Assessing the Implementation Prospects of the Waste Act within the Msunduzi Municipality through the Theory U

By

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ABSTRACT

The Msunduzi Municipality is confronted with a waste management crisis. It struggles to provide existing refuse collection services and is unable to extend refuse collection services to more than 40% of households in the municipality, illegal dumping and littering continue unabated, waste volumes continue to grow in the absence of waste minimisation programmes and the only landfill site within the municipality is poorly managed and has less than seven years of airspace remaining. In the midst of this crisis, the new National Waste Act has been approved for implementation requiring all municipalities in South Africa to provide universal access to refuse collection services, to comply with national norms and standards for waste disposal and to implement new services that provide opportunities for recycling and the treatment of waste. The Waste Act requires the Msunduzi Municipality to transform its waste management system from a poorly run collection and disposal operation to an ecologically sustainable system where waste generation is prevented, materials are recycled and organic waste is treated in order to prevent the release of greenhouse gases.

This research project sought to develop a deeper understanding of the implementation obligations confronting the Msunduzi Municipality as a result of the Waste Act and explored the prospects for implementation success and failure. The conceptual framework of the Theory U was used to provide insights into how transformational change of the Msunduzi waste management system can be undertaken. A qualitative research methodology was used in order to understand implementation issues from the perspectives of all the stakeholders within the Msunduzi waste management system. The main research tool used was a semi - structured interview conducted with individual stakeholders from government, NGO's, technical experts, labour and the organised business sector. A documentary analysis of relevant literature and direct observation of the research participants complemented the interview data.

The research results indicate that leaders of the administrative, political and labour components of the waste management sector within the Msunduzi Municipality and the organised business sector within the city of Pietermaritzburg are collectively attending to waste management issues from an absencing cycle. Given that these key institutions are

unable to think and act to improve the entire waste management system, the quality and quantity of waste management services being delivered will steadily decline whilst pollution levels will increase; and the system is at risk of eventual collapse.

Key stakeholders from within the Msunduzi Municipality are unlikely, in the current context, to either initiate or participate in the activities of a diverse group of core players who could be brought together through common intention to transform the waste management system. The NGO sector, the regulatory authorities, the technical experts and the organised waste management business sector on the other hand are willing to come together to transform the Msunduzi waste management system. Given that the waste management sector within the Msunduzi Municipality operates within an absencing cycle and some of the other core players in the system are operating from a presencing cycle, the need for transformational change is both urgent and possible. The process is likely to be protracted, conflict ridden and complex. If the core players within the system who share a common transformational intention are able to collectively sense the system, learn from the future to develop a common vision and create prototypes to embody new practices, they can, however, gradually create forces within the system that can unlock opportunities for profound change to occur.

Key Words: Waste Management, Policy Implementation, Theory U, Local Government

DECLARATION

I Riaz Jogiat declare that

(i) The research reported in this dissertation, except where otherwise indicated, is my original work.

(ii) This dissertation has not been submitted for any degree or examination at any other university.

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TABLE OF CONTENTS

LIST OF ABBREVIATIONS

ANC	African National Congress
BESG	Built Environment Support Group
COSATU	Congress of South African Trade Unions
CSIR	Council for Scientific and Industrial Research
DA	Democratic Alliance
DAEARD	Department of Agriculture, Environment Affairs & Rural Development
DEA	Department of Environmental Affairs
DEAT	Department of Environmental Affairs and Tourism
DUCT	Duzi uMgeni Conservation Trust
DWA	Department of Water Affairs
DWAF	Department of Water Affairs and Forestry
EU	European Union
GDP	Gross Domestic Product
IDP	Integrated Development Plan
IMATU	Independent Municipal & Allied Trade Union
IWMP	Integrated Waste Management Plan
KPCA	Keep Pietermaritzburg Clean Association
LSU	Landfill Site Unit
MIDI	Msunduzi Innovation Development Institute
MM	Msunduzi Municipality
NEMA	National Environmental Management Act
NGO	Non-Governmental Organisation
PCB	Pietermaritzburg Chamber of Business
RSA	Republic of South Africa
SACN	South African Cities Network
SAMWU	South African Municipal Workers Union
UMDM	uMgungundlovu District Municipality
USA	United States of America
WASTE ACT	National Environmental Management Waste Act
WMU	Waste Management Unit

LIST OF FIGURES

LIST OF TABLES

CHAPTER 1 - INTRODUCTION

1.1 Background

The world has changed radically over the past two decades, the global population has grown from 5 billion to 6.7 billion and there has been a net annual rise in gross domestic product per person of almost 2 per cent with continued increases in trade volumes and CO2 emissions (UNEP,2007). Globalisation has resulted in increased flow of goods, services, capital, people, technologies, information, ideas and labour with corresponding increases in the consumption of natural resources and generation of solid waste. It is estimated that the amount of municipal solid waste produced globally in 2006 was 2.02 billion tonnes with a 37% growth rate expected between 2007 and 2011 (Key Note, 2007). Such increases in waste volumes are far beyond the handling and treatment capacities of governments with the result that most cities in the world are now facing serious problems of ever-increasing volumes of waste, characterized by inadequate disposal technologies, rising costs of management, and the adverse impact of wastes on the environment (Adedipe, 2005). Studies undertaken by the World Resources Institute indicate that despite waste reduction measures and significant improvements in the efficiency of material use in Austria, Germany, Japan, The Netherlands, and the United States of America, the overall quantities of wastes flowing into the environment each year continue to grow and that efficiency gains brought about by the rise of e-commerce and the shift from heavy industries toward knowledge and service-based industries have been more than offset by the scale of economic growth and consumer choices that favor energy and material intensive lifestyles (WRI, 2001).

These problems have however also provided opportunities for governments and business communities to find solutions that involve the community, the private sector, innovative technologies, behavioural changes, and awareness raising amongst people especially in the developed world of the need to minimize waste and manage resources more efficiently (Adedipe, 2005). The paradox of waste management in the developed world today is that in spite of the largest economy in the world, the USA, throwing away 2.5 million plastic bottles every hour and making 400 billion photocopies a year from 900 million trees (Clean Air Council, 2007) the USA by 2006 had managed a municipal solid waste recycling rate of 32% whilst it managed to recycle 51% of all paper and treat 62% of all garden waste (Kollikkathara, 2009).

Globally developing countries are facing contexts of ever increasing volumes of municipal solid waste due to growing economies, increasing urbanisation; expanding middle classes and poor waste management practices that typically result in limited waste minimisation services, large backlogs in refuse collection services and poor waste disposal methods (Oelofse, 2009b). South Africa is no different, municipal solid waste volumes are increasing rapidly having grown by a conservative estimate of 60% in the period from 1997 to 2008 whilst 35% of all households in the country have no access to a weekly refuse collection service (Savage, 2009). According to Oelofse (2009b) large scale waste minimisation programmes have only recently started in a few metropolitan municipalities whilst 87% of all municipalities do not have the infrastructure and the capacity to implement waste minimisation programmes. According to Savage (2009) most landfill sites in South Africa are designed and operated in ways that do not comply with national regulations and land for future sites is becoming harder to find whilst waste treatment facilities are virtually nonexistent.

Despite establishing an impressive legislative framework for the environmental sector through the passing of the National Water Act and the National Environmental Management Act in 1998, the Protected Areas Act of 2003, the Biodiversity Act and an Air Quality Act of 2004, legislation for the waste management sector on the other hand has been accorded a very low priority with the Waste Act only being signed into law in March 2009. This is almost ten years after the progressive National Waste Management Strategy and White Paper on Integrated Pollution and Waste Management were released. Many bemoan the ten wasted years in between the development of the National Waste Management Strategy and the promulgation of Waste Act given that the general objectives and many legal provisions in the Waste Act are based very much on the National Waste Management Strategy.

The Msunduzi Municipality (MM) is located within the city of Pietermaritzburg which is the capital city of the KwaZulu Natal province. The MM will have the seventh largest municipal budget in South Africa, during the 2009/10 financial year; expenditure will exceed the R 2 billion mark (National Treasury, 2009). The MM has an estimated population of 616,000 people and at least 80% of the population is urbanised (MM, 2009a). The 2007 Community Survey conducted by Stats SA estimated that more than 90% of households within the MM had access to basic water, sanitation and electricity services (UMDM, 2009). The Waste Management Unit (WMU) of the MM estimated that more than 40% of households do not

have access to basic refuse collection services, the majority of whom live in urban informal settlements, rural areas and newly developed low-income settlements (MM, 2006c). The New England Road landfill site has a well-earned reputation of being a poorly managed facility whilst municipal efforts at recycling have not succeeded. The city is confronted with a waste management crisis; it struggles to provide existing services and is unable to extend refuse collection services to new households, illegal dumping continues unabated, waste volumes are growing whilst the only landfill site within the municipality has less than seven years of airspace remaining. The approval of the Waste Act has created a legal obligation for the MM to address its complex waste management challenges.

1.2 Need for the Study

The passing of the National Environmental Management Waste Act 59 of 2008 to regulate the solid waste management sector in South Africa heralds the start of a new era. For the first time all aspects of the solid waste management system are legally regulated within a single piece of legislation. In many ways South Africa has finally met its legislative obligation in terms of Agenda 21 and adopted waste management policy approaches that are aligned to best practices in the developed world. The stage has been set for the transformation of the waste management sector from a disposal oriented approach to a resource management approach which is sensitive to the need to preserve natural resources and ecosystems, mitigate and adapt to climate change and obtain economic and ecosystem value from materials through reuse, recycling and treatment. Given the short period of time that has passed since the Waste Act was approved very little research has been undertaken into the implications of these legislative changes for local government, this research project intends to fill some of the gaps that currently exist in the research field.

A limited amount of research has been undertaken into waste management issues within the MM, these include research undertaken by Makhanye (2002) which undertook a policy analysis of implementation and regulation of waste management within the MM based on the National Waste Management Strategy of 1999 and the objectives of the National Environmental Management Act, whilst Yengwa (2004) examined the role of public participation in addressing waste management problems in the Sobantu area of Pietermaritzburg. This research will therefore provide some of the first insights into the challenges and opportunities confronting the MM and other stakeholders within the

Msunduzi waste management system as implementation processes associated with the Waste Act commence.

South Africa has approved many progressive policies since the advent of democracy, yet very few have been effectively implemented. Given the low priority associated with the waste management sector and the complex issues involved in moving from waste to resource management approaches, implementation of the new policy is likely to be characterised by limited success. This research will utilise the conceptual framework provided by the Theory U in order to improve the understanding of the underlying issues associated with changing complex social systems and will also utilise the methodology provided by the U process to understand how to effectively undertake transformational change processes within complex social systems. Research that helps to increase understanding of how transformative change can be effectively undertaken within complex social systems is sorely needed given the widespread despair with ongoing policy implementation failures.

1.3 Problem Statement

The Waste Act makes it mandatory for the MM to provide refuse collection services to all households and business enterprises within its municipal area; currently the MM is only able to reach 60% of all households and experiences serious operational challenges providing these services. The Waste Act requires municipalities to promote waste minimisation through waste avoidance, recycling and treatment prior to disposal on landfill sites. The MM does not currently have any waste avoidance and waste treatment programmes whilst a small recycling project aimed at source separation collection services has recently commenced. Whilst the Waste Act requires municipalities to undertake integrated waste management planning and the maintenance of waste information systems, the MM currently has poorly functioning waste information systems and the MM is reluctantly engaging in processes to develop an integrated waste management plan. The New England Road landfill site has been poorly operated for a number of years and the Waste Act now imposes severe penalties for waste disposal services that are not provided in terms of national norms and standards. Clearly the Waste Act presents the MM and all other municipalities in South Africa with onerous and complex challenges that cannot be addressed by municipalities alone and by reliance on conventional approaches to waste management.

The essence of the problem is that the MM will struggle to implement the Waste Act and this will lead to increasing threats to the climate system, human and ecosystem health. Ongoing failure to collect waste results in the pollution of various water sources which pose threats to human and river ecosystem health. Failure by the MM to effectively implement the new waste management policy will also lead to opportunities being lost to mitigate against climate change drivers like the greenhouse gases emitted from decomposing organic waste and the benefits associated with the use of recycled materials. Poor implementation of the Waste Act would also result in opportunities being lost to create job opportunities through the development of new industries around recycled materials and the treatment of organic waste

This research project will seek to develop a deeper understanding of the implementation obligations confronting the MM as a result of the Waste Act and explore the prospects for implementation success and failure. This will be achieved by understanding implementation issues from the perspectives of all the stakeholders within the Msunduzi waste management system. Given the importance of improving the Msunduzi waste management system the conceptual framework of the Theory U will be used to provide insights into how effective transformational change of the Msunduzi waste management system can be undertaken.

1.4 Research Aims and Objectives

The overall aim of this research project is to understand the implementation prospects of the Waste Act within the MM and to develop strategies that could possibly lead to improved implementation of the Act within the Msunduzi waste management system. In order to achieve this broad goal the research project will need to focus on three research objectives. These are:

1. Understand the implementation prospects of the Waste Act within the MM from the perspective of all the stakeholders within the Msunduzi waste management system by identifying the key challenges, opportunities, obstacles, risks, underlying systemic issues and possible solutions.

2. Assess the prospects for undertaking transformational change of the Msunduzi waste management system through the conceptual framework of the Theory of U. This will be achieved through examining the barriers and opportunities that would most likely

be faced should the U process be undertaken within the Msunduzi waste management system.

3. Develop insights into how the implementation prospects of the Waste Act can be improved within the Msunduzi waste management system.

1.5 Limitations

The Waste Act is a framework type of legislation that enables the Minister of Environmental Affairs to issue regulations from time to time in order to provide more detailed legislative provisions. Given that this study occurred during the first year of the promulgation of the Waste Act a limited number of regulations have been issued for public comment; and it is therefore difficult to know with any degree of certainty the precise obligations that arise from the Waste Act for local government.

This study will not explore the implementation prospects for waste disposal and waste treatment services within the MM in order to enable the study to focus more intensely on refuse collection, recycling, financing, waste management information systems, integrated waste management planning, enforcement and co-operative governance issues.

The stakeholder groupings selected for the semi-structured interviews did not include a sample of ordinary residents or community based organisations from the MM. This study is therefore unable to understand and examine the perceptions on waste management issues held by different communities within the MM.

The Theory U provides a methodology to undertake transformational change within complex social systems; this methodology is referred to as the U process. The U process focuses on getting core players in a system to suspend their habitual ways of seeing and thinking so that they are able to sense the complex system that they collectively create and begin to develop insights into how the system can be collectively transformed. It will not be possible to implement and assess a U process as part of this research project, instead the research will focus on utilising the theoretical basis of the Theory U to gain insights into the prospects for undertaking transformational change of the Msunduzi waste management system.

1.6 Research Methodology

This research study made use of the qualitative research methodology and utilised three research techniques to undertake the research, these were: the review of the relevant literature, semi-structured interviews with key stakeholders within the Msunduzi waste management system and direct participant observation. A wide range of literature covering global, South African and MM waste management trends were reviewed to highlight the context whilst literature focussing on systems thinking, organisational learning, the Theory U and scenario planning were reviewed to provide insights into undertaking transformational change within complex social systems. The sample of stakeholders selected for semi-structured interviews was determined on the basis of ensuring representativity from amongst the different sectors of the Msunduzi waste management system and the need to interview key informants from each of the sectors. The researcher's direct observations of the stakeholder's perceptions during the interviews were documented and will be included in the results of the research.

1.7 Clarification of Concepts

Absencing

According to Scharmer (2009a) absencing refers to behaviour that leads to a disconnection of human capacity to relate to the future that wants to emerge. During absencing cycles leaders exploit the system to serve their own egos and interests instead of improving the system to better serve the whole of society (Scharmer, 2009a).

Downloading

Scharmer (2009a) defines downloading as re-enacting habitual patterns of action, conversation and thought.

Deeper Levels of Learning

According to Senge (2007) all learning is about how we interact with the world and the types of capacities that develop from our interactions. Deeper levels of learning reach beyond superficial events and current circumstances to penetrate more deeply in order to see the larger wholes that generate "what is" and our connection to this wholeness. Deeper levels of learning change the source and effectiveness of our actions (Senge, 2007).

Dialogue

According to Senge (2006) dialogue processes are characterised by members of a team being able to suspend their assumptions and interests in order to enter into a genuine thinking together which is characterised by free and creative exploration of complex issues through deep listening to one another.

Highest Possible Future

According to Scharmer (2009a) the highest possible future is the capacity of people to look at the present from the highest possible future that can emerge within their system and to do all that they can to bring that future into being. Essentially it is about collectively creating futures that people within a whole system desire.

Learning Organisation

According to Senge (2006) a learning organisation is a place where people are continually discovering how they create reality and how they can change it by continually expanding their capacity to create the results they truly desire.

General Waste

The National Waste Act defines general waste as waste that does not pose an immediate hazard or threat to health and the environment and includes domestic waste, business waste and inert waste (Waste Act, 2008).

Msunduzi Waste Management System

The Msunduzi waste management system refers to the larger waste management system that exists beyond the organisational boundaries of the MM. This system would include the whole system of interrelationships between ecosystems and social systems within the Msunduzi municipal area that results in the creation, collection, recycling, reuse, treatment and disposal of waste or discarded materials.

Municipal Solid Waste

Municipal solid waste refers to waste that includes food waste, household or domestic waste, garden waste, business waste, construction debris, and in many parts of the world industrial waste that is non-hazardous (Eawag, 2008).

Presencing

According to Scharmer (Leeb, 2002) presencing means liberating one's perception from the "prison" of the past and then letting it operate from the field of the future. This means that you literally shift the place from which your perception operates to another vantage point. In practical terms presencing means that you link yourself in a very real way with your "highest future possibility" and that you let it come into the present. According to Scharmer (2009a) presencing is a second type of learning based upon the ability to learn how to bring -into-the present all future possibilities.

Prototyping

To create microcosms of the future that allow people to explore the future by doing rather than analyzing.Prototyping works on the principle of "failing early to learn quickly" (Scharmer, 2009a).

Recycling

Recycling refers to the process of converting a product into the original materials from which it was manufactured with the intention of manufacturing a new product from those materials (DTI, 2009).

Transformational Change

Scharmer (2007) proposes that the way individuals and organizations attend to a situation determines the path that the system takes. Transformational change would accordingly refer to the ability of people, organizations and societies to shift away from attending to situations in a quick fix and reactive manner which aims to address the symptoms to a deeper more generative level of attention that addresses the systemic root causes of problems within a whole system.

Waste Minimisation

Waste minimisation refers to processes that intend promoting reduced waste generation and disposal rates through either undertaking waste avoidance, recycling or waste treatment activities (Waste Act, 2008).

Waste

Waste refers to any substance whether or not that substance can be reduced, re used, recycled, that is surplus, unwanted, rejected, discarded or disposed of. (Waste Act, 2008)

1.8 Sequence of Chapters

This research report consists of six chapters. The first chapter introduces the waste management context within which the MM operates. It highlights the general challenges faced by the MM, introduces the research problem, outlines the research objectives and provides a motivation for the need to undertake the research.. Chapter one then proceeds to outline the research methodology selected, identifies any limitations in the research process and concludes by providing clarity on certain key concepts applicable to the research process.

The second chapter reviews the literature that is relevant to a study of this nature. It commences by exploring global waste management policy and trends and then proceeds to outline the South African waste management context and the new waste management policy created by the Waste Act. The literature review then proceeds to examine systems thinking, organisational learning theory and the Theory U which collectively provide a framework for understanding transformational change issues within complex social systems. The literature review is concluded by undertaking an examination of the Dinokeng Scenarios and its lessons for bringing alternate futures into being.

The third chapter outlines the research methodology for this research project. It provides a general overview of qualitative research methods and proceeds to describe the research design and sampling process associated with this research project.

Chapter four provides a description of the existing waste management situation within the MM in order to set the local context for the research process and to provide a basis for reporting on the research results.

Chapter five provides a description of the results of this research process. It commences by looking at the different stakeholders views of the implementation prospects of the Waste Act within the MM and then proceeds to assess the prospects for transformational change of the Msunduzi waste management system.

Chapter six provides a discussion on the research results as well as the conclusions that can be made from these research results. The conclusions of the research process provided a basis from which recommendations for improving the implementation prospects of the Waste Act were developed. These recommendations are also included in chapter six of the research report.

CHAPTER 2 - LITERATURE REVIEW

2.1 Introduction

The review of literature will have three focal points; firstly a review of the literature covering the evolution of waste management will be undertaken with a focus on the global trends and experiences with integrated waste management systems. The review will then proceed to examine the legal obligations created by the Waste Act and the implementation challenges confronting local municipalities in South Africa as they prepare to implement the Waste Act. Finally the review will examine literature which provides a framework for transforming complex social systems that face collapse. This aspect of the review will examine literature dealing with policy implementation issues, systems thinking, complexity, organisational and inter organisational learning, scenario planning, and undertaking transformational change in complex systems.

2.2 The International Policy Context - Agenda 21

At the Earth Summit in June 1992 organised by the United Nations the governments of 179 countries in the world agreed to a programme of action entitled Agenda 21. Agenda 21 was meant to serve as a guideline to improve human development and build a sustainable environment capable of sustaining present and future human populations (United Nations, 1992). Chapter 21 of Agenda 21 provided detailed objectives and targets for the waste management sector. The key objectives identified were the minimisation of waste, maximisation of reuse and recycling of waste, environmentally sound waste treatment and waste disposal practices and the extension of waste collection services (United Nations, 2002). Some of the targets set by the policy document were that by 2010 all developing countries should have a national programme for waste recycling and reuse whilst developed countries should consider investing 1% of their GDP in waste minimisation programmes (United Nations, 1992). Other targets included a goal that 50% of solid waste in developed countries be treated by 1995 whilst the same target would apply to developing countries by 2005, finally the policy hoped that by 2025 all urban populations would be provided with refuse collection services (United Nations, 1992). The basis for much of the policy direction taken on waste management issues within the Agenda 21 document was a concern around the unsustainable levels of consumption of natural resources, the growth in persistent wastes that threaten human health and the need to reduce the numbers of people especially children that

were dying from waste management related diseases (United Nations, 2002). The Commission on Sustainable Development was set up to monitor implementation of Agenda 21, ten years later it concluded that progress had been slower than anticipated on most of its goals and that in some cases conditions had worsened (United Nations, 2002).

Research into global waste management trends are very limited, the Waste Management Journal has just one global survey of waste management trends and that is for the year 1996. Implementation of Agenda 21 at a global level appears to be uneven. Data from 1995 to 2006 indicates that some European Union countries have experienced ongoing growth in their municipal solid waste generation rates whilst others have managed to reduce their volumes of municipal solid waste, the United States of America on the other hand has increased its volumes of municipal solid waste every year since 1960 (Chowdhury, 2009). The literature review will now proceed to explore the waste management context in developing countries.

2.2.1 Waste Management in Developing Countries

A survey of the research undertaken into the challenges facing municipalities within developing country contexts by Oelofse (2009a) identified significant similarities in the challenges being faced, these include increasing quantities of waste, ineffective collection systems, lack of legislation and enforcement, lack of political commitment to deal with waste management issues, lack of skilled staff, limited public understanding of waste management issues, underfunding and under pricing of waste management services. Novella (2006) argues that the difficulties getting waste management to be a priority in developing country contexts is well explained by reference to Maslow's hierarchy of needs and his conclusion that people have to satisfy their physiological needs for food, shelter and well being before they can become concerned about issues like the environment. Ball (2006) has suggested that waste management systems in developing countries commonly share principles and characteristics; Table 1 provides a summary of these principles and characteristics.

Table 1 - Principles and Characteristics of Developing Country Waste Management Systems (Ball, 2006a)

PRINCIPLE	CHARACTERISTIC
Low Priority Standing	Waste management services seldom ranks higher than fifth place as a priority need by various people and within developing country systems usually water, food, shelter, roads, electricity and sanitation needs precede waste

	management.
Political Will	Given the low priority accorded to waste management there is very little political will to implement improvements in waste management systems.
Lack of Resources	Given the low priority of waste management services resources are lacking in the form of personnel, know how, infrastructure, plant, equipment, and finances.
Lack of Systems and Information	Given the low priority very few reliable systems are in place, which leads to very little information on waste management making planning and strategic interventions very frustrating and difficult.
Unacceptable Practices	Given the above set of problems unacceptable practices like illegal dumping occurs in unserviced areas whilst the majority of landfills remain unlicensed.
Local Factors	Local culture and politics are significant in determining attitudes and practices regarding waste management and the need for change.
Donor Funds	Developed countries sometimes provide funding to help find solutions to waste management problems in developing countries but often place conditions that require international consultants to be used who prescribe developed country solutions and technologies which do not work in developing countries

Given these conditions in developing countries new waste management policies will struggle to be implemented. It will be necessary to understand system dynamics in order to deal with complexity and to be able to lead organisations through transformational change processes. The literature review will now proceed to explore the South African waste management policy context.

2.3 The South African Waste Management Policy Context

The Constitution of the Republic of South Africa provided a foundation for the development of environmental policy by indicating in the Bill of Rights, Section 24, that everyone has the right to an environment that is not harmful to their health and well being, and that legislative and other measures should be used to ensure that the environment is conserved and protected for future generations (RSA, 1996). Since then much progress has been made with regards to the development of environmental policy and legislation. The 1997 White Paper on Environmental Management was the first document to explicitly identify an integrated waste

management hierarchy premised on waste prevention and waste minimisation as intended government policy (DEA, 2009a). The National Environmental Management Act of 1998, the framework legislation that lays the basis of most of South Africa's environmental policies identified various environmental principles which have provided the framework for the development of the National Waste Management Strategy in 1999 and the White Paper on Integrated Pollution and Waste Management in 2000. These principles included the reduction in the consumption of natural resources through waste avoidance, reuse and recycling; the polluter pays principle and a life cycle approach to waste management which lays the basis for extended producer responsibility (RSA, 1998a). Section 26 of NEMA also provides that the Minister of Environmental Affairs must undertake an annual performance report on the extent to which Agenda 21 commitments have been met (RSA, 1998a).

The National Waste Management Strategy published in 1999 sought to achieve three main goals: firstly to develop strategies for implementing integrated waste management practices that favoured waste avoidance and waste minimisation through reuse, recycling and treatment prior to disposal, secondly to develop action plans to implement these strategies and lastly to build the capacity within the DEAT and the DWAF to implement these plans (DEAT, 1999). The strategy also documented plans for the implementation of the strategy by the different spheres of government until 2010. According to DEA (2009a) the implementation of the policy has been uneven and delayed with some aspects not even implemented at all due to the lack of human and financial capacity at all levels of government and the inability of DEAT to enforce compliance with the strategy in the absence of enforceable legislation. The White Paper on Integrated Pollution and Waste Management was completed in 2000, it indicated that there was a need to develop legislation to implement integrated waste management practices and declared that the implementation of waste avoidance, waste minimisation and refuse collection services were strategic goals of the DEAT (DEAT, 2000).

At the first national waste management summit in democratic South Africa held in Polokwane in 2001 the DEAT committed itself to the ambitious goal of reducing municipal waste generation volumes by 50% in 2012, waste disposal volumes by 25% in 2012, developing a plan for zero waste by 2022 and developing and implementing a legislative and regulatory framework to enable the achievement of these goals by June 2002 (DEAT, 2001). Ball (2006b) points out that the Polokwane declaration is unlikely to be achieved given the

inconsistencies, contradictions and ambiguity contained in the declaration. According to Ball (2006b) one of the goals contained in the declaration identified reducing waste disposal volumes by 50% in 2012 whilst another goal in the same declaration envisaged reducing waste disposal volumes by 25% in 2012. The declaration also committed government to develop a plan for zero waste by 2022 whilst another part of the declaration proposes a vision for zero waste by 2022 (Ball, 2006b).

The legislative process envisaged at Polokwane in 2001 and within the National Waste Management Strategy of 1999 took until March 2009 to materialise with the promulgation of the Waste Act. Oelofse (2009c) suggests that some of the delays experienced in obtaining legislation for the waste management sector can be attributed to concerns about the feasibility of implementing integrated waste management practices within a developing country context, the difficulties in building consensus amongst stakeholders on key waste management concepts, the institutional challenges at DEAT associated with restructuring processes and the filling of key posts as well as the low priority associated with waste management issues. According to Joanne Yawitch, the Deputy Director General of Environmental Quality and Protection at the DEA, the promulgation of the Waste Act was significant given that waste is at the bottom of the South African mindset and the Act would hopefully provide a framework to pull stakeholders in one direction even though the cost implications of the Act are a sticky matter since no one is prepared to pay for the externalised costs associated with waste management services (DEA, 2009e).

2.4 The Objectives of the National Environmental Management Waste Act 59 of 2008

The Waste Act seeks to protect the health and well-being of human beings and the environment through achieving the following objectives:

- minimising the consumption of natural resources;
- avoiding and minimising the generation of waste;
- reducing, re-using, recycling and recovering waste;
- treating and safely disposing of waste as a last resort;
- preventing pollution and ecological degradation;
- securing ecologically sustainable development and

- promoting and ensuring the effective delivery of waste services (RSA, 2009).

According to Olver et.al (2009) the Waste Act is an ambitious piece of legislation and read in the context of the whole body of environmental legislation provides a comprehensive framework for addressing the challenges of the waste management hierarchy. The objectives of the Waste Act require government at all levels and municipalities specifically to undertake a shift of paradigms whereby their current focus on waste collection and disposal must make way for an approach premised on the need to conserve natural resources through the prioritisation of waste avoidance, reuse, recycling and waste treatment options. The literature review will now proceed to examine the literature outlining the evolution of waste management practices.

2.5 The Evolution of Waste Management

In 500 BC the city of Athens set up the first municipal dump in the western world, a site was designated some 1, 6 km from the city walls where residents could dump their waste (USEPA, 2006). Since then waste management practice evolved to provide collection services for domestic, industrial and commercial waste which were disposed within waterways, open oceans or land areas demarcated for waste disposal purposes (McCarthy, 2007). Ever increasing volumes of waste generation and the hazards posed by certain waste products have forced a system of resource governance to be gradually established that attempts to mediate the relationship between society and the economy on the one hand and the survival of ecosystems on the other (Brunckhorst, 1998). Unprecedented economic and population growth, low raw material and waste disposal costs have helped and continue to help some parts of the world to create ever-increasing amounts of waste and significant barriers to the recycling of materials (Palm, 2006). At the same time life cycle assessments of materials have begun to conclude that the recycling of materials and energy leads to lower environmental impacts and reduced consumption of energy resources than landfilling processes (Rigamonti, 2008). The link between waste management and climate change has also been well established (LaGrega et al 2001, McDougall et al 2001, Baumert et al, 2001), especially the production of greenhouse gases at landfill sites, today climate change mitigation plans include waste prevention, recycling and treatment. In a seminal book called Cradle to Cradle, McDonough and Braungart have provided a reconceptualisation of the idea of waste altogether by proposing new ways of material use and production whereby products

are designed in an ecologically intelligent manner in order to prevent the creation of waste in the first place so that commerce and nature can fruitfully co-exist (Kollikkathara, 2009).

2.6 Integrated Waste Management

One of the first places in the world to consider waste management in an integrated manner was the Palm Beach County in the state of Florida in 1975 (Seadon, 2006).By 1995 the concept of waste reduction was developed further out of the work being done to develop total quality management systems (May et al, 1995) and by 1996 the United Nations Environmental Management Programme referred for the first time to the concept of integrated waste management as a "'a framework of reference for designing and implementing new waste management systems and for analysing and optimising existing systems" (Seadon, 2006, 1328). Since then the concept has developed further to embrace sustainability issues and is widely accepted today as an approach to waste management that looks at the entire system of waste management from the extraction of natural resources through to the manufacture of goods to the eventual discarding of unwanted materials and collection of resources for reprocessing through recycling and treatment and in some cases as a last resort, the disposal of waste on land (Bosman, 2009). Figure 1 reflects the paradigm shift in waste management practice that is steadily occurring globally from the traditional waste management practice which focussed on waste disposal to integrated waste management practices that focus on waste avoidance and minimisation.

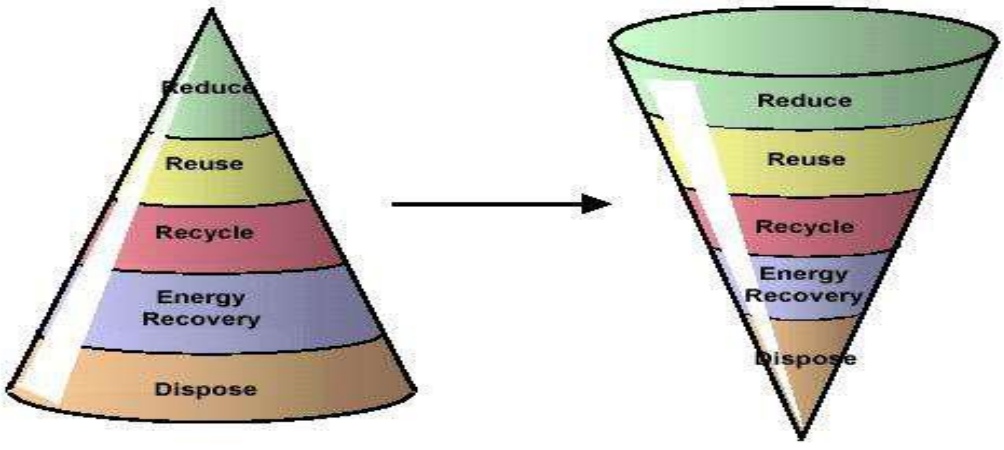

Figure 1 - The Paradigm Shift to the Integrated Waste Management Hierarchy (Fermanagh, 2001)

Bosman (2009) proposes that sustainable development and environments can only be achieved if energy and resources are conserved through reductions in the production of waste in the first instance and then protecting natural resources and human health from pollution by making the best possible use of discarded materials. Mcdougall (2001) has questioned the mantra like acceptance of the waste hierarchy amongst waste practitioners without much discussion occurring about its limitations. Amongst the issues Mcdougall (2001) raises are the cost implications of the waste hierarchy, its suitability in unusual contexts where low populations and isolated areas prevail the need to cross subsidise uneconomic options in the hierarchy, and the challenges of applying the hierarchy to all discarded materials not only those most easily exploited due to market conditions.

Schmidt (2007) notes that in developed countries like Denmark where the waste hierarchy has been used for more than 15 years to guide the handling of waste materials it has become increasingly necessary to assess whether the hierarchy can feasibly still apply to all materials especially during periods when significant changes are occurring in the economy and the environment. According to Schmidt (2007) life cycle assessments of materials on a regular basis are beginning to provide greater clarity on environmental costs, risks and benefits enabling decisions on the waste management hierarchy to be made that look beyond the conventional economic cost benefit approach. The literature review will now proceed to explore the Waste Act and its service delivery implications for local government.

2.7 Key Obligations of the Waste Act

The Waste Act is a framework type of legislation in that it lays the broad framework for the regulation of waste management in South Africa and assigns responsibility to national and provincial government to develop norms, standards and regulations to guide the implementation of the broad framework of goals provided for in the Act. The Waste Act is groundbreaking in that for the first time legislation exists in South Africa that provides for the establishment of norms and standards relating to waste management issues. Groundwork (2008) argues that framework legislation is the law of deferral since the regulations that provide the details of the policy are yet to come and each set of regulations are likely to become grounds of struggle between competing interest groups and whilst these battles rage implementation is delayed.

The Waste Act seeks to achieve its objectives by creating mandatory and discretionary obligations for the different spheres of government. The separation of various service delivery and regulatory obligations into either mandatory or discretionary obligations provides some insight into the policy priorities selected by the policy makers. Table 2 provides an overview of the discretionary and mandatory obligations arising from the Waste Act for the different spheres of government.

Table 2 - Key Mandatory and Key Discretionary Obligations of the Waste Act (RSA, 2009)

National Government	
Key Mandatory Obligations	Key Discretionary Obligations
Must set norms and standards for the classification of waste, integrated waste management planning, collection, storage, treatment and disposal of waste including planning and operation of waste treatment and waste disposal facilities. Section 7 (1)(a)(b)(c)	May set norms and standards for waste minimisation, reuse, recycling and regionalisation of waste management services. Section 7 (2) (a)(b)(c)(d) May declare a waste type to be a priority waste requiring avoidance, reuse, recycling or treatment. Section 14 (1)
Must develop the national waste management strategy within two years of the promulgation of the Act. Section 6 (1)	May with the agreement of the Minister of Finance set national standards in respect of tariffs for waste management services. Section 7 (3)
Must support and strengthen local government's capacity to deliver waste management services. Section 9 (4)	May after consulting Minister of Trade and Industry require any person to reduce, reuse, recycle and recover components of a product manufactured. Section 17 (2)
Must undertake licensing of waste management activities. Section 43(1) Must establish a national waste information system. Section 60 (1)	May identify a product or class of products for the application of extended producer responsibility. Section 18 (1)
National government has limited its role to strategy development, standard setting, licensing and a municipal support role. It is ironic that the one of the key objectives of Waste Act is to minimise the consumption of natural resources yet the development of norms and standards	

for recycling, waste avoidance and extended producer responsibility measures are discretionary obligations for national and local government. The setting of compulsory landfill diversion targets within the EU has been cited by Harder et al, 2008 and WRAP, 2008b as a key driver to ensuring increases in the recycling rate.	
Provincial Government	
Must ensure the implementation of the national waste management strategy, norms and standards for waste management services. Section 8 (1) Must develop provincial integrated waste management plans Section 10 (2)	May set provincial norms and standards that do not conflict with national norms and standards. Section 8 (2) May establish provincial waste information system. Section 62 (1) (2)
Must support and strengthen local government's capacity to deliver waste management services. Section 9 (4)	May declare waste types as priority wastes and list waste activities needing to be licensed with the agreement of the Minister of Environmental Affairs. Section 14 (2)
Must undertake licensing authority function for waste management activities. Section 43	May request the preparation of industry waste management plans. Section 28 (2)
Provincial government must enforce compliance from local government on national or provincial service delivery standards and license waste management activities. According to Rabie et al (2009), the Waste Act departs radically from the Water Services Act and the Biodiversity Act in that it prescribes that non-adherence to norms and standards are an offence subject to a legal sanction of either a fine of R 5 million or imprisonment not exceeding 5 years.	
Local Government	
Key Mandatory Obligations	Key Discretionary Obligations
Must ensure residents have access to refuse removal, storage and disposal services in terms of national standards Section 9 (2)	May set local standards and norms for the separation, compaction and storage of waste. Section 9 (3)
Must submit an integrated waste management plan to the MEC, Section 11 (4)	May set local standards for waste avoidance, littering, minimisation of waste, re-use,

as well as an annual performance report Section 13 (3)	recycling and recovery of waste. Section 9 (3)
Must provide receptacles for the collection of recyclable waste. Section 23 (2)	May direct waste to specific waste treatment and disposal facilities. Section 9 (3)
Must designate a waste management officer to be responsible for co-ordinating waste management services. Section 10 (3)	May require waste transporters to register their activities. Section 25 (1)
Given the backlogs in refuse collection services that currently exist and the low priority attached to waste management issues, it is important that municipalities are under a mandatory legal obligation to provide the service to all residents. The Waste Act does not however make it compulsory for municipalities to develop standards for waste minimisation services; given the objectives of the Waste Act this seems rather contradictory.	

2.7.1 The National Environmental Management Waste Act – Implementation Plan

The DEA released an implementation plan in March 2009 which provided short and medium term timeframes for the achievement of key regulatory milestones. Table 3 highlights the key milestones intended to be implemented over the next three years.

Table 3 - Key Waste Act Regulatory Milestones (DEAT, March 2009)

2009	2010	2011
Develop waste collection standards	Classification of Waste	Adopt the national waste management strategy
Establish the national waste management information system	Develop regulations to guide remediation of contaminated land	Develop standards for storage, treatment and disposal of waste
Develop guidelines for integrated waste management planning	Regulations on waste management planning	Support and strengthen local government to enable delivery of waste management services
Develop a popular version of the Act for the general public	Develop an enforcement and compliance strategy	Set standards for waste minimisation, recycling and extended producer responsibility.

Continue with licensing authority role for waste management activities		Set national standards for waste management tariffs and incentives for waste minimisation

The implementation plan prioritises immediate regulatory intervention into refuse collection services, the creation of a national waste management information system, integrated waste management planning, public education and the licensing of waste management activities like waste disposal. According to a Groundwork representative who is currently involved in the national consultative processes to develop the national waste management strategy the DEA has very limited policy making capacity with most of the current work being undertaken by external consultants, this raises concerns about the capability of DEA to meet the milestones indicated in the implementation plan (Euripedou, pers. com, 2009) The effective implementation of the Waste Act will require fundamental changes to the waste management system in South Africa and in order to undertake systemic changes implementers will need to understand systems thinking approaches and be able to deal with hyper complexity. The literature review will now proceed to explore key local government Waste Act obligations in greater detail.

2.7.2 Refuse Collection Services in South Africa

During 2007 it was estimated that 64.5% of households in South Africa had access to some form of refuse collection service (Stats SA, 2007) whilst Fiehn et al (2005) estimated that in 2005 only 50% of the total population had access to refuse collection services. Given the poor waste management information systems in South Africa it is difficult to provide an accurate per capita waste generation rate per individual on an annual basis as is standard practice in the developed world. Access to the refuse collection services are greatest in metropolitan municipalities were a 92.5% collection rate has been reached and lowest in rural municipalities where only 16% of households obtain a service (Stats SA, 2007). In South Africa's secondary cities the collection rate is 62.9% whilst in large towns it stands at 57.4% (Stats SA, 2007). Almost 4.4 million households receive inadequate or no refuse collection service in South Africa, of these households almost 1, 6 million are to be found in metropolitan areas, secondary and large towns in South Africa (Stats SA, 2007). Savage (2009) indicates that on average collection services have grown at 10% a year between 2005 and 2007 with most of this growth happening in metropolitan municipalities. The expansion

of services to mainly poor households in the last few years has however led to a decline in revenues per consumer of about 5,4% a year between 2005 and 2007, initial data is beginning to point to a slowing in the pace of service expansion especially within Metro municipalities due to declining revenue and increasing costs (Savage, 2009).

Given the poor waste information management practices in South Africa quality data on waste generation rates is lacking. Savage (2009) estimated that South Africa will generate 67 million cubic metres of general waste in 2010 up from 42 million cubic metres in 1997 whilst the DEA (DEA, 2009e) estimate that in 2007 some 24 million tonnes of general waste was disposed of at landfill sites in South Africa. All these volume estimates need to also be viewed in the context that almost one third of households do not have their waste collected. Mining waste makes up 80% of all waste generated in South Africa with estimated volumes of 510 million tonnes (DEA, 2009d) however such waste is excluded from the ambit of the Waste Act and according to Bosman (2009) an opportunity has been lost to facilitate a truly integrated waste management system.

Studies in Mumbai (Rathi, 2005), Pietermaritzburg (Fransen et al , 2003) and Cape Town (Mckinnon, 2008) demonstrate that certain types of community based refuse collection services can be financially cheaper and offer better quality of services than private sector models and municipality provided services. Usually they can create more employment opportunities and generate partnerships between the community and the municipality to create habitable living environments for poor communities (Fransen et al, 2003). In the city of Cairo there were almost 70,000 informal waste workers in 1999 collecting up to one third of Cairo's waste (Novella, 2006) whilst Medina (2000) estimated that as much 2% of the urban population in Asia and Latin America depend on waste pickers for all or part of their livelihood. Given South Africa's high unemployment levels and repeated calls for labour intensive projects to deliver services and create employment community based refuse collection services with source separation could be used to efficiently address the backlogs in service delivery currently being faced and create livelihoods for significant numbers of unemployed people.

2.7.3 The Waste Act - Refuse Collection Services Obligations for Municipalities

The Waste Act provides that national government must set standards refuse collection, storage and disposal services whilst local government must ensure access of such services to all residents. In August 2009 the DEA issued a draft standard for waste collection services. The draft standard proposes that the type of collection service provided is dependent on settlement type and cost efficiency issues (DEA, 2009b). The draft standard also requires municipalities to encourage recycling by either providing source separation collection services or establishing facilities to drop off recyclables and separate waste (DEA, 2009b). Table 4 provides a summary of the important features of the draft standard on refuse collection services.

Table 4 - Draft National Waste Management Collection Standards (DEA, 2009b)

Type of Settlement	Level of Refuse Collection Service	Frequency of Collection Services
Low density settlements (less than 10 dwellings per ha)	On site disposal	Not applicable
Medium density settlements (10 to 40 dwellings per ha)	Community transfer to central collection point	Within 24 hours of receptacles being reported as full
High density settlements (more than 40 dwellings per ha)	Kerbside collection service or organised transfer to central collection points	Non recyclables – weekly Recyclables – every two weeks

The DEA aims to adopt the collection standard as a regulation by December 2009 and negotiate changes to the equitable share grant in order to make implementation feasible (Baloyi, pers.com, 2009). The DEA has also released a draft policy on free basic refuse collection services which provides that indigent households must receive refuse collection services and a refuse receptacle that complies with national standards at no cost to the household (DEA, 2009f).

The DEA commissioned the Council for Scientific and Industrial Research (CSIR) to undertake research into existing refuse standards and develop proposals on future norms and standards for refuse collection services. The CSIR study concluded that there are no existing standards that can be merely adopted for use as national standards and that whilst there are some similarities in refuse collection approaches there are significant localised variations (Mvuma, et al, 2009). The CSIR research concluded that differing service standards are appropriate in different settlement types but acknowledged that there are difficulties associated with defining a particular settlement type (Mvuma et al, 2009). Savage (2009) argues that beyond settlement type it would be important to look at affordability, municipal capacity, the quality and nature of the waste being generated, climate, the availability of storage facilities, topographic conditions and road conditions. Savage (2009) also argues that the waste collection standards do not reconcile with the variability in municipal resources and ends up leaving the process to individual municipalities to decide which creates problems for enforcement and measurability.

Baloyi (pers.com, 2009) acknowledges that municipalities in South Africa currently receive an equitable share grant subsidy of R30 per month per indigent household and that the current backlog in services could likely be attributed to the grant being insufficient to cover service delivery costs or that the grant is not being utilised for the purpose intended. The DUCT (2007) indicated that their calculations of the equitable share grant indicate that as a result of the budget balancing formulae used to annually calculate equitable share grants the R30 per month benchmark subsidy for refuse collection services has actually doubled but without any consequent increases in the coverage of refuse collection services within the MM. Savage (2009)concludes that the development and implementation of national refuse collection standards is very much a work in progress complicated by the under pricing of capital and operating costs for the refuse collection services which is resulting in growing operating deficits which create additional barriers to extend service delivery.

2.7.4 Recycling in South Africa

Recycling refers to processes aimed at converting discarded products into the original materials from which it was manufactured with the intention of manufacturing a new product from those materials instead of using virgin materials (DTI, 2009). According to Matete et al (2007) South Africa has a well-established recycling industry despite the absence of

enforcing legislation; this is largely due to the efforts of private recyclers. Most recycling in South Africa is conducted by the packaging industry through private entrepreneurs and agents for recycling companies, a number of manufacturing sectors have also established buy back systems for their products such as beverage cans, glass, oil, waste paper, steel, plastics and batteries (Matete et al, 2007). The bulk of recyclable items include discarded packaging materials, consumer goods and defective products (DTI, 2009). The Packaging Council of South Africa closely monitors the packaging market and has reported the data contained in Table 5.

Table 5 - Total Recycled Packaged Material 2007 (Purnell, 2009, 7)

Packaging Material	Recycle %
Glass	19.1
Metal Cans	71.1
Paper	53.8
Plastic Packaging	20.1
Average Recycling Rate	40.8

The information above relates to packaging materials only for a more comprehensive picture of recycling rates it is necessary to look more closely at each of the different sectors recycling programmes. The Glass Recycling Company is a Section 21 company established by both industry and government stakeholder's reports that during the 2007/08 financial year almost 24% of the glass produced for consumption was recycled (Purnell, 2009). The Paper Recycling Association of South Africa reports that during 2007 almost 54% of recoverable paper was recycled (Purnell, 2009). The Plastics Federation of South Africa (Plasfed) reported that on average 16.9% of plastics consumed during 2005 were recycled and that 75% of all plastics consumed are for packaging purposes (Purnell, 2009). Collect a Can is a Section 21 company established in 1993 as a joint venture by Arcelor – Mittal South Africa and Nampak to recycle metal cans, they indicate that 71% of metal cans consumed during 2007 was recycled which is one of the highest rates in the world (Purnell, 2009). The recycling efforts of the paper and metal cans industry within a voluntary recycling environment driven by only by economic incentives offered by the use of recycled materials are promising. The glass and plastics industry on the other hand have low recycling rates that could require government intervention through the creation of incentives to improve

recycling. A national assessment of waste management capacity undertaken in 2007 for DEAT which had a questionnaire response rate of 62% from local municipalities found that 87% of municipalities did not have the capacity or infrastructure to pursue waste minimisation activities like recycling (Moosa et al, 2007).

2.7.5 The Waste Act – Recycling Obligations for Municipalities

The Waste Act provides that local government may adopt norms and standards for waste minimisation through the provision of source separation, recycling, reuse and recovery services and incentives. The Act does not compel municipalities to act on waste minimisation issues which seem contradictory given the objects of the Act are to reduce the consumption of natural resources. According to Oelofse (2009c) this decision stems from concerns around the capacity of local government to provide such services. By making waste minimisation a discretionary obligation Oelofse (2009c) suggest that municipalities with the capability to deliver the service will provide such services whilst those without capacity will not feel compelled to do so and could rather focus their limited resources on getting refuse collection services delivered to all households.

From a municipal perspective one of the most effective means of contributing to the reduction of the consumption of natural resources and the creation of a low carbon economy would be to ensure that mainline recyclables like glass, paper, metal and plastics found in domestic and business waste streams are collected separately and are made available to the recycling industry. To achieve these goals municipalities should provide source separation collection services or set up material recovery facilities to separate mixed waste. The draft national standard on refuse collection services proposes that mainline recyclables be collected every two weeks whilst biodegradable waste is collected every week (DEA, 2009b).

Data on recycling of domestic waste by municipalities in South Africa is difficult to obtain due to poor waste management information systems and because South African municipalities have been largely involved in end of the pipe services like refuse collection, street cleaning and operating landfill sites (Baloyi, 2006). A comprehensive waste composition assessment of the Gauteng province waste stream during 2008 found that mainline recyclables which include paper, plastic, glass and metals made up on average 25% of the total domestic waste stream whilst non recyclable waste made up 40%, organics

comprised of 15% and the remaining 20% consisted of building rubble (DTI, 2009). Taiwo (2006) estimated that the city of Johannesburg recycled only 6% of domestic waste compared to New York that recycles 20%, Oslo 28% and New Delhi 17% whilst Novella (2006) indicates that studies have shown that the City of Cape Town could recycle 22% of its waste but that a lack of data means that the city does not know what levels of recycling they currently achieve. A study undertaken at the Marianhill landfill site material recovery facility within the eThekwini Municipality indicates that up to 28% of all materials entering the site can be recycled (Purchase, 2008). Source separation is not occurring on a large scale except within certain parts of some of the large metropolitan municipalities with many in pilot stages (Lombard, pers.com, 2009). One of the largest schemes is the Mondi orange bag scheme within the eThekwini Municipality which is in the second year of operation. According to Mondi an estimated 400,000 households are supplied with both an orange bag and a black bag, the orange bag is meant to be used for all recyclables whilst the black bag is used for non-recyclables (Griffin, pers.com, 2009). Data on the recycling rates being achieved on this project were not made available; confidentiality of sensitive information is one of the ongoing problems experienced when dealing with the private sector on waste minimisation issues (Laner et al, 2009).

Recycling at all levels in society is a complex process, for a start recycled materials have to compete in the marketplace with new or virgin materials and the cost of collecting and sorting the materials usually means that they are equally or more expensive than virgin materials, a situation that is most often the case in urbanised developed countries (Palm 2006, Anon, 2007, Kollikkathara et al, 2009,). McDougall (2001) argues that at high levels of recovery proportionally more energy is needed to collect used materials from diffuse sources with little environmental gain, this view is also supported by Ball (2006b) who argues that recycling, material recovery and treatment facilities do not create significant reductions in waste due to the laws of diminishing returns and cost constraints. Ball (2006b) proposes that the only way to make significant reduction in waste is to start to focus on waste avoidance where producers are forced to produce biodegradable or recyclable products.

Effective source separation and recycling requires residents to change their personal behaviour towards waste management in their households or workplaces. A survey undertaken into the barriers of recycling at home in the United Kingdom in 2007 found that

people did not have adequate containers, space, time, routines or systems in place at their homes to separate waste, collection services were often unreliable, people were not prepared to make special trips to drop off recyclables, some people did not understand how the system worked, some did not understand the environmental benefits and some people did want to recycle since they could not obtain any personal reward from recycling (WRAP, 2008b). Some of these findings are confirmed by (Price, 2001, Spiers and Tucker, 2001, Mattson et al, 2003,Knussen et al, 2004;; Lyas et al, 2005 and Woodard et al, 2005) who also advocate careful design of recycling schemes to be convenient to residents, education of householders, and the use of financial incentives to address some of these barriers.

The DEA in South Africa is considering increasing the price of waste disposal in order to incentivise recycling rather than setting recycling targets (DEA, 2009d). The Waste Strategy 2000 adopted by the United Kingdom recognised the need to create statutory performance standards for local government in order to achieve a national recycling rate of 30% by 2010 (Harder et al, 2008), by 2001 recycling targets were introduced for all local authorities based on their previous track records with recycling. Tsiliyannis (2007) proposes that recycling rates must be flexible to changes in the economy in order to maximise environmental gains, accordingly during periods of economic expansion a higher rate should prevail whilst during periods of economic contraction the rates should be relaxed. In 1987 New Jersey became the first state in the United States of America to require mandatory recycling and within 7 years was averaging a 44.5% recycling rate for mainline recyclables, twenty years later New Jersey is no longer a leading state in recycling due to the absence of state and local government support for recycling programmes, low costs for waste removal and the lack of public education on recycling (Kollikkathara et al, 2009). According to Skumatz (2008) the use of pay as you throw forms of waste collection fees to 25% of households in the USA has resulted in an average waste diversion rate to recycling of 16%, most of these pay as you throw schemes charge consumers refuse collection fees based on the size of containers being utilised or the number of bin bags being put out for collection and the quantity of collection services provided.

The United Kingdom experiences with source separation services since 2000 have concluded that in the current market conditions the kerbside sort approach to collecting recyclables offers the lowest net costs and highest benefits although the two stream mixed collection

approach offers costs that are not very different (WRAP, 2008a). By 2007 the kerbside sort approach was used in 44% of all local authorities in the United Kingdom whilst the two stream mixed approach is used in 11% of local authorities (WRAP, 2008a). The kerbside sort method requires that households sort waste into fibres (paper and board), containers and non-recyclables. The containers are then left at the kerbside by householders, collection crews then sort the collected materials into different compartments in specially designed collection vehicles, this practice prevents contamination of recyclables and the need for waste to go to material recovery facilities for sorting (WRAP, 2008a). The two stream mixed approach requires that householders separate waste into fibre and containers and collection crews deposit the materials into separate compartments of a twin compartment vehicle (WRAP, 2008a). The implications of using this experience in the South African context are significant for local government. It will require changes in the types of collection vehicles currently used in South Africa and different collection systems with implications for labour, operating times, the need for sorting facilities and the financial implications of all these changes.

According to Palm (2006) material recovery facilities are not automatically feasible; their feasibility depends on the quantities of recyclables, prices obtained for recycled materials and the costs of operating such facilities. The sustainability of such facilities depends on whether the facility can operate effectively when the prices of recycled materials drop, in some cases it may be necessary for the local government to subsidise such facilities during prolonged commodity price declines in order to continue to obtain environmental gains through recycling and save on landfill airspace (Palm, 2006). The link between economic growth, urbanisation and significant growth in waste volumes is best demonstrated by China which in 2005 surpassed the USA as the largest generator of municipal solid waste in the world accounting for 29% of all municipal solid waste produced globally (World Bank, 2005). Efforts by local government in Beijing to stem the tide of ever increasing waste volumes by introducing source separation collection services has resulted in 30% of the population participating in the programme but serious operational capacity challenges are now faced at transfer plants and treatment facilities and expansion of the programme is dependent on the development of additional facilities and infrastructure (Zen Shan et al, 2009). According to Wilson et al (2009) the role of informal waste pickers should also be carefully considered given that in developing countries the informal sector achieves a recycling rate of between

20% to 50% with more than half of the recycled materials being in a clean form directly collected from households and businesses paid for by the revenues obtained from selling recycled materials. This is in great contrast to the situation in Europe and America where the recycling rates have come at great cost to the public sector (Wilson et al, 2009).

2.7.6 The Fiscal Situation of Waste Management in South Africa

The financing of waste management services in South Africa is complex and in need of serious reform if it is to enable the implementation of integrated waste management practices. An analysis of waste management expenditure and revenue of all local municipalities in South Africa during the 2007/08 financial year indicated that there is a significant under pricing of waste management services with operating costs being on average 15% higher than the revenues collected by the sector (Savage, 2009). Such a situation does not provide incentives for waste minimisation whilst the prospects for the extension of services with such a large operating deficit look gloomy. According to Savage (2009) the operating deficit is likely to be quite higher if more municipalities used accounting practices that are based on full cost accounting principles that require the inclusion of the historical costs for service delivery. To compound the problem further the National Treasury (2009) reported that a significant structural adjustment of user charges for large and small households was undertaken in 2006/07 financial year when tariffs for large households increased on average by 465% and small households increased by 251%. These huge increases have not led to a corresponding growth in solid waste revenues, which suggests revenue collection rates have declined as people struggle to afford increased costs (Savage, 2009). Municipalities seem to place little priority on solid waste management investments given that during the 2007/08 financial year only 1.6% of the total capital budgets of all municipalities in South Africa was allocated to waste management infrastructure and services whilst in the 2005/06 financial year only 2.2% of Municipal Infrastructure Grants projects were allocated to the waste management sector (Savage, 2009).

Staff costs are the largest expenditure item for waste management services averaging 41% of total waste expenditure in secondary and large towns in South Africa (Stats SA, 2008a). In the three year period from 2005 to 2008 average staff costs in secondary cities of South Africa increased by 71% whilst staff numbers reduced by 11%, metropolitan municipalities on the other hand managed to contain staff costs despite growth in staff numbers (Stats SA,

2008b). Most municipalities in South Africa charge fixed monthly rates for waste collection services, which provides no incentives for waste minimisation by consumers whilst some municipalities like Johannesburg, eThekwini and Ekhuruleni have moved to calculate waste collection charges based on the size or value of the property where waste is collected (Savage, 2009). This approach may assist with determining the location of indigent households but does not create incentives to minimise waste. The Tshwane Municipality on the other hand have recently introduced a form of 'pay as you throw' collection charges, whereby collection costs are determined by either the size of the bins used or the number of bags put out for collection (Savage, 2009). Neither fixed monthly costs nor property based collection charges reflect the actual costs incurred to provide the service nor are they able to calculate charges based upon actual use of the service like for water and electricity. Consequently they result in the under pricing of services and fail to provide incentives to recycle and minimise waste (USEPA, 2004, Bilitewski; 2008, Skumatz, 2008; Kollikkathara et al, 2009 and Savage, 2009). Pay as you throw schemes in the USA cover 25% of all households, collection fees are based on the size of bins and bags that are utilised for waste storage and have had the effect of reducing waste volumes by an average of 16% to 17% as households increase recycling and compact their waste in some cases (Skumatz, 2008). Illegal dumping is considered as a greater fear than a reality with only 20% of communities surveyed indicating that it is a problem with only 3% saying it lasts longer than 3 months once enforcement set in (Skumatz, 2008).

Two thirds of municipalities report that they have a free basic refuse collection subsidy in place although municipalities report a 10% decline in the numbers of households receiving free basic refuse collection services between 2005 and 2007 primarily as a result of tightening up on the allocation of the subsidy (Savage, 2009). One of the major effects of under pricing waste management services is that non-poor households are being subsidised through the use of property rates revenue and equitable share grant funding to cover the full costs of waste management services. Developers are also not levied with development charges when they intensify land use, rather such developments rely on existing customers to subsidise their access to solid waste infrastructure and services (Savage, 2009). According to Savage (2009) this subsidy leakage needs to be limited by putting in place measures to target subsidies to geographical areas where the poor reside and to set up systems to get other consumers who require subsidy to be means tested. This will enable funding to be used to extend service

delivery and build new infrastructure rather than subsidising large polluters and creating disincentives for waste minimisation.

2.7.7 The Waste Act – Fiscal Opportunities and Obligations

The Waste Act provides powers to the Minister of Environmental Affairs to improve the financial management of waste services as well as the use of economic incentives provided that the Minister of Finance concurs with such measures. Section 7 of the Waste Act provides that the Minister of Environmental Affairs may develop national standards for tariffs relating to waste services as well ensuring that the funds obtained from waste services are used for waste management services. Section 7 also provides that the Minister of Environmental Affairs may impose tariffs in order to provide for the development of waste management infrastructure and facilities. The Waste Act also provides in Section 18 for the Minister of Environmental Affairs to prescribe financing arrangements for waste minimisation programmes provided the Minister of Finance agrees to such arrangements. Section 69 of the Waste Act also permits the Minister of Environmental Affairs to apply economic incentives or disincentives to change behaviour towards the generation of waste by all sectors of society provided the Minister of Finance concurs with such measures. Section 9 of the Waste Act requires that waste management financing at a municipal level must be ring fenced, it is unclear how the ring fencing of waste management revenues and expenditures will work in the context of generally acceptable accounting practices but it will be a necessary first step in ensuring better financial management of waste services (Savage, 2009). Given the huge backlogs in refuse collection service delivery and the need to provide new services like source separated recyclables collection and the treatment of organic waste, the challenges of financing the policy shift will be complex.

According to Savage (2009) universal access to waste collection services in South Africa over the next ten years is unlikely to be achieved unless capital investment and operating expenditure is increased by more than 100% of current levels and sustained for a ten year period. If such increases do not occur operating deficits of between R2.5 to R4.4 billion a year will be incurred. These conclusions were made on the basis of using the Municipal Services Financial Model, an approach to infrastructure investment analysis that is extensively used by National Treasury and the Development Bank of South Africa (Savage, 2009). The current dependence on grant funding would also need to be reduced since it

perversely encourages under recovery of user charges and creates subsidy leakage to non-poor households (Savage, 2009). Significant increases in user charges would be difficult to implement in the current situation given the above inflation increases in electricity tariffs and the effects of the new property rates system. Savage (2009) proposes the establishment of a waste project development fund capable of financing capital development in the waste management sector in a sustainable manner whilst also attracting private capital to finance carbon credit type projects.

2.7.8 Integrated Waste Management Planning in South Africa

The absence of proper plans and strategies leads inevitably to poor waste management practices (Lorenz, 2003) whilst a tendency exists in local government that upon completion of a plan, it is filed and forgotten whilst those responsible for implementing the plan operate much as they did before the plan was formulated (Waterson, 1979). A review of integrated waste management plans in South Africa in 2005 found that no updated national database existed of completed integrated waste management plans whilst only 61% of municipalities had completed or were in the process of completing integrated waste management planning processes. Furthermore many of the completed plans that were reviewed showed that the plan only covered the status quo or situational analysis stage without going into actual integrated planning processes (Godfrey et al, 2006). It must be borne in mind that in 2005 no legislative provision existed to force integrated waste management planning processes to occur at a municipal level.

Some of the completed plans that were reviewed were also found to be operationally and financially unfeasible whilst 62% of the municipalities surveyed felt that the waste data they were collecting for planning purposes was unreliable (Godfrey et al, 2006). The review also found that 82% of the completed plans were prepared by consultants, this raises the issue around the ownership of the planning process and the prospects for implementation given that consultant driven planning processes often result in limited participation by municipal officials responsible for implementation (Atkinson, 2002; Godfrey et al, 2006). The review process seems to confirm this proposition by reporting that 82.6% of municipalities base their planning decisions on obvious problems whilst 33% on information obtained from investigations conducted into issues (Godfrey et al, 2006). The end result of planning is a plan, “which is nothing less than a carefully worked out programme of intended action"

(Botes et al, 1992:189), municipalities need to take the plan and incorporate it into service delivery budget implementation plans so that planning processes influence the day to day operations of delivering improved waste management services. In countries where the integrated waste management practices have been established for a long time like Denmark, Germany and other EU countries it is becoming increasingly necessary to move beyond just integrated waste management planning processes in order to make decisions. Alternative waste management strategies like life cycle assessments are increasingly being used to shed light on the input of energy and resources and the outputs of waste and pollutants for each life stage of the products being assessed (Kollikkathara et al, 2009).

2.7.9 The Waste Act - Integrated Waste Management Planning Obligations

The Waste Act requires national, provincial and local government spheres to prepare an interlocking set of integrated waste management plans (DEA, 2009d). At a municipal level the plan must describe the current waste management situation and provide a plan to achieve the priorities and targets set by each municipality (DEA, 2009d). Savage (2009) argues that the strategic planning conventions that guide waste management planning provisions in the Waste Act do not provide solutions for the complex and intractable problems facing more rural municipalities since these challenges relate to limited human and financial resources and increasing collection backlogs in different settlement types. According to Savage (2009) at least 75% of municipalities have undertaken some form of waste management planning already, these plans are either framed as feasibility studies with a strong focus on institutional and financial modelling or a strategic planning approach is used which provides a plan that contains a situational analysis with a generalised statement of objectives without establishing any service delivery standards and targets. Savage (2009) suggests that planning should be undertaken using outcomes or service delivery targets based methodologies rather than the extensive procedural, coordination and content requirements that characterise waste planning currently which are aimed at achieving compliance rather than improving service delivery. Savage (2009) also proposes that given the limited institutional capacity of local government and the emerging institutional framework to co-ordinate waste management issues within the state, a phased approach should be adopted to developing integrated planning outcomes.

2.7.10 State of the National Waste Management Information System

The need to obtain accurate data on waste generation, recycling and disposal volumes is well documented in the literature (, Grossman et al, 1974, Leoa et al 2001, Beigl, 2008 and Chowdhury, 2009) as it enables the design of routes for collection services and the establishment of waste management facilities like landfill sites, treatment plants and material recovery facilities. During 2009 the DEA commissioned research into various issues affecting the implementation of the Waste Act, all the subsequent research produced have indicated that high quality data and research relating to solid waste management services in South Africa is difficult to obtain (Oelofse, 2009a; Savage, 2009; Purnell, 2009; and Goldblatt, 2009). Purnell (2009) argues that one of the factors responsible for this situation is that the national waste management information system that was developed for pilot implementation in 2006 is currently based on voluntary reporting. The current system is also not designed to collect, record and analyse data and information on the waste stored, transported, treated, transformed, reduced, reused, recycled and recovered (Purnell, 2009). According to Ball (2006a) given the minimal resources allocated to waste management services in developing countries it is to be expected that there will be few, if any, systems in place to capture reliable and relevant information on waste management. Chowdhury (2009) proposes that the waste management information system within the USA should be maintained at a county or metropolitan level because municipalities within the USA, the world's largest economy are ill equipped to establish and maintain a waste information system. Van der Sloot (2004) suggests that poor knowledge management practices has resulted in many millions being spent on collecting waste management information only to find that such information is not sufficiently accessible to be useful.

The current national waste information system was launched in 2006 and piloted in three municipalities in the Eastern Cape and Mpumalanga; in 2007 it was piloted in KwaZulu Natal, North West and Free State (Purnell, 2009). Initially some 133 waste management facilities registered and although most reported regularly during the start up phase, reporting has steadily declined largely due to the voluntary nature of the reporting process (Purnell, 2009). Some of the key challenges identified during this phase included the lack of weighbridges, lack of standardised waste information systems, the limited capacity of reporting institutions to have access to competent staff and resources to comply with the

information system and the lack of fences, gates, security and internet access amongst small municipalities (Baloyi, 2006). A waste information system should collect data in order to inform government of the waste management challenges facing the country or the municipality where it is collected (Godfrey, 2008a). Research into the need for waste information systems in South Africa have found that all levels of government primarily collect data for planning purposes whilst national and provincial government also utilise data for compliance and enforcement purposes, municipalities on the other hand use data to manage operations, undertake billing and budgeting processes (Godfrey, 2008a). Almost two thirds of the municipalities surveyed believed that the data they are collecting is unreliable, 74% are collecting data on waste disposal at landfill sites whilst 46% are collecting data on waste generators and 14% are collecting data on waste recycling (Godfrey, 2008a).

2.7.11 The Waste Act – Waste Management Information System Obligations

The lack of accurate information on waste management services prevents proper planning and management of the waste sector. The Waste Act attempts to address this critical issue by requiring the Minister of Environmental Affairs in terms of Section 60 of the Act to establish a national waste information system for the recording, collecting, management and analysis of waste management related data and information. The information system must include data on waste generation, storage, transportation, treatment, reduction, reuse, recycling, recovery and disposal of waste according to the waste classification system. The waste information system may also include information on the levels and extent of waste management activities on a municipal basis as well a list of all licensed waste management facilities. The Waste Act does not explicitly require municipalities to establish a waste information system but rather to provide national government with any information required for the national waste information system. This obligation compels municipalities to establish a municipal waste information system in order to comply with national government requirements.

In May 2009 a draft waste management regulation was published for comment, the regulation stipulated waste management activities that needed to be registered with the national waste information system as well as procedures for submitting information (Purnell,2009). The draft regulation requires that all medium, large and hazardous landfill sites provide information on the types and volumes of waste entering their site for disposal as well as any

energy recovery processes occurring from waste (DEA, 2009g). The draft regulation also requires all recycling facilities handling paper, plastic, glass, metal cans, tyres, scrap metal, electronic waste and used oil to report volumes being recycled (DEA, 2009g). The draft regulation also requires that the responsible persons for all registered activities provide actual weight data two years from the enactment of the regulation (Purnell, 2009). Municipalities that operate landfill sites classified as medium, large and hazardous will therefore be required to install weighbridges to provide actual weight data whilst recycling facilities operated by municipalities or within municipalities will need to report on actual volumes of waste being recycled.

2.7.12 Environmental Compliance and Enforcement Issues in South Africa

The majority of landfill sites and waste water works within South Africa are either not operated in compliance of their licence conditions or are not licensed to perform the functions that they undertake, both these types of activities are considered criminal offences under the National Water Act, the National Environmental Management Act and the Waste Act yet the owners of these facilities, municipalities, are not prosecuted for such offences due to the doctrine of co-operative governance (Snyman et al, 2006, Godfrey et al , 2008b, Bosman and Boyd, 2008, Bosman, 2009). Section 41 of the Constitution requires that different spheres of government must co-operate with each other to undertake their different obligations and avoid legal proceedings against each other, by treating municipalities differently national and provincial government creates inconsistencies in the legislative process and weakens the overall enforcement regime (Bosman et al, 2008). Given the adherence to the co-operative governance doctrine Bosman et al (2008) propose that more innovative governance instruments are utilised to ensure compliance, these include incentive systems like public performance rating assessments, market based instruments and environmental co-operation agreements. A good example of an incentive based performance rating system is the blue drop and green drop assessment process designed to achieve improved water quality standards in South Africa. According to DWAF (2009) the blue and green drop assessment processes identifies a range of critical measurable norms and standards that need to be attained by municipalities in the provision of drinking water (blue drop) and the treatment of waste water (green drop). Annually municipalities are audited or assessed for compliance with these norms and standards by DWA officials and the results are reported at a public level (DWAF, 2009). Municipalities that achieve all the criteria have the right to the declare

their water as having achieved a blue drop status whilst those that persistently fail to achieve a minimum water quality level are deemed to be a red drop supplier of water (DWAF, 2009).

2.7.13 The Waste Act – Compliance and Enforcement Obligations

Chapter 7 of the Waste Act sets out a system of offences and penalties, this system of compliance monitoring and enforcement will be implemented in terms of Chapter 7 of NEMA and will rely on Environmental Management Inspectors working in conjunction with Waste Management Officers (Olver et al, 2009). Chapter 7 of NEMA creates a network of Environmental Management Inspectors, commonly known as "Green Scorpions" who have the responsibility for monitoring compliance and enforcement of environmental legislation across South Africa through administrative inspection, investigation and enforcement powers granted to them under NEMA (Olver et al, 2009). According to Olver et al (2009) the capacity of the environmental management inspectorate at the DEA will need to be significantly increased in order to deal with the additional regulatory burden arising from the Waste Act. Currently there are around 900 designated environmental management inspectors, the majority being officials employed by the South African National Parks (Olver et al, 2009). Given the significant enforcement and compliance monitoring responsibilities of environmental legislation at a municipal level, environmental management inspectors have also been extended to a municipal level (Olver et al, 2009). Table 6 provides a summary of the offences that municipalities could potentially commit in terms of the Waste Act and indicates the penalties that could potentially apply.

Table 6 - Waste Act Offences and Penalties for Local Government (Olver, 2009)

Offence	Penalties
Fails to provide information required for the national waste information system – S 63(4)	Fine or imprisonment for no longer than 6 months
Undertakes an activity that contaminates land and fails to inform Minister of Environmental Affairs of contamination – S 36 (5)	Fine not exceeding R5 million or imprisonment not exceeding 5 years
Fails to remedy contaminated land S 38 (2)	Fine not exceeding R10 million or imprisonment not exceeding 10 years
Fails to comply with a condition of a waste management license S 40	Fine not exceeding R10 million or imprisonment not exceeding 10 years

Fails to comply with a norm and standard established in terms of this Act S67 (1)(f)	Fine not exceeding R5 million or imprisonment not exceeding 5 years
Fails to transport waste in terms of norms and standards of Act	Fine not exceeding R5 million or imprisonment not exceeding 5 years

The DEA envisages the achievement of the objectives of the Waste Act through a tiered and consensual model which seeks to combine government regulation and compliance actions with the application of economic incentives, self regulatory components, fiscal mechanisms and voluntary initiatives (DEA, 2009d). Fourie (2006) raised a pertinent issue when he questioned the point of having world class legislation like South Africa has, only to be unable to enforce the legislation because the necessary skilled personnel and testing facilities to interpret the results simply do not exist. Whilst London et al (2000), Seeliger et al (2003), Lukey et al (2004), and Godfey et al,(2007) all confirm that despite having some of the most progressive environmental legislation the South African government is perceived to be unwilling and unable to enforce pollution and waste related legislation. The Author can confirm from personal experience how the repeated violations of the landfill site permit conditions by the MM and the lack of legal enforcement by DWA and DEA through concerns about co-operative governance have created a vicious cycle where the perpetrators now have an attitude of invincibility and the enforcers have turned their backs in submission.

2.7.14 Policy Implementation and Co-ordinating the State

Van Meter et al (1975) provided a useful definition of policy implementation as those actions taken by public and private groups and individuals that are directed at the achievement of objectives set out in prior policy decisions. Cloete et al (2000) identifies three generations of thinking on policy implementation, the first generation was the classical Weberian framework of the ideal bureaucracy which was machine like, authoritarian and hierarchical where a small group of decision makers at the top create policy and subordinates at the bottom dutifully carry out the policy in a neutral, professionalised and non political manner. In the post World War 2 period it became clear that policy implementation was not the efficient and orderly machine the classical theorists made it out to be but rather that it was more complex and political and would not just automatically be implemented (Cloete et al, 2000). The third generation of implementation thinking has been more concerned with understanding how implementation works and how its prospects might be improved. Warwick (1982) proposed

that policy implementation follows an evolutionary model since formal policy does not set an exact course of implementation but rather shapes the potential for action. Warwick (1982) uses a transactional model to explain policy implementation since the concept of a transaction implies deliberate action to achieve a result, according to this model conscious dealings occur between the implementers, and the program environment through negotiations amongst parties with conflicting interests in the implementation process.

According to Cloete et al (2000) no common theory on policy implementation has been constructed but a remarkable convergence on the critical variables of policy implementation is evident in reviews of the policy implementation literature. The five variables that have been consistently identified as being critical to understanding policy implementation include: the content of policy, the context within which policy is to be implemented, the commitment of those carrying out the implementation, the capacity of the implementers and the support of the clients and coalitions whose interests are enhanced or threatened by the policy (Cloete et al, 2000). The five variables are often referred to as the 5 C protocol and are founded on the notion that policy implementation is a complex political process capable of being understood by appreciating the interplay amongst the five variables and strategically understanding the linkages between the five variables in order to synergise implementation processes (Cloete et al, 2000). The dynamic 5 C protocol implies that implementation cannot be seen as an activity to be carried out according to a predetermined plan but rather as a process that can only be managed as one proceeds with implementation. Implementation can be viewed as steering a process to more effective outcomes which will entail fixing the variables over which the implementer has some direct or indirect influence so as to induce changes in the ones over which the implementer does not have such influence (Cloete et al, 2000). In essence policy implementation management is "akin to rewriting the music in the act of playing it" (Cloete et al, 2000, 187), policy formulation and policy implementation under such a dynamic context do not seem like consecutive processes but are usually parallel processes where policy formulation is subject to ongoing redesign during implementation as a consequence of the complexity of our modern world (Cloete et al, 2000). Given the complexity of policy implementation processes it is becoming increasingly important for policy implementers to have insights and experiences into processes aimed at leading individuals, organisations and societies through transformational change processes.

The Green Paper on National Strategic Planning concedes that weaknesses in the co-ordination of government have led to policy inconsistencies and poor service delivery outcomes (The Presidency, 2009a). The Green Paper proposes that policy co-ordination should be "about ensuring that government's priorities are given due attention in allocating resources and responsibilities throughout government and that government as a whole can develop and effectively pursue its objectives and priorities through the myriad of institutions, spheres, agencies and public corporations" (The Presidency, 2009a,8). The Green Paper highlights the need for the Presidency to intervene to build greater co-operation and co-ordination between different government departments, spheres and state owned enterprises because the major policy objectives require all these different institutions to work together and this has not always happened in the past (The Presidency, 2009a). The Green Paper on Performance Management, Monitoring and Evaluation proposes to develop a system of performance management based on ten strategic outcomes which will be closely monitored to assess outcomes performance within an entire sector rather than individual state institutions (The Presidency, 2009b). The environmental sector is not identified as a priority sector amongst the ten identified priority sectors although it could be part of the food security or sustainable resource management sectors. The low priority that continues to be accorded to the environmental sector despite the environmental crisis facing the planet is symptomatic of the non systemic thinking that seems to characterise planning within government.

The Waste Act like most other legislation is founded on the basis of co-operative governance relationships between the different spheres of government. The different spheres of government are supposed to be interdependent and integrating, co-operating amongst themselves to develop policy, provide finance, regulate and enforce implementation and deliver services. The Waste Act creates a system of Waste Management Officers from national through to local government level wh o are given the responsibility of co-ordinating all powers and functions assigned to their levels of government by the Waste Act. Savage (2009) argues that Waste Management Officers should be assigned the roles of independent regulators in order to ensure norms and standards are implemented; Olver et al (2009) proposes that the Waste Management Officers should not be appointed from within the solid waste management department of municipalities in order to avoid them becoming involved in policy making and service delivery roles but they should rather be based within the office of the Municipal Manager in order to promote their oversight roles and establish an effective

regulatory mechanism. Savage (2009) raises concerns that combining policy making, regulation and service delivery roles as envisaged by DEA will result in conflicts of interest as policy makers can reduce compliance burdens and weaken the regulatory function.

2.8 The Global Crisis and the Need for Profound Change

According to Scharmer (2009a) the world we live in today is characterised by intense conflict and massive institutional failure, the global system only works for a relatively small elite whilst 80% of humankind is classified as poor and in spite of scientific evidence of climate change, we continue as if nothing much has happened. Every day 40,000 children die from preventable diseases, our schools and higher education institutions have not been able to develop people's capacity to sense and shape the future, collectively at times it seems as if we are trapped in a race to the bottom and that we have not learned to transform our centuries old way of thinking and living to fit the realities of today (Scharmer, 2009a). As the crisis deepens Scharmer (2009a) argues that three possibilities exist, we can return to the past, we can just keep on going or we can find a new way to live where we break our old patterns of thinking and acting by individual and collective transformational change guided by attaining our highest future possibility. The road map to individual and transformational change is built on the foundation of systems thinking, new ways of learning and through the use of new social technologies proposed by the Theory U to address complex social challenges.

2.9 Systems Thinking

According to Senge (2006, 68) systems thinking is a conceptual framework with a body of knowledge and tools developed over the past fifty years and "it is a discipline for seeing wholes, it is a framework for seeing interrelationships rather than things, for seeing patterns of change rather than static snapshots". Senge (2006) argues that most people and organisations fail to fix their deepest problems because they tend to focus on snapshots of isolated parts of a system or on linear cause and effect chains because they are unable to see the whole system they are part of and the interrelationships underlying a problem within the system that they find themselves in. According to Senge (2006) one of the fundamental characteristics of complex human systems is that cause and effect are not close in time and space, yet our predominant ways of thinking about reality is that cause and effect are close in time and space with the result that our solutions do not often diagnose the correct causes of problems.

Senge (2006) proposes that the most obvious solutions that people and organisations usually implement are familiar quick fix types of solutions which usually only work in the short run and tend to make things worse in the long term. The application of non systemic solutions creates the need for more quick fixes whilst the fundamental problems grow; ultimately the system is made weaker than before and in greater need of help (Senge, 2006). According to Senge (2006) this situation tends to occur on a recurring basis because the high leverage changes that are needed are usually non-obvious until all the forces at play within the system are understood.

One of the key concepts of systems thinking is that reality is more complex than the linear cause and effect method that we have been taught to apply, systems thinking is founded on the idea that causality is circular with cause and effect being influenced in both directions creating a feedback loop that either amplifies or reinforces actions or stabilises or delays processes in the system (Senge, 2006). Given the systems view that we are part of a living whole interacting and influencing each other and other systems it becomes apparent that everyone shares responsibility for the problems generated by a system and the blaming game should therefore stop (Senge, 2006).

According to Senge (2006) one of the most important insights to come from the field of systems thinking is that certain management problems are not unique and a relatively small number of these system archetypes are common to a very large variety of management situations. Senge (2006) proposes that the mastering of system archetypes reconditions the perceptions of managers enabling them to see the structures at play and to identify leverage points; and they could also help to change the thinking that produced the problems in the first place. Two system archetypes that recur frequently are referred to as the "limits to growth" and the "shifting the burden" archetypes (Senge, 2006). The "limits to growth" archetype is characterised by situations where organisations, working groups and even individuals undertake processes to achieve a specific result, typically this creates a spiral of success that inadvertently creates effects that slow down the success and limits the growth (Senge, 2006). The "shifting the burden" archetype is characterised by people and organisations treating the symptoms of problems rather than the underlying problems, the symptoms tend to be ameliorated whilst the underlying problem grows worse, usually unnoticed because the

symptoms clear up and the system loses whatever abilities it had to solve the underlying problem (Senge, 2006).

Systems thinking provides a foundation for looking at the world anew, providing a conceptual cornerstone for building people and organisations that are capable of understanding reality in all of its ambiguity and complexity and creating solutions that can address the underlying causes of societies intractable problems like waste management (Senge, 2006). Already a systems perspective has enabled many societies to accept that what were once considered to be waste are actually resources that can still add value. This has led to a shift in focus from merely collecting all waste efficiently and then burying it in the most sanitary of landfill sites never to be seen or smelt again to a situation where increasingly the focus is on the management of natural resources throughout the production and consumption system. Thinking in terms of systems has assisted in showing the interconnection between climate change and waste management. By focussing on making and wasting we have used ever increasing amounts of fossil fuel that has led to global warming, whilst burying large amounts of organic waste has led to the release of methane gases which are more potent as a greenhouse gas than carbon dioxide.

2.10 Complexity

Scharmer (2009a) identifies three types of complexity present in the world today that require deeper levels of thinking to cope with. Dynamic complexity is characterised by cause and effect being distant in space and time, an example of this would be the dynamic complexities of global warming where the emissions of carbon dioxide is one cause but the greenhouse effects we observe today are caused mainly by emissions from the 1970's and 1980's (Scharmer, 2009a). If the cause and effect chain is long, the dynamic complexity will be higher and the management implication is that a whole system approach that pays attention to cross system interdependencies will be the right approach to problem solving (Scharmer, 2009a). Scharmer (2009a) points out that once dynamic complexity is addressed the most likely complexity to emerge will be social complexity which is characterised by conflicting interests and worldviews amongst diverse stakeholders. The greater the social complexity the more important it is that a multi stakeholder approach to problem solving is used (Scharmer, 2009a). According to Scharmer (2009a) emerging complexity is characterised by disruptive patterns of innovation and change in which the future cannot be predicted and addressed by

patterns of the past. In situations of emerging complexity the solution to the problem is unknown; the problem statement is still unfolding and who the key stakeholders are, is unclear (Scharmer, 2009a). Scharmer (2009a) recommends that such hyper complexity within a system requires organisations and individuals to develop the capacity to operate from deeper levels of thinking and learning.

2.11 New Ways of Thinking about Learning

Senge et al (2007) argues that all learning is about how we interact in the world and the types of capacities that develop from our interactions. According to Senge et al (200) the key difference is the depth of our awareness and the consequent action, if our awareness never reaches beyond superficial events and current circumstances, our actions will be reactive. On the other hand if we penetrate more deeply to see larger wholes that generate what is and understand our own connection to this wholeness, the effectiveness of our actions can change dramatically (Senge et al, 2007). Most learning and change methods are based on the Kolb learning cycle that follows a sequence of observe, reflect, plan and act, such learning cycles are grounded on the basis of learning from the experiences of the past.(Scharmer, 2009a). Figure 2 provides a representation of the traditional Kolb learning model.

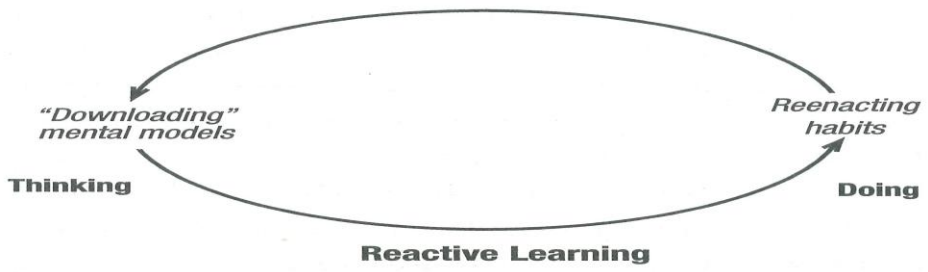

Figure 2 - Traditional Learning model (Senge et al, 2007)

The hyper complexity of our world today is increasingly creating situations where the past cannot be relied upon to understand and develop the future (Scharmer, 2009a). The implication of this is that reactive learning models which function on the basis of people downloading habitual ways of thinking and of seeing the world with the familiar categories they have become comfortable with need to make way for deeper levels of learning and awareness (Scharmer, 2009a). These deeper types of learning processes is characterised by learning from the future that has not yet happened and from continually discovering our part

in bringing that future into being (Senge et al 2007). According to Scharmer (2000, 7) the traditional learning model "is no longer effective as the single source of learning because the previous experiences embodied in the leadership team are no longer relevant to the challenges at hand and the experiences that would be of relevance are not yet embodied in the experience base of the leadership team. The issue for management is how to learn from experience when the experience that matters most is the not-yet-embodied experience of the future". Scharmer (2000, 2004, 2009a) refers to this new form of learning as "Presencing", the ability to sense, embody and enact emerging futures. This new type of learning is founded on the basis of suspending pre established mental models, moving to seeing the whole system and the role all stakeholders within a system are playing to create the system that affects their lives in a negative manner and then starting to connect with the highest potential future that wants to emerge in that system (Scharmer, 2009a). Figure 3 provides a representation of these deeper learning levels.

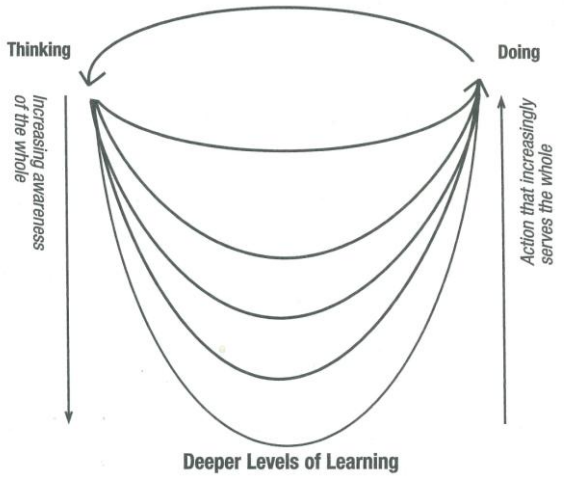

Figure 3 – Deeper Levels of Learning (Senge et al, 2007)

2.12 Organisational and Inter-Organisational Learning

Nonaka (2004) argues in his theory of dynamic organisational knowledge creation that knowledge held by individuals and organisations can be enlarged and enriched through a spiral interactive amplification process between tacit and explicit knowledge. Nonaka (2004) describes tacit knowledge as being developed by human beings through their life experiences; human beings seem to form mental models of their perceptions and definitions of the world based on their beliefs, paradigms and viewpoints. Explicit knowledge on the other hand

maybe referred to as the knowledge of rationality which is formal and codified (Nonaka, 2004). Organisations cannot create knowledge without individuals, the learning organisation manages processes whereby tacit knowledge is transferred between individuals in teams through socialisation and dialogue to create new organisational knowledge whilst explicit knowledge is also through similar socialisation processes between individuals, combined and transferred to create new explicit knowledge (Nonaka, 2004). The process whereby individuals internalise explicit knowledge by converting it into tacit knowledge is the traditional learning model, Nonaka (2004) however observes a further knowledge conversion process whereby tacit knowledge is shared and accepted by individuals leading to the creation of explicit knowledge through an externalised process. In this way knowledge creation is therefore an upward spiralling process of interaction between explicit and tacit knowledge between individuals, groups, organisations and society (Nonaka, 2004).

According to Nonaka (2004) learning organisations create fields for such knowledge interactions to occur usually through teams. Organisational knowledge creation seems to be speeded up by creative chaos, this refers to periods when a real crisis is faced requiring new knowledge to solve the problem faced (Nonaka, 2004). Nonaka (2004) proposes the creation of hypertext organisations to maximise knowledge creation within an organisation, a key design feature of this type of organisation is the circular movement of organisational members who are the source and subject of organisational knowledge creation and the key feature of management capability would be the extent to which it can create organisational knowledge in a continuous and swift manner. Nonaka identified three key characteristics that are common to successful knowledge creating companies; firstly knowledge creating processes enjoyed a physical place, a social mental place where a social context and trust was provided as well as a shared purpose and vision amongst the knowledge creators (Scharmer, 2009).

Senge (2006, 3) describes a learning organisation as a place "where people continually expand their capacities to create the results they truly desire, where new and expansive patterns of thinking are nurtured, where collective aspiration is set free and where people are continually learning how to learn together". According to Senge (2006, 4) organisations that will excel in the future are those that are able to "discover how to tap into people's commitment and capacity to learn at levels of the organisation" and to move away from one

person learning for the entire organisation. Senge (2006) identifies five disciplines that would need to be developed within people in order to create truly learning organisations, these include:

1. People should have the ability to utilise systems thinking approaches;

2. People should cultivate high levels of personal mastery whereby they are able to realise the results that matter most deeply to them;

3. People should be conscious of the effect of their mental models, they should be able to bring their mental models to the surface and hold them rigorously to scrutiny and allow them to be influenced by other mental models;

4. People within an organisation should hold a shared picture of the future they are trying to create;

5. People need to belong to teams where they are able to suspend their individual assumptions and think together, this type of team learning is able to discover insights not attainable by individuals.

2.13 The Theory U

According to Scharmer (2009a, 5) the Theory U "delineates a social technology of transformational change that will allow leaders in all segments of our society, including in our individual lives to meet their existing challenges.

The Theory U is founded on the proposition that human beings have a source from where their actions, intentions and attention arises and that the social systems within which human beings live in, is constantly being created by human beings (Scharmer, 2009a) . According to Scharmer (2009a) the context or the quality of these social systems is determined by how members of the system attend to a situation, this attention is determined by the inner sources from which human attention originates. According to Scharmer (2009a) the place from which human beings operate from is a blind spot because it is an invisible dimension of our social system, human beings cannot see the source from which they operate from and nor are

they aware of the place from which their attention and intention originate. Scharmer (2009a) proposes that one of the critical factors in undertaking transformational change within people and organisations would be the interior condition of human beings; this would require an understanding of the sources from which human beings operate from. Given that our attention, intention and actions as human beings create the social reality that we experience, if we can begin to understand how the field of our attention or our blind spot works, then we can begin to make profound changes in the world (Scharmer, 2004). According to Scharmer (2009a) the essence of leadership and one of the most important leverage points for shifting all levels, sectors and systems within our complex world would be for human beings to become collectively aware and change the inner place from which they operate from. Scharmer (2009a) refers to the source of human attention and intention as the field structure of attention and proposes that there are four different layers of attention and that each gives rise to a different quality of attention.

According to Scharmer (2009a) the first layer of attention is attending to world from inside one's organisational boundaries so that I attend to and perceive based on my habitual ways of seeing and thinking. According to Scharmer (2009a) the second layer of attention is from the periphery of one's organisational boundaries so I would pay attention to disconfirming data and engage in debates over diverging views. According to Scharmer (2009a) the third layer of attention is from beyond one's organisational boundaries, so I would dialogue with others in order to think together from divergent perspectives, a connection with another person or a whole system is made and we are able to sense the system and forget about our own agenda. According to Scharmer (2009a) the fourth layer of attention is from the emerging whole, the future that is seeking to emerge, so I see the world from a surrounding sphere, a place that allows the emerging sphere to come into being. I now have the capacity to redirect the beam of attention and intention across all levels and fields with the capacity to shift the place from which attention, intention and action originate (Scharmer, 2009a). The significance of the sources of our attention is that, depending on which source we operate from we effect and facilitate different social dynamics and create the system or society that we live in (Scharmer, 2009a). According to Scharmer (2009a) every social system and social action can be performed and enacted from the four different sources of attention but most human beings and systems tend to operate only from the first two layers of attention resulting in people and systems becoming stuck in re-enacting past patterns, engaging in debate over diverging views

and using quick fix solutions rather than thinking together and bringing into being the highest potential future of the system.

Scharmer (2009a) proposes that the greater the levels of hyper complexity within a system, the more critical it is for attention to originate from the third and fourth layers of attention which enable profound change and renewal. According to Scharmer (2009a) for profound change and innovation to occur within complex systems, three instruments viz. the open mind, the open heart and the open will must be used by human beings to navigate into the deeper layers of the field structure of attention. The open mind must enable human beings to access their intellectual capacity to see with fresh eyes and suspend habitual ways of thinking, the open heart must enable human beings to access emotional intelligence in order to see different contexts and to sense the system and the open will must be used to let go of old identities and intentions in order to connect to an emerging future field of possibility (Scharmer, 2009a).

According to Senge (Scharmer 2009a) the Theory U embodies the view that humanity is not powerless to alter the dominant trends of the industrial age that have caused climate change, spreading poverty and political paralysis. Senge (Scharmer, 2009a) suggests that the future that humanity collectively faces can be very different from the past because alternate social structures can be created once habitual ways of thinking and acting give way to deeper ways of attending to the world. Scharmer (2009a) proposes that in order to undertake profound change and innovation in complex systems a process of moving through seven cognitive spaces arranged in a U formation needs to be attained. Figure 4 displays the seven cognitive spaces viz. downloading, seeing, sensing, presencing, crystallising, prototyping and performing along with the six thresholds (suspending, redirecting, letting go, letting come, enacting and embodying) that need to be crossed in order to navigate through each of the deeper cognitive levels.

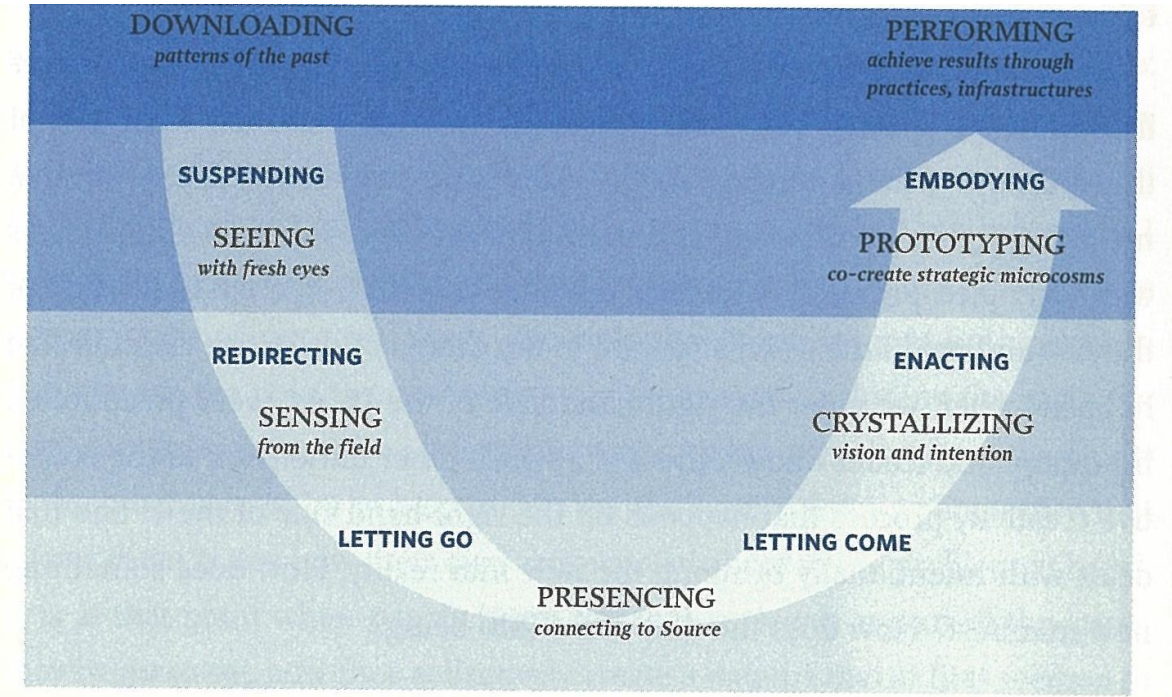

Figure 4 – The Complete U – The Six Inflection Points (Scharmer, 2009a)

According to Scharmer (2009a) to move from downloading ways of attending to the world to sensing the system, habitual ways of thinking will need to be suspended and redirected, causing people to operate from the third layer in the field of attention. In order to learn from the highest possible future that wants to emerge in any system people would need to let go of their old intentions and connect to the future that wants to emerge through allowing a shared vision and prototypes of the future to be created through attending to the world from the fourth layer of attention. In this way the Theory U integrates the field structure of attention with cognitive processes aimed at creating profound changes in people and systems.

2.14 The Five Movements of the U

According to Scharmer (2009a) to lead profound change requires shifting the field structure of attention from which an entire system operates and this can only be done in a collaborative manner. Scharmer (2009b) suggests that the profound economic, environmental and social disruptions of our time require leadership that can respond in new ways, yet the leadership of today focuses on individual – person -centric leadership whilst the challenges of today require collective system wide transformation. Real leadership today would be the capacity of a system or a community to co sense and co create its future at it emerges (Scharmer, 2009b). Scharmer (2009a) identifies five movements that need to be performed by players in

a system wanting to undertake profound systemic wide change and renewal. Figure 5 provides a representation of the five movements of the U process.

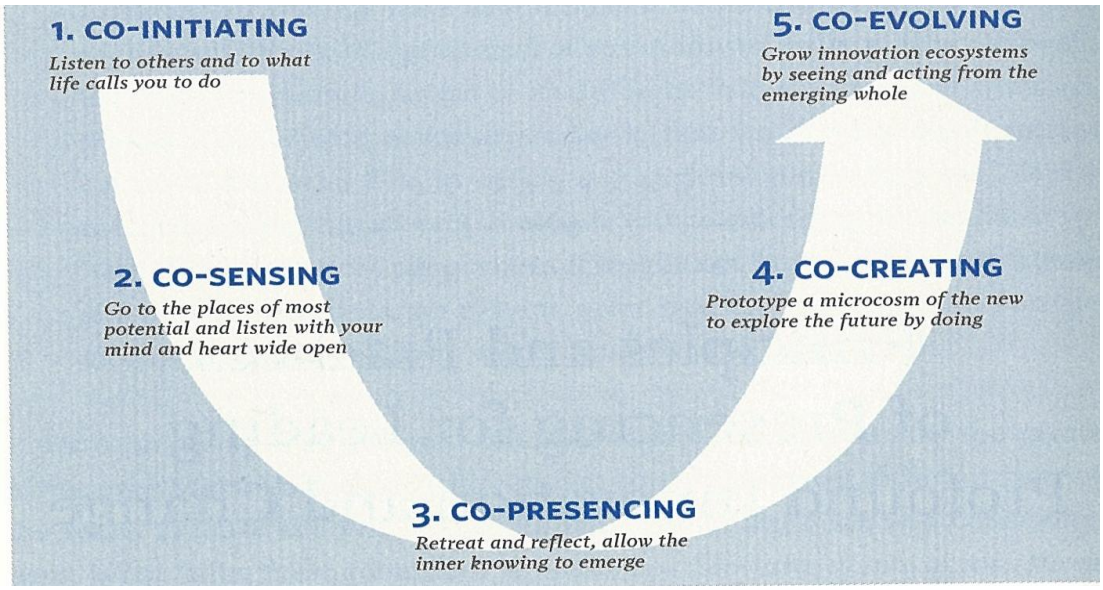

Figure 5 – The Five Movements of the U (Scharmer, 2009a)

According to Scharmer (2009b, 5) there are seven enabling conditions that can ignite a group of people to take effective collective action to change their current system to bring forth futures they desire, these include: "a shared desire to innovate amongst senior leaders of organisations, the formation of a diverse microcosm of players that mirrors the key stakeholders of the larger whole ,dialogues with inspired and remarkable persons who have changed systems, deep diving journeys that take the group to the edges of the system where they can experience it through the eyes of marginalised stakeholders, stillness and deep reflection practices that allow people to connect to the sources of inner knowing to discover who they really are and what they are here for , rapid cycle prototyping projects that provide safe practice fields to link the intelligence of the head, heart and hand and a support infrastructure that helps move the projects with the best results from the prototyping into the next stage of institutional innovation". Figure 6 provides a complete walk of a "U Tour" summarising the action principles and practices that enable systems to collectively shift the inner place from which they operate and to learn from the future.

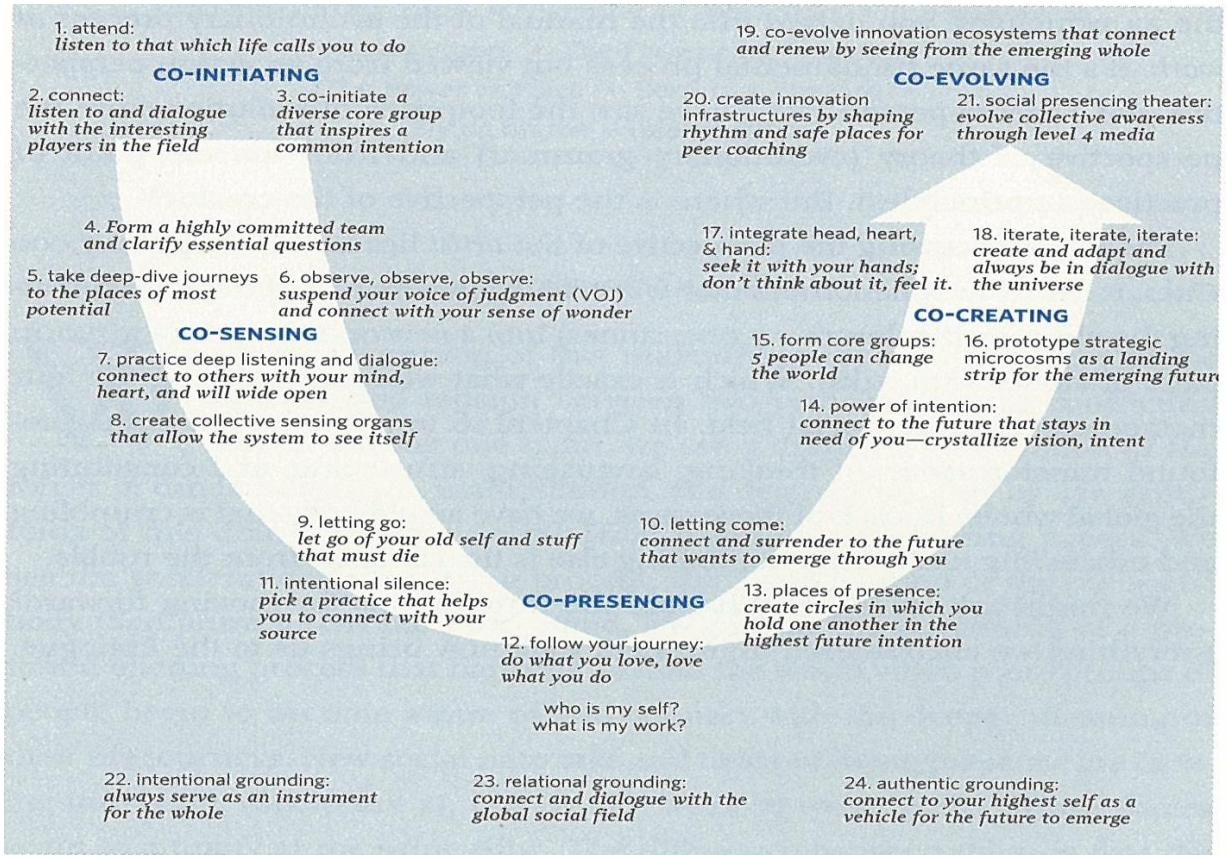

Figure 6 – The U Process (Scharmer, 2009a)

2.15 Absencing

Scharmer (2009) maintains that the bigger the gap between external systemic complexity and interior capacity to access deeper levels of thinking like presencing and crystallising new visions and intentions, the more likely a system or society will go off track and revert to a destructive space characterised by absencing. Scharmer (2009) maintains that unfortunately a defining feature of our time is the existence of both presencing and absencing forces and that both are path of a single evolutionary movement.

Scharmer (2009) defines the cycle of absencing as starting from blinding or institutional ignorance where the leaders in a such system are stuck in the ideology of a single truth and are unable to recognise anything new, they proceed to isolate themselves from parts of reality that do not fit with their ideology. According to Scharmer (2009a) the leaders in such a system proceed from institutional ignorance to institutional arrogance through desensing processes whereby they are unable to see themselves from the perspective of others and resort to blaming others for the problems they face, instead of seeing that the collective creates the system that all the players find themselves in. Such systems proceed into an absencing cycle,

where leaders in the system put their egos and interests at the centre and exploit the system for their own interests shutting of the capacity of the system to connect to its highest future possibility.

Scharmer (2009a) suggests that during the absencing cycle leaders are under illusions that their path is the only correct one and engage in disinformation, intrigue and violence to control collective thoughts and actions, in the process they destroy social norms, values and stifle innovation. According to Scharmer (2009a) this cycle of absencing eventually leads to institutional or social collapse, the Nazi era in Germany and the collapse of the East German state in 1989 are cited as examples of absencing cycles (Scharmer, 2009a). Figure 7 provides the cycle of absencing and presencing in greater detail. Scharmer (2009a) indicates that the dynamics between presencing and absencing are dialectical and non linear and that these two cycles gives rise to the phenomenon of the social field, this underlying field tends to show up on a very frequent basis in everyday social life, and due to the non linear relationships one cycle can very easily flip to become the other cycle. According to Scharmer (2009a) most people want to operate from the space of creative emergence yet the organisations they work at or the societies they live in seem to be firmly in the grip of the cycle of absencing and destruction.

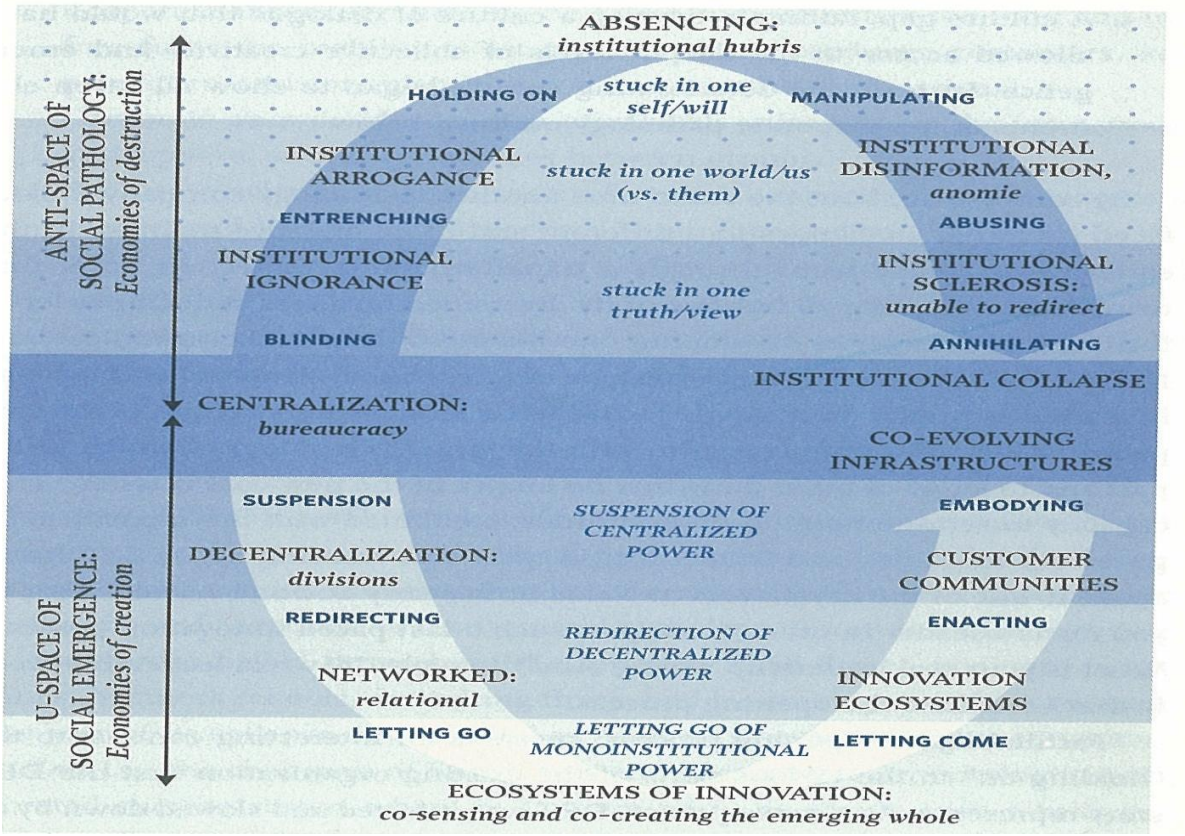

Figure 7 – The Cycle of Absencing and Presencing (Scharmer, 2009a)

2. 16 Scenario Planning – The Dinokeng Scenarios

Given the importance attached to learning from the future in the Theory U it is necessary for the literature review to briefly examine plausible scenario planning processes undertaken within South Africa. By examining possible South African futures it will help to deepen understanding on the key trends, drivers, opportunities and risks the future could potentially have on the highest possible future of the Msunduzi waste management system. Senge et al (2004, 10) reports that "we've learned from years of scenario-planning exercises that imagining alternative futures, even negative futures, *can* actually open people up. Used artfully, scenarios can alter people's awareness of their present reality and catalyze profound change. In the mid-1980s, five years before Nelson Mandela was released from jail, citizens in public forums throughout South Africa confronted "the low road" and "the high road" – two scenarios about the consequences of, respectively, maintaining or stopping the country's apartheid policies. The key to making potentially fearful futures generative is to see that we have choices and that our choices matter".

Between August 2008 and February 2009 a group of diverse South Africans came together to develop scenarios about possible future pathways that South Africa might take, they collectively agreed that, "scenarios are not predictions, they describe possible future paths ...and all of them depend to a great degree on the quality of leadership in government and in society as a whole and on the quality of the relationship between citizens and government" (Dinokeng, 2009, 15). Three possible scenarios were developed viz. walking apart, walking behind and walking together. Figure 8 provides a summary of these scenarios.

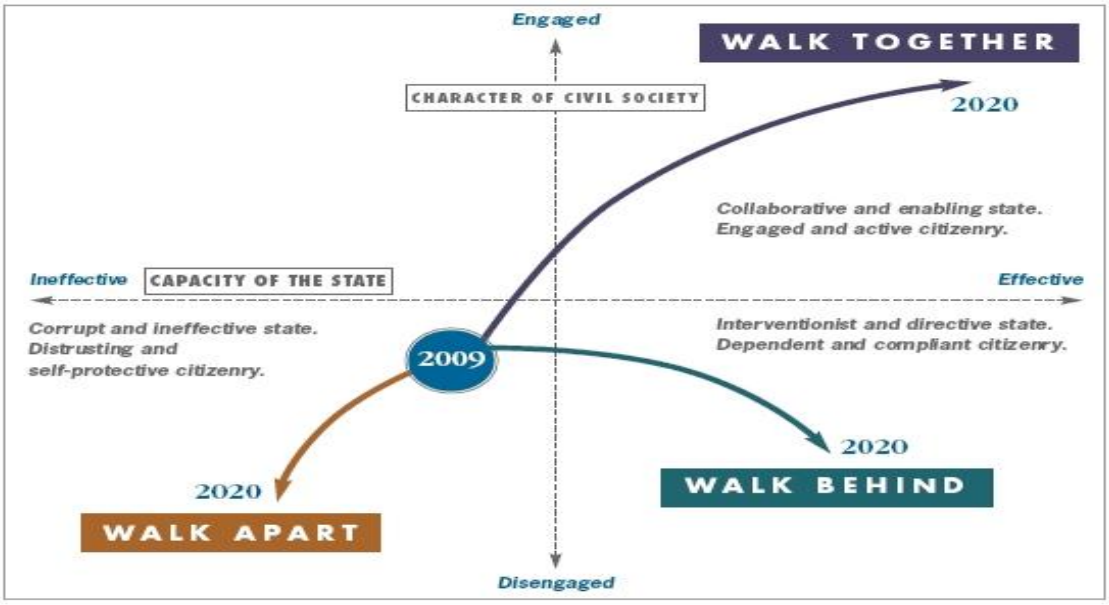

Figure 8 – The Dinokeng Scenarios (Dinokeng, 2009)

2.16.1 Walking Apart Scenario

In this scenario the country continues on the same path we are on today with our pressing problems like unemployment, poverty, safety and security, poor public health care and education worsening and government being unable to deliver because it fails to appoint the most competent people to the public service (Dinokeng, 2009). Government tries to address service delivery protests by increasing social grants instead of addressing cronyism and corruption, so the situation worsens, government clamps down on protests and South Africa moves from a developing democracy to an authoritarian state (Dinokeng, 2009). The message of this scenario is that if we carry on the way we live, we will all experience rapid disintegration and decline (Dinokeng, 2009).

2.16.2 Walking Behind Scenario

This scenario involves the state intervening actively in the economy through large infrastructure projects and through support of state owned enterprises to create more jobs and deliver services (Dinokeng, 2009). This scenario requires the state to borrow large amounts of money and when the economy declines the state is forced to increase taxes and impose a wage freeze on civil servants which results in competent public servants leaving the state and service delivery worsening (Dinokeng, 2009). Some of the big industrial projects funded by the state turn out to be loss makers requiring the state to borrow even more money, the state ends up obtaining loans with conditions that require cutbacks in social expenditure, social discontent rises and the state imposes its will by force and our democracy is compromised (Dinokeng, 2009). The message of this scenario is that state led development cannot succeed if state capacity is weak and if the private sector and civil society is pushed aside, citizens need to guard against being complacent and expecting the state to provide everything (Dinokeng, 2009).

2.16.3 Walking Together Scenario

In this scenario our challenges are addressed through active citizen engagement, capable state and strong leadership across all the sectors (Dinokeng, 2009). In this scenario citizens take the initiative to demand improvement in the delivery of education, health care and safety (Dinokeng, 2009). Government responds by listening and engaging with society to improve the situation, business and trade unions work together to deal with unemployment, parents and teachers work together to improve education and government focuses on better service delivery (Dinokeng, 2009). The message of this scenario is that it is going to take all of us to address our challenges, citizens must hold government accountable and all sectors need to rise above their narrow self interests so that the country can get on the right path (Dinokeng, 2009).

The message of the Dinokeng scenario planning process is clear, South Africa stands at the crossroads, we have made great strides since 1994 but also many mistakes, which threaten all our futures if they are not fixed (Dinokeng, 2009). All sectors in society are not walking together at the moment, government is weak in certain critical areas and other sectors like business, labour and civic leadership have tended to focus on their own interests (Dinokeng,

2009). Our challenges can be addressed by working together with the state but we need to insist that all spheres of government account for their performance (Dinokeng, 2009).

2.17 Summary

This chapter provided an overview of the literature relating to global integrated waste management trends and practices, the new waste management policy in South Africa and the implementation challenges facing municipalities. This chapter concluded by reviewing the literature on systems thinking, organisational learning, the Theory U and the Dinokeng Scenarios which collectively propose ways of dealing with complex challenges and improving policy implementation.

CHAPTER 3 - RESEARCH METHODOLOGY

3.1 Introduction

Given that this research project seeks to obtain insights from key stakeholders within the Msunduzi waste management system on the implementation challenges they are faced with and possible strategies to improve the implementation prospects of the Waste Act, a qualitative research design will be utilised. According to Van Maanen (1979, 520) qualitative research is an "umbrella phrase covering an array of interpretive techniques which seek to describe, decode, translate and otherwise come to terms with the meaning of naturally occurring phenomena in the social world". Welman et al (2005,193) proposes that qualitative research is primarily concerned with uncovering ways in which people in particular settings "come to understand, account for, take action, and manage their situations as well as the problems and difficulties they encounter". According to Welman et al (2005) qualitative research tries to obtain an insider's view by talking to subjects or observing their behaviour in order to obtain first hand experience of the object under investigation, whilst Miles (1994) notes that qualitative research involves small samples of people researched through in depth methods like interviews and focus groups. In the case of this research project key stakeholders involved in the Msunduzi waste management system from government, business and non -governmental organisations have been interviewed using a semi structured format to obtain their insights into the challenges facing the Msunduzi waste management system as it commences to implement the Waste Act. These stakeholders have also been asked to share perceptions on the manner in which the implementation prospects of the Waste Act can be improved, this information has been recorded, analysed, interpreted and used to develop strategic actions that the stakeholders could utilise to improve implementation prospects within the Msunduzi waste management system.

3.2 Research Methodology

According to Welman et al (2005) research is a process of using scientific methods to expand knowledge in a particular field of study. For knowledge to be deemed scientific it must be obtained through systematic observation rather than selective observation and the process must be controlled in order to ensure that alternative explanations for the results obtained have been systematically eliminated (Welman et al, 2005). The manner in which the results have been obtained must be replicable so that the conclusions reached can be interrogated by

the scientific community (Cary, 1998). According to Welman et al (2005) research is undertaken to define reality through describing how things are or to explain why things are they way they are and to make predictions on phenomena such as human behaviour. Welman et al (2005) suggests that research is undertaken either through deductive or inductive processes; deductive research involves the development of theory and the testing of such theory for validity and truth value through empirical observation whilst inductive research on the other hand systematically observes phenomenon in order to unravel relationships and patterns in order to eventually develop concepts and theories.

There are two main approaches to research, the qualitative and the quantitative methodology. This research project will be undertaken within the framework of the qualitative research methodology which is concerned with understanding human behaviour from the perspectives of the people involved, seeking to establish the socially constructed nature of reality through flexible and explorative methods that enable the researcher to probe the context to develop a deeper understanding of what is being investigated (Stainback, 1984, Cary, 1988, Welman et al, 2005).

3.3 Qualitative Research Methods

Given that the primary task of qualitative research is to uncover and explain the ways in which people in particular settings understand, account for and take action to manage their situations, the processes of uncovering and explaining such phenomena are usually based on observations of the people involved, interviews with the people involved in a phenomena and analysis of documents relating to the phenomena (Welman et al, 2005). Qualitative researchers tend to anlayze their data inductively using case study approaches whereby research is directed at understanding the uniqueness and idiosyncrasy of a particular case (Cary, 1984). According to Welman et al (2005) a single bounded system, usually a social system, is demarcated and through participant observation, focus groups, structured and unstructured interviews and documentary analysis. The researcher then defines and explains the phenomena being observed whilst through the use of inductive approaches identifies "recurring patterns and consistent regularities" in order to propose causal explanations and conclusions (Welman et al, 2005,194).

3.4 The Role of the Researcher

The qualitative researcher will constitute the primary research instrument dealing with subjective data that is produced in the minds of the respondents, the researcher must therefore "observe without affecting that which is being observed" (Welman et al, 2005,8) and have the insight to be detached from yet highly involved with the object of the study (Welman et al, 2005). Yin (1994) identifies a number of requirements for a researcher to be successful within a qualitative research approach, these include extensive background knowledge, an unbiased and flexible approach and the ability to ask the right questions and correctly interpret the answers whilst both Jocher (2006) and Stake (1995) emphasise the value of clear and concise descriptions of all observations.

3.5 Validity and Reliability

One of the main problems with qualitative research involves the subjectivity of the researcher in interpreting observations and drawing conclusions. Lincoln (1985) proposed four ways of defending qualitative research from accusations of lacking in academic rigour; these include establishing truth value, applicability, consistency and neutrality. In terms of establishing internal validity and truth value Lincoln (1985) proposes inviting subjects to evaluate data and analysis, proper recording of respondent's data and the use of different sources through triangulation processes. Lincoln (1985) also proposes that testing for external validity within qualitative research is problematic and that qualitative research conclusions provide only a working hypothesis for other times and contexts provided that there is a degree of similarity between contexts. Welman et al (2005) proposes that reliability relates to the credibility of the findings and whether the evidence and the conclusions will stand up to scrutiny, the test would be to duplicate the procedures, analyses and conclusions so that another researcher should be able to come to a comparable conclusion after evaluating and interpreting the sources. Yin (1994) suggests that qualitative researchers must use multiple sources when collecting evidence, establish a chain of evidence and develop transcripts of interviews in order to reduce claims of subjectivity. Neysmith (2008) indicates that case study based research may not have high external validity but instead focuses on assisting those under study to improve their situations.

The researcher is a role player within the Msunduzi waste management system and has had to take great care to be unbiased and neutral during the research process. Some of the responses

given by the subjects interviewed are likely to be affected by the dynamics within the Msunduzi waste management system and the author's role in that system.

3.6 Research Design

The research design is primarily concerned with two aspects, firstly how the research participants will be selected and the methods to be used to collect information from research participants.

3.6.1 Sampling

The research problem focused on the Msunduzi waste management system , a purposive sample consisting of at least 20 key stakeholders from different government spheres, municipal trade union sector, organised business sector , non - governmental organisations sector and waste management specialists working within and affected by the waste management system was originally identified as part of a purposive sample. .The interview process was undertaken during a six week period and a total of twenty eight interviews were conducted with representatives from the different sectors. Appendix A identifies the different organisations sampled and indicates where possible the employment levels of the representatives interviewed. Purposive sampling has been selected over random sampling approaches because social processes have a "logic and coherence that random sampling can reduce to uninterpretable sawdust" (Miles, 1994, 27). Qualitative researchers usually select individuals as key informants based on their position and experience within the context being researched; the sample selected for this research was based entirely on those criteria.

Representatives from the MM were selected on the basis of positions held within the municipality and the span of influence over the waste management function. A total of six officials from the MM were originally selected for the sample and requests for interviews were made telephonically and via email. Included amongst the sample of six were two senior management officials responsible for waste management and four operational managers of various business units providing waste management services. Eventually a total of five senior managers and four operational level managers were interviewed with one senior manager being non responsive to the request for an interview. In order to ensure the different political perspectives on waste management were included in the research process a single political representative with responsibility for waste management issues from the ANC which

is the ruling party within the MM and the DA which is official opposition within the MM were requested to provide an interview. Eventually two representatives of the ANC and one from the DA were interviewed. Representatives of the two trade unions active in the municipal sector viz. SAMWU and IMATU were also included in the original sample, both representatives were eventually interviewed.

The organised business sector was sampled in the following manner; two representatives were interviewed from the organised business sector represented by the Pietermaritzburg Chamber of Business whilst two representatives were interviewed from the waste management business sector. The non governmental organisations that where included in the sample are Groundwork, the Duzi Umgeni Conservation Trust (DUCT), the Built Environmental Support Group (BESG) and A Rocha South Africa. Groundwork has been actively involved in national advocacy efforts aimed at improving waste management practices on landfill sites in order to avoid pollution and to improve the status of wastepickers for a number of years (Groundwork, 2008) whilst BESG has pioneered community based refuse collection projects to poor communities within the MM (Jogiat et al, 2003, Fransen et al, 2004). DUCT has pioneered river care services within the MM which focus on collecting waste that is dumped in rivers and has also advocated for improved waste management services within the MM (DUCT, 2007) whilst A Rocha South Africa have sought to develop awareness around the impacts poor waste management practices have on ecosystem services within the MM (Goddard, 2009). Representatives from all four NGO's were interviewed.

The sample also included a representative from the Department of Agriculture, Environmental Affairs and Rural Development (DAEARD) since the department has been active in efforts to improve waste management services within the MM and has a legislative mandate to monitor the implementation of national norms and standards at a municipal level. The Department of Water Affairs (DWA) was also been included in the sample as they have been involved in regulating and monitoring waste disposal sites through permit approval and auditing processes for many years and have been instrumental in addressing operational challenges confronting the MM at the New England Road landfill site. The sample also included local experts from the waste management sector who have been intensely involved in planning, implementing and prototyping waste management projects within the MM and the KwaZulu Natal province.

3.7 Research Techniques

The research process made use of three research techniques to understand the waste management system within the Msunduzi Municipality and to complete the research process. These included documentary analysis, participant observation and semi-structured interviews.

3.7.1 Documentary Analysis

A study of relevant literature was undertaken to understand the new national waste management policy. This involved going through legislation, policy documents, academic journal articles and research papers published to support the development of a national waste management strategy. In order to understand the waste management system within the MM three different sources of information was used. Literature from integrated waste management planning processes in 2004 and 2009 were reviewed as well as reports prepared for the Community Services Portfolio Committee by MM waste management officials for the period January 2006 to September 2009. The final source of documentary information on the MM waste management system was a series of articles published on waste management issues in The Witness newspaper from January 2005 until July 2009. This triangulation process tried to ensure that different sources of information was used to define and explain the phenomenon under research. Information from the Management Committee of the MM chaired by the Municipal Manager would have provided a wealth of information on the week to week operational challenges faced by the WMU and the LSU but attempts to obtain access to this information were unsuccessful. In order to understand concepts and theories for transforming complex social systems and improving policy implementation prospects literature related to systems thinking, organisation learning, complexity, Theory U and scenario planning were also reviewed.

3.7.2 Participant Observation

The researcher was employed by the uMgungundlovu District Municipality as a Manager responsible for solid waste management services. Since 2008 the researcher was responsible for the management of an integrated waste management planning process involving key stakeholders within the Msunduzi waste management system whilst the researcher was also a participant at the District Waste Management Forum since December 2006. These processes have provided opportunities to gather information pertinent to this research and to observe

the various stakeholders in action within their context. From time to time the research process will be informed by observations made by the researcher from conversations with key stakeholders and information from meetings attended by key stakeholders and the researcher. Welman et al (2005) indicates that researchers involved in participant observations perform a dual role of experiencing the activities of the group and observing and recording the experiences. Welman et al (2005) cautions that such a role could lead to conflicts between the roles of participant and observer where the researcher becomes so involved with the stakeholders that he or she fails to notice developments that could have been detected by outsiders immediately. Welman et al (2005) recommends that the researcher should take notes and create written reports of observations in order to improve reliability of the data.

3.7.3 Semi Structured Interviews

Monette (2002) suggests that despite interviews being time consuming they offer far greater control and flexibility in terms of gathering the required information. Stake (1995) proposes that interviews are ideally suited to uncovering the multiple realities held by the different stakeholders and offer opportunities for interacting with stakeholders which can only deepen a researchers understanding of a context. According to Welman et al (2005) semi-structured interviews offer the researcher a flexible measuring instrument in the research process since the researcher has a list of themes and questions to be covered and may vary these from one interview to the next. The semi-structured interview offered an ideal measuring instrument for this research project because of the different organisational contexts the various stakeholders represented and the need to tailor each interview to suit the context. The inherent flexibility of the semi structured interview also allowed the researcher to probe certain themes in order to clear up vague responses and pose additional questions in order to explore a particular theme or response (Welman et al, 2005).

The interview guide developed for this research process included possible questions for the different stakeholders to answer in order to enable the researcher to gain insights into the different perspectives held on the key research issues. The semi structured nature of the interview allowed each stakeholder to offer their insights on these broad thematic areas and then to give specific responses to the mainly open-ended questions posed by the researcher. Welman et al (2005) recommends the use of open-ended questions since the responses are

then not influenced by the researcher and a rich variety of data can be obtained provided that the questions posed take into account the subject's literacy levels and do not offend the subject. It is also important for questions to be brief and focused; the questions should also be free of ambiguity and must not encourage participants to answer in a particular way (Welman et al, 2005). Finally ethical considerations have been taken into account when drafting the questions so that no harm is caused to the research participants. In the case of this research project the research participants identities have been protected, all of them have participated voluntarily and the results have been reported truthfully.

One of the major disadvantages of the semi-structured interview instrument is that the researcher is directly involved and in control of the process and could display bias in the interview session and in the interpretation of the data. The need to take detailed notes and observations of the interview process including the audio or video recording of interviews is well documented in the literature reviewed (Lincoln, 1985, Cary, 1988 and Welman et al, 2005). In order to create a level trust amongst the research participants the researcher did not make audio or video recordings of interviews. This decision was based on the sensitivity of the research topic since subjects were being asked to identify obstacles and propose strategies to improve service delivery and subjects could evade sensitive questions if they feared their perceptions about other stakeholders could be revealed through audio recordings or interviews that were not anonymous. Bradburn (1979) found a positive link between complete confidentiality and the respondents' willingness to answer sensitive questions. Given this decision it will be critical for the researcher to take detailed notes during the interview and to write a detailed report on the interview immediately after it has been completed. This process enables the researcher to capture an accurate picture of the respondent's views, non verbal behavior, opinions of the researcher on the respondent and the interaction between respondent and researcher during the interview (Welman et al, 2005).

The interview questions were developed by the researcher and refined during sessions with the research Supervisors. The interview guide is included in the report as Appendix B. In order to detect any possible flaws in the measuring instrument and to identify unclear items a pilot study was undertaken with at least three subjects from the sample list. The pilot experience proved to be invaluable as it became clear that the interview guide contained too many questions which led to the process taking too long and the subjects becoming

exhausted. It also became clear in discussions with the research Supervisors that the interview questions focussed heavily on the first research objective which resulted in a limited focus on the second and third research objective. Given that the second and third research objectives focused on understanding the barriers and opportunities for transforming the Msunduzi waste management system and how the implementation prospects of the Waste Act can be improved within the MM, which was the central themes of the research project, the interview questions were amended to focus on these aspects.

3.7.4 Interview Procedure

Once the interview guide was refined through a pilot process the researcher contacted all the subjects identified in the sample in order to introduce the research project and to seek their participation. This was done via email or through telephonic contact. A total of 28 subjects agreed to be interviewed and all interviews were undertaken during October and November 2009. There were two non responses to the request to be interviewed; these subjects were replaced with other subjects who could ensure the sample remained representative of the stakeholders within the Msunduzi waste management system. The researcher started each interview with an introduction of the research objectives and indicated the ethical principles underpinning this research project. Welman et al (2005) suggests that the interviewer must gain the trust of respondents by being honest and frank, assuring the subject of complete anonymity and behaving neutrally despite what is being said by the respondent. Given the researcher's historic and current role within the waste management system of the MM it was vital that the research participants were assured of their anonymity and the researcher's neutrality during the research project. The researcher had to exercise maturity and skill to ensure that a neutral stance was demonstrated to the subjects and that the research findings lacked bias that can be attributed to the researcher's role within the Msunduzi waste management system.

The interview questions started with a very general enquiry into the new waste management policy before proceeding to look into the respondents views regarding the implementation prospects of the new policy within the MM. The final part of the interview provided a basic description of the Theory U and proceeded to elicit responses from the subject on ways of improving the implementation prospects within the general framework provided by the Theory U. The interviews generally lasted for an hour and the researcher then spent an

average of half hour per interview on the day of the interview to document the contents of the interview.

3.8 Data Interpretation and Analysis

After the completion of each interview the researcher converted the interview notes into detailed reports which included the responses given by each interview subject to the questions posed, any other comments made by the subject relating to the research as well as observations made by the researcher of the interview process. Stake (1995) suggests that these records of the interview could be more valuable that the interview notes on the basis that the interview report constitutes an interpretive commentary of the interview instead of just raw data. The interview report also assists the data analysis process since an intelligible product has been created which can be read, edited, analysed and commented upon (Welman et al, 2005). According to Yin (1994) analysing qualitative research data is difficult because the techniques are not well defined.

According to Welman et al (2005) one of the main outputs for analysing qualitative data is to identify the dominant themes that occur in the data whilst the coding of data attaches meaning to raw data through tags or labels that then enable data to be categorised within the different thematic areas. Theme identification and coding processes enabled large amounts of data collected during research processes to be reduced to manageable and understandable texts that served as a basis for further analysis and interpretation (Miles, 1994). Codes were usually developed for basic description of phenomena, interpretations of data, connecting patterns in the data and making reflective observations of the research process (Welman et al, 2005). Miles (1994) suggests that once the data has been organised into themes and coded it will be possible to display the data in a manner that is systematic and visual so that the researcher can draw conclusions. The use of long winded narrative texts is too cumbersome making it difficult to analyse the material and to see the data as a whole (Miles, 1994).

The researcher analysed the interview reports to identify dominant themes on a general and sectoral basis. The researcher then documented the different themes that were identified in order to compare and contrast the themes within each of the different stakeholder sectors and at a general level in order to identify areas of convergence and divergence. This analytical process enabled the researcher to deepen understanding of the perceptions held by the

different stakeholders in order to begin the process of documenting findings on the research questions posed.

3.9 Summary

This chapter began with a description of research in general and proceeded to describe the characteristics of the qualitative research methodology. It then outlined the research design for the current research project. The sampling process was explained and the various research techniques utilised during the research process were identified and described. This was followed by an explanation of the data interpretation and analysis process. Chapter 4 will provide an overview of the waste management situation within the MM.

CHAPTER 4 - THE MSUNDUZI MUNICIPALITY WASTE MANAGEMENT CONTEXT

4.1 Introduction

This chapter will provide an overview of the waste management issues within the MM in order to set the local context for the research process and to provide a basis from which to understand the research results.

4.2 Waste Management Issues within the Msunduzi Municipality

The city of Pietermaritzburg is located within the Msunduzi Municipality and is classified as a secondary city given its demographic and settlement profiles (SACN, 2006). A secondary city according to the South African Cities Network is a city with a population of between 250,000 to 1 million people with established commercial and suburban nodes, capable of rapid urbanisation, economic growth, growing inequality and poverty (SACN, 2006). Pietermaritzburg is the legislative capital of the KwaZulu Natal province and the second largest city in the province after Durban It is a major urban centre in South Africa with a diverse economy which includes manufacturing, services, public sector and agriculture. The population of the city has been estimated through the Community Survey undertaken by Statistics SA in 2007 at 616,730 people living in an estimated 134,390 households (MM 2009a). Eighty percent of these households live in urban environments whilst twenty percent are considered to reside in rural areas (UMDM, 2009).

4.3 Refuse Collection Services within the Msunduzi Municipality

The 2007 Community Survey estimates that 94,848 households within the MM have access to weekly refuse collection services whilst about 40,000 households do not have access to such services (UMDM, 2009). The Waste Management Unit (WMU) of the MM estimated that only 75,000 households obtain a weekly collection service and almost 59,000 households get no weekly refuse collection service (MM, 2006c). Given the different estimates it would be prudent to estimate that about 52,000 or about 40% of households within the MM do not have access to weekly refuse collection services. Half of these unserviced households are located in areas considered to be peri-urban and rural whilst a significant portion of the remaining unserviced households are people living in informal settlements and people living in newly developed low cost housing settlements (MM, 2006c).

Of the 75,000 households that are estimated by the WMU to obtain a weekly service, 10,000 are provided with the service by private contractors employed by the MM whilst the remaining households obtain refuse collection services provided by the municipality (MM, 2007a). The MM decided in 2006 that it would progressively extend refuse collection services through the use of private contractors who would be required to collect refuse, clean up illegal dumping, provide brush cutting services on public open spaces and maintain stormwater system infrastructure (MM, 2006c). Since the commencement of the 2007/2008 financial year no funding has been allocated to extend refuse collection services through this approach (MM, 2007c, 2008b and 2009b).

4.4 Waste Generation Rates within the Msunduzi Municipality

The Manager of the New England Road landfill site indicated that providing accurate historical data on the amount of domestic waste generated within the MM is not possible given the poor waste management information systems that have existed at the New England Road landfill site (Naidoo, pers. com, 2009). Data is available from the weighbridge at the New England Road Landfill site for the period January 2003 to December 2007 but this data must be treated with caution given that municipal refuse compactor trucks bringing both domestic and garden waste are not weighed in on a regular basis (Lombard, pers.com, 2009). The unreliability of the available data is aptly demonstrated by the very negligible growth rates of domestic waste reported over the five year period which is inconsistent with the population and economic growth in the municipality and the lack of an effective municipal waste minimisation programme (Phelamanga, 2009). Given the problems associated with this data and the need for accurate data for planning purposes, the consultants undertaking the MM's Integrated Waste Management Plan during 2009 undertook a weighbridge information management project at the New England Road landfill Site during September 2009 in order to obtain accurate waste disposal data. The project undertook to ensure that all waste that entered the landfill site during September 2009 was weighed, classified and allocated to the different municipalities using the facility. According to Phelamanga (2009) an estimated 13400 tons of waste entered the site during September 2009, whilst the breakdown of waste entering the site in terms of general waste classification system was as follows: domestic (41%), soil cover (31%), builder's rubble (14%) and garden refuse (13%).

Despite having access to only a single month of accurate data it is possible to extrapolate a very preliminary waste per capita rate calculated on the basis of distributing the total municipal solid waste generation volume per annum amongst the residents whose waste is collected. Given the data collected and without adjusting the data for seasonal variations and escalations each resident within the MM whose waste is collected will generate an average of 297 kilograms of waste per annum or 0.810 kg of waste per capita per day. This figure is calculated on the basis that only 60% of residents in the municipality obtain a refuse collection service and soil cover material volumes are excluded from the definition of municipal solid waste. The per capita waste generation rate in Beijing in 2006 was 0.850 kg per day, Mexico was 0.917 kg per day in 2003 (Zen Shan, 2009) whilst Mumbai had a per capita rate of 0.436 kg per day in 2004 (Sharholy, et al, 2008). No data could be obtained from other South African cities to compare per capita waste generation rates.

4.5 Waste Disposal Services within the Msunduzi Municipality

The MM operates one landfill site located in New England Road which is on the edge of the Sobantu and Hayfields residential areas and adjacent to the city's booming conference, bed and breakfast node. This landfill site is classified as a large general waste disposal facility and has been operational since the 1950's. The landfill site is widely acknowledged to have been poorly run for a number of years, (Geomeasure, 2007; Oosthuizen, 2007; Groundwork, 2008; MM, 2009c; Umgeni Water, 2009.) often the lack of cover material and compaction equipment have resulted in increased risks of fire outbreaks and odour problems, the dysfunctional leachate and gas treatment facilities have led to air and water pollution whilst the difficulty controlling access to the site has led to informal waste pickers recycling on the site with associated health and safety concerns.. The poorly functioning weighbridge has often led to the municipality being unable to bill waste generators resulting in the loss of revenue and failure to apply the polluter pays principle (MM, 2009c).

An airspace study undertaken by Wilson and Pass in November 2007 estimated that the New England Road landfill site had airspace available for the next six to nine years provided that 250,000m^3 is disposed of annually (Wilson et al, 2007). These estimates did not provide for growth in waste disposal rates and the lower airspace estimate is based on a lower final landfill height demanded by local residents whilst the upper airspace estimate is based on the permitted landfill height

4.6 Recycling Services within the Msunduzi Municipality

In March 2006 the Msunduzi Municipality awarded a tender to a company called Shoretech to establish and operate a material recovery facility adjacent to the New England Road landfill site (MM, 2006c). In June 2008 Shoretech initiated a basic environmental assessment process in order to obtain authorisation to compost organic waste and separate mainline recyclables (Naidoo, pers. com, 2009). The competent authority that had jurisdiction over the assessment, the DAEA now DAEARD reported that the assessment process was never registered with DAEA as is normally the case in such processes yet an independent environmental practitioner seems to have been appointed by Shoretech since a public meeting of interested and affected parties was advertised in the local newspaper and a background information document was circulated on request (Sheard, pers.com, 2009). No additional documentation has since been circulated and according to officials within the MM the contract with Shoretech has been cancelled due to the lack of progress (Rajah, pers. com., 2009). According to Whyte (pers. com., 2009) the process of appointing a service provider to develop a material recovery facility was doomed before it got off the ground as the period of appointment was too short; the termination clauses were unconditional; and the municipality was not prepared to contribute to the development costs of the facility whilst requiring the service provider to pay a portion of the profits of the material recovery facility to the municipality who would continue to collect revenue from all waste entering the landfill site. Clearly the municipality had not undertaken feasibility studies prior to inviting service providers to propose potential recycling projects and an opportunity to establish an effective material recovery facility has been lost.

In February 2009 Mondi Paper started a pilot source separation project in the Chase Valley suburb of Pietermaritzburg in partnership with the MM and the DAEARD. The project sought to get households to separate their waste into two bags, an orange bag was provided to collect mainline recyclables whilst all non-recyclables were to be stored in normal black bags or household bins (Griffin, pers.com, 2009). The bags were sponsored by the DAEARD because the MM did not have funding to cover such costs, the orange bags are collected by agents of Mondi Paper and the MM effectively makes no financial or logistical contribution to the project (Griffin, pers.com, 2009).

The project has successfully managed to get many households in the pilot area to separate their waste as required, but building a partnership with the MM has proved to be difficult for Mondi (Griffin,pers.com, 2009). Senior managers from the WMU of the MM did not respond to emails nor return telephone calls from the Mondi project manager for a six month period starting just after the project commenced which resulted in the project partners being unable to meet to discuss issues affecting the project (Griffin, pers.com, 2009). The education and awareness drive that the MM agreed to undertake at the project inception stage was not undertaken effectively, municipal refuse collectors have also collected orange bags when it was not their function in terms of the project and the MM failed to identify emerging contractors that were meant to be given recyclable collection opportunities (Griffin,pers.com, 2009). Mondi have implemented a similar project within the Ethekwini Municipality where in the space of two years the project has reached a collection level of 400,000 households which represents 70% of all households within the municipality (Griffin, pers.com, 2009). Griffin (pers.com, 2009) attributes the success of the project in Durban to the commitment of the municipality to the process by supplying both black and orange bags, educating the public and staff about the project and making the project viable for recyclers.

4.7 Planning for Waste Management Services within the Msunduzi Municipality

An analysis of the May 2009 version of the Integrated Development Plan (IDP) of MM reveals that waste management is not a priority to the MM given that the IDP hardly mentions any of the waste management challenges facing the MM and does not indicate strategies and projects to address waste management challenges (MM, 2009a). This is hardly surprising given that the MM does not have an integrated waste management plan and has never undertaken integrated waste management planning despite the National Waste Management Strategy of 2000 calling on municipalities to undertake such planning processes.

In July 2008 the UMDM appointed the Phelamanga Joint Venture to undertake integrated waste management planning for all local municipalities within the UMDM. According to Lombard (pers.com, 2009) the planning process with all local municipalities has been characterised mainly by a general lack of interest from officials and politicians involved in the process, long delays in trying to obtain good quality information on key waste management challenges and a lack of financial management information.

4.8 The Msunduzi Municipality Waste Management Business Unit

According to the 2007/08 Annual Report of the MM, the WMU employed 322 people, of this 262 were involved in waste management service provision, a further 52 staff were employed to supervise these service delivery staff and 8 staff are involved in administration and top management functions (MM, 2008a). The organogram of the unit indicated in Figure 9 identifies four core functions performed by the unit, these include refuse collection services, street sweeping, cleansing of public facilities like toilets and taxi ranks and public education provided by the Keep Pietermaritzburg Clean Association (KPCA). The refuse collection sub unit has a 25% vacancy rate, the street sweeping and cleansing sub unit has a 44% vacancy rate and the administration and KPCA unit has a 40% vacancy rate (Reddy, pers.com, 2009). The landfill site function is not part of the WMU since the function was transferred to the Risk Management Unit in February 2009 (MM, 2009c). This is an unconventional and disintegrated institutional arrangement since waste disposal services are an integral part of waste management services. It was not possible to obtain details on the landfill site organogram.

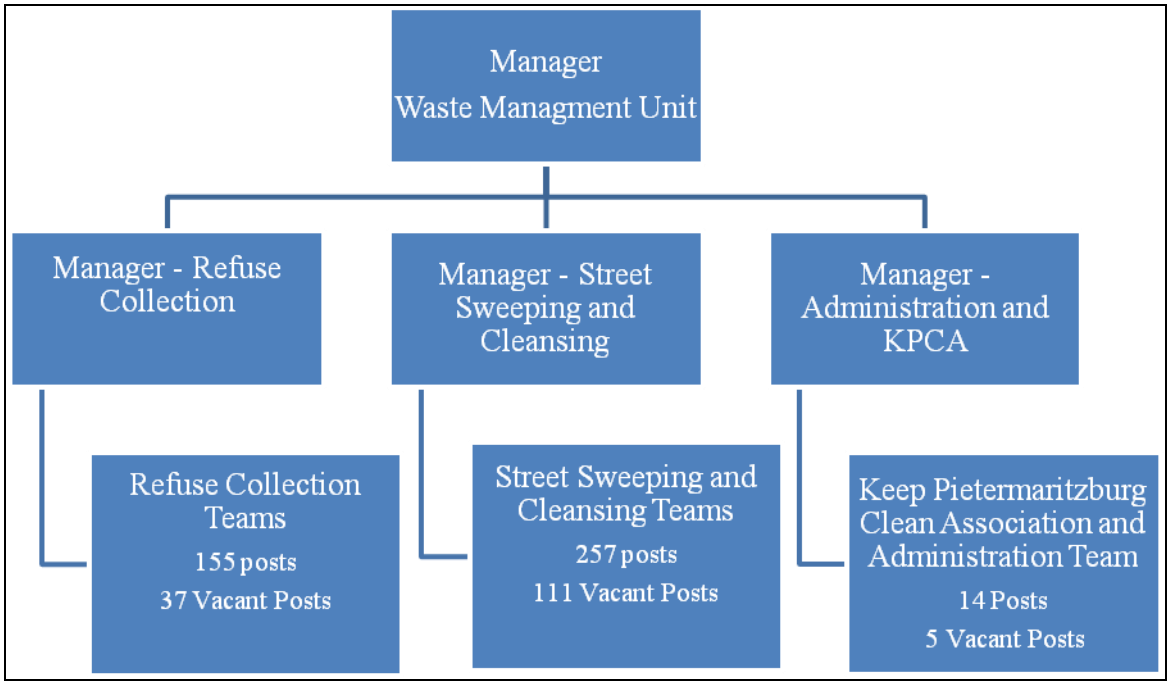

Figure 9 – Organogram of the Waste Management Business Unit (Adapted from unpublished Approved Organogram)

It is interesting to note that there are no dedicated posts within the organogram for waste management planning, waste prevention and waste minimisation activities like recycling and waste treatment. The organogram does not provide for dedicated posts to enable enforcement of waste management by - laws and for dealing with the waste management needs of big business in the city of Pietermaritzburg.

4.9 Operational Funding of Waste Management Services within the Msunduzi Municipality

An analysis of the approved operating budget of the MM for the 2008/2009 financial year has been undertaken in order to identify income, expenditure and deficit trends. According to the MM 2008/09 Annual Budget (MM, 2008b) the MM budgeted to spend R 85, 4 million on waste management services and expected to receive income of R 55, 6 million. A deficit of R 29, 7 million on expenditure was projected, this amounts to an under recovery rate of 34%. This is a significant deficit or underpricing of waste management services given that Savage (2009) has indicated that the averaged national waste management deficit or underpricing of waste management services stands at 15%. The budgeted operating expenditure for waste management comprises of 4.5% of the total budgeted operating expenditure for the MM for the 2008/09 financial year (MM, 2008b). The major contributors to waste management income are refuse collection (80%), landfill site tariffs (10%) and equitable share grants (10%) (MM, 2008b).

The major expenditure items for waste management services are staff costs at 48%, plant and vehicle costs at 20%, administration costs at 23%, costs for contracting out refuse collection services stood at 3.5% and overtime costs are budgeted at 22% of total staff costs (MM, 2008 b). A comparison of the MM waste management operational expenditure items with the averaged operational expenditure items of other secondary cities in South Africa reveals that the Msunduzi Municipality spends an average of 7% more on staff costs than other secondary cities, 4.3% more on plant and vehicle costs, 8% more on administration costs and 3.5% less on contracted refuse collection services. The data on other secondary cities used to make the comparison with MM was sourced from Savage (2009).

4.10 Capital Funding of Waste Management Services within the Msunduzi Municipality

The capital budget of a municipality gives an indication of the new infrastructure and services that the municipality intends providing and provides the clearest indication of the priorities that the municipality intends addressing during the financial year. During the 2008/09 financial year no funds were allocated on the capital budget of the Msunduzi Municipality for waste management services (MM 2008b). It is interesting to note that during the 2008/09 budget process ward councillors from across the MM where asked to identify their highest priority project, only one councillor identified a waste management project, the councillor for Ward 36 asked that the garden refuse site within his ward be improved whilst all the other councillors identified mainly with the need for new roads, halls, houses and access to sanitation services (MM, 2008b).

During the 2009/10 financial year a total of R 8, 6 million was allocated to waste management services, this represented 16% of the total capital budget allocated to the Community Services Department (MM 2009 b). The majority of the waste management capital budget during the 2009/10 financial year will be spent on developments at the New England Road landfill site (R 5, 1 million), R 1,5 million will be spent on establishing a garden refuse site at Imbali and R 1 million will be spent purchasing refuse storage containers (MM 2009 b). Funding to extend refuse collection services has not been included in the capital or operating budgets of the Msunduzi Municipality for the past three financial years whilst recycling activities have obtained their first allocation in the 2009/10 financial year with an amount of R 350, 000 being allocated to establish a schools recycling centre (MM, 2009 b, 2008 b and 2007c).

4.11 Waste Management Issues Reported to the Community Services Portfolio Committee

In order to provide a variety of different sources of information on the situation of waste management services within the MM information related to waste management issues has been analysed from the minutes of the Community Services Portfolio Committee for the period January 2006 to August 2009. This Portfolio Committee meets monthly to provide a political oversight role for the Community Services Department within which the WMU and LSU is located. During the three and half year period under analysis a total of 21 reports on

waste management issues were tabled before the Community Services Portfolio Committee. Table 7 provides an overview of the issues reported upon by senior management of the WMU and the LSU to the Portfolio Committee.

Table 7 – Summary of Issues Tabled at Community Services Portfolio Committee – January 2006 to August 2009

Waste Management Issue Reported & No. of Reports Tabled	Brief Summary of Issues Reported
Operational Challenges at the New England Road Landfill Site. 7 reports tabled to committee which comprise of 33% of all waste management issues reported during the period under review.	Appointment of a private partner to establish a gas to energy carbon emissions reduction project at the New England Road Landfill Site, May 2006 Report (MM, 2006f). Landfill Monitoring Committee Issues, June 2006 and June 2007 Reports (MM, 2006e and 2007d) Operational Challenges at Landfill Site,Oct. 2007, Jan. 2008 and March 2009 Reports (MM,2007a, 2008h and 2009c)
Refuse Collection Services Issues 7 reports tabled to committee which comprise of 33% of all waste management issues reported during the period under review.	Need to employ of additional staff to undertake refuse collection services, Aug. 2006 Report (MM, 2006d) Policy decision that refuse collection services are extended to unserviced households through outsourcing to small and medium sized external service providers, Sept. 2006 Report (MM, 2006c) Loss of private sector collection business due to operational problems, Jan. 2007 Report (MM, 2007f) Development and Establishment of a waste for food exchange project March 07, Sept.07, Feb, 08 and

	Aug.08 Reports (MM 2007e, 2007b, 2008g and 2008e)
Garden Refuse Site Issues 4 reports tabled to committee which comprise of 20% of all waste management issues reported during the period under review.	Employ additional garden refuse staff , Aug. 2006 Report (MM, 2006d) Upgrade garden refuse sites, Dec. 2006 Report (MM,2006a) Donation of wood chipper equipment, Mar. 2007 Report (MM,2007e) Proposed composting project at garden refuse site, Mar. 2008 Report (MM, 2008f)
Waste Recycling Issues 2 reports tabled to committee which comprise of 10% of all waste management issues reported during the period under review.	Appointment of a company to develop a material recovery facility at New England Road landfill site, Oct. 2006 Report (MM, 2006b) Proposed source separation project with Mondi Paper, October 2008 Report (MM, 2008d).

4.12 Waste Management Issues reported in the Witness Newspaper

Another useful source of information about waste management issues within the MM are articles reported in the local newspaper, the Witness. A total of 35 articles where written during the period February 2005 to July 2009 dealing with waste management issues within the MM. Table 8 lists the type and frequency of waste management issues reported and provides a brief summary of the issue reported.

Table 8 – Summary of Waste Management Articles Published in the Witness Newspaper

Waste Management Issue & No. of Articles	Brief Summary of Issue Reported
Landfill Site (12 Articles)	Six articles reported on outbreaks of fire at the New England Road landfill site (Saville, 2005, Bishop, 2005a, Bishop, 2005b, Mbanjwa, 2006, Bishop, 2007and Shamase, 2009a). Two articles reported on the harsh treatment meted out to waste pickers at the

	landfill site by municipal security guards (Hans, 2008a andDell, 2009a)
Recycling (8 Articles)	Two articles reported on the challenges faced regarding glass recycling (Dell, 2008a and Dell, 2009b). Two articles reported on the long delays being experienced with getting a material recovery facility project to be implemented (Naidoo, 2006 and Dell, 2008b).
Refuse Collection (6 Articles)	Two articles reported on delays in getting refuse collected due to non payment of municipal fuel accounts and breakdowns of municipal collection vehicles (Gumede, 2008e and Shamase, 2009b,). One article reported on children collecting refuse for municipal workers (Naidoo, 2007) and two articles reported on a food for waste exchange pilot project (Gumede, 2008d and Gumede 2008f)
Labour Issues (4 Articles)	Three articles reported on three strikes by refuse collectors over poor management, over time, salary grades, hire of private trucks instead of upgrade to municipal fleet (Mbanjwa et al, 2008, Louw, 2009 and Shamase, 2009b)
Illegal Dumping (5 Articles)	Three articles reported on dumping in CBD area (Gumede, 2008b, Gumede, 2008c and Douman,2008) Two articles reported on dumping into rivers (Gumede, 2008a and Still, 2008)

The New England Road landfill site operational challenges are clearly the most reported issue at both the Community Services Portfolio Committee and the Witness newspaper. An analysis of the content and timing of landfill site reports appearing in the Witness and Community Services Portfolio Committee indicates that only in a single case could it be likely that a media report appearing in the Witness could have led to a report being tabled very soon afterwards at a Portfolio Committee meeting. It is interesting to note that the lack of successful waste recycling projects within the MM is the second most reported waste management issue in the Witness newspaper over the period under review yet recycling issues are the least reported item at the Community Services Portfolio Committee. This seems to suggest that waste management issues which are not being addressed within the MM are instead being raised in the media probably as a result of growing frustrations

amongst external stakeholders. The challenges experienced delivering refuse collection services are amongst the most consistently well reported waste management issue in the Witness and the Community Services Portfolio Committee. There appears to be a significant level of congruence between the issues being raised in the media and the issues being reported upon within the Community Services Portfolio Committee. This could be attributed to the media highlighting issues and the politicians then requesting a report which suggests a very reactive approach to service delivery and political oversight within the MM.

The obligations arising from the Waste Act for the MM are onerous; the MM will need to extend free basic refuse collection services to at least 40% of its households within a context of limited financial resources and serious operational challenges delivering existing collection services. The MM will also need to establish recycling drop off centres or provide source separation collection services which will require significant operational changes to refuse collection services. Both of these service delivery challenges can be addressed through partnerships with the business sector and civil society but given the difficulties the MM has in forging partnerships, this will be a complex and difficult process. In order to extend service delivery the WMU will also need to increase revenue from waste management services and contain costs. Given the huge loss that waste management services are currently provided at and the general concern over the spiralling costs of municipal services it will be very difficult to increase tariffs for waste management services. As if these challenges are not enough the MM will also be expected to develop and implement norms and standards for waste avoidance and waste minimisation processes along with establishing treatment facilities for organic waste and making significant improvements to the operations of its landfill site.

4.13 Summary

This chapter provided an overview of the status quo situation of waste management services within the MM. It highlighted the various challenges confronting the MM currently and set the scene for examining the results of the research process which is the subject of the next chapter.

CHAPTER 5 - RESULTS

5.1 Introduction

This chapter presents the results of the research process by analyzing, interpreting and describing the information obtained from interviewing a sample of the key stakeholders of the Msunduzi waste management system. The results of the research are presented in terms of the scope identified by the research objectives. The first research objective results are presented on the implementation prospects of the Waste Act within the MM in the short term based on the perspectives of key stakeholders within the Msunduzi waste management system. Results of the second research objective are presented in terms of the stakeholder perspectives on the barriers and opportunities for transforming the Msunduzi waste management system based on the conceptual framework provided by the Theory of U. Results of the third research objective are presented in terms of insights gained from the various stakeholders into how the implementation prospects of the Waste Act can be improved within the Msunduzi waste management system.

The perspectives of the different stakeholders will be presented in an anonymous manner in order to protect the identity of the different stakeholders and to avoid any harm coming to any of the research participants as a result of participating in this research project. This anonymity relates primarily to protecting the identity of individual research participants and in some cases where it was deemed necessary the organisational identity of research participants has also been protected.

The results of the research process often refer to the Msunduzi waste management system instead of the Msunduzi Municipality waste management system in order to refer to the bigger system of which the Msunduzi Municipality is a part of. This bigger system provides a basis for sensing issues beyond the organisational boundaries of the MM and enables a deeper understanding of the waste management system as it actually operates within the Msunduzi context. Waste management services within the MM are provided by the Waste Management unit (WMU) and the Landfill Site unit (LSU), both are part of separate business units within the Community Services Department of the MM. Results of the research process from both these units will be reported under the MM Waste Management Services sector.

The results for research objective one will now be reported upon.

5.2 Awareness of the Waste Management Act

5.2.1 The NGO Sector

All the NGO's interviewed were aware of the new waste management policy. Groundwork and DUCT had become aware of the new policy directly through their advocacy work whilst BESG and A Rocha South Africa had attended public hearings organised by national government prior to the adoption of the Waste Act. Groundwork has been involved in advocating for national waste management policy development for a number of years and is currently participating in consultative processes aimed at developing the national waste management strategy. BESG, DUCT and A Rocha have been involved in waste management policy advocacy processes within the MM for a number of years. All the NGO's raised the importance of educating the public about integrated waste management practices in order to ensure smooth implementation of the new policy.

5.2.2 The MM Waste Management Services Sector

Senior management of the WMU and LSU indicate that they are aware of the Waste Act having attended municipal consultations organised by the DEA of Environmental Affairs over the past two years. Supervisory level staff interviewed who work within the refuse collection section, the KPCA and the landfill site report that no events have been organised by senior management of the WMU and the LSU which were aimed at increasing their awareness of the Waste Act. The interviews for this research took place almost a year after the Waste Act was approved in Parliament and senior management of both the WMU and the LSU confirmed in their interviews that supervisory and operational level staff had not been exposed to the provisions of the Waste Act. When probed into the possible reasons for not undertaking such a process, senior management cited the lack of time and the value of such processes given that operational level staff merely implemented decisions taken by higher levels. All senior managers identified the need to educate members of the public on the changes in waste management services that will eventually occur as a result of the Waste Act.

5.2.3 The MM Political Sector

According to a political representative interviewed who is a member of the Executive Committee of the MM, no presentation on the Waste Act has ever been made to the Executive Committee which is legally the most powerful political decision making structure within the municipality. The Executive Committee meets weekly within the MM to consider issues in terms of Section 44 of the Municipal Structure Act which provides that an Executive Committee is the principal committee of the municipal council which must oversee service delivery to communities and monitor the management of the municipality's administration in the implementation of council strategies, policies, programmes and budgets (RSA, 1998b). According to political representatives interviewed who are members of the Community Services Portfolio Committee which is meant to provide political oversight over waste management services, the first time that the provisions of the Waste Act were presented to the committee was in September 2009 as background information for the integrated waste management planning process. According to the consultant employed to undertake the integrated waste management planning process the presentation *"consisted of no more than 5 slides on the Waste Act, the entire presentation and subsequent discussion lasted no more than half an hour as it was intended as a report back and feedback session with councillors responsible for oversight of waste management services"* An analysis of the minutes of three and half years of meetings of the Community Services Portfolio Committee confirms that no prior item dealt with the new waste management policy.

5.2.4 The MM Labour Sector

Representatives from both SAMWU and IMATU who are shop stewards representing workers employed in the WMU and the LSU indicate that no workshops or meetings have been organised by senior management of both units with labour representatives and general workers in order to inform them of the provisions of the new Waste Act and its implications for service delivery within the MM. Both shop stewards indicated to hearing about the Waste Act for the first time during a site visit organised by senior management of the WMU to a private recycler called Central Waste during the early part of 2009. According to one shop steward, *"we were asked to accompany senior managers to a meeting with Central Waste, we were told they would be helping to pilot separate collection of paper, we were told it is important to do experiments with separate collection services because the new Waste Act*

require municipalities to provide such a services, it was our first time to hear of a new waste law in South Africa".

5.2.5 The Business Sector

The organised business sector represented by the Pietermaritzburg Chamber of Business (PCB) reported that they are not very familiar with the Waste Act given that there is a degree of apathy amongst their members on waste management issues. One of the representatives of the PCB indicated that *"our members don't lose sleep over waste issues".* The waste management business sector primarily made up of waste management service providers and recyclers reported that they are very aware of the Waste Act and are involved in processes to develop their capacity to deliver the new services required by the Act.

5.2.6 The Regulating Authority Sector

Representatives from both the DWA and the DAEARD indicate that they are well informed of the Waste Act given that they were involved in developing the new policy direction and are currently involved in processes aimed at implementing the Act. Both representatives indicated that public awareness of the Waste Act was very low and needed to be addressed.

5.2.7 The Technical Expert Sector

Predictably all the individuals interviewed within this sector are very familiar with the Waste Act; most of them are involved on a daily basis with activities relating to implementation of the Act on behalf of government or private sector clients. The majority of technical experts raised concerns about the limited extent to which local government politicians and the general public were aware of changes made to South Africa's waste management policies by the Waste Act and the negative effects this would have on implementation. One of the technical experts raised the issue in the following manner, "*the new Waste Act requires behavioural changes at an individual level in order for practices like recycling to be sustainable, yet many of the people who need to change their behaviour have not been made aware of the effects of the Waste Act, waste is too low down on the priority list of government to expect for it to be addressed at a public level like the way smoking has been addressed over the past few years"*

5.3 Prospects for Extending Refuse Collection Services

5.3.1 The NGO Sector

All the NGO's interviewed indicated that a very low growth scenario is likely to characterise the extension of refuse collection services to unserviced households within the MM. All the NGO's felt that generally the MM and the WMU specifically were poorly managed, that waste management was not a priority within the MM and that the collection services currently provided to households was not undertaken efficiently and effectively. One of the NGO's interviewed offered this insight, *"the prospects for growth in refuse collection services do not look good, the waste management unit is poorly managed, current serviced areas are not effectively serviced so it will be tough to extend delivery and I am afraid there is not much hope left for improvement of the situation".*

Two of the NGO's interviewed pointed out that the MM would need to buy more refuse collection vehicles to extend service delivery and to replace the ageing fleet they currently operate. Both NGO's accepted that given the current expenditure priorities of the MM these purchases were unlikely to happen. Another NGO interviewed was of the view that greed is causing major service delivery challenges since the high costs of employing the top management of the MM and the alleged corruption in the procurement processes within the MM are reducing the amount of money available to deliver basic services. The same NGO reported that *"At a recent clean -up campaign held on World Rivers day, the ward councillor of the area we were working in saw us and came over to chat, he could not tell us when service delivery would be extended to his ward and could not explain how to solve the service delivery crisis facing his ward"*

5.3.2 The MM Waste Management Services Sector

All the senior managers interviewed from the WMU and the LSU predict that a low growth scenario on the extension of refuse collection services is most likely to occur in the short term due to financial limitations, fleet management, labour issues and the low priority attached to waste management at all levels within the MM. The prospects of the MM providing additional financial resources to purchase trucks and employ additional staff or to even outsource service delivery to private contractors are considered by all the managers interviewed to be very unlikely in the short term given the limited financial resources

available to the MM. All the senior managers cited the reduction of the operating budget for waste management services in certain key areas in the current financial year as evidence of the low priority of waste management services within the MM and the scarcity of financial resources within the MM. All the senior managers interviewed were of the view that increases in equitable share grants to the MM are unlikely to result in increased allocations for waste management services given that the MM does not generally use equitable share grants for the purposes that they are intended.

The strongest indicator cited by officials that service delivery extension is unlikely to be funded by the MM in the short term is that the Waste Management Unit has been desperately motivating, without success, for a number of years to acquire new refuse collection compactor vehicles for current service delivery needs. According to the managers interviewed the current fleet is more than 15 years old and experiences frequent breakdowns resulting in service delivery delays, huge repair bills and the need to employ staff outside of normal working hours at overtime rates to undertake current collection services. One of the managers provided the following insight into the fleet management and overtime problems faced by the WMU; "*The Msunduzi Municipality provides refuse collection services using overtime labour, some staff work two shifts a day which is illegal due to truck shortages, to date (October 2009) R5.9 million of the R8.5 million annual over time budget is finished after three months of the financial year despite repeated reports calling for the replacement of the current fleet, nothing happens, the option of renting fleet vehicles is also opposed by labour, it's a hopeless situation".* Operational level staff from the WMU pointed out that management is unlikely to succeed in extending service delivery given how poorly they manage existing operations.

5.3.3 The MM Political Sector

All three political representatives interviewed, two from the ruling ANC and one from the official opposition, the DA, agree that a low growth scenario with regards to addressing refuse collection backlogs is most likely to occur in the next five years. All the political representatives agreed that waste management services is not a priority within the MM, that the staff responsible for waste management services are not adequately qualified to do their jobs and that in most cases the managers responsible for waste management services are political appointments who do not feel that they are accountable to councillors.

All of the political representatives agreed that before looking at extending refuse collection services the crisis being faced in providing existing services needed to be addressed. All the political representatives pointed out that given the difficulties experienced over a number of years in purchasing a new fleet of refuse compactor vehicles, the lack of progress in dealing with labour issues related to performance, working hours and overtime, it would be very difficult for the MM to consider extending services unless national government provided additional resources. A quotation that reflected the general views of the political representatives interviewed on this matter was provided by one of the political representatives: *"It will be difficult to extend service delivery to new areas as we do not have trucks and staff to cover existing areas, there is also an overtime crisis in this municipality, we are forced to hire trucks to improve service delivery currently , we cannot buy trucks as we do not have the money, the Metro status will help us get more funds from national government and thus improve service delivery, if this Metro status does not happen serious service delivery problems will continue and worsen".*

5.3.4 The MM Labour Sector

Both trade union representatives expressed the opinion that service delivery is unlikely to be extended until new trucks and additional staff is employed. Both unions are also opposed to the privatisation of municipal services through outsourcing of collection services to small and medium enterprises and the rental of refuse compactors from private companies since they believe that individuals within the MM and private business people are benefitting from these options and the municipality's problems are not being addressed. Both representatives indicated that they had no mandate to discuss the overtime issue with external parties.

5.3.5 The Business Sector

The organised business sector indicated that the extension of collection services was unlikely to happen easily given the low priority associated with waste management services, incompetent staff, lack of performance management systems within MM and the growing urbanisation trend.

5.3.6 The Regulating Authority Sector

The regulating authority representatives were concerned that despite the MM having a large budget and meeting the basic criteria of a high capacity municipality, it nonetheless had a very high refuse collection backlog, faced serious risks trying to provide the current collection services effectively and would be unlikely to extend service delivery to new areas. One of the regulating authority representatives commented that the WMU *"had no management skills to change the current situation and no plan to guide them to an improved situation".*

5.3.7 The Technical Expert Sector

Predictably all the technical experts felt that MM would in the short term be unable to extend refuse collection services, amongst the key factors identified that inhibit the extension of service delivery include poor leadership, conflict ridden bureaucracy, lack of capability amongst staff, low political priority for waste management issues, no fiscal commitment, lack of community protests against non delivery of waste management services and a lack of innovation amongst managers responsible for waste management within the MM.

5.4 Prospects of Source Separation Refuse Collection Services

5.4.1 The NGO Sector

All the NGO's indicated that source separation services must be provided by the MM but each NGO raised critical concerns regarding the implementation of such services. One NGO indicated that the MM did not have a dedicated recycling official or unit and that given the lack of staff, skills and experience with this type of service, implementation by the MM is unlikely to occur. Another NGO felt that the MM had just abandoned responsibility for recycling to the private sector and excluded informal waste pickers who are an integral part of waste management systems. Another NGO indicated that the source separation efforts in the city needed a champion to drive the process. This would involve building partnerships with recyclers, looking at subsidising the prices of recycled materials to sustain the process and ensuring residents were educated about the value of source separation. Another NGO interviewed was surprised by the involvement of the private sector in the pilot source separation project since they expected more public sector involvement given the volatility in recycling markets and the opportunities to create sustainable livelihoods for waste pickers.

5.4.2 The MM Waste Management Services Sector

The prospects for providing source separation collection services within the MM are viewed in two very different ways by senior management within the WMU and the LSU. One view held largely at a senior management level within the WMU argues that source separation collection services will be rolled out to all households currently receiving refuse collection services within the next two years utilising private sector recyclers like Mondi Paper. This view is of the opinion that if it is possible for Mondi Paper to do it in the Ethekwini Municipality within a two year period then it can also be done within MM in a similar time frame. According to this view recyclers participating in these types of projects will be expected to incur all transport, labour and plastic bag costs in return for free access to recyclables separated by households and businesses. The managers who support this view indicate that municipal labour had no problems with source separation services being provided by the private sector. Some of the challenges identified by supporters of this view include doubts about the process they would need to follow to move this project from a pilot state to a fully fledged programme extending across the city as well the need to include other recyclers beyond Mondi Paper so that no monopoly existed. When probed into how the municipality would support recyclers during cycles when commodity prices declined and recycling became difficult as it usually does from time to time, one manager provided the following response: "*that is not a municipal problem but a problem for those who assume responsibility to provide recycling services to the municipality, they should plan for such cycles in their businesses".*

Senior managers from the LSU believe that it will be very difficult for MM to forge such partnerships with the private sector due to competing interests within the MM for recyclable materials; the lack of commitment, innovation and work ethic by senior management most likely to be involved in building of such partnerships and the suspicions and opposition coming from labour over the project. One of the senior managers also pointed out that recycling is done most effectively through a material recovery facility located at a landfill site.

According to operational level staff in the WMU the source separation project has become a nightmare to them;"*we were involved in the pilot recycling project as trainers, we trained 10*

educators who then had to train the community in source separation, management claimed then that they had already consulted labour on the project, now it seems clear that they did not do so, now senior management want us to fix the mess by training shop stewards on recycling, the shop stewards now see us as being responsible for the project and the threats they see the project posing to their jobs, we are not going to get involved in this project anymore".

5.4.3 The MM Political Sector

All the political representatives indicate that they have been informed that a pilot source separation project commenced in early 2009 in one ward of the MM. They are not clear about the length of the project and whether an independent evaluation of the project is being undertaken. All the political representatives believe that source separation collection services should be provided, two of the representatives agree that the private sector must do it because the MM does not have the capacity to undertake such a service whilst the other political representative is of the view that the MM will need to take a policy decision on the manner in which the service is to be provided.

5.4.4 The MM Labour Sector

Both union representatives are of the view that the pilot source separation project is a way of introducing privatisation of collection services and are opposed to the project. They believe that the MM must purchase additional vehicles and employ more staff to undertake the source separation collection services. The collection of orange bags containing recyclables by MM collection vehicles instead of the recycler seems to confirm labours opposition to the project and consequent attempts to sabotage the project.

5.4.5 The Business Sector

The organised waste management business sector is involved in the current source separation pilot project; they are predictably enthusiastic about the project and require the MM to extend the project throughout the city. However both of the representatives of the waste sector indicated that it is very difficult to work with and build partnerships with MM. The following quotations provide insight into the challenges facing the waste business sector in their partnerships with MM: *"The pilot project should have been extended long ago, things are taking a long time to move. It seems as if Msunduzi is unsure of the future, not sure who*

is the champion and who leads the project. Msunduzi needs to be a real partner, Central Waste collects recyclables at no cost but must still travel to the main gate of the landfill site, we waste diesel travelling for 14 kilometres to the main entrance when we can use the back gate to the landfill site that is about 1.5 kilometres from our premises. We are ready, we can extend service delivery very easily to the entire city and create many jobs but municipality needs to get its act together. Unsure why there are labour problems, we have met labour, they came here and had a meeting and then suddenly they change their mind and start creating problems. The municipality does not pay a cent for the current project, it simply needs to give the go ahead and the entire city will have source separation services".

"There is a lack of support from the Msunduzi Municipality, emails are unanswered, voice messages are not returned, no feedback is given, there has been no meeting in at least six months yet they talk of a partnership, Msunduzi workers are picking up the orange bags, these bags cost about 70cents each which Msunduzi does not pay for and Central Waste ends up wasting their time and fuel looking for bags that Msunduzi staff have already picked up".

5.4.6 The Regulatory Authority Sector

According to the regulatory authorities source separation collection services are unlikely to be provided in the next two years to the majority of households in the MM given the serious problems facing the pilot project. Both representatives of the regulatory authorities believe that the WMU must address the challenges that have arisen on the project to date before the project can be extended on a larger scale.

5.4.7 The Technical Expert Sector

Most of the technical experts agree that source separation collection services are unlikely to be extended in the next two years to all households and businesses currently receiving waste collection services within the MM. The basis for these conclusions vary from MM lacking the capacity to implement such services to the MM lacking capacity to work in partnership with the private sector and the complex challenge of changing people's attitudes and behaviour to waste management issues. One expert believes that international experience has shown that source separation does not work effectively and efficiently, according to this technical expert it would be more efficient to collect all the waste in one bag and set up a material recovery facility to sort out the waste. Another technical expert is of the view that

the private sector stakeholders can deliver effective source separation collection services if the MM enables them to do this by building an effective partnership.

5.5 Prospects for Increasing MM Budgets for Waste Management Services

5.5.1 The NGO Sector

All the NGO's interviewed were of the opinion that the MM would struggle to increase waste management expenditure on the basis that waste management services were not a priority within the MM, however all the NGO's hoped that the Waste Act would have the effect of increasing the priority of waste management services at a municipal level. At least half of the NGO's interviewed felt that political will to change the situation either emerged from inspired political leadership or pressure from protesting communities for service delivery improvements. All the NGO's agreed that the principle of the 'polluter pays' must apply, except to poor households who must be given free basic refuse collection services.

Two NGO's raised concerns about increasing household refuse collection charges in order to increase waste management revenue given the huge increases in property rates and electricity charges that households have faced during 2009. Given the significant increases in property taxes these NGO's argued that more resources should be available for service delivery. However both NGO's seemed well aware that increased revenue was unlikely to be spent on waste management services specifically or service delivery improvements in general given the political and administrative leadership currently in place within the MM.

5.5.2 The MM Waste Management Services Sector

All the senior managers of the WMU and the LSU who were interviewed agreed that service charges must be based on the polluter paying the full costs of waste management services. Some of those interviewed did however indicate that this principle should only apply if the MM provided an efficient and effective waste management service. Some of the managers of the WMU and LSU believed that given all the inefficiencies associated with fleet, labour and corruption in the procurement processes it would be unfair to expect the business sector to absorb such costs. They would end up passing it on to their consumers and the entire society would suffer from increasing inflationary pressures due to poor management practices within the MM.

One of the senior managers of the WMU supported the 'pay as throw' system of waste collection tariffs since it created incentives for waste prevention and recycling activities at source. However the manager raised concerns about the levels of corruption that would occur in the billing and administration of the system if staff from the WMU and the MM were involved. All the senior managers interviewed agreed that if service charges are increased or if a pay as you throw system is adopted to increase revenue, then enforcement capacity would need to be increased in order to prevent illegal dumping. All the managers agreed that the prospects of expanding the MM capacity to enforce waste management by-laws against illegal dumping would be very challenging and unlikely to happen in the short term.

All senior managers agreed that the WMU should be a 'ring fenced entity' capable of procuring its own goods and services and funding itself from income derived from providing waste management services. They were all aware that for an initial period the ring fenced unit would be dependent on MM for financial support given the huge losses that waste management services are currently provided at. All managers indicated that the prospects of ring fencing service delivery units within the MM in order to create conditions similar to business enterprises and improve efficiencies were highly unlikely given that water and electricity business units within the MM had failed in their attempts to get political approval to create such structures. All the managers agreed that the prospects of reducing costs and lowering the deficit of the WMU and the LSU within the current institutional arrangements were very limited. One senior manager of the LSU summarised financial issues within the MM with this striking quote: *"The budget process is a joke, it is a waste of time to go through a process of planning and budgeting only to be told your unit will get last year's budget plus a 5% escalation, there is no alignment between planning, needs and budget. Operational budgets do not allow units to respond to service delivery challenges, they enable the status quo to be repeated year after year".*

Operational level staff felt that senior management and labour were jointly responsible for the financial situation of the WMU and LSU, according to them senior management benefitted personally from projects undertaken by the WMU and the LSU and were responsible for some of the high costs paid by the MM for certain services since they forced service

providers to pay bribes whilst labour was preoccupied with obtaining overtime payments for their members.

5.5.3 The MM Political Sector

All the political representatives agreed that households could not be subject to any further inflation increases for service delivery charges and that the prospects of increasing the WMU and LSU budgets from internal MM sources are very limited given the other service delivery challenges facing the MM. One political representative was of the view that the two tier system of local government meant that funding intended for local municipalities from national government was diverted to district municipalities putting additional pressure on local municipalities. However the declaration of the MM as a metropolitan municipality would significantly improve its financial status and result in improved service delivery from 2011. All the political representatives felt that ring fenced entities would merely serve the personal financial interests of senior management given that increased powers would need to be delegated to senior management to procure goods and services and enter into contractual obligations. One political representative captured the mood of the political representatives aptly by saying, *"you must be joking to think of ring fencing that unit, given their levels of incompetence and greed, the entire process would be a disaster as the MM would have limited oversight over their activities".*

5.5.4 The MM Labour Sector

Labour was of the view that increased income for the WMU and LSU was unlikely to occur given the track record of the MM over the past decade. Both agreed that senior management cite the lack of funds when it comes to improving operations but somehow find funds when it comes to flying to various places around the world to attend workshops that add little value to the WMU and the LSU. Both shop stewards were anxious about ring fencing the WMU believing that it would be a first step on the road to privatisation of waste services and increased opportunity for corruption by senior management. Both shop stewards supported measures aimed at making business pay more for waste management services but were opposed to increasing the burdens on the working class. One of them put their view on the matter in this way: *"this place is run by stupid people, they subsidise services to the businesses, then they have no money left to improve services and the same business people phone them and abuse them on the phone for late coming and poor service delivery, if*

charges are increased the wealthy business people must pay more instead of struggling working people".

5.5.5 The Business Sector

All the representatives of the organised business sector agreed that the business sector must pay reasonable costs for the waste management services provided to them, however they pointed out that the business sector should not be made to subsidise inefficiency because some of their members would resort to illegal dumping whilst others would increase the costs of goods and services to embattled consumers. Both representatives agreed that incentives should be created to enable the business sector to avoid creating waste in the first place and then recycling their waste to reduce the consumption of energy and other resources. Both agreed that significant progress can be made with the private sector because they operate on the basis of increasing profits and would intervene quickly in their business enterprise to reduce costs and increase profits should an incentive system dealing with waste management be set up. Both representatives were of the view that the current WMU and the LSU leadership would be unable to create an incentive based approach to waste management with the business sector given that the WMU and LSU could barely manage their own basic labour and operational issues.

5.5.6 The Regulatory Authority Sector

Both regulatory authorities were of the view that financial incentives needed to be used to get big waste generators to reduce the amount of waste sent to landfill and to reduce the consumption of natural resources and virgin materials in the production stage through incentivizing the use of recycled materials. Both were sceptical about whether the MM had the capacity to intervene effectively in the business sector because they were consumed in trying to fix their own sinking ship and lacked credibility amongst the business sector due to poor service delivery and allegations of corruption. None of the regulatory authorities believed that more income would be spent on waste management services by the MM in the short term despite the recent approval of the Waste Act.

5.5.7 The Technical Expert Sector

All the technical experts agreed that the polluter pay principle must apply when calculating waste management service charges. All but one expert agreed that poor households should

be fully subsidised by wealthier households and that the business sector should not be subsidized. Two of the experts indicated that recycling services needed a subsidy to cope with fluctuating commodity markets. One of the technical experts agreed that the Waste Act could cause MM to increase the WMU budget whilst the others were of the view that this would not happen due to waste being a low political priority. None of the technical experts believed that the current WMU leadership had the capacity to manage a proper ring fenced entity according to commercial norms and standards. Essentially none of the technical experts believed that the leadership of the WMU and the LSU could collectively provide waste management services in an economically efficient manner where the revenue received for services should cover the costs of providing the services and where the services must be delivered on time and in terms of the specifications agreed to between the client and the service provider.

5.6 Prospects for Integrated Waste Management Planning

5.6.1 The NGO Sector

Two of the NGO's that have worked with the MM on service delivery issues in the past indicate that planning processes do not have much value to the MM. Critically both confirm that from their experiences; planning does not inform MM budgeting processes. All the NGO's indicated that plans can be well drafted but they do not automatically implement themselves and that the MM is notorious for simply not implementing plans, instead proceeding in an unsystemic way with the result that they face even greater problems than they did in the past. All the NGO's cited the dysfunctional waste information system at the landfill site as symptomatic of a culture prevailing within the MM that does not attach any value to information collection and knowledge management processes.

5.6.2 The MM Waste Management Services Sector

All of the senior managers interviewed from the WMU and the LSU provided a different perspective on integrated waste management planning and waste information management systems within the MM. One senior manager indicated that IWMP's would struggle to be used as a guide to improving service delivery within the MM because individual managers tend to determine plans on a day to day basis and that if *"IWMP's start to dig deep into operational issues within the WMU and the LSU, it will create more problems than we*

already have". The same manager was of the view that significant progress had been made on improving waste management information systems at the landfill site after the recent problems that had occurred with the system. *According to the manager of the LSU, the problems faced related to the weighbridge computers having been stolen and the weighbridge data collection software system needing to be urgently upgraded.* Another senior manager simply indicated that the MM is generally an uncoordinated place; the length of time that it took to fix the inoperative weighbridge at the landfill site was cited as an example of the attitudes that prevail within the WMU and the LSU towards information and planning. The same manager pointed out that after many years of experience with the planning and budget process within the MM it seems that, *"the capital budget is allocated to special interests and those who make the loudest noise rather than allocations being based on strategic planning".* One of the senior managers, however, felt that the IWMP would help to support arguments for additional funding for waste management services. Operational staff interviewed from the WMU indicated that the problems associated with the waste information management system at the landfill site could be a ploy by staff and management at the site to prevent information emerging in the public domain that could have embarrassed them. No further details on this issue could be obtained from the person who made the statement.

5.6.3 The MM Political Sector

All the political representatives indicated that planning processes did not count since officials would in most cases not implement the plans and that planning processes within the MM are usually characterised by intense conflict between the competing business interests of corrupt officials and politicians. None of the political representatives were aware of the problems with the waste management information system at the landfill site but two of the political representatives interviewed offered the view that in the MM when information management systems no longer function, then it is quite likely that someone is covering up something. One political representative from the ruling party put the planning process challenge in its Msunduzi context by stating that; *"most officials and politicians in the MM look issues from the point of view of what is in it for them, not what is in the approved plans or what can be done to improve the lives of the poor, progress on innovative projects are therefore stalled due to this greed and selfishness".*

5.6.4 The MM Labour Sector

Both shop stewards indicated that they are not included in planning processes, they are only called in when implementation is about to commence and they usually end up opposing the process because they were not consulted in the first place.

5.6.5 The Business Sector

Both representatives from the organised business sector indicated that the MM is averse to planning for the future and that they often felt that consultations with the business sector by the MM during planning processes where a waste of time since the MM does not operate in terms of planning processes. According to both representatives of the organised business sector, the state of the waste management information system typified the MM approach to basics, one of them offered the following analysis, *"the weighbridge problem is akin to having a car without a fuel tank, how Msunduzi can go on operating that site without basic information for planning and billing is mind boggling but hardly surprising".*

5.6.6 The Regulating Authority Sector

Both regulating authorities felt that the most recent generation of IWMP's were unearthing more issues than previous IWMP's but were disappointed by the lack of interest shown in the IWMP process by senior managers and politicians of the MM. One of regulating authorities felt that the problems of waste information at the landfill typified local government attitudes to waste management issues, *"It's so shocking that the weighbridge did not work effectively for such a long period of time, if it was a water or electricity issue, the municipality would have immediately realised the financial losses they were incurring and done something about it, but not for waste issues, even when it has value as revenue at landfill sites, waste is waste, people still do not see its value".*

5.6.7 The Technical Expert Sector

All the technical experts indicated that IWMP's have not led to huge improvements in service delivery and in most cases have had little influence on budget allocations, all of the technical experts who make these conclusions claim to speak from having been involved in processes aimed at developing IWMP's. One of the technical experts who is currently involved in developing an IWMP for the MM indicates that planning will not count in the budget process. According to this technical expert, IWMP's do not go deep enough to uncover strategic

issues since senior managers of the WMU and the LSU act as gatekeepers in the planning process intentionally refusing to hand over information, *"with the result that the disease cannot be diagnosed because the person with the disease will not disclose the symptoms, people prefer to be defensive, they close up and refuse to divulge issues".* Another technical expert lays partial blame for poor quality IWMP's in the hands of consultants who 'cut and paste' from previous plans and use formulae's to make projections that nobody else can understand and support whilst the institutional issues are not covered. According to another technical expert interviewed IWMP's as they are currently undertaken are not participatory with the result that the majority of people are excluded from defining the problem and proposing solutions. All the technical experts agreed that a waste management information system at the landfill site is a very basic system to operate and the MM should not have experienced the kinds of problems it has. Such failures point to an inability to get the basics right which is of great concern, but hardly surprising coming from the MM.

5.7 Enforcement of Waste Management Laws and Policies

5.7.1 The NGO Sector

All the NGO's interviewed believe that MM is creating an unmanageable situation by not enforcing by-laws on illegal dumping and littering in a more effective manner. According to most NGO's interviewed people have become accustomed to behaving in a negative way, i.e. people dump and litter without any consequences from the state, so these types of behaviour will continue to grow whilst the MM will struggle to employ ever-increasing numbers of street sweepers. One NGO put the issue in context by saying that *" municipalities have created a situation where ordinary people believe that if they litter and dump they create job opportunities for unemployed people since municipalities do not enforce by-laws on littering instead they engage in ongoing employment of street sweepers to pick up litter".*

5.7.2 The MM Waste Management Services Sector

The general consensus from the managers of the WMU and the LSU is that there is no political will to create enforcement capacity for waste management by - laws. According to one manager there is no shortage of peace officers within the MM to undertake these duties since the former parking meter attendants can be used for this purpose. Another manager indicated that the WMU does not interact with the public in a meaningful way by educating

them about littering and dumping. Officials from KPCA indicate that they have tried for a number of years to educate members of the public in the central business district to prevent littering but with limited success due to lack of enforcement capacity and the shortage of bins. All senior managers confirmed that the WMU had no posts dedicated to enforcement activities and had a 50% vacancy rate for community educator posts within KPCA.

5.7.3 The MM Political Sector

All the political representatives interviewed agreed that creating enforcement capacity to prevent littering and illegal dumping was a not a priority of the MM and this was unlikely to change in the short term.

5.7.4 The MM Labour Sector

Both trade union representatives indicated that the street sweeping unit had a vacancy rate of almost 50% which resulted in the remaining staff having to work harder to keep the city clean which was unfair; they believed that the MM should fill vacant posts urgently to address the litter problem.

5.7.5 The Business Sector

One of the representatives of the organised business sector commented that *"we are generally a non-compliant society whether it comes to the speeding, smoking or littering, enforcement will be a huge challenge".* Another representative of the organised business sector raised the issue that wide spread corruption had also reduced the enforcement capacity of the state.

5.7.6 The Regulatory Authority Sector

Both representatives of the regulatory authorities emphasised that the system of co-operative governance had reached the point where local government can disregard environmental laws and know from previous experience that it will not face any sanctions. According to both the regulatory authority representatives the MM has for a number of years consistently failed to comply with its landfill permit conditions and due to the doctrine of co-operative governance none of the penalties associated with these offences have been implemented by the regulatory authorities. According to one regulatory authority *"because we do not apply the penalties that we should against local government for transgressions of environmental law, they*

continue to act with impunity, this trickles down to within their own municipalities where they do not enforce by - laws against citizens that transgress their laws. Slowly we are also seeing the private sector behave in a way that demonstrates that they do not respect or fear us because we practice double standards. Also it can take us up to 3 months for us to issue a compliance order because these would need to be issued by senior management instead of field officers like us, the entire enforcement system is slowly disintegrating". One of the regulating authorities explained that incentive based enforcement programmes like the blue and green drop for water quality where demonstrating promising results at this early stage and perhaps the waste sector needed to a follow suit and develop a similar programme.

5.7.7 The Technical Expert Sector

All the technical experts agreed that the enforcement of environmental laws against local government could significantly improve service delivery. However they believed that national and provincial government would be unable to penalise local governments in terms of the law in the current context, which is likely to lead to further deterioration in service delivery. All the technical experts agreed that enforcement of illegal dumping and littering by - laws needed to be undertaken by the MM alongside public education campaigns in order to create cleaner living environments and control pollution threats to the environment. Most of the NGO's were of the view that both these processes were unlikely to occur within the MM in the medium term due to their low priority status and the unsystemic approaches that characterise littering solutions in South Africa.

5.8. The Challenge of Co-ordinating the State

5.8.1 The NGO Sector

There is consensus amongst the NGO sector that the South African state from national through to local government level appears to be uncoordinated within the environmental sector. According to the NGO sector there is little evidence to suggest that local government in general manages environmental issues within the provisions of NEMA or the National Water Act or will be willing in the future to manage waste issues in terms of the Waste Act. One NGO suggested that the notion of co-operative governance is an overused term with very little substance to it. The general view from the NGO sector is that national government must provide technical expertise to local municipalities to support them to implement the new

Waste Act, create national awareness of the new policy and hold local government accountable for grant funding expenditure. Two NGO's doubted if national government could undertake this role given that most of their policy making capacity on the Waste Act was currently being provided by consultants. The views on provincial government were more diverse, half of the NGO's felt that provincial government should play an enforcement role by ensuring that grant funding was being used for the purposes intended and that waste management activities were being undertaken in accordance with permitted conditions. One NGO representative felt that provincial government should be disbanded because it played no meaningful role in environmental issues or waste management specifically.

5.8.2 The MM Waste Management Services Sector

The consensus amongst senior management of the WMU and the LSU was that the co-ordinated state was not working effectively in the waste management sector since national government had taken too long to legislate the sector; failed to provide sufficient resources to enable municipalities to extend service delivery; and failed to provide support to enable waste minimisation services to be implemented. One senior manager indicated that *"we have felt very alone in the waste sector all these years, nobody from the Department of Environmental Affairs has come in the past 12 years to see how they could support Msunduzi, we have felt like there was no part of national and provincial government that was responsible for waste, now they are all coming to tell us to implement the Waste Act".* All senior managers from the WMU and the LSU believe that national government must provide financial and technical support to implement the Waste Act and create conditions to promote recycling in certain material sectors especially plastic and glass.

5.8.3 The MM Political Sector

All political representatives agreed that the co-ordinated state had not materialised and the two tier system of local government had not worked well. One of the political representatives indicated that the notion of co-operative governance is designed to fail and provided the following explanation "*how can national government pass a law that requires the lowest level of government, a municipality, to perform a function or duty and when they fail to do what they should be doing, what you gave them money to do, you do nothing, you look the other way and say we are co-operating and then you give them more money and somehow expect them to change, they must be punished for failing to deliver, penalised financially and*

then you will see how quickly they will change!". All the political representatives agreed that national government must provide financial support to enable service delivery and enforce compliance of national legislation. Surprisingly all political representatives questioned the role of provincial government concluding that it was a waste of time and money.

5.8.4 The MM Labour Sector

Both shop stewards believed that national and provincial government must intervene more regularly within the MM to fight corruption amongst senior management and provide funding to improve service delivery.

5.8.5 The Business Sector

The organised business sector indicated that the co-ordinated state did not exist in South Africa. One of the representatives cited the MM as an example where all levels from local through to national government are controlled by the same party yet they collectively fail to communicate and work with each other. Both representatives of the PCB believed that national governments role is to fund local government and increasingly to provide human resources to enable services to be delivered.

5.8.6 The Regulatory Authority Sector

Both regulatory authorities felt that co-ordination between national and provincial government was a difficult process. The DWA is a national government department and suffers from too much power being centralised whilst the DAEARD is a provincial government department which faces major challenges in decentralising its powers and functions. The regulatory authorities agreed that national government must direct the implementation of the Waste Act through regulations and funding. DAEARD is of the view that the commencement date of the Waste Act has been too ambitious as government at a national and provincial level are not ready to proceed with implementation. DAEARD were also of the view that provincial government was useful in the implementation and enforcement process since they are able to practically monitor and support local government.

5.8.7 The Technical Expert Sector

All the technical experts agreed that the existing norms on co-operative governance were hindering co-ordination of the state and ironically creating unco-operative relationships

within the state as local government was refusing in most cases to comply with environmental regulations created by other levels of government. One of the technical experts believes that national government has abdicated key national government responsibilities in terms of the Waste Act to provincial government because it lacks the capacity to deal with the issues. The majority of technical experts expect national government to develop regulations that will provide guidance to local government on integrated waste management practices especially waste minimisation and waste treatment. All the technical experts believe that provincial government should develop provincial strategies in order to support local government to carry out their obligations in terms of the Waste Act and to monitor and enforce regulatory compliance from local government and the private sector.

This section concludes the reporting on research objective one, the remainder of this chapter will report on the results of research objective two and three.

5.9. Co – Initiating From Downloading to Seeing with Fresh Eyes

5.9.1. The NGO Sector

There is consensus amongst the NGO sector that the MM does not value working together with other stakeholders as there are currently no dialogue processes between the key stakeholders within the MM on waste management issues. Most of the NGO sector representatives believed that senior management from the WMU and the LSU preferred to isolate themselves from other stakeholders in order to pursue their own objectives rather than to interact with key waste management stakeholders within the Msunduzi waste management system who had diverse views and who could end up questioning the views and actions of MM officials. Half of the NGO representatives reported being involved in situations with senior management of the WMU where their views were rejected; where they felt as if they were silenced and blamed for having secret agendas. According to the NGO's who reported this type of behaviour the issues that pulled the stakeholders apart related to transparency at the landfill site, the future of community based refuse collection projects and issues related to recycling and informal waste pickers. All the NGO representatives report that the senior management of the WMU and LSU have string views on various issues and become

defensive when these views are challenged making it very difficult for co-operative relationships to exist between the parties.

Two of the NGO's interviewed that have been involved in river clean up campaigns for a number of years within the MM report that after initial interest from the WMU they were left alone to undertake the cleanup activities without support from the WMU. One of the NGO's reports having been told quite frankly by senior management of the WMU that domestic waste in the river systems was not strictly speaking a waste issue but rather a water issue. The NGO sector insights indicate that leaders within the WMU are dealing with issues through downloading processes which merely maintain the status quo as they continue to deal with issues as they have always dealt with them, either by reference to their past experiences or from the vantage point of their own organisations being unable to suspend their habitual ways of looking at reality in order to see what others see.

5.9.2 The MM Waste Management Services Sector

All the senior managers within the WMU and the LSU agreed that there are currently no partnerships or dialogues between the key waste management stakeholders within the MM. One senior manager from the WMU explained the rationale behind working in the way that they do; *"the business sector is hard to work with as they have their own agendas whilst with the NGO's have to carry out the agendas of overseas donors in order to survive and some of them work to build up non elected people who are claiming to be leaders of communities, this makes it difficult to work with them, we work with councillors and their ward committees and SMME's whom we control through contracts, it is easy to get things done if you work in this way".*

Another senior manager of the WMU explained that it is hard for the WMU to work with the business sector given that the MM provides very poor waste management services to the sector and the relationships between the parties are conflict ridden. The situation according to this manager has reached a point where *"we have been losing 4 to 5 clients a month over the past year or more because we cannot provide a proper service, we either cannot give them bins, or we collect these bins very late, often when they have overflowed or we either fail to return their bins, who would want to have a dialogue with an organisation that consistently behaves like this?".* Perceptions from operational level staff interviewed indicate

that senior managers within the WMU do not have open dialogue-type relationships with staff within the WMU and conclude that it will be very difficult for senior managers of the WMU to then communicate with external stakeholders. One staff member summarised her interactions with senior managers within the WMU in the following manner, *"they only see things the way they want to see it, if there's money involved its worse, they will only look to gain a personal benefit".*

A senior manager of the LSU believed that poor service delivery and the lack of organisational coherence can be attributed to management practices within the WMU, *"individual senior and middle managers only support and implement projects that they personally prefer, projects that may be critical to the organisation are not funded and implemented if they cannot fit the personal needs of these managers, worse still these managers want to work only with certain service providers and if they fail to secure their service providers in the procurement process, the project will be shelved, given this state of affairs it is hard to find an organisational strategic plan that is guiding the work we undertake".* Given these results it seems that senior management operate the WMU and the LSU from the perspective of their own interests with little concern for the views of other stakeholders within their organisations, getting them to dialogue with external stakeholders will be difficult.

5.9.3 The MM Political Sector

All the political representatives interviewed indicated that they struggle to co-operate and dialogue with senior management generally within the MM and specifically with the WMU and the LSU, and cannot see these managers working together with external parties in an effective way. All the political representatives agreed that no multi stakeholder dialogues were happening in the MM currently on waste management issues. All the political representatives gave anecdotal accounts of events where officials in general within the MM and the WMU specifically undertake projects and programmes without consulting the political structures of the MM. They believe this is usually done when officials have personal financial interests in these projects or are simply participating in power struggles on behalf of political parties or political factions.

One political representative did indicate that tension currently existed between the MM and the organised business sector since certain politicians within the MM believe that the business sector was getting involved in politics by publically supporting one potential mayoral candidate over another. All the political representatives agreed that greed, corruption and the need for secrecy amongst some politicians and officials within the MM were pulling stakeholders within the organisation apart. One of the political representatives indicated, "*this organisation does not dialogue with itself, how on earth will it enter into dialogue with parties outside this place who have no way of forcing it to dialogue".*

5.9.4 The MM Labour Sector

The trade union sector indicated unanimously that senior managers from the WMU needed to build partnerships with the trade unions before thinking about partnering or dialoguing with other stakeholders. They described having conflict ridden relationships with their management because *"their management simply wanted to do things according to their own views, they come to monthly meetings only with their issues, often failing to address our issues from the last meeting, so we have a fight and then we are forced to march to city hall to tell everyone including the Mayor of how poorly we are treated".*

5.9.5 The Business Sector

The representatives of both the organised business sector and the waste management business sector concur that building partnerships and having dialogues with the WMU and the MM in general have not happened historically and look unlikely to materialise in the short term. The organised business sector claim that in the past 12 years no formal partnerships have been built between the MM and the PCB on broader economic and development issues let alone waste management issues. According to the organised business sector The Msunduzi Innovation Development Institute (MIDI) is a new development that holds promise but seems to be driven largely by the University of KwaZulu-Natal instead of the MM. One of the representatives of the organised business sector interviewed who is also a trustee of MIDI confirmed that only one of three MM trustees regularly attended meetings of the MIDI Board of Trustees, whilst the Municipal Manager and a political representative from the MM, who are trustees of MIDI, have hardly attended any meetings at all.

One of representatives of the business sector believed that elements of both the MM and the PCB operated on mental models that were not based on reality which ended up driving the parties further apart, "*you have a situation where certain leaders within the MM believe that all business owners exploit black workers and make huge profits and do not care about social issues whilst some business owners believe that black people are incapable of running the state and do not want to become involved in partnerships with the state".* One of the representatives of the organised business sector indicated that part of the problem is that " *the Msunduzi Municipality does not have the leadership that is able to reach out to PCB, instead they behave like gatekeepers, when the uMgungundlovu District Municipality indicated that it intended forming a consultative forum with business as part of its turnaround strategy, the leadership of the MM started saying to PCB that PCB should have consulted with the MM prior to agreeing to participate in such a forum with the district*". The organised business sector also indicated that some leaders within the business sector nationally and locally believe that since the ANC National Conference in Polokwane in 2007, government has steadily forged an alliance with the trade union federation COSATU, intentionally leaving the business sector out of major policy decisions.

The organised waste management business sector also believes that the MM is difficult to work with, preferring to look at issues from their own perspectives only and not from the viewpoints of other stakeholders making co-operation very difficult. The relationships between this sector and the WMU have been well documented in the section that deals with source separation collection results.

5.9.6 The Regulatory Authority Sector

Both the regulatory authorities have tried to develop relationships with senior management of the WMU and the LSU over the past ten years in order to undertake their monitoring and enforcement role on waste disposal and environmental protection issues. According to both representatives of the regulatory authorities, their relationships with most senior managers of the WMU and LSU are not based on co-operation and dialogue but rather they have been characterised by downloading and debating conversations. One of the representatives of the regulatory authorities described the approach followed by the managers of WMU and LSU in the following way, "the managers start of talking politely, making empty promises but when they are confronted with allegations of ongoing non-compliance with environmental

regulations they become defensive, start talking tough and blaming others including the regulatory authorities for the problems that they face". This type of pattern has played itself out on an ongoing basis making transformational relationships with the WMU and the LSU impossible.

5.9.7 The Technical Expert Sector

All the technical experts indicated that they are unaware of any partnership or dialogue type processes between the WMU and other key stakeholders within the broader Msunduzi waste management system. All the technical experts agreed that from their experiences it would seem that the WMU leadership appears not to like outsiders becoming involved in waste management issues. They cited the landfill monitoring committee, the integrated waste management planning process and the mooted waste park project as examples from their personal experiences where the leadership of the WMU and the LSU prefers instinctively to isolate themselves from processes involving outside stakeholders. One of the technical experts captured the prevailing situation in the following manner: *"Senior officials from the waste management unit of the Msunduzi Municipality do not want to open their minds to new ideas, they want to control everything, so it is going to be very problematic to get new ideas of the ground, I have tried since 2000 without success because they do not care about the environment, they look to make money from processes, they do not have the skills and understanding to do their own jobs, they are unlikely to innovate, they are not open to partnerships, MIDI seems to drag Msunduzi along, the university provides intellectual and financial capital, the MM is reluctant as always to come to the party".*

All the technical experts agreed that the WMU leadership is averse to taking responsibility for their legislative obligations, and one of the technical experts described the situation in the following manner*, "officials within the waste management unit prefer for complex issues to float around in open spaces with no one talking responsibility to resolve the issue, no one has a mandate to act when you confront them with options and there are no champions to be found who are willing to work with outside parties to get things done".*

5.10 Co Sensing – Seeing the System

5.10.1 The NGO Sector

Most of the representatives of the NGO sector were frustrated by the inability of the MM and the business sector to see the entire waste management system from the extraction of raw materials through to the production of goods and discarded materials to the eventual release of greenhouse gases from decomposing organic waste buried in landfill sites. They believe that the limited progress that has been made on waste prevention and waste minimisation issues within the MM can be attributed to the MM and the business sector lacking a big picture, system wide perspective that enables them to see linkages between climate change, production and consumption patterns and waste management. One NGO representative summed up their concerns with unsystemic approaches by saying, "*we need to stop calling it waste because it is not waste, it is discarded materials that can be recycled or reused, if we stop seeing it as waste we encourage people to add value to the materials they have collected either at a landfill site or from bins, we need take a life cycle approach to materials, a more systemic approach to issues of resource management – not waste management".*

Another NGO was frustrated by the destruction of biodiversity within watercourses in the MM caused by the dumping of domestic waste into river systems due to the lack of collection services and the failure of the MM to educate people that rivers are not places to dump domestic waste. The NGO reported that interactions with the WMU did not prove to be useful as they did not see rivers as their area of responsibility. According to this NGO, *"the narrow approach to waste management is resulting in pristine river systems with high biodiversity levels being destroyed and nobody within the MM wanting to take responsibility for the situation, more frighteningly there appears to be a lack of understanding of the services provided by ecosystems to human beings, in the case of rivers, the most valuable of all resources, fresh water".*

Another area of concern expressed by the NGO sector was the creation on an unsustainable society within the MM due to the huge gaps between the rich and the poor and the role that the MM was playing in entrenching these inequalities by paying huge salaries to their top management and then being unable to provide poor people with jobs and services due to a lack of resources. The inability of the leadership of the MM to see how they were perpetuating the system of inequality and poverty by their actions was cited as a classic case of unsystemic thinking at the highest level of leadership within the MM.

5.10.2 The MM Waste Management Services Sector

Senior managers within the WMU and the LSU are focussed largely on the waste management system as it exists within the MM organisational boundaries. According to one senior manager within the WMU, operational level staff cannot see the bigger picture and the system that their unit is part of nor are they prepared to adapt to meet the needs of the system. The manager explained that "*middle management and selected operational level staff where taken on a study tour of operations at Durban Solid Waste in order to expose them to the operations of a very successful waste management organisation, after the visit we agreed to copy certain practices in order to improve our operations, within a week most of the innovations were stopped because workers complained that the new systems were creating more work and affecting their overtime payments*".

All the senior managers of the WMU and the LSU agreed that the MM did not operate as an integrated whole but rather as separate parts of the whole. In their opinion it was almost impossible to get the different business units to co-operate with each other in order to provide services in an integrated m anner. An interesting example of this type of behaviour cited by a senior manager of the WMU, "*we have a situation where the Parks and Recreation unit will cut grass or trim trees and then expect the WMU to collect their cuttings because they consider it as waste whereas they are quite capable of collecting these trimmings on their own and making compost or taking them to a garden refuse site, but in a silo type organisation like the MM each unit does only what it should do and nothing else usually out of fear of spending their budgets or creating additional work which there staff will refuse to do".*

According to all the senior managers interviewed the disintegrated systems within the MM result in the WMU and the LSU having little control over the staff employed, service providers procured and repairs undertaken to its fleet. A manager who is frustrated by the silo mentality that operates within the MM remarked that " *I have to deal with a situation where people who know nothing about waste management take decisions about the staff who should be employed in my unit, I end up getting staff who know very little about waste and I get held accountable for poor service delivery, the system we have in terms of employment*

and procurement effectively strips me of the power to take decisions on how to improve service delivery".

5.10.3 The MM Political Sector

All the political representatives indicated that most politicians within the MM were either focussed on issues that affect their wards or their Portfolio Committee or their own personal financial interests. All of them were of the view that most politicians are unlikely to have the time or the insight to examine system-wide issues affecting the MM. All the political representatives agreed that most senior managers of the WMU and LSU look after their own interests and do not care about the bigger picture of climate change, poverty and development. One of political representatives interviewed believed that many senior managers were using their power to create systems so that they could benefit privately. One political representative of the ruling party indicated that the cadre deployment policy of the ruling party had ensured that in some cases *"officials were employed who had no clue about what they are supposed to do, how are they then going to understand the challenges involved in the entire waste management system?, how are they going to work with external stakeholders who will realise they are clueless and importantly who will want to work with them?*

Another political representative indicated that senior managers and political heads of Portfolio Committees often end up *"merely defending their own turf, refusing to take responsibility for the performance of their departments and having a very narrow conception of reality since they only consulted each other on issues that affect all the people in the city, so those types of people lead this city and they see the system as themselves, they do not see other people's views and things as they really are".*

5.10.4 The MM Labour Sector

Both the trade union representatives outlined ways that the human resource system within the MM could be changed in order to improve the lives of workers in the WMU, LSU and the broader MM workforce. They argued that should changes be made in the human resource system workers would be motivated and service delivery would be improved. The changes they referred to included changes to the job grading system, salaries, promotions and other

remunerative type of changes to the current system within the MM.

5.10.5 The Business Sector

Both representatives of the PCB believed that most of their members focussed on understanding systems that affected their businesses and were quite skilful in using their knowledge of these systems to make profits and avoid losses. One of the representatives outlined the efforts their members had made in trying to improve the waste management system within the MM, "*some of our members began to see the opportunities out there for preventing waste, recycling and setting up a new waste industry, they did research to fully understand the issues and the local system, in one case an investor was even found, but they were ahead of their time, the MM officials listened to them and went away and like lots of projects within Pietermaritzburg, nothing was ever heard about it again".*

According to the PCB representatives the MM seems to lack a long term vision and has a narrow conception of the key role players within the MM development planning system. *"They think in terms of five year election cycles, development takes longer than that to materialise, if they planned for a longer term period they could begin to understand the bigger issues that affect MM, instead they update their IDP every year and think they have planned, they go out and have consultations with communities but have you ever heard of them consulting us, well they do not do that because the system that they think about does not include us'.*

One of the PCB representatives indicated that in his assessment of the Dinokeng Scenarios within the MM context, it would seem that other stakeholders like organised business were walking behind the state allowing the state to lead when it is clear that all stakeholders should be part of efforts to govern, lead and develop our society. The representative concluded that such a situation resulted because key stakeholders like business allowed government to exclude them and continue to view municipal issues from within the organisational boundaries of the MM only and not to see the larger system of which they were all a part of.

5.10.6 The Regulatory Authority Sector

Both regulatory authorities were concerned that MM leadership continued to ignore the negative effects poor waste management services had on environmental systems. Key

amongst these were the water sector which was being polluted by uncollected domestic waste, poor operational management at the landfill site and pollution from untreated sewer due to the lack of proper sanitation services to many residents within the MM. Both representatives were of the opinion that many decision makers within the MM did not fully understand the interrelatedness of all environmental, social and economic systems.

One of the representatives of the regulatory authorities indicated that from personal experiences working with some officials and politicians responsible for waste management within the MM it was quite routine for unsystemic blaming game allegations to be pulled out of the hat sooner or later when a service delivery deficit about the MM was queried; *"usually they resort to blaming other levels of government for their failures, for example, the slow pace of extending refuse collection services is blamed on national governments meagre equitable share grants and not their own wasteful expenditure patterns, the poor operations at the landfill site is due to the district municipality not taking responsibility for their functions and not providing additional resources and the lack of recycling activity is due to provincial government not providing for a recycling facility within the MM".*

5.10.7 The Technical Sector

Most of the technical experts concurred that despite the numerous study tours to other cities and conferences attended by senior managers of the WMU and the LSU, these have not had the effect of enabling Managers to identify best practice solutions from other waste management systems that could be used to fix the problems of the MM.

To most of the technical experts the senior managers from within the MM cannot see beyond their own personal benefits and in some cases people are in positions for which they do not have the required capability and technical expertise. Most technical experts felt that they were not being utilised effectively by the MM to solve the problems currently being faced as well as the problems that are being created for the future by the unsystemic 'quick fix' solutions that are currently being implemented.

5.11 Co –Presencing: Learning from the Future

5.11.1 The NGO Sector

Representatives from Groundwork indicated that they would want to help bring into being a society that makes wise use of materials by working towards a total recovery of resources through mainstreaming cleaner production technologies. Groundwork would also want to create co-operatives of waste pickers who are playing a role in collecting recyclables at the landfill site and help to add value to discarded materials in order to create sustainable livelihoods for waste pickers. According to Groundwork the MM needs to become a more creative place that allows innovative projects to bloom for this future to emerge. One of the Groundwork representatives indicated that "*this transformative process within the MM needs to occur urgently because climate change is a real threat to our future and the sooner concrete actions to mitigate against climate change are taken in localities around the globe, the more likely are we to create alternate futures".*

According to Groundwork the system can attain its highest future possibility if stakeholders are able to let go of the old ways, *"Groundwork would need to stop seeing all municipal officials and councillors as being ignorant and disinterested about environmental issues whilst the MM would need to stop being distrustful of NGO's and accept that NGO's have a right to criticise the state, the MM would also need to recognise that waste pickers at their landfill sites have a right to decent work opportunities in order to create sustainable livelihoods for themselves and their families".*

The DUCT would like to create a future where river care services are mainstreamed into the MM service delivery systems and the MM is capable of identifying polluters and making them pay for the costs of cleaning up pollution as well as the environmental costs associated with their actions. The DUCT believes that for this future to emerge the MM and other key stakeholders need to act immediately since "*we are very nearing a tipping point where we could go down the tubes completely, we need to act now to bring this future into being."* The DUCT believes that the highest potential of the system can be reached if MM admits it has weaknesses and requires support whilst NGO's like DUCT need to be less conflict oriented towards the MM and rather focus on building bridges.

A Rocha South Africa would like to help create a future where the MM is socially, economically and ecologically sustainable because natural food is produced, rivers are free

from pollution, all waste is collected, packaging is drastically reduced and all recyclables are collected separately. A Rocha believes that this future can emerge if leaders in the city are able to understand that all life depends on the environment and that *"life is not a fairy tale that is somehow going to have a happy ending, the reality is that we are in dire straits and we need to start protecting the one thing we have abused for so long, our biological diversity which provides the basis for the ecosystems that enable all creation to thrive".* A Rocha believes that the highest future potential of the system can be reached if all the stakeholders work together and the MM is prepared to accept that working with the NGO sector involves dealing with organisations and leaders that are guided by values and principles of social and environmental justice.

The BESG would like to bring into being a future where service delivery at a municipal level is greatly improved and where ordinary people accept that they need to take greater responsibility for issues like waste management. BESG believes that the MM needs to accept that we are already in a crisis and start acting in new ways in order to create a future where residents experience improved levels of service delivery. According to BESG the highest future potential of the system can be attained if the MM accepts the need for dialogue with civil society and accepts that criticism is necessary for robust engagements between stakeholders seeking to address complex challenges.

5.11.2 The MM Waste Management Services Sector

A senior manager within the WMU would like to help create a future where people are able to fish in our rivers and catch healthy fish because all domestic waste and sewerage has been collected enabling river health to be restored. According to this manager such a future can only become possible if municipal staff put aside their personal differences and interests and act collectively for the greater good. Another senior manager would like to bring into being a future where waste is treated in order to prevent decomposing organic waste from contributing to climate change. According to this manager this alternate future can only be created if ordinary people are educated on environmental issues, volunteer to clean up the environment and monitor for pollution as if their lives depended on it.

5.11.3 The MM Political Sector

One of the political representatives interviewed would like to bring into being a future within the MM where there could be universal access to refuse collection services and the city is free of dumping and littering. This future is only possible if the MM creates public private partnerships with capable service providers who are able to deliver cost effective services. Another political representative would like to create a future where source separation services are provided to all households and businesses and the MM is able to enforce littering and dumping by-laws against citizens and street traders. According to the political representative these innovative projects can only occur if greedy and selfish officials and politicians are no longer employed within the MM. According to this political representative, the system can only reach its highest future potential; *"if WMU staff are not involved in the process as they have proved to be incompetent in the past, rather we should bring in a private recycler with whom we can make plans with and at the end of the day you know that the plans would have been followed up and you can work together to improve the process, with WMU staff they will tell you all the time why things can't be done without even trying".*

5.11.4 The MM Labour Sector

The trade union representatives concurred with each other that they would like to help transform the MM into a place where staff felt satisfied with their working conditions, were capable of undertaking the duties assigned to them and worked hard to deliver quality services. They believe that this future is only likely to be created if top management within the MM can stop taking care of only their own conditions of employment and start to address issues for other staff employed in the organisation.

5.11.5 The Business Sector

One of the representatives of the organised business sector would like to help transform the MM into an organisation run along the best practices of the business sector. In this arrangement the shareholders of the MM are its citizens who are able to easily access credible data on how their business is performing and take actions against its managers should the business performance not be acceptable. In order for this future to be created the leadership of the MM would need to become transparent and accountable to its citizens.

One of the representatives of the organised waste management sector would like to help create a future where all waste is collected in a source separated form to enable recycling. In order for this future to be created *"the MM needs to look at the bigger picture which is currently saying that recycling is the future and that all people want to recycle not just rich people and that we need to work together to make this future possible, however should this not be possible, companies like mine would make this future happen by ourselves, we are ready to do it".*

5.11.6 The Regulatory Authority Sector

Both regulatory authorities would like to bring into being a future where there is universal access to source separated collection services, treatment of organic waste and legally compliant landfill sites within the MM. The regulatory authorities believe that this future can be brought into being if all stakeholders work together transparently without needing to be defensive about their service delivery challenges.

5.11.7 The Technical Expert Sector

One of the technical experts would like to help bring into being a cohesive, functional and high capacity WMU within the MM capable of delivering universal source separated refuse collection services, large scale composting of organic waste and a properly functioning landfill site. According to this technical expert, this future WMU can only be brought into being if the political leaders are made aware of the serious deficits in the current institution and the administrative heads are humble enough to seek help to remedy their institutional crisis.

Another technical expert would like to create a whole new industry based on the beneficiation of discarded materials which is capable of generating a significant number of jobs within the MM. According to the technical expert this project can only be brought into being if senior management within the MM 'get over their large egos' and allow other people to work on waste management issues. This technical expert believed that in order for the highest future potential of the system to be attained stakeholders would need to work together and let go of the past, *"I would need to leave behind the bitterness I have developed towards the senior leadership of the MM and the view that they are incapable of doing their jobs but they would also need to admit to having weaknesses and needing support to improve the city".*

One of the technical experts would like to bring into being a large scale project that can compost organic waste in order to set up effective community food gardens which can reduce poverty and malnutrition. According to the technical expert this project can be brought into being if MM officials undertake deep self audits of their roles, weaknesses and achievements and then commit to improving the situation by working with other stakeholders who can help to make a difference. This technical expert believes that for the system to achieve its highest future potential the key role players would need to work together; *"I would need to let go of my views that bureaucracy is a camouflage for incompetence and that municipal officials only act in self interested ways, I guess that if I change and reach out to help others selflessly then I increase the possibility that more will do the same".*

One of the technical experts would like to bring into being a future where citizens have a deeper understanding of environmental issues and *"are able to engage in waste exchange processes, clean up campaigns will be a thing of the past since we will not dump and litter and we will develop community based recycling projects at schools in order to ensure that the next generation is capable of protecting our planet in better ways than their parents did".* According to this technical expert this type of future can only be created if organisations like MIDI are able to find space to undertake their work and find champions who are able to move projects from conceptual ideas through to implementation stages.

5.12. Co Creating – Prototyping the Future

5.12.1 The NGO Sector

Groundwork would like to prototype by-laws on source separation and cleaner technology practices and pilot the formation of co-operatives to beneficiate discarded materials.
The DUCT would like to prototype the mainstreaming of river care services within the service delivery mechanisms of the MM and understand the costs, benefits and risk associated with a large scale river care programme undertaken within a municipal context. The DUCT would want to prototype innovative ways to teach people not to litter and pollute the environment through the use of comedic street theatre and mime. The DUCT also believes that prototyping activities need champions and role models, local councillors could

be ideal role models to communities whilst the MM would need to identify champions to drive the extension of river care projects.

A Rocha South Africa would like to prototype community waste educators projects and begin replacing timber plantations that surround the MM with indigenous forests. BESG would like to prototype a large scale environmental education campaign to schools and communities in order to increase awareness of pollution, integrated waste management and climate change.

5.12.2 The Waste Management Services Sector

A senior manager from the WMU would like to prototype pay as you throw forms of refuse collection charges in order to get waste tariffs to be based on actual use and create incentives for recycling. According to this manager emphasis during the prototyping process should be on closing the opportunities for free riding and corruption. Another senior manager from the LSU would like to prototype improvements to glass collection schemes within the MM. The focus of this prototyping process would be on setting up glass collection bins in places of high demand and setting up early warning systems to ensure glass bins are emptied before they reach full capacity. Prototyping activities would also need to focus on developing improved partnerships with recyclers and owners of facilities where glass bins are located. Another senior manager within the WMU would like to prototype the ring fencing of the WMU and the LSU as well functioning business units operated on conventional business principles. According to this manager open minded, progressive and high capacity middle management capacity will need to be built up in order for this prototyping experience to be worthwhile.

5.12.3 The MM Political Sector

One of the political representatives interviewed wanted to prototype composting of garden refuse at a garden refuse site and also prototype a mobile garden refuse chipping service to households in order to enable residents to compost at a household level so that garden refuse sites could eventually be closed down. In order to undertake such a process the councillor indicated he would need inspired leadership from the WMU who would need to provide committed municipal officials and equipment to enable the prototyping to occur. Another political representative would like to prototype source separation collection services within the ward that he is elected to serve as a Councillor.

5.12.4 The MM Labour Sector

A trade union representative interviewed indicated that it would be interesting to prototype a performance bonus type of collection service system within the WMU whereby staff could earn performance bonuses if they completed their work earlier than normal or if their work was of a higher than normal standard and if vehicles were properly operated so that the need for repairs and maintenance were reduced.

5.12.5 The Business Sector

One of the representatives of the organised business sector indicated that they would want to prototype educational programmes within all schools in the MM in order to educate children and youth on environmental issues. This prototyping activity was necessary in order to learn how to effectively alter the attitudes of the next generation of consumers, workers and parents and lay the foundation for more environmentally sensitive human beings for many generations to come, especially those generations that must deal with the greatest effects of climate change.

5.12.6 The Regulatory Authority Sector

One of the regulatory authority representatives would like to prototype activities aimed at improving the institutional arrangements at the WMU and the LSU. According to this regulatory authority representative much of the work will involve replicating and adapting the institutional set up of Durban Solid Waste to fit the local MM context. This representative of the regulatory authority would also like to become involved in processes aimed at implementing high leverage projects identified during the current IWMP process within the MM. Another representative of the regulatory authority would want to prototype public education and awareness campaigns on recycling and reuse of discarded materials and the production of compost at every home. Both regulatory authorities believed that these prototyping activities could be worthwhile learning processes if MM officials participated in a meaningful manner and supported the processes financially and through transparent implementation activities.

5.12.7 The Technical Expert Sector

Two of the technical experts would want to become involved in prototyping recycling projects either through improving source separation collection schemes or setting up material recovery facilities for waste pickers at the landfill site. Both of these technical experts indicated that they would need to act as project champions in a voluntary capacity in order to encourage others to act in a similar way. One of other the technical experts would like to prototype the use of builders rubble and sludge from the Camps Drift Weir in order to produce blocks that can be used in the construction industry. Another technical expert would like to prototype the establishment of waste exchange centres and setting up composting projects to supply food gardening projects with high quality compost to increase the quality and quantity of food produced.

5.13 Co - Evolving – Creating New Institutional Ecosystems and Supporting Infrastructure

5.13.1 The NGO Sector

All the NGO representatives agreed that the WMU and the LSU are not places that can encourage innovation nor are they places that could provide a sheltered cocoon from where the prototyping teams can implement lessons they have learned to improve the infrastructure and practices of the WMU and the LSU. Most of the NGO representatives mentioned MIDI as a possible cocoon for the prototyping teams to develop new practices but where concerned about whether MIDI had the capacity to influence decision making within the MM generally and the WMU and the LSU specifically. One NGO representative indicated that working with approaches that required setting up ecosystem type relationships between players in the waste management system and working to build new institutional infrastructures that will enable prototypes to evolve would be far more challenging than getting people to sense and presence. All the NGO representatives agreed that the MM could make transformational change of the WMU a more likely prospect by being aspirational, adopting service delivery targets and bringing in new leadership.

Some of the NGO's believed that the MM needed to set an example to the rest of the city by adopting and implementing waste prevention and waste minimisation policies and targets internally. Some of the NGO's indicated that education and awareness campaigns would be

more effective if prominent city leaders acted as role models by recycling, composting and cleaning up dump sites and rivers so as to demonstrate the seriousness of the issues to residents of the city. One NGO was of the view that it would be important for the city to demonstrate their new approach to enforcement by making a few high profile prosecutions against polluters and then adopting a zero tolerance approach to minor transgressions as a way of putting across a message that the MM was serious about bringing to an end littering and dumping practices amongst its citizens.

One NGO was of the view that MM needed to incentivise voluntarism amongst citizens for environmental projects by holding ongoing competitions for the cleanest streams, rivers, wards and the best gardens so that people take an active interest in these issues and act in a collective way to change their living environments.

5.13.2 The Waste Management Services Sector

The majority of senior managers within the WMU and the LSU indicated that the MM, the WMU and the LSU are not innovative places at the current moment that are capable of making changes in the way they operate as a result of lessons learned from prototyping processes. One of the managers indicated that in order for the WMU to become a place of innovation and to provide an effective shelter for a prototyping team it would need to rid itself *"of corruption, low work ethic and an obsession with earning overtime"*. The same manager advised that the situation within the WMU had reached crisis proportions and service delivery levels have declined sufficiently for a political intervention to be made. According to this manager an appropriate intervention must start with the creation of a core team to put in place new policies and practices to restore service delivery. The only criteria for membership of such a core team according to this manager would be people who were committed to changing the society, protecting the environment and had no financial interests in the WMU and the MM.

Another manager indicated that MIDI would be unable to play the role of driving innovation within the MM largely because *"it is a very white institution with a lot of academics who seem to think they know it all, yesterdays food summit was an example of the problems we face, they had no interpreters, the summit lacked representativity from the black community and to some black people who were there, it seemed as if we needed white people from the*

university to tell us how to solve our problems". A middle manager from the WMU believed that the WMU and MM in general were not places that encouraged innovation because *"if you have an idea it will either be stolen or killed by your managers, if a project has money very few people as possible will be involved since the mangers here don't care about innovation, they care about making money".*

One senior manager of the WMU however believed that the WMU was well known as a place of innovation where many innovative projects had been tried out in contrast to other departments within the MM. The manager referred to various projects to illustrate this point, these included food for waste projects, contractor based refuse collection services, community based refuse collection projects, the swing bin project and adopt a spot campaigns. This manager was of the view that the WMU would provide an ideal shelter for prototyping teams to work from and that the WMU would welcome the development of new practices to improve service delivery. According to this manager the WMU could be transformed if the politicians declared waste management as a priority service alongside water, sanitation and electricity services.

5.13.3 The MM Political Sector

All the political representatives indicated that the MM, the WMU and the LSU were not innovative places that adapted their operations according to lessons learned within the MM or in other parts of the country or even the world. One of the political representatives interviewed was of the opinion that the WMU and the LSU would ignore the lessons learned from prototyping experiences because they would require significant changes to the way the units operated and would threaten the comfort zones that many managers and their staff had become accustomed to. This political representative also indicated that MIDI would fail if it did not include politicians and officials with real decision making power in the work that they undertake, *"in this place if you do not involve those with power in your work your reports and recommendations will merely be noted and end up being read only the committee secretary whose job it is to prepare the agenda".*

Another political representative indicated that the MM is not a place of learning and co-operation because it is *"a place overwhelmed with battles amongst officials or between politicians or sometimes between officials and politicians or between communities and their*

politicians, here the mayor and the municipal manager fight openly and show their disrespect for each other openly, this cascades throughout the organisation, so very little co-operation and learning is possible, now if you bring outsiders here to prototype new things all these people will gang up and fight them until they leave, this MIDI thing is going to suffer the same fate".

5.13.4 The MM Labour Sector

Both representatives of the trade unions warned that innovative projects and new practices must be tabled before the Local Labour Forum for consideration and approval prior to management of the WMU and the LSU implementing them.

5.13.5 The Business Sector

All the representatives of the organised business sector and the organised waste management business sector believed that the MM and the WMU were not places that valued innovation and could not therefore host a prototyping team to develop new practices that would improve service delivery. One of the organised business representatives felt that government generally were not places of innovation and learning but usually characterised by repetition of the same mistakes. The same representative was of the view that MM should work hard to develop a better relationship with the PCB in order to lay a solid foundation for a new era where new practices would be initiated when existing models failed to deliver the services and outcomes required. Another representative of the organised business sector who is also a Trustee of MIDI was concerned about whether MIDI would get the support of the MM to drive innovation and act as an observatory on development and service delivery issues given the poor track record of MM in the formative stages of the development of MIDI.

Both representatives of the organised waste management business sector were of the view that the WMU would not encourage innovation and experimentation with new practices to improve service delivery given their poor track record in working with them to deliver source separation collection services. One of the representatives of the organised waste management business sector indicated that the LSU should formally recognise the waste pickers on its landfill site as an innovative approach to recycling and develop practices to integrate them into the waste management system.

5.13.6 The Regulatory Authority Sector

One of the representatives of the regulatory sector believed that the WMU would be unable to become an innovative organisation because it lacked the ability to get the basics of waste management done and should focus on these before trying to innovate. Another regulatory authority was of the view that high capacity waste management municipal institutions must be utilised to support and mentor low capacity institutions like the WMU and LSU within the MM as this could help to provide a foundation for putting the basics of waste management in place. Both of the regulatory authority representatives believed that neither the WMU and LSU could provide a shelter for a creative prototyping team nor do they believe that these units will adopt the lessons learned from prototyping experiences to improve their operations. One of the regulatory authority representatives cites the experiences of the landfill site mentoring process involving the LSU a few years ago as the basis for concluding that the institution would not be open to learning from outsiders even those who were renowned nationally for running successful waste management institutions.

5.13.7 The Technical Expert Sector

All the technical experts indicated that the WMU did not have the people or the champions in place to become a place of innovation and a holding space for a highly creative team of prototypers. One of the technical experts believed that a change of leadership was the only way that the WMU could become innovative and responsive to new practices. Another technical expert was of the view that MIDI held lots of promise as a potential place of innovation but that it would struggle to influence the WMU or most other institutions within the MM as they would be considered as outsiders and would lack the formal power needed to enforce innovation.

Another technical expert believed that the current leadership of the WMU and the LSU were incapable of leading transformational change within their units and that if the current leadership remained in place, the situation was unlikely to change for a another 15 to 20 years. This technical expert cited the Ethekwini Municipality as an example of a municipality that had created a cocoon to shelter prototyping and innovation in the form of the Special Projects Unit driven by the Municipal Manager. This technical expert felt that *"the WMU leaders blow hot and cold, sometimes they can be inspirational and then they just*

slump, the potential is there, but there is no visible and effective champion to transform the place".

5.14 Summary

In this chapter the results of the research process were presented. Generally the results for research objective one indicates that the implementation prospects for the Waste Act are not promising given that many sectors in the MM are unaware of the Waste Act, the MM is currently unable to extend refuse collection services to unserviced households and the MM fails to work effectively with other parties to provide source separation services. In terms of the results for research objective two and three, it is apparent that many barriers are likely to be faced in efforts to transform the Msunduzi waste management system. On a more positive note however the results indicate that most stakeholders have useful insights into how the system can be transformed. The following chapter will discuss these results in greater detail, formulate conclusions on the research objectives and make recommendations on how the implementation prospects of the Waste Act can be enhanced.

CHAPTER 6 - DISCUSSIONS AND CONCLUSIONS

6.1 Introduction

This chapter provides a discussion of the research results in order to enable the Author to reflect upon the results and provide a basis for formulating conclusions on the research objectives. The chapter then provides recommendations on improving the prospects for implementation of the Waste Act within the MM as well as outlining future areas of research that needs to be undertaken.

6.2 Awareness of the Waste Act

6.2.1 Discussion on Awareness of the New Waste Act

The research results indicate that there are low levels on awareness of the provisions of the Waste Act amongst key parts of the MM. These include the political level, the middle management and operational levels of the WMU and LSU and the trade union sector. In terms of the current arrangements the development of new municipal policies, strategies and services associated with the Waste Act can only be driven by the senior management of the WMU and LSU given their awareness of the Waste Act. By keeping the political leadership of the MM unaware of significant changes in national waste management policy and their effects on the MM, senior management of the WMU and the LSU could be intentionally seeking to maintain existing waste management policy within the MM since it allows them to remain in their existing comfort zones and not have to develop new strategies, plans and services to implement the policy. In doing so senior management of the MM are contributing to ensuring waste management services continue to remain a very low priority within the MM despite shifts nationally to increase the attention given to waste management issues.

As a result of not making staff aware of the new waste management policy opportunities for enabling the internalisation of explicit knowledge contained in the policy documents have been lost, with the result that knowledge related to the new policy has not become part of the tacit knowledge of front line staff involved in service delivery. Given this deficit in tacit knowledge amongst the middle management and operational level staff of the WMU and the LSU, it is unlikely that these levels of staff will be in a position to conceptualise strategies, plans and projects to implement the Waste Act and they may also resist changes in service

delivery required by the Waste Act given their limited understanding of integrated waste management practices. By keeping labour in the dark about national policy changes senior management are creating a situation where local policy changes that affect service delivery and workers will eventually be harder to implement. It is quite likely that labour will oppose future policy changes given that they have no background knowledge on the Waste Act and its possible effects on their members, they are unable to develop insights and options to cope with the changing context.

The apathy amongst the organised business sector on waste management issues could suggest that the sector continues to view waste management issues in terms of the conventional approach whereby municipalities collect and dispose waste with minimal obligations for the business sector.

All the stakeholders interviewed were unanimous in their concern over the low levels of awareness on the new waste management policy amongst the general public and the negative effect this would have on the implementation of new services like waste prevention, recycling and extended producer responsibility obligations. All stakeholders agreed that government at all levels was responsible for making ordinary citizens aware of the new policy and a failure to create sufficient awareness of the new policy and induce changes in waste management practices amongst citizens, is likely to increase the prospects of implementation failure.

6.2.2 Conclusions on Awareness of the Waste Act

The results obtained from senior management of the WMU and the LSU suggest that both units are operated as centralised machine bureaucracies where all powers are located at the centre, usually around one person with lower levels of staff not being involved in planning and decision making. According to Scharmer (2009a) centralised bureaucracies are blinded to what is actually going on internally and externally because their leaders are stuck in one view of reality, usually leaders of such organisations believe that they know what is best for their institution and the broader society, left unchecked such organisations evolve into absencing and eventual collapse.

Given that the political structures of the MM have very limited or no knowledge of the shift required in municipal waste management policy as a result of the Waste Act, it is unrealistic

to expect the political structures to act as drivers for shifts in the waste management policy, services and funding within the MM.

Given that senior management of the WMU and the LSU have not undertaken basic policy awareness activities within the MM it is unlikely that they would provide leadership to enable subsequent stages of the policy development cycle to be undertaken in the short term, one of the obvious effects of this situation is that the MM is unlikely to have new waste management policies that are aligned to the Waste Act in the short to medium term (1 to 3 years).

The low levels of tacit knowledge about the Waste Act and integrated waste management practices amongst middle management and operational level staff within the WMU and the LSU could result in new waste management policies and practices being delayed, opposed, lacking co-ordination and commitment from the levels responsible for policy implementation and service delivery. According to Scharmer (2009a, 314), one of the typical characteristics of organisations in systems that eventually collapse is that they display institutional ignorance, "most staff do not know what is really happening in their company....and are not seeing what changes were happening in the marketplace".

The low levels of tacit knowledge on the Waste Act amongst shop stewards and operational level staff in general will make it difficult to introduce new waste management services. The current opposition of labour to the source separation pilot project operating in a single ward of the MM is already demonstrating the effects of not sharing explicit knowledge and creating opportunities to influence the mental models and perceptions held by individuals.

Senge (2006) describes learning organisations as places where people are expanding their capacity to achieve organisational results that truly matter; this is achieved through team learning, shared vision and open mindedness. The WMU and the LSU do not meet these basic requirements for learning organisations since the senior management of these institutions prevent team learning and the building of a shared vision by keeping all levels of the MM that are affected by waste management issues unaware of the new policy direction that the municipality must pursue.

Cloete et al (2000) suggests that despite the absence of a generally acceptable policy implementation theory, the 5C implementation protocol has consistently identified the five key variables that determine implementation prospects, viz. the content of policy, the context of implementation, the commitment and capacity of implementers and the support of clients and coalitions. Given the limited capacity and commitment of the policy implementers within the MM the new waste management policy is unlikely to be effectively implemented.

The low levels of awareness on the Waste Act by the organised business sector and the lack of knowledge and experience with integrated waste management practices will most likely result in limited or delayed application of waste prevention measures relating to cleaner technology and extended producer responsibility obligations. In a context where it has been difficult to get global consensus on the need to reduce greenhouse gas emissions despite the threat climate change poses to our planet, it is hardly surprising to find the organised business sector within the MM apathetic to waste management issues specifically and environmental issues generally. The obsession with the financial bottom-line within the sector persists in spite of overwhelming evidence of the need for economic growth to occur in a more ecologically sustainable manner.

6.2.3 Recommendations on Awareness of the Waste Act

Senior management of the WMU and the LSU should undertake processes that increase the awareness of the Waste Act and its implications for service delivery within the MM amongst the political, administrative and labour sectors of the MM affected by waste management issues. Senior management of the WMU should establish project teams comprising of political, middle management and labour representatives to develop strategies, policies plans and prototypes to bring the new waste management system embodied by the Waste Act into being. It will be important to develop a shared vision of the future waste management system and to nurture project teams to engage in learning and thinking around bringing the future system into being.

The IWMP planning process currently underway should be utilised to bring the different role players within the Msunduzi waste management system together in order to develop collective strategies and plans to transform the delivery of waste management services as envisaged by the Waste Act.

The MM should develop a public awareness strategy and programme to ensure the transfer of explicit knowledge relating to the Waste Act and integrated waste management practices to residents and business organisations within the MM.

The organised business sector should undertake measures to increase the awareness of the Waste Act amongst its members especially the largest waste generators in order to promote the adoption of cleaner technology, the development of industrial waste management plans, the establishment of recycling practices and the fulfilment of extended producer responsibility obligations.

6.3 Prospects for Extending Refuse Collection Services

6.3.1 Discussion on the Extension of Refuse Collection Services

A remarkable consensus exists amongst all the stakeholders on the great difficulty that the MM will face in extending refuse collection services; no stakeholder believes that services will be significantly extended in the next five years. All the stakeholders including senior management of the WMU and the LSU agreed during interviews that a low growth scenario is most likely to characterise the extension of refuse collection services to unserviced households in the short term. Given the concerns raised by all sectors within the MM on the difficulties experienced providing services to existing customers of the MM, it is a possibility that service delivery will not be extended to any new households in the short term, as has been the case in the past two financial years.

The prospects of substantially increased national government grants for waste management services in the short term do not look promising given the pressures that national government revenue is coming under due to the recession in the South African economy. Municipalities currently also receive an equitable share grant to provide refuse collection services to indigent households and in a context of shrinking government revenue, new priorities and growing deficits such grants will most likely be maintained at current levels or even face the possibility of being reduced.

All of the NGO's interviewed are involved in activities that seek to advocate improvements in waste management service delivery. This is done either through service delivery projects that demonstrate possible solutions, lobbying and advocacy activities on key environmental issues or through support to vulnerable groups to enable them to achieve their legal rights. No formal partnerships seem to exist between the NGO's themselves and between the NGO's and the MM, this situation works against the possible adoption of new services and policies by the MM that are currently being prototyped and advocated by NGO's.

The management of the WMU has found ways of laying the blame for the service delivery failures on the lack of financial resources and the greed of labour. Indirectly they seem to be blaming the political level for not providing additional finances to purchase new collection vehicles, yet they do not accept any responsibility themselves for failing to develop policies to increase revenue from waste management services or for not implementing cost cutting measures to free up resources or for failing to enter into innovative agreements with compactor vehicle suppliers. Most of the stakeholders interviewed with the exception of the senior management of the WMU, were of the view that the WMU has poor leadership capability which reduces the prospects of service delivery being improved.

The political representatives have provided responses that seek to exonerate themselves from taking any responsibility for the service delivery failures that plague the MM instead they put the responsibility at the feet of officials, labour and even national government. If the local policy makers refuse to accept any responsibility for service delivery failures and start playing the blame game, the system remains unseen and it continues to create the current problems being experienced.

The reluctance on the part of the trade union representatives to discuss overtime issues in a generalised way is symptomatic of an organisation in which the players do not dialogue with others. Instead they talk tough, debating issues instead of dialoguing, even silencing debate on issues when it seems that their views are unlikely to be agreed with.

The organised business sector takes no responsibility for its members who are amongst the largest generators of waste in the MM rather it focuses on the deficits in the WMU. This is consistent with the traditional outlook on waste management that seems to be held by the

organised business sector whereby waste management is a government responsibility. Clearly the MM and business sector are not walking together as envisaged by the Dinokeng Scenarios rather the business sector appears to walking behind government allowing it to continue to govern without input from key role players in society.

6.3.2 Conclusions on the Extension of Refuse Collection Services

Given that refuse collection services have not been extended to unserviced households in the MM over the last two years, the serious challenges facing the MM in providing existing customers with services and the low priority attached to waste management within the MM, it is quite likely that refuse collection services will either continue to not be extended to any new households or very small gains will be made in addressing backlogs in the short term. It is also quite likely that refuse collection service backlogs within the MM may actually grow in the short term due either to services not being extended or the service delivery growth rates being lower than the growth of new households within the MM. It is also very likely that the quality of refuse collection services to existing households will decline given the operational challenges faced and the unsystemic approaches adopted to attending to such problems. The collapse of refuse collection services within the MM for a two week period in November 2009 (Shamase, 2009c) as a result of conflict between senior management of the WMU and labour over overtime issues highlights the negative outcomes of the absencing cycle.

The MM is considered by national government to belong to the category of highest performing local government institutions (COGTA, 2009) due to its location within a large urban centre with developed economies to provide revenues, services and skilled labour. However the potential that the MM has to be a high performing institution is not evident when one considers its refuse collection service performance.

Given the high levels of institutional ignorance and arrogance within the WMU innovative NGO refuse collection projects that focus on collecting domestic waste from river ecosystems are unlikely to succeed in being mainstreamed within the WMU in the short term. Given the limited prospects of refuse collection services being extended to households who illegally dump waste into river ecosystems, the pollution of rivers within the MM by domestic waste is also unlikely to be reduced in the short term.

The labour sector seems to have entered the cycle of absencing since it refuses to allow the MM to find solutions to the refuse collection service crisis if it does not favour its members. According to Scharmer (2009a) organisations that engage in silencing other views and blaming others for all the problems in the system enter into the state of absencing where the whole becomes a resource to be subject to unlimited exploitation, instead of being used to create solutions that benefit the entire system.

6.3.3 Recommendations on the Extension of Refuse Collection Services

The leadership of the WMU would need to firstly establish awareness of the implications of Waste Act amongst the political and administrative leadership of the MM before beginning inclusive processes with all stakeholders within the Msunduzi waste system to develop local norms and standards for refuse collection services which are aligned to the national standards. The leadership of the WMU should utilise the IWMP process to develop a realistic ten year plan to extend refuse collection services throughout the MM. The plan should identify the refuse collection service delivery models that will be used to extend service delivery to the different settlement types and the possible costs associated with such a plan. The plan should have a spatial basis with each ward within the MM having a refuse collection service improvement plan which should indicate the extent to which existing collection services meet the local norms and standards for refuse collection services, identify illegal dumping hotspots within the ward, identify unserviced households and households that are indigent and should therefore be receiving free basic refuse collection services. The plan should also undertake an audit of refuse collection services to commercial business clients within each ward and provide plans to improve existing services for all customers.

The MM should enter into a dialogue process with the labour sector in order to develop collective agreements on the issues that pull them apart in the delivery of refuse collection services. Such a process could seek to move labour from an absencing cycle into a more collaborative approach that could increase the co-operation between the parties.

6.4 Prospects for Source Separation Collection Services

6.4.1 Discussion on Source Separation Collection Services

The possibility of extending source separation collection services to all existing customers of the MM is only supported by a single manager within the WMU and the recyclers currently undertaking the pilot project. The optimism of the recyclers is understandable given the lucrative nature of the new business opportunity that they have become part of. The optimism displayed by the manager of the WMU appears to be unfounded on a number of important grounds. Firstly the MM has not taken a policy decision on the provision of source separation services to its customers, the pilot project may serve to inform the policy making process but the political structures of the MM will need to support policy that provides source separation collection services. Given the lack of tacit knowledge on the new waste management policy amongst the political leadership of the MM, the process is unlikely to occur in the short term and is likely to be characterised by delays and policy contestations when it is eventually undertaken. The trade union sector also has serious problems with source separation services being provided by the private sector since it believes that the MM is privatising a core function and very little appears to have been done to address these issues with labour. Critically the MM must procure the services of all external service providers in terms of their supply chain management policies; and it will therefore be illegal for the WMU to merely extend the scope of the project to cover the entire city using the current service providers.

Managers from the WMU and the LSU have very different views on the prospects of source separation services within the MM, these divisions can be largely attributed to the lack of an integrated waste management institution within the MM. The separation of the waste management functions into two separate institutions within the MM, viz. the WMU dealing with cleansing and refuse collection services and the LSU dealing with waste disposal issues provides fertile breeding ground for uncoordinated, overlapping and unsystemic solutions to be developed to the waste management challenges facing the MM. Source separation is likely to be the centre of division and disintegration given that the LSU believes that source separation and recycling should be done at the landfill site through a material recovery facility following the successes at the Marianhill landfill site (Purchase, 2008) whilst the WMU believes that source separation should be undertaken during refuse collection services.

The approach used by the WMU to implement a pilot project into source separation is very useful given the range of complex issues involved in recycling. These include the volatility in recycled material and virgin material markets, high transport costs, significant barriers at the household level to source separation and the lack of state support during cyclical declines in the recycling commodity market. Given this level of complexity and the lack of a regulatory environment to support recycled materials the pilot project could provide valuable lessons that need to be learned in order to develop viable recycling practices. . It will be important to have opportunities for all the stakeholders to reflect on the pilot project so as to understand all the issues that affect the Msunduzi waste management recycling system.

Training shop stewards on recycling issues will not help to resolve the fundamental problems that labour has with the use of external service providers within the WMU, it seems as if management of the WMU defers labour issues through quick fixes instead of pursuing a more long term solution with labour.

It seems that the WMU has not properly defined the scope and duration of the pilot project, has not anticipated the impacts likely to be created by the pilot project and has not followed reasonable norms that can be expected from partners in a pilot project. The private recyclers predictably want to move from a pilot to a city wide programme and are frustrated by the delays in the process. The WMU is caught with a labour problem on the one hand and on the other hand the WMU does not have a strategy and policy on source separation services. To complicate matters further, the WMU is likely to come under pressure from other recyclers and other interested parties on the rationale for providing a recycling opportunity to only a single recycler within the MM.

The divergent views amongst the technical experts on the optimal approach for source separation services highlight the learning challenges facing societies dealing with rapid changes in complex systems. There are no past projects and experiences that the technical experts have worked on in this field that can be used to reflect upon in order to provide possible solutions, the challenge requires presencing and prototyping based solutions.

6.4.2 Conclusions on Source Separation Collection Services

Given the range of factors that affect the provision of source separation collection services within the MM, from labour resistance through to the lack of policy, the inability of the WMU leadership to work in partnerships, the divisions between the WMU and the LSU on responsibility for recycling and the limitations imposed by the procurement regulations that apply to local government, it is unlikely that the MM will succeed in extending source separation collection services to all existing refuse collection customers within the MM in the next two years.

Given the dynamic, social and emerging complexity involved in recycling issues that have been identified through the current research process and the literature reviewed (Palm, 2006, WRAP, 2008a & 2008b and Kollikkathara et al, 2009,) and the lack of third and fourth layer attention to recycling, as defined by Scharmer (2009a), from most of the stakeholders within the Msunduzi waste management system, it is likely that recycling issues will destruct within an absencing cycle.

The inability of the senior management of the WMU to work in partnerships with private recyclers during the pilot project suggests that the leadership of WMU does not value input from outsiders and prefers working within its own organisational boundaries. This is likely to lead to solutions being developed that are unsystemic since other players within the Msunduzi waste management system have not been meaningfully engaged by the WMU and the solutions implemented are only being informed and driven by the perspectives of the leadership of the WMU whilst other players are isolated. Cloete et al (2000) identified the support of clients and coalitions affected by a policy as being one of the five key variables that lead to policy implementation success, given the attitude of the WMU to recycling clients and coalitions, the implementation of source separation collection services is unlikely be successfully implemented.

6.4.3 Recommendations for Source Separation Collection Services

The MM should consider developing an integrated waste management institution to deliver integrated waste management services rather than the fragmented institutional arrangements that currently prevail. The proposed waste management unit should be responsible for all

waste management services from waste avoidance and minimisation to cleansing, collection, storage, disposal and treatment of solid waste.

The WMU should evaluate the current pilot project in order to understand the strengths, weaknesses, opportunities and risks associated with source separation collection services within the MM. This study should be complemented by undertaking a review of effective source separation collection projects and the issues involved in effectively operating material recovery facilities within South Africa and other parts of the world.Projects currently occurring within the eThekwini Municipality also offer good case study material. The results and conclusions of such studies should be used to inform the development of norms and standards for recycling services within the Msunduzi waste management system.

6.5 Prospects for Increasing MM Budgets for Waste Management Services

6.5.1 Discussion on Increasing the MM Waste Management Budget

All the stakeholders agree that the MM is unlikely to increase the WMU and LSU budgets substantially due to waste management not being a high priority issue within the MM. It is also clear from the research results that the political, labour, NGO and business sector do not support large increases in waste management tariffs given the large increases in electricity and property taxes that have recently occurred in South Africa. It is interesting that senior management of WMU and the LSU on the other hand are open to larger increases in tariffs, pay as you throw tariff systems and ring fenced waste management business units. Such support is however logical to expect from people involved in managing service delivery given the inadequate capital and operational budgets they currently work with but any increases in tariffs would not be in the interests of politicians within the MM who have to face constituencies already affected by increased tariffs and poor service delivery.

Most of the stakeholders interviewed agree that the polluter pay principle should apply to all waste generators with the exception of poor households. The support for such a principle from the organised business sector is surprising but it could be as a result of the triple bottom line philosophy gaining ground amongst the leadership levels of organised business. This support is however, unlikely to be found amongst the majority of commercial enterprises within the MM, especially large waste generators since it could lead to increased tariffs and

the loss of a subsidy that has been enjoyed for waste collection and waste disposal charges for a number of years within the MM.

Most of the stakeholders are of the view that whilst the polluter must pay for waste management services, these costs must be reasonable. In the case of the MM this is unlikely to be the case given the positions labour has taken on overtime and the poor management practices that prevail on procurement and fleet management issues which collectively cause operating costs to spiral upwards.

All the stakeholders with the exception of the senior management of the WMU and the LSU believe that ring fencing the WMU and the LSU will not lead to increases in revenue, lowering of operating costs and improvements in the services delivered. The MM labour sector, the MM political sector and the middle management sector of the WMU and the LSU collectively make serious allegations of corruption against senior management of the WMU, the LSU and the Procurement Unit within the MM. These stakeholders are also of the view that senior management of the WMU and the LSU support ring fenced entities in order to advance their own financial interests through control over income and procurement processes associated with waste management services. These allegations highlight the low levels of trust and co-operation that characterise relationships between stakeholders within the MM.

6.5.2 Conclusions on Increasing the MM Waste Management Budget

The political and administrative sectors of the MM believe that increases in revenue for waste management services from within the MM is unlikely in the short term therefore some of fundamental problems that affect the WMU and the LSU which require financial resources are unlikely to be addressed in the short term.

The prospects of increasing the tariffs for waste management services in order to generate additional resources are unlikely to obtain political support in the current climate of escalating electricity tariffs and property taxes.

The prospects of ring fencing the WMU in order to enable it to function as a commercial enterprise is not supported by the political leadership of the MM and the labour sector and is therefore unlikely to occur in the short term. Given that ring fencing of other more

sustainable municipal services like electricity and water have not yet been undertaken within the MM it is unrealistic to expect a loss making service like waste management to be the primary candidate for financial ring fencing type processes.

The prospects for reducing the costs to operate the WMU and the LSU is severely limited by the high maintenance costs associated with an ageing fleet and the stranglehold that labour appear to have over the management of the WMU and the LSU. It is quite likely that operating costs will continue to increase given the inability of the MM to make significant capital investments into waste management infrastructure and the hegemonic status labour interests currently occupy within the WMU.

The prospects of introducing a pay as you throw tariff scheme in the short term is unlikely given the lack of prototyping activities or feasibility studies currently being undertaken in this regard.

6.5.3 Recommendations on Increasing the MM Waste Management Budget

The MM should undertake feasibility studies and prototyping activities into pay as you throw forms of waste collection charges for households and commercial waste generators. Initially the focus could be on identifying the largest commercial waste generators within the MM in order to develop incentives to promote waste avoidance and waste minimisation practices within such companies. As soon as an effective source separation collection service is established to service the majority of households within the MM pay as you throw schemes must be prototyped. It would be useful to prototype some of the most effective approaches developed elsewhere in the world, one of these is the system whereby waste is only collected by the collection agent if a specific type of bin bag is used to store the waste, the costs to purchase such bin bags is linked directly to the costs of refuse collection and disposal (Skumatz, 2008). Several studies have demonstrated that pay as you throw schemes increase the diversion rate of waste from landfill to recycling (Skumatz, 2008 and Kollikkathara et al, 2009) which could result in avoided waste disposal costs.

The MM should also undertake a cost benefit analysis to determine the feasibility of either purchasing or leasing a new fleet of refuse collection compactors in order to reduce the high operating costs associated with an ageing fleet.

The MM should also undertake a feasibility study into the treatment of all organic waste generated within the MM in order to reduce the release of greenhouse gases, such a study must also determine the value of potential carbon credits that could be earned should such projects be implemented and qualify as carbon emission trading schemes under the Kyoto Protocol. If such a project is viable it could result in revenue being earned for the MM, avoided waste disposal costs as well as the implementation of climate change mitigation programmes within the MM.

6.6 Prospects for Integrated Waste Management Planning Processes

6.6.1 Discussion on Integrated Waste Management Planning Processes

The consensus amongst all the stakeholders interviewed with the exception of senior management of the WMU and the LSU is that both units are uncoordinated institutions where planning and information management processes are not taken seriously nor are they used to facilitate strategic change management processes. The implication arising from this view is that both units will continue to operate without reference to strategic plans to address service delivery issues; instead they will continue to look for quick fix solutions. According to Senge (2006) these short term solutions provide immediate results but they result in less use of fundamental long term solutions and a greater reliance on symptomatic solutions with the result that fundamental changes are never effected within the system and the problems created by short terms solutions continue to arise in a vicious cycle.

The political representatives of the MM blame the uncoordinated situation between planning and budgeting processes within the WMU and LSU on the senior management of the WMU and the LSU instead of realising that one of their key legal obligations as political representatives is to oversee the implementation of service delivery through participating in the formulation of IWMP's, allocating resources for their implementation and monitoring implementation of these plans. Senior management of the WMU and the LSU on the other hand blame politicians for taking budgetary decisions without reference to approved plans.

It is interesting that technical experts who have undertaken IWMP processes have indicated that in most cases such planning processes are not leading to improved service delivery. It

tends to suggest that planning processes are being undertaken by municipalities for legislative compliance purposes only or due to obligations arising out of grant funding and that planning is not informing budgeting processes and performance management systems as they should be.

6.6.2 Conclusions on Integrated Waste Management Planning Processes

Given the lack of interest in the current integrated waste management planning process by senior managers of the WMU and the LSU and the reluctance by senior management of these units to disclose the underlying challenges facing their units during the current planning process, the plan that will be developed through the process is unlikely to be of significant strategic value nor will it be used by senior managers of the WMU and the LSU as a medium term planning framework.

Given that integrated waste management planning processes appear to be ignored by key decision makers within the MM at both a political and administrative level, it is quite likely that operational and budgetary decisions taken for the waste management sector would be characterised by non-strategic, disintegrated and short term quick fix measures that will not create lasting improvements in service delivery. It is most likely that senior managers and political leaders responsible for waste management will continue to use quick fix solutions to address the fundamental problems within the Msunduzi waste management system with the result that the system will remain unchanged and continue to create the same problems on an ongoing basis. This unsystemic approach is likely to result in the worsening of existing problems and the weakening of the Msunduzi waste management system. The collapse of refuse collection services within the MM for a two week period reported by Shamase (2009c) tends to support this conclusion.

6.6.3 Recommendations on Integrated Waste Management Planning Processes

The WMU and the LSU should utilise integrated waste management planning processes to develop a five year plan that outlines strategic issues facing the units, service delivery improvement plans with annual targets and budgetary issues that need to be dealt with.

These plans should be amended on annual basis to reflect any targets that have been achieved or missed, changes in the internal and external context and related budgetary issues.

Integrated waste management planning processes should also be undertaken on a ward basis where feasible so that spatial based planning approaches can be used to integrate service delivery and monitor performance.

6.7 Prospects for Enforcement of Waste Management Laws and Policies

6.7.1 Discussion on Enforcement of Waste Management Laws and Policies

All the stakeholders within the Msunduzi waste management system believe that enforcement related to littering and illegal dumping is necessary to maintaining healthy and clean environments yet according to most of the stakeholders from within the MM little or no enforcement takes place despite the MM employing several peace officers that could undertake enforcement activities It seems that the MM prefers to employ ever increasing numbers of street sweepers to deal with littering instead of getting people to comply with generally accepted social and environmental norms on littering and dumping. This unsystemic approach followed by the WMU in dealing with littering ensures that most residents will continue to litter and expect the WMU to clean up and the WMU will face ongoing needs to employ more street sweepers as population numbers increase.

The lack of enforcement of environmental laws such as NEMA and the National Water Act against local governments in South Africa due to the need for co-operative governance amongst all spheres of government is leading paradoxically to unco-operative governance between the spheres of government, this view is well supported in Lukey et al, 2004, Patterson et al, 2009 and Muller in Strydom and King, 2009. It is common to see national and provincial government officials responsible for the enforcement of these laws ending up having tense relationships with local government officials when they feel as if they are being undermined and ignored. Some regulatory authority officials end up not going through all these frustrations and simply cease to become involved in compliance monitoring activities all together. Ultimately the legislative effect of environmental laws in South Africa is disintegrating on the altar of co-operative governance. National government has a well established system of undertaking annual audits of municipal finances in order to hold officials and politicians accountable for public finance yet the environmental sector does not enjoy such similar levels of transparency and accountability with the result that non compliant behaviour seems to flourish.

According to Scharmer (2009a) two key defining characteristics of social decay in the world today are the loss of norms and values and the breakdown of social structures which lead to the inability of institutions to renew themselves and redirect themselves to serving the whole. Such systems usually operate within the cycle of absencing which is characterised by destruction rather than creation. By allowing citizens of the city to litter and dump without enforcement, the norms and values that should be enforced to create a healthy and clean environment are being destroyed, the society's value system is changing and it will become progressively more difficult to renew those values and to build structures that can promote those values again.

6.7.2 Conclusions on Enforcement of Waste Management Laws and Policies

The prospects of the MM enforcing municipal by - laws on illegal dumping appear very limited given that the WMU does not a have dedicated enforcement capacity currently and has no plans to create such capacity in the short to medium term. Incentives for residents and business people within the MM to change their behaviour to comply with social and environmental norms on littering and pollution generally do not exist within the MM. Instead of enforcing norms and standards for littering the MM has chosen to deal with the symptoms of the disease by cleaning up littering in certain parts of the city. The causes of the disease are left untouched and so the symptoms will keep recurring requiring more use of quick fix solutions. According to Senge (2006) the ongoing use of quick fix solutions without the underlying problem improving is a reliable indicator of unsystemic thinking whilst the ongoing use of quick fixes creates an ever increasing reliance on quick fixes which weakens a system, leaving it in need of more help than ever before.

Given the consistent non compliant approach by the MM with regards to its landfill site permit conditions and the environmental laws upon which these are based upon, it is unrealistic to expect the same institution to start enforcing environmental laws against its residents.

This lack of commitment to social and environmental norms by the MM along with the absencing trend that seems to characterise the activities of the leadership of the WMU on various service delivery issues confirm that the WMU is operating within a collapsing system

characterised by what Scharmer (2009a, 314) "calls the anti space of institutional pathology". According to Scharmer (2009a) institutions in systems that are collapsing display corporate ignorance internally and corporate arrogance externally which leads to absencing behaviour characterised by leaders having no interest in serving the whole and no capacity for sensing what is happening within their institutions and the external context. Such leaders lack the capacity to reflect and engage in dialogues with others preferring to blame others for their failures. Such leaders even hold back true information or spread false information in order to remain in control with the result that they are unable to let go of ideas, operations, projects, products and principles that have become dysfunctional, eventually such institutions become unable to renew themselves and collapse (Scharmer, 2009a). The prospect of the WMU collapsing completely is unlikely provided that other institutions with oversight over their functions within the MM are able to intervene to ensure a minimal level of service delivery.

6.7.3 Recommendations on Enforcement of Waste Management Laws and Policies

The WMU should undertake a prototyping project on the enforcement of by-laws relating to littering and dumping within a specified area or ward within the MM. Baseline data on the volumes of waste needing to be picked prior to the pilot project should be measured so that any effects on these volumes as a result of enforcement activities can be measured. The MM would need to provide sufficient bins, deploy enforcement staff, educate people on the bylaws and develop appropriate penalties for transgressions of by - laws in order for the prototyping project to be effective.

6.8 Prospects for Co-operative Governance and the Co-ordinated State

6.8.1 Discussion on Co-operative Governance and the Co-ordinated State

None of the stakeholders interviewed believe that government institutions in South Africa operate in a co-ordinated and co-operative manner with each other. This generalised conclusion converges with the findings of a national study undertaken by COGTA (2009) which indicates that the expectations of intergovernmental co-operation have not been met and that concepts like co-operative governance and the co-ordinated state appear in practice to be undefined and voluntary despite the existence of the Intergovernmental Relations Framework Act which is meant to regulate such matters. The consequence is that policy is not coordinated throughout the state system with the result that the policy priorities of

national government are not allocated resources at other levels of the state nor do other levels of the state take responsibility for achieving national government priorities.

The lack of policy co-ordination and co-operation between government spheres is well demonstrated in the MM attitude to implementing the Waste Act. All the stakeholders from the MM who were interviewed felt that national government must provide financial resources if it wanted the Waste Act to be implemented by the MM yet waste management according to the South African Constitution is an exclusive function of local government which should undertake measures to deliver the services that are needed to maintain a healthy and safe environment (RSA, 1996). Waste management services are also trading services capable in most cases of generating sufficient revenue to be self sustainable, the MM also receives property taxes from property owners within its municipality for purposes of delivering services therefore it should be able to implement the Waste Act without making it conditional upon the receipt of funding from national government. It seems that the MM does not accept that it should utilise municipal resources to implement a policy developed at national government level. The organised business sector within the MM seems to support such an approach given that national government grants would have the effect of possibly preventing the MM from increasing waste management tariffs to its members.

The voluntary nature of co-operative governance relationships in South Africa and the consistent failure by the regulatory authorities to enforce environmental legislation against municipalities have destroyed most of the potential for co-operative governance relationships to be forged. The regulatory authorities are unlikely in the current context to obtain co-operation from the MM nor will they be able to enforce compliance with the Waste Act.

6.8.2 Conclusions on Co-operative Governance and the Co-ordinated State

Given the difficulties being experienced in getting the entire state system to act in a co-ordinated manner on policy implementation generally, the prospects of the MM acting in a co-ordinated manner with other spheres of government to implement the new waste management policy appear very slim. The prospects of the MM having co-operative relationships with other levels of government involved in waste management issues, especially those with monitoring and enforcement roles also appear to be unlikely given the

ease with which the WMU and the LSU fails to currently comply with norms and standards for operating landfill sites and maintaining waste information systems.

6.8.3 Recommendations on Co-operative Governance and the Co-ordinated State

The MM should consider setting up an intergovernmental forum on waste management that brings together national, provincial, district and local levels of government in order to examine ways of increasing co-operation and co-ordination between the spheres of government.

The report will now proceed to discuss and make conclusions related to the second and third research objectives.

6.9 Prospects for Co - Initiation Processes

According to Scharmer (2009a) the first movement of the U process, co initiation, involves individuals and organisations within a system moving from working in isolation to forming an intention to work together to explore changes within their system. This process becomes possible only when individuals within the system are able to suspend attending to their context according their own mental models and interests to seeing with fresh eyes what other key stakeholders think and experience within the same system. According to Scharmer (2009a, 378) the ultimate purpose of the co initiation stage is to create a "field or container from which the remaining four movements can come into being".

6.9.1 Discussion on Co - Initiation Processes

It is interesting that the majority of stakeholders interviewed including the political and trade union sectors of the MM find the WMU and LSU leadership unable to suspend their views and interests in order to dialogue and partner with other stakeholders within the MM and outside of the MM. Some of the senior managers of the WMU and the LSU defend this approach by indicating that there is no point in working with external stakeholders like business and the NGO's because these parties have interests that are in conflict with the MM whilst other senior managers within the WMU and LSU leadership indicate that those leaders who do not want to work with external stakeholders are also unable to work with their colleagues within the WMU and the LSU. The claims by the WMU and LSU leadership that

they choose to work only with those parties with whom they share common views is very interesting given that all the other stakeholders within the system confirm that the WMU and the LSU do not co-operate or dialogue with them. The golden question that then begs to be answered is who then does the senior management of the WMU and the LSU work with? The research results indicate that the senior management of the WMU and the LSU have isolated themselves from other stakeholders.

The political sector and the organised business sector both confirm that they do not work with each other generally and specifically on waste management issues. The business sector suggests that MIDI could bring the parties together if the MM actively participated in MIDI whilst the political sector representatives did not seem overly unconcerned about the lack of a partnership with the business sector. The lack of partnerships between the MM and the business sector is a cause of great concern given the need for both parties to co-operate in order to improve the waste management system specifically and to address other important issues like unemployment.

The behaviour of the senior managers of the WMU and the LSU towards the NGO sector conforms to what Scharmer (2009a) describes as 'institutional pathology' which is characterised by institutional ignorance and arrogance whereby silencing and blaming conduct is preferred rather than collaborative engagements. Eventually such organisations start absencing whereby they exploit the entire system for their own benefit resulting eventually in the system collapsing and destruction and chaos occurring in society.

6.9.2 Conclusions on Co - Initiation Processes

None of the stakeholders interviewed across all the different sectors within the Msunduzi waste management system are involved in any kinds relationships with each other that can be defined as a partnerships or dialogues. All the key stakeholders within the Msunduzi waste management system seem to be working by themselves to improve waste management issues.

All external stakeholders seem to have a desire to make a difference within the Msunduzi waste management system but lack collaborative relationships with the WMU and LSU specifically for those efforts to be integrated and form part of a coherent set of measures that can improve the current system.

The WMU and the LSU do not have any existing partnership-type relationships or dialogues with any of the external stakeholders within the Msunduzi waste management system that have been confirmed by any of these stakeholders, despite the WMU claiming partnership type relationships with external stakeholders like Mondi or Central Waste.

The senior management of WMU and the LSU seem to work in isolation even within the organisational boundaries of the MM. They appear not to have partnership and dialogue-type of relationships with the political leadership of the MM, the trade unions and operational staff from the WMU and the LSU.

Co-operative governance relationships with the regulatory authorities and the MM do not exist since the WMU and the LSU consistently fail to comply with environmental regulations whilst sections of the political leadership of the MM question the need for the existence of provincial and district levels of government that currently have monitoring and enforcement roles within the MM. The prospects of the state sector collaborating to lead transformative change within the Msunduzi waste management system appear unlikely currently.

Current attempts to form a diverse core group of key stakeholders for the Msunduzi waste management system in order to promote dialogue and sensing processes could suffer from the lack of a credible senior political or administrative leader within the MM who could champion the process. MIDI has been identified by some of the stakeholders as the only institution that currently has a mandate to bring the stakeholders together in order to enable dialogue on some of the burning issues that face the MM. MIDI may however find that it lacks the formal power to make the key stakeholder, the MM, participate meaningfully in its processes and that key decision makers within the MM are not involved in driving the activities of MIDI.

According to Scharmer (2009a) it is critical during the co-initiation stage for the handful of people with common intention to persevere and maintain the initial holding space that they collectively created despite all the obstacles they face since the incubation period for new ideas often stretches many years and if the holding space of common intention is destroyed these ideas will never live to be prototyped and evolved. Despite the lack of players within

the MM currently with the intention of collectively improving the waste management system to better serve the whole, the U process can still be undertaken by other members of the system who have a common intention and purpose to improve the system. Players from the NGO sector, the technical expert sector, regulatory authorities like DAEARD and the organised waste management business sector could potentially form a core group because they share a common intention to transform the Msunduzi waste management system.

If the current trends within the Msunduzi waste management system continue outcomes associated with the "Walking Apart" and "Walking Behind" Dinokeng Scenarios could play themselves out in the medium to long term within the Msunduzi waste management system. The lack of desire from within the WMU and the LSU to address service delivery failures, corruption and incompetence could eventually result in the waste management system suffering serious decline, on the other hand if all the stakeholders including the MM continue work in isolation from each other the solutions that are implemented by a weak local state are unlikely to succeed because it will lack the insight and support of the private sector and civil society.

6.9.3 Recommendations for Co - Initiation Processes

The waste management crisis facing the Msunduzi waste management system requires a co – initiation process as envisaged in the Theory of U. It will be critical for players within the Msunduzi waste management system who seek to improve the system to serve the whole to form a core group. It would be useful for core players to listen and dialogue intensely with one another in order to create the basis for the core group to form and to attract like minded players to belong to a core group. The core group should strive to include key decision makers and sponsors from the Msunduzi waste management system along with key knowledge suppliers, activists and role players whose voices have been excluded in the current system.

Ideally the core group should include key role players from the MM but should core players from within the MM be disinterested in such processes other core players in the system with a core intention to transform the Msunduzi waste management system should proceed to establish a virtual holding space for their intentions.

6.10 Prospects for Co-Sensing Processes

Co-sensing refers to the process whereby the stakeholders move from thinking in terms of what the system is doing to them to realising that they create the system that they find themselves within.

6.10.1 Discussion on Co – Sensing Processes

All the external stakeholders indicate that the senior managers of the WMU and the LSU do not seem to have an understanding of the larger waste management system to which they all belong. They seem to suggest that this narrow definition of the waste system serves to exclude external stakeholders and position the WMU and the LSU at the centre of a very small system that is all about waste collection and disposal. The results of the research process confirm that for most of the MM stakeholders the waste management system does not exist beyond the organisational boundaries of the MM. It is therefore not surprising that senior managers within the WMU and the LSU have great difficulty working with external stakeholders given that they cannot understand the role these stakeholders play within the MM waste management system.

The senior managers of the WMU and the LSU lay the blame for the poor quality of waste management services on other MM departments and the lack of insight into waste management issues from operational level staff employed within the WMU and the LSU. The blame game allows senior management of the WMU and the LSU to avoid taking responsibility for the consequences of their unsystemic actions, it also allows them to avoid seeing how the system is collectively created by all those affected by waste management issues and how the system can only be collectively changed by those who created it in the first place. It is also clear however from the research that the leadership of the WMU and the LSU face severe challenges from within the MM system. These include pressures from the trade unions and other business units that have a negative effect on the functioning of both units as well as pressure from politicians with their own narrow interests for a specific ward or some political party objective. These pressures seem to affect the quality of waste management services delivered by the MM but they also seem to provide confirmation to leaders within the WMU and LSU that their waste management system is only about fleet management, procurement issues, trade unions and councillors. It also became clear to the

Author during the research process that most stakeholders within the MM have a limited understanding of how systems actually work and possible approaches to changing complex social systems.

The organised business sector indicates that the MM seems to have excluded them from the development planning process and from forging public private partnerships to improve waste management services. They are probably correct about the being excluded from planning processes but the formation of public private partnerships is a more complex issue. Often the business sector proposes public private partnerships that bring huge benefits to the private sector participants without similar benefits to the state sector resulting in the state sector being very cautious and sceptical of the benefits of public private partnerships. The advent of black economic empowerment has also made it difficult for the private sector which is still largely white owned to forge partnerships with the state without having partners who are black. These issues serve to make relationships between local government and the organised business sector complex and difficult to manage, often as in the case of the MM, the parties remain isolated and distrustful of each other.

The technical expert sector consistently highlights the lack of capability amongst managers of the WMU and the LSU. Whilst these comments are valid in certain cases, the conflict of interest dilemma facing the technical expert sector needs to be recognised. Technical experts flourish in contexts of limited human resource capability and some technical experts can develop an interest in keeping that capability limited in order to ensure their own survival.

6.10.2 Conclusions on Co –Sensing Processes

The leadership of the MM responsible for waste management issues are restricted in their attempts to find systemic solutions to waste management problems because they think and act as if the waste management system ends at the organisational boundaries of the MM. This results in them focussing most of their planning and implementing efforts on players within the MM organisational system boundaries whilst players outside of the MM are usually excluded.

The leadership of the MM also seems to lack basic knowledge of how systems function and how systems can be changed. Given their limited understanding of systems, the stakeholders

from the MM spend more effort blaming each other or the MM system rather than focussing on understanding how the system is collectively created by the players affected by the system. The lack of capacity to sense the larger system and its players prevents the leadership of the WMU and the LSU from making systemic decisions capable of addressing the fundamental problems facing the Msunduzi waste management system.

The NGO, regulatory authorities and technical expert sectors seem to sense the larger system and all its interconnections but collectively they have very limited influence on the MM.

6.10.3. Recommendations on Co-Sensing Processes

Stakeholders within the MM need to be made more aware of the basic functioning of systems and the approaches to changing system dynamics.

Opportunities should be created for core players within the Msunduzi waste management system to engage in shadowing practices in order to enable them to sense the system that they belong to or to learn about the functioning of high potential systems. Scharmer (2009a) suggests that in order to enable core players in a system to sense the larger system it is useful to provide opportunities for core players to engage in shadowing practices. Shadowing involves creating opportunities for core players to closely observe another core player at work in the system or to observe players involved in new and unfamiliar high potential systems (Scharmer, 2009a).

The NGO, regulatory authority, technical expert and organised waste management business sector could utilise the core group they have formed to create a collective sensing organ so that they are all able to see the system that they create and begin thinking together about ways they could change the system. The core group could also go to places of high potential in order to make sense of how effective waste management systems operate. The results of both these sensing processes should be documented and shared with all stakeholders within the Msunduzi waste management system and beyond.

6.11 Prospects for Co - Presencing Processes

According to Scharmer (2009a) presencing is the ability to shift the place of perception to the source of an emerging future and to bring that future into being. Presencing is a new form of

learning based on sensing and enacting the future rather than learning by re-enacting the patterns of the past in terms of the Kolb type of learning cycle (Scharmer, 2000).

6.11.1 Discussion on Co – Presencing Processes

All the stakeholders within the Msunduzi waste management system would like to bring into being futures that are closely aligned to the objectives of the Waste Act from universal access to source separation collection services, to the treatment of organic waste and the creation of a recycling industry. Despite the stakeholders belonging to different organisations they would collectively like to ensure that the future Msunduzi waste management system is characterised by integrated waste management services with a focus on environmental protection and mitigating against climate change. It is strange that the stakeholders tend to have a common outlook for the future but differ significantly on approaches to address the current challenges. It is likely that conflicts of interest play a partial role in causing the divisions that currently exist between the stakeholders. It is also likely that the widespread use by all the stakeholders of traditional learning cycles which focus on re-enacting patterns of the past contribute to the maintenance of the status quo.

The leadership of the WMU and the LSU have predictably and rather ominously identified nothing that they would need to leave behind in order to enable them to work more effectively with other stakeholders. This is in stark contrast to honesty of the NGO and technical expert sectors which have identified serious issues relating to their attitudes to the MM that they would need to leave behind if they wish to collaborate successfully with the MM.

The business sector is quick to point out that they require the MM to become transparent and accountable in order for relationships to improve between the two parties but are silent on what their members would need to let go of in order to realise the highest future potential of the Msunduzi waste management system.

The political sector has had enough of the current leadership of the WMU and the LSU and believes that the highest future potential of the system is only likely to be attained if the current leadership of the WMU is replaced, unsurprisingly they do not identify any matters they would need to let go of in order to work with other stakeholders..

6.11.2 Conclusions on Co – Presencing Processes

During the research process it has become clear that core players within the Msunduzi waste management system collectively have very limited or no past experiences with some of the challenges that they are now expected to face in realising the objectives of the Waste Act. Amongst the issues that the stakeholders have identified that will require presencing type approaches to learning include cleaner production technologies to prevent waste, source separation collection services to enable recycling, the operation of material recovery and waste treatment facilities and the building of high capacity municipal waste management institutions to meet the challenges of providing integrated waste management services.

Stakeholders within the Msunduzi waste management system would collectively like to bring into being futures that are very well aligned to the objectives of the Waste Act. The MM has legal obligations to achieve the objectives of the Waste Act within the Msunduzi waste management system and is therefore very fortunate to have access within this system to highly capable NGO's, technical experts, specialised waste management businesses as well as regulatory authorities who would like to work collectively to create a new waste management system.

During the research process most of the stakeholders identified issues that they would need to leave behind in order to work effectively with the MM to create better futures. The leadership of the WMU and the LSU as well as the political leadership of the MM have not identified any issues during the research process that they would need to leave behind in order to work with other stakeholders. This indicates institutional arrogance on their part, ie. the belief that they know what is best for the system,this is likely to prevent the stakeholders within the system from working together to create alternate futures. This conclusion is consistent with an earlier conclusion that suggested that stakeholders within the MM are operating within the cycle of absencing which creates economies of destruction instead of the economies of creation that is associated with the cycle of presencing.

The political leadership of the MM has indicated that the leadership of the WMU and the LSU would need to be replaced in order to improve the waste management system; this position is likely to escalate the institutional arrogance, absencing and pathological

tendencies within the WMU and the LSU. Given this situation limited prospects exist for stakeholders within the MM to be brought together to support one another to engage in co-presencing activities.

6.11.3 Recommendations on Co – Presencing Processes

Key role players within the MM would need to participate in sensing processes designed to enable them to let go of their old self and habitual ways of seeing that prevent them from working together with other stakeholders within the Msunduzi waste management system in order to achieve the highest future possibility of the system.

The stakeholders of the Msunduzi waste management system would need to support each other in order to enable each other to access their creative potential so that each of them can do the work that they love to do and collectively bring into being the highest future possibility of the Msunduzi waste management system.

The stakeholders of the Msunduzi waste management system would need to establish a safe collective holding space in which they can support each other to make sense and to advance the work that they are undertaking to improve the Msunduzi waste management system. Scharmer (2009a, 410) refers to such spaces as "Circles of Presence" in which core players hold one another in the highest future intention. Specifically they would need to look at the present from the highest possible future that can emerge within their system and do all that they can to bring that future into being.

6.12 Prospects for Co - Creating Processes

According to Scharmer (2009a) the purpose of co creating is to put ideas onto their feet by prototyping microcosms of the future in order to maximise learning through generating feedback from all stakeholders about how the prototype works and feels.

6.12.1 Discussion on Co – Creating Processes

The two most popular prototyping activities identified by the stakeholders are environmental education to the general public and transformation of the waste management institutions of the MM. Support for each of these activities came from across all the different stakeholders

interviewed. It is interesting that the majority of stakeholders identified prototyping activities that seek to make improvements to people rather than to waste management services directly as a means of reaching the highest future potential of the Msunduzi waste management system. It suggests that the stakeholders instinctively believe that people create systems and that by improving people through education and institutional transformation, systems can be changed.

An analysis of the stakeholder's preferences for service delivery prototyping activities indicates that the majority of stakeholders would like to prototype source separation collection services and composting of organic waste. None of the stakeholders identified prototyping conventional refuse collection services and waste prevention approaches. These types of preferences could be the result of recognition by stakeholders that conventional refuse collection services have been subjected to intensive prototyping across South Africa and the world whilst the small sample size of the business sector could account for the lack of interest in waste prevention prototyping activities.

Scharmer (2009a) suggests that prototyping is about moving into action before the all the elements of a project have been fully figured out and having the confidence to improvise along the way and undertake deep learning as a result of doing and sharing these experiences with other core players. It will be very interesting to observe whether the key stakeholders within the Msunduzi waste management system are able to operate in prototyping or fast cycle learning contexts which function on the basis of failing early to learn quickly. Given the emphasis placed in our context on intensive planning, quick success and the desire to expose government failures it will be challenging for all stakeholders within the Msunduzi waste management system to engage in prototyping activities.

6.12.2 Conclusions on Co – Creating Processes

The majority of stakeholders believe that prototyping activities should focus on learning about how to enable people to change waste management systems and this is reflected in the majority of stakeholders wanting to become involved in environmental education prototypes and institutional transformation prototypes. The majority of stakeholders have identified the need to educate young children on environmental issues in order to ensure future generations are able to develop and maintain an ecologically sustainable way of life.

The transformation of the WMU and the LSU into high capacity institutions managed in terms of conventional business principles is considered by the majority of stakeholders to be critical to enabling the Msunduzi waste management system to reaching its highest future potential.

The prototyping of source separation collection services has been identified by a significant number of the stakeholders interviewed due to the lack of previous experience with such services and the lack of tacit knowledge amongst the stakeholders to enable effective provision of such services. This service provides an ideal opportunity for utilising the U process to undertake presencing and prototyping processes in order to create innovative practices that could be embedded within the transformed WMU of the future.

The prototyping of processes to compost organic waste is considered to be a priority amongst a significant number of the stakeholders interviewed due to the potential of such processes to mitigate against climate change drivers and the potential value that compost has to poverty alleviation projects involving food gardening.

The prototyping preferences of the different stakeholders revealed that the majority of stakeholders within the Msunduzi waste management system have a very common vision of the highest future possibility of the waste management system. Some of the factors that prevent collective action to create this future are likely to be centred on the social complexity or conflicts of interest, essentially who would benefit and who would lose from creating this kind of future. Another divisive factor would be the different perspectives held around dealing with emerging complexity, according to Scharmer (2009a) this would essentially be situations where the solutions to problems are unknown and the problem statement is unfolding.

6.12.3 Recommendations on Co-Creating Processes

The stakeholders of the Msunduzi waste management system need to form a small prototyping team of least five key players from the system. According to Scharmer (2009a), the five people that must be included are the owners of the problems at hand, people with

front line experience with the problems, people who represent people without voices in the system but who are most affected by the system, creative outsiders and activists.

According to Scharmer (2009a) creative economics should be the basis of all prototyping activities, in terms of the principles of creative economics a person would need to give all they have and all they are to an essential project before everything will be given to them. According to Scharmer (2009a) creative economics is usually at the heart of every profound innovation in science, business and society.

According to Scharmer (2009a) the key virtue required to navigate through the right hand side of the U is the practical integration of head, heart and hands which will prevent mindless action, endless reflection and too much talk.

6.13 Prospects for Co – Evolving Processes

According to Scharmer (2009a) once prototyping activities are completed it is necessary to begin the next stage of the U journey which involves embedding microcosms of the future that have been created through prototyping into an institutional infrastructure that will allow such new practices to evolve.

6.13.1 Discussion on Co – Evolving Processes

Of all the stakeholders interviewed only one senior manager from within the WMU believed that the WMU was a place capable of innovation and providing a shelter for creative prototyping activities. All the other stakeholders including other senior managers from the WMU and the LSU as well as the political leadership of the MM felt that the WMU and the LSU were not innovative places that could provide a holding space for prototyping activities and allow new practices developed through prototyping to evolve. Most of the stakeholders were of the view that the WMU and the LSU would be unable to transform itself into a place of innovation with the current leadership driving the process. This is the second occasion that the research results are pointing specifically to the need to replace the current leadership of the WMU and the LSU in order to enable the Msunduzi waste management system to cross into deeper thresholds of the U process and undergo transformational change.

Most stakeholders indicated that MIDI could be an alternate site of innovation within the MM given the limitations of the WMU and LSU in this regard. However all the stakeholders who identified MIDI as an alternate site raised serious doubts about the capacity of MIDI to obtain the support of officials and politicians with decision making powers from within the MM and the ability of MIDI to influence the WMU and the LSU to support innovative waste management projects. Ultimately the stakeholders seem to question the outsider status of MIDI and lack of formal power within MIDI to make decisions around innovation that would apply to the WMU and LSU. It would be ideal if MIDI enjoyed access to direct formal power so that it could make decisions around innovation that would apply to the MM but MIDI is based upon a partnership between three independent parties and will most likely exert influence within the MM through voluntary, persuasive and consensual approaches.

Some of the NGO sector representatives raised the important need for the WMU and the LSU to become aspirational with regards to its Waste Act obligations in order for innovation to flourish; in this regard they have suggested that the MM set performance targets for waste management services. The absence of effective performance management systems and the lack of transparency and accountability amongst most local municipalities makes it is extremely difficult for targets to be monitored and service delivery performances to be measured. It is surprising that none of the NGO's offered their institutions as possible holding places for prototyping activities given the obstacles identified with the WMU and the LSU undertaking this role. It could perhaps reflect the reality that the NGO sector believes that for the Msunduzi waste management system to undergo transformational change, the WMU and the LSU must be the sites where prototyping activities should be implemented.

6.13.2 Conclusions on the Co – Evolving Processes

The majority of stakeholders were unable to identify an effective institution within the MM that could be capable of hosting and sheltering a prototyping team. The WMU and the LSU are not considered by the majority of stakeholders interviewed during the research process to be innovative places capable of providing a cocoon to enable the prototyping activities identified by the stakeholders to be implemented. The MIDI is considered as an alternate site for hosting prototyping activities but serious doubts exist about its capacity to influence leaders from within the MM given its outsider status. Scharmer (2009a) indicates that one of the limitations in getting transformational change to spread across systems is the lack of

institutional infrastructures to bring together the diverse players within a system who need one another in order to transform the system. Scharmer (2009a) admits that currently theorists and practitioners are only beginning to figure out what it really takes to put such infrastructures into place.

The majority of stakeholders indicated that the current leadership of the WMU and the LSU would be unable to nurture and sustain the new practices, policies and infrastructures developed through the prototyping process. Significant stakeholders suggest that a change of leadership within the WMU and the LSU is a necessary pre condition for transformational change to occur within the Msunduzi waste management system. One of the aims of transformational change processes would however be to transform the incumbents rather than to replace them in order to create change. According to Scharmer (2009a) in an ideal situation leadership would need to be in place within these institutions to create supportive places, practices and processes for the newborn to develop and be sustained.

The gatekeeping approach of the labour sector is most likely to prevent the introduction of new practices, policies, services and infrastructure within the WMU and the LSU.

6.13.3 Recommendations on Co Evolving Processes

The MM would need to quit organising waste management services around standard processes and programmes but rather move to organising waste management services around the ecosystem or the whole system that it wants to address and transform.

The MM should provide a sheltered place for the core group of diverse stakeholders to create a new waste management system. Nonaka (2001) proposes that an innovation cocoon requires a physical place, a social –mental place to enable sharing and trust to develop amongst the core group and a shared purpose and intention for the core group.

6.14 Improvements in the Research Methodology

One of the main shortcomings in this study's methodology was the representativeness of the political and business sector samples. The political sector sample was limited to the chairperson of the Community Services Portfolio Committee and two ward councillors from within the Community Services Portfolio Committee. The two ward councillors sampled

represent wards were waste collection services are currently provided by the MM and therefore their thoughts and experiences are unlikely to be representative of ward councillors who represent wards were no waste management services are currently delivered by the MM.

The organised business sector sample was limited to the Chief Executive Officer and the Vice President of the Pietermaritzburg Chamber of Business whilst large industrial business organisations within the MM were not included in the sample, therefore the thoughts and experiences reflected by the organised business sector cannot be representative of the business sector as a whole and the large industrial waste generators specifically. The organised business sector sample was selected on the basis of their ability to provide informative answers to issues relating to the relationship between the Pietermaritzburg Chamber of Business and the MM and their ability to provide an overview of the waste management issues facing the business sector. An improved research methodology would seek to obtain a broader sample from both the political and business sector given the diversity that prevails with both sectors.

Some of the results obtained from key stakeholders are likely to be influenced by the fact that the research was undertaken by a core player within the Msunduzi waste management system. It is therefore quite likely that another researcher who is not a core player within the system may obtain different results from the research process due to greater levels of disclosure by the stakeholders. This is most likely to apply to stakeholders from within the MM who are directly affected by issues relating to Authors employment within the Msunduzi waste management system.

6.15 Recommendations for Future Research

During the course of this research it became apparent that further research was required into recycling services generally within the Msunduzi waste management system, with a special focus on source separation collection services. It is also necessary for further research to be undertaken into refuse collection services provided by the MM and private contractors with a view to developing a deeper understanding of the challenges currently being faced to deliver services and the prospects for extending service delivery to informal and rural settlements within the MM. The financial issues relating to waste management services within the MM is another area that further requires further research, with special focus into the application of

pay as you throw forms of waste management tariffs and the effects of utilising financial instruments to create incentives for waste prevention and recycling. It would also be important for future research to explore issues relating to the enforcement of environmental laws within the co-operative governance system and the enforcement of waste management by-laws within the MM. Research should also be undertaken into the development of suitable waste treatment technology options for organic waste within developing country contexts with possible linkages to the Kyoto and possible Copenhagen protocols on greenhouse gas emissions.

It would also be important to undertake further research into the Theory U especially around the development of collective sensing organs, presencing methodologies and the establishment of ecosystem type institutional infrastructure to allow microcosms of the future to evolve and create transformational change within complex systems.

6.16 Concluding Remarks

The research results indicated that the senior management of the WMU and the LSU, the labour sector of the MM, the political sector of the MM and the organised business sector are collectively operating within an absencing cycle. This conclusion is based on the results obtained through the research process which demonstrate that these institutions do not act to improve the entire waste management system but rather act in support of their own narrow interests which have the effect of weakening the overall system and leading to declines in the quality and quantity of waste management services that are delivered. The prospects of such a system reaching its highest future possibility in the short to medium term are very limited. In the medium term the MM is unlikely to extend refuse collection services to unserviced households beyond a low growth scenario. It is also unlikely that source separation collection services will be provided to all existing customers in the medium term. The WMU and LSU are not likely in the medium term to increase their revenue base through enhanced tariff schemes nor will they be in a position to reduce operational costs associated with waste management services. The unsystemic approach adopted by the senior managers of the WMU and the LSU to integrated waste management planning processes, enforcement of waste management by - laws and co-operative governance relationships is most likely to deepen the hold the absencing cycle has over the MM and the prospects for implementing the Waste Act objectives within the MM in the medium term look rather bleak.

Core players from within the MM are unlikely in the current context to either initiate or participate in the activities of a diverse group of core players from within the Msunduzi waste management system who have a common intention to transform the waste management system. The NGO, regulatory authority, technical expert and organised waste management business sectors on the other hand, have leaders who seem to have a common transformational intention for the Msunduzi waste management system. These core players should initiate processes aimed at creating a holding space for a team to begin exploring the prospects for profound change and innovation within the Msunduzi waste management system. Most stakeholders within the MM are currently unable to conceptualise that the waste management system extends beyond the organisational boundaries of the MM and they therefore think and act unsystemically and see little value in collaborating with diverse external stakeholders to improve the waste management system, this situation is unlikely to change in the short to medium term.

Most stakeholders have a common vision of the highest possible future of the Msunduzi waste management system, this vision is well aligned to the objectives of the Waste Act, yet the stakeholders have very different ideas on how to bring that future into being and who should benefit from such a future. Core players in the system believe that people can change systems and would therefore want to prototype activities that increase the awareness and tacit knowledge of citizens on integrated waste management practices. The majority of players in the system seem to believe that profound change and innovation can only occur within the Msunduzi waste management system if the waste management institutions of the MM are transformed and would consequently like to spend their energies on this task. Given that the waste management sector within the MM is operating within an absencing cycle and some of the other core players in the system are operating within a presencing cycle, the need for transformative change is urgent and possible. The process is likely to be protracted, conflict ridden and complex but a core group of players within the system with common intention for transformational change and a perseverance to sense the system, to learn from the future and be able to create prototypes to embody new practices can gradually create forces within the system that can lead to profound change. Figure 10 provides a graphic representation of the key conclusions and recommendations of this research project.

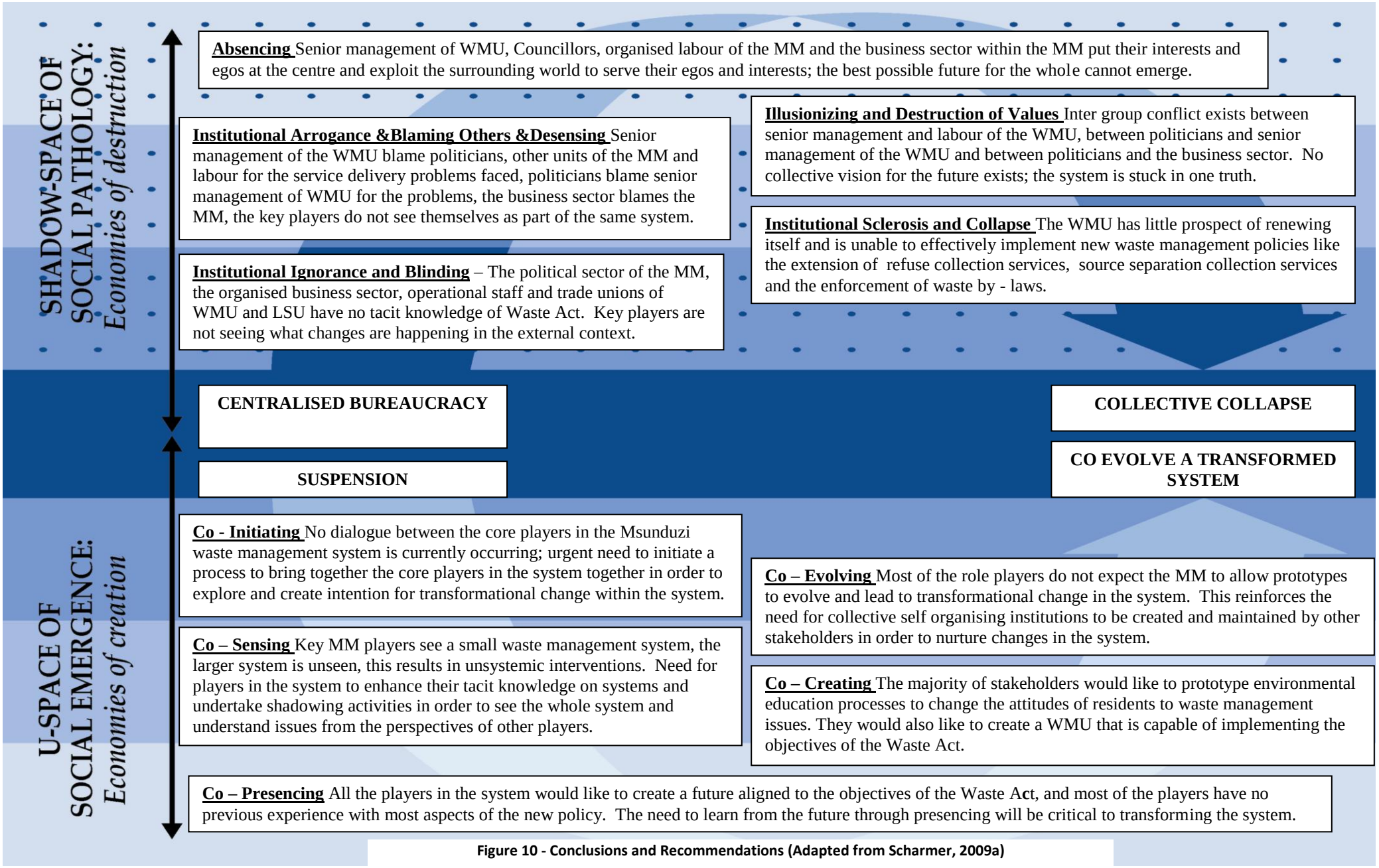

Figure 10 - Conclusions and Recommendations (Adapted from Scharmer, 2009a)

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APPENDIX A - SAMPLE OF KEY STAKEHOLDERS INTERVIEWED

The Msunduzi Municipality

Political Representatives

1. ANC representative on the Executive Committee of the MM
2. ANC representative on the Community Services Portfolio Committee
3. DA representative on the Community Services Portfolio Committee

Senior Management of the Waste Management and Landfill Site Unit

4. Process Manager – Risk Management
5. Manager – Waste Management Unit
6. Manager – Landfill Site Unit
7. Manager – Refuse Collection Service
8. Manager – Administration and New Business

Operational Level Staff Waste Management and Landfill Site Unit

9. Supervisor Refuse Collection Services
10. Supervisor Landfill Site
11. Educators – Keep Pietermaritzburg Clean Association
12. Supervisor Administrative Section

Municipal Trade Unions

13. SAMWU Representative
14. IMATU Representative

Non Governmental Organisations

15. Groundwork Representatives
16. Duzi Umgeni Conservation Trust (DUCT) Representatives
17. Built Environment Support Group (BESG) Representative
18. A Rocha South Africa Representative

Business Sector

19. Chief Executive Officer of the Pietermaritzburg Chamber of Business

20. Vice President of the Pietermaritzburg Chamber of Business
21. Representative of Central Waste
22. Representative of Mondi Paper

National and Provincial Government / Regulatory Authority

23. Representative of Department of Environment, Agriculture and Rural Development
24. Representative of the Department of Water Affairs

Technical Experts

25. Technical Expert No. 1
26. Technical Expert No. 2
27. Technical Expert No. 3
28. Representative of Msunduzi Innovation Development Institute (MIDI)

APPENDIX B – SEMI STRUCTURED INTERVIEW GUIDE

General Questions to Introduce Research
1. Are you familiar with the Waste Act?
2. From your perspective what are the three key obligations arising out of the Act for local government? Why would these obligations be key or critical?
3. What are the three most important actions that national government could undertake to ensure these obligations are met by local government? 4. What are the three most important actions that provincial government could undertake to ensure these obligations are met?
5. (MM only) - What is Msunduzi Municipality currently doing and planning to do in order to meet these new obligations? 6. (NGO or Business sector only) What is your organization doing to help local government or society to meet the new obligations created by the Act?
To understand the implementation prospects of the new waste management policy for the Msunduzi Municipality from the perspective of key stakeholders by identifying the key challenges, underlying systemic issues, opportunities, obstacles, risks and possible solutions;
1.Waste Collection
Almost 40% of households within the Msunduzi Municipality do not have access to weekly refuse collection services. Almost all of these unserviced households are poor residents of the municipality living in informal settlements, newly developed low income settlements and rural communities. Based on your experience of policy implementation in general and the Msunduzi municipality specifically what levels of growth in refuse collection service delivery do you foresee occurring over the next three to five years? High Increase (extension to 10% of backlog per annum or more than 10,000 households, Moderate Increases (extension to 5% of backlog per annum or 5,000 households) or Low Increases (extension to less than 2% of backlog per annum or 2500 households).

What factors did you take into account when you made the projection? What are some of the obstacles and opportunities in the waste management system that create barriers or incentives for extending service delivery?
2. Waste Minimization
The draft national norms and standards on waste management issued in terms of the Waste Act require that municipalities provide refuse collection services that allow for separate collection of recyclables (paper, cardboard, newspapers, magazines, plastic, glass, metal) and biodegradable domestic waste. According to the draft standard recyclables should be collected every two weeks whilst biodegradables should be collected weekly, if this norm cannot be met then convenient drop off centres should be provided. Do you think that the Msunduzi Municipality can deliver such services in two years time to households already receiving a refuse collection service? Please explain your answer What would be the major obstacles and opportunities to be encountered in this process to provide a new type of collection service?
3. Waste Avoidance and Partnerships
Significant amounts of waste can be avoided and recycled if industry and the commercial business sector are part of an integrated waste management process aimed at avoidance and minimization of waste. Do you know of any partnerships for implementing waste minimization between the Msunduzi Municipality and the business sector within the Municipality? Do you think such partnerships can be built by the current municipal waste management leadership and leadership of the business community? Please explain your answer?
4. Waste Information System
One of key requirements of the Waste Act is that local municipalities must establish and operate a waste information management system. Will this obligation prove to be too onerous for the Msunduzi Municipality given that its current waste information practices are poor? Please explain your answer.

5. Financial issues
The Msunduzi Municipality provides waste collection and waste disposal services at a loss requiring subsidies from the rates fund and equitable share funding to be made in order for services to be provided in a sustainable manner. Should the subsidy process continue or should waste generators pay the full cost for waste management services? Please explain your answer. Do you think pay as you throw forms of waste management tariffs will increase revenue and promote waste minimisation? If pay as you throw is not ideal what other measures should be considered to increase revenue and cut costs given that implementation of new obligations will be impossible without additional resources being made available?
Estimates undertaken at a national level indicate that implementing the new waste management policy will require capital expenditure to increase by almost 100% with corresponding increases in operating costs. What are the prospects of the Msunduzi Municipality increasing their waste management capital budget by 20% per annum for the next five years and reasonable increases in the operating budget to maintain these new services as a minimum approach to implement the new services required by the Act?
6. Planning Issues
The Waste Act requires that local government to have an integrated waste management plans to guide short and medium term strategies and projects. An integrated waste management plan is being developed currently for the Msunduzi Municipality. Do you think the plan will form the basis for waste management budget allocations in the next financial year or are budget allocations a more complex process? Will the plan count once it has been produced or will it become another compliance and audit requirement? Do IWMP's go deep enough to uncover the underlying structure that creates the system that produces the problems we want to avert?

7. Coordinating the State, Regulation and Enforcement
The act requires all levels of government to co-operate with each other to implement the Act and for local government to implement national and provincial norms and standards. The act provides that national and provincial government have both regulatory and enforcement responsibilities over local government. What are the prospects of local government allocating resources to national government priorities to ensure a coordinated state? What are the prospects of national and provincial government enforcing obligations against local governments that are not performing? Explain The national DEA and provincial DEA belong to different spheres of government, with separate political and administrative heads, mandates and budgets. What are the prospects of co-ordination and co-operation between these two spheres who share a common function ?
What are the prospects of the Msunduzi Municipality improving their enforcement capacity by employing environmental monitoring inspectors? How does the municipality obtain compliance from residents on issues relating to recycling, littering and dumping?
Analyse the implementation issues using the theoretical framework of the Theory U in order to develop strategies that could improve implementation prospects within the Msunduzi Municipality
Co Initiating
1. What key issues within the Msunduzi waste management system pull the stakeholders apart and prevent them from working together? 2. .Are there any interesting dialogue processes currently going on within the Msunduzi waste management system between key stakeholders that could lead to some positive action being taken within the Msunduzi Waste Management System ? 3. What are the prospects of the key stakeholders suspending their personal mental models on the

Msunduzi waste management system and co-operating with each other in order to better understand the system and the ways in which they play a role in creating and maintaining the system? 4. Can a team of core stakeholders from the Msunduzi waste management system be brought together and held together to pursue a common intention to improve the system? Who could bring them together? What could hold them together?
Co Sensing
5. What processes could be undertaken to enable the core stakeholders of the system to deepen their awareness of the Msunduzi waste management systems problems? 6. Could visits to places of high potential assist stakeholders to obtain fresh insights into the Msunduzi waste management system? 7. Do you think core players in the Msunduzi waste management system are capable of seeing and understanding that they create the system that they find themselves living in by the way that they attend to the waste management reality and that they can change the system if they act collectively? 8. What limiting factors prevent the Msunduzi waste management system from developing further?
9. What high leverage initiatives if implemented could have a wider impact for you and the greater system as a whole ?
10. What about your current work on waste management within Msunduzi Municipality waste system frustrates you and what work within the system energises you?
11 What perspectives or mental models of the Msunduzi waste management system would you as a core player have to leave behind in order to be part of a new system that works better for all residents and stakeholders within the municipality? Will it be easy for you to do ?will it make a difference in the system? Can other core players you know in the system leave behind their old self

that creates the problems we find in the system?
Co Presencing
12. Watch yourself and your organisation from above as if you are in a helicopter, what are you trying to do within the Msunduzi waste management system? Is it working or do you need to try new things?
13. Imagine you could fast forward to the last moments of your life, what would you want to see occurring within the Msunduzi waste management system at that moment? 14. What handprint or footprint would you want to leave behind in that system?
15. From that future place, look back at your current situation, what advice would you give yourself from the vantage point of your highest future possibility in order to move the Msunduzi waste management system forward?
Co Creating
16. Over the next three months, if you were to prototype a microcosm of the future Msunduzi waste management system in which you could discover "the new" by doing something, what would some of these prototypes that you pilot look like? Why do you choose these?
17. Who in the system can help you make your highest future possibilities for the Msunduzi waste management system a reality?
Co Evolving
18. What are the prospects of this core group being given a place of safety /cocoon from which to develop innovative pilots, practices and infrastructure to create evolutionary growth in the system? 19. What obstacles and opportunities do you foresee arising should the creation of this place of safety / cocoon of innovation be seriously considered?
20. Do you think it is possible that for you and other core players in the system to be freed from their old selves that were prisoners of the old waste management system to a new self that can help to gives birth to a new Msunduzi waste management system?