respondent 2: *none*

Respondent 3: *none*

6 **As residents what other ways can be employed to reduce the amount of waste disposition in landfills?**

Respondent 1: *requesting for educational awareness's. Some street pickers help reduce waste to the landfill as the pick to sell to the recycling companies.*

Respondent 2:*recycling and composting*

Respondent 3: *composting leftovers and garden waste*

Respondent 4: *composting leftovers and garden waste*

➤ *Composting and recycling recyclable waste*

Respondent 5: *maybe if we can separate waste according to their type*

5b: Respondent 1: *maybe if we can compost biodegradable waste.*

Respondent 2: *no idea*

Respondent 3: *burn waste which can easily be burnt*

7 **What happens to garden waste as well as food leftovers?**

Respondent 1: *food leftovers are collected for pigs while garden waste is channelled to the landfill together with other waste.*

Respondent 2: *garden waste is collected for disposal while food is disposed separately. Things like raw potatoes are replanted*

Respondent 3: *food leftovers are not screened from other waste and it is thrown in the nearby forest*

Respondent 4: *some have dug mini landfill to use for food leftovers*

- *Some food leftovers are used to feed cows, chickens, dogs as well as pigs*

Respondent 5: *dug mini-landfills*

5b: Respondent 1: *mini-landfills are dug- compost for gardens*

Respondent 2: *composting*

Respondent 3: *composting*

8 **What was the main problem you have encountered with the waste collection in this area?**

Respondent 1: *disposal of waste anyhow by residents was the main problem*

Respondent 2: *late collection of waste causing land pollution*

Respondent 3: *late collection of waste by the municipality workers*

Respondent 4: *dogs tear black plastic bins waiting to be collected*

- *Waste gets blown all over the place because municipality waste collectors at time they don't collect on specified days*

Respondent 5: *the place becomes filthy dirty and it is worse if it rains or windy*

8b: Respondent 1: *waste in the skip container when burnt pollutes the ambient air. Land pollution as waste gets blown away if it's windy.*

Respondent 2: *all sorts of waste are left lying especially if the skip container is left full for quite some time before its emptied*

Respondent 3: *Burnt waste pollutes the air around the residents' area. Some of the waste gets to block the storm water drainages as some waste is deposited to the storm water drain which is closer to the skip container in ward 31*

9 **According to the environmental laws, everyone is entitled to an environment which is not harmful which is healthy. Can you consider the environment you are living in healthy and not harmful?**

Respondent 1: *EPWP services providing service thereby creating the environment cleaner than before*

Respondent: 2: *ward 27 the environment is not healthy because residents are not co-operating in trying to keep the environment clean.*

Respondent: 3: *ward 31 is partly healthy: shop owners, residents send kids as well as old people who are not energetic to lift waste into the municipality skip container.*

Respondent: 4: *the environment is not completely clean due the fact that the area is an informal settlement*

Garden waste is not taken care for as a result there are snakes seen around due to long grass around homes.

Respondent: 5: *partly clean*

9b: Respondent: 1: *environment not healthy, it is dirty and not attended to by municipality*

Respondent: 2: *environment not healthy and cutting of grass around resident's area is needed.*

Respondent: 3: *environment partially clean*

10 **Are you satisfied with the services rendered to you on waste collection in this area?**

Respondent: 1: *partly satisfied because this area offers the services despite the fact that it's not yet under the municipality's responsibility.*

Respondent: 2: *no we are not because we have problems of un-empted skip containers which are placed closer to residents.*

Respondent: 3: *not satisfied due to the fact that waste is not collected in this area as such we end up using the nearest forest to deposit waste.*

Respondent: 4: *people in Siyahlala-la are somehow satisfied as they partly get services even though they are not paying rates.*

Respondent: 5: *not at all*

10b If not, why? Who are the contributors of such an environment?

Respondent: 1: *Resident's sends kids to the skip containers who do not afford to deposit waste inside to skip container due to their heights.*

Respondent: 2: *unreliability of municipality in collection of waste in the skip containers in such a way that they get full resulting in residents throwing waste outside the skip container and into storm water drainages.*

Respondent: 3: *Absences of municipality skip containers in the area.*

Respondent 4: *residents themselves they deposit waste everywhere they feel like*

Respondent 5: *it is the residents instead of using the skip containers they throw their waste near the skip container and in the storm water drainages.*

11 Why do we have waste all around us and not collected?

Respondent: 1: *waste is not collected from the skip containers to landfill. We are not exercising any of the forms of reducing waste at source.*

Respondent: 2: *there is no control over how waste has to be collected*

Respondent: 3: residents are the generators of waste and are the ones responsible for the waste in the surrounding areas

Respondent: 4: *lack of responsibility from the residents*

Respondent: 5: *skip containers tend to stay for a long time before waste is collected by the municipality waste collectors*

What is your own opinion on how to remedy the present situation in this area?

11b: Respondent: 1: *need additional municipality skip containers since the one available accommodates a lot of people as such it gets full within a short space of time.*

Respondent: 2: *if at all, residents can dig some mini-landfills to deposit biodegradable waste at home in order to minimise waste to be deposited to the skip containers as well as landfills.*

Respondent 3: *mini-landfills to be dug in homes and separation of waste such as plastics. Garden waste must not be deposited to the municipality skip containers but to be used on compost in order to encourage one home one garden.*

Overall analysis on environmental governance and waste management on municipal waste in Newcastle Local Municipality

Waste management is far from perfect in the eastern parts of this municipality. There is poor collection of waste and residents also contribute in making the environment dirty, as they dump waste in illegal places. Waste is not sorted before it is deposited. There should be screening of waste and environmental governance needs to ensure that in the drawing up of laws this is included.

- 1 The bylaws drawn up to govern the environment have to favour all residents in this municipality.
- 2 Environmental governance has to monitor the waste management department regarding the implementation of bylaws set to govern the area.
- 3 Trucks used to collect waste need to be replaced as they are old and can no longer manage to cover all the areas required.

- 4 Educational awareness campaigns on how to treat waste – that is, reducing waste at source – is one of the ways of solving the waste problem.
- 5 Vigorous implementation of laws is needed.

➤ **An interview between the researcher and the landfill monitors (final stage of waste management).**

Landfills which are the final stage of waste disposal should be monitored and it is the responsibility of environmental governance to lay down the rules that govern the day to day duties of landfill monitors. Waste needs to be screened before it is deposited in the landfills. Only biodegradable waste should be deposited in landfills. The researcher found it imperative to interview people working in the landfills to find out whether the place was monitored and whether there were any challenges faced by landfill workers. This helped the researcher to gain information on whether the current laws serve the situation in the landfill, as well as knowing the amount of waste deposited in the landfills and the type of waste deposited there. The interviewing questions and responses were as follows:

1 According to waste management policies, waste must be screened before disposal in landfills. What steps do you take as monitors and gatekeepers, to ensure that waste disposal in landfills is screened?

Respondent: 1: date 14/02/2015: Monitor: *waste is screened at the gate by the gatekeeper before it is weighed and recorded*

Respondent: 2: gatekeeper: *we check all the trucks as they enter the landfill*

2 What type of waste is allowed in landfills? (Biodegradable/non biodegradable)

Respondent: 1: *all sorts of waste are allowed except for clinical waste also builder's rubble is accepted as it is used in covering waste. There are also special trenches for condemned food or expired food from stores.*

Respondent: 2: *all types of waste except clinical waste*

3 What provision has been made to avoid waste polluting underground and surface water?

Respondent: 1: *Drains are available for channelling leachate to a specific area where it will be treated in order to avoid pollution. Storm water drains are available too.*

Respondent: 2: there are two drainages that is, the storm water drainage and the one which directs the leachate the small dam created

4 How often do the waste management officers visit the landfill?

Respondent: 1: *they monitored though they do not have specific times of visiting the landfill*

Respondent: 2: *they visit the landfill any time they feel like*

5 why do we have people not working here busy with waste deposited?

Respondent: 1: because waste is not sorted at source, people seen are from different recycling companies to pick any waste which can be recycled.

Respondent: 2: these are recyclers who are here to pick up things which can be recycled by their companies

6 what challenges are you facing while working in such an environment?

Respondent: 1: *gases produced by waste deposited in the landfill pollute the ambient air which results in a lot of disease attacks.*

Respondent: 2: polluted air

Respondent: 2: *decomposing waste smells or pollutes the air we use when breathing*

7 Is this landfill serviced and how often?

Respondent: 1: yes

Respondent: 2: yes

8 Waste produces poisonous excrete, what has the municipality provided as a way of protection to the workers who are collecting and receiving waste?

Respondent: 1: *we are provided with safety boots, overalls, dust mask and gloves for workers*

Respondent: 2: *we are provided with proper working clothes*

9 Why do we have a lot of waste deposited in the landfill? Why?

Respondent: 1: *Most people seems they have not yet received awareness campaigns on reducing waste at source as a way of reducing waste deposited in the landfill.*

Respondent: 2: *awareness campaigns have not been properly done*

10 Are there any challenges you are facing as the final stage of waste management? Elaborate on your response.

Respondent: 1: *during rainy season and windy days waste is difficult to manage in the landfill*

Respondent: 2: *waste is difficult to manage during windy and rainy days.*

11 What are the most problems you have encountered with the waste disposal in this landfill?

Respondent: 1: *disposal of unscreened waste is a major challenge, but some recycling companies are helping in screening and collected the staff they need to recycle.*

Respondent: 2: *unscreened waste is not easy to manage*

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