

# Evaluating the monitoring and review of the integrated waste management plans (IWMPs) of the Drakenstein Local Municipality

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## PREFACE AND ACKNOWLEDGMENTS

*"If we are to improve our performance, we have to reflect on what we are doing, what we are achieving against what we set out to achieve, and why unexpected results are occurring".*

(Collins Chabane: Former Minister of Performance Monitoring, Evaluation and Administration).

On the eve of South Africa's 2021 local government elections, this study was undertaken to evaluate how local government and its municipalities monitor and review their Integrated Waste Management Plans (IWMPs). Using the Drakenstein Local Municipality as a case study, this research isolated for interrogation, waste management as a critical component and determinant of service delivery in South Africa. It has been a privilege to work with the Drakenstein Local Municipality, who availed information this study needed to monitor and review policy implementation as South Africans prepared to go to the polls. The findings will make a meaningful contribution towards a better local government and the achievement of national priorities at the local level by attesting to what the late Collins Chabane and former Minister of Performance Monitoring, Evaluation and Administration put forward in noting how improved performance must always reflect what is as opposed to what it should be, and why the unexpected has occurred.

The completion of this study would therefore not have been possible without the support of my supervisor, Dr Claudine Roos, for her excellent guidance, support, and continuous encouragement.

I am indebted to Lizo Mati for his inputs in selecting the study area. Notably, the Drakenstein Local Municipality and Western Cape provincial officials showed me tremendous support and willingness to meet my never-ending document requests. More importantly, their desire to participate and contribute as study respondents has made this study come to completion.

Finally, my heartfelt gratitude to my family and friends for their support throughout this academic journey.

## ABSTRACT

Integrated waste management planning is essential for designing or improving a waste management system. It allows municipalities to evaluate current waste management practices; and consider waste management options that suit their desired end state, budget, and demographics. The need to develop and implement an integrated waste management plan (IWMP) is a legislative requirement provided for by Section 12 of the National Environmental Management Waste Act (59 of 2008) (NEMWA). In essence, an IWMP is a 5-year plan that provides for a municipality's waste management planning needs. It is implemented through an implementation plan, which needs to be incorporated into the municipality's integrated development plan (IDP) as a sector plan.

The monitoring and review phase is one of the essential steps that municipalities must undertake to evaluate how the IWMP is performing. The process must be done yearly and at the end of the five years of implementation period. Monitoring through annual reports determines if the identified projects and the set targets are achieved, and it informs the review process as to whether targets must be adjusted or not.

This research aimed to critically evaluate the monitoring and review phase of the IWMP process, using the Drakenstein Local Municipality in the Western Cape Province of South Africa as a case study. A mixed-methods approach was applied to address the research aim, document review and self-administered questionnaire were used to gather data. The Lee & Colley review package (traditionally applied for Environmental Impact Assessment report quality) was applied for the document review to determine the suitability and adequacy of the IWMP monitoring and review process. Self-administered questionnaires, distributed to five participants were used to determine the barriers and challenges experienced during IWMP monitoring and review.

The document evaluation revealed gaps in the IWMP implementation plans, which is the primary driver of IWMP implementation. The implementation plan lacked the necessary details to monitor and review the IWMP. Although the IDP and SDBIP contained waste management projects, most of the projects could not be traced back to the IWMP. Subsequently, annual reporting had little impact on the IWMP performance. The self-administered questionnaire revealed that though reporting is done according to Section 46 of the Municipal Systems Act, it does not meet the requirements of Section 13 of NEMWA. Insufficient budget and human resource capacity were identified as barriers to reporting, monitoring and reviewing the IWMP. From the document assessment, it is evident that the reporting, monitoring and review of the IWMP are linked to the quality of the IWMP implementation plan. Therefore, it is crucial to ensure that the implementation plan is developed as stipulated in DEA's guidelines for developing IWMPs.

**Keywords:** *Integrated waste management plans, municipal planning, monitoring and review, waste governance, Integrated development planning, Drakenstein Municipality*

## ABBREVIATIONS AND ACRONYMS

<b>CSIR</b>	Council for Scientific Innovation and Research
<b>DEA</b>	Department of Environmental Affairs
<b>DEAT</b>	Department of Environmental Affairs and Tourism
<b>DFFE</b>	Department of Forestry, Fisheries and Environment
<b>DLM</b>	Drakenstein Municipality
<b>DPME</b>	Department of Planning, Monitoring and Evaluation
<b>EIA</b>	Environmental Impact Assessment
<b>EMS</b>	Environmental Management System
<b>FNAS</b>	Faculty of Natural and Agricultural Sciences
<b>IDP</b>	Integrated Development Plan
<b>ISWM</b>	Integrated solid waste management
<b>IWM</b>	Integrated Waste Management
<b>IWMP</b>	Integrated Waste Management Plans
<b>MFMA</b>	Municipal Finance Management Act
<b>MPPMR</b>	Municipal Planning and Performance Management Regulations
<b>MSA</b>	Municipal Systems Act
<b>NWU</b>	North-West University
<b>NWMS</b>	National Waste Management Strategy
<b>NEMWA</b>	National Environmental Management: Waste Act
<b>PDCA</b>	Plan-Do-Check-Act
<b>SDBIP</b>	Service Delivery and Budget Implementation Plan
<b>UNEP</b>	United Nations Environmental Programme
<b>US EPA</b>	United States Environmental Protection Agency
<b>WMO</b>	Waste Management Officer

## KEY DEFINITIONS

**Adequacy:** The state or quality of being adequate (Oxford dictionary).

**Deming Cycle:** a sequence of actions that aim at system or process improvement by solving quality problems and implementing new solutions (Jagusiak-Kocik, 2017:19)

**Integrated waste management (IWM):** A comprehensive and integrated system intended to avoid and minimise the impacts of waste on the environment by managing all waste streams and handling waste through a cradle-to-grave approach. (US EPA, 2002:1).

**IWM** is also referred to as integrated solid waste management (ISWM): A strategic initiative for the sustained management of solid waste through the use of a comprehensive integrated format generated through sustained preventive & consultative approach to the complementary use of a variety of practices to handle solid waste in a safe and effective manner. (UNEP,2009:10).

**Integrated waste management plan (IWMP):** This means a plan prepared according to Section 12 (NEMWA, 2008).

An **IWMP** is a document that outlines various aspects of waste management, including the collection, storage, and disposal of waste, source reduction, recycling and composting, facility management, and budgeting and financing. (US EPA, 2009: 3).

**Monitoring:** A continuous function that uses the systematic collection of data on specified indicators to provide management and the stakeholders of an ongoing development intervention with indications of the extent of progress and achievements of objectives and progress in the use of allocated funds. (The OECD, 2002: 27).

**Performance:** Continually effectively achieving the preferred results (Oxford dictionary).

**Reporting:** Used to indicate if the plan (IWMP) is implemented fully or partially, although accuracy cannot be confirmed (Oxford dictionary).

**Review:** Formal assessment or appraisal [of integrated waste management plans (IWMPs)] with the intention of instituting change, if necessary, when developing the next (IWMP) (Oxford dictionary).

**Waste Management Officer (WMO):** This means a waste management officer designated in terms of section 10 (NEMWA,2008).

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# CHAPTER 1 INTRODUCTION

## 1.1 Introduction

Integrated waste management planning is essential for designing or improving a waste management system. It allows municipalities to evaluate current waste management practices; and consider waste management options that suit their desired end state, budget, and demographics. The need to develop and implement an integrated waste management plan (IWMP) is a legislative requirement provided for by Section 12 of the National Environmental Management Waste Act (59 of 2008) (NEMWA). This introductory chapter sets the basis for this study by providing background. The chapter outlined the problem statement, research aims and objectives, and the study's scope.

## 1.2 Background

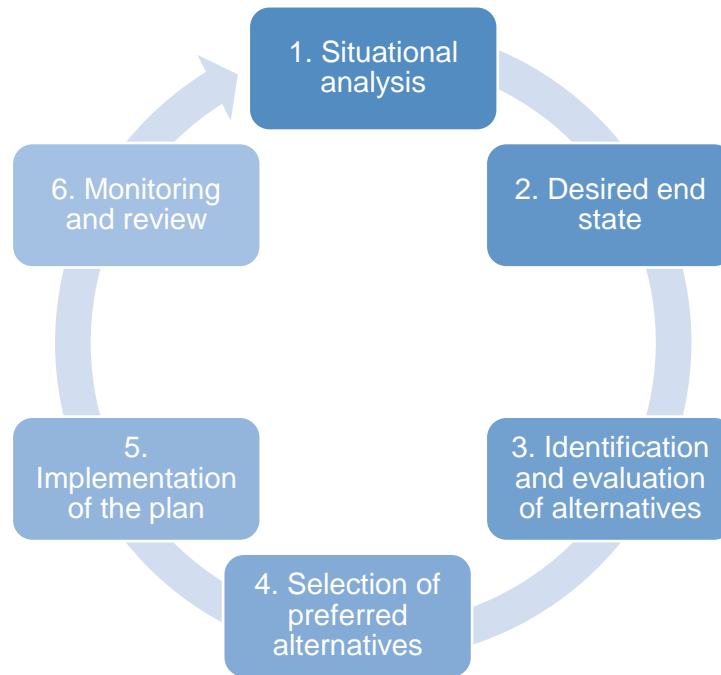
Internationally, waste management planning (through different approaches or instruments) provides mechanisms for changing and improving waste management and related behaviour. For example, when United States America transitioned from open-burning dumps to controlled incineration in 1885, a national waste management strategy was developed to include these measures as part of the waste management planning process (Hickman, 2000). Similarly, in South Africa, integrated waste management planning (through integrated waste management plans (IWMPs)) has been identified as one of the instruments to achieve the goals set in the National Waste Management Strategy (NWMS) (DEA, 2011). In Italy, on the other hand, integrated waste management planning brought transformation to waste management by defining responsibilities, introducing targets for separated municipal waste collection, and replacing previous waste taxes with new waste tariffs (Ferraris and Paleari, 2013).

Integrated waste management plans (IWMPs) are plans that describe the actions and resources needed to manage waste within stipulated timeframes following the requirements of the National Environmental Management Waste Act (59 of 2008) (NEMWA). IWMPs should ideally be aligned to the goals and objectives of the NWMS. It is a five-year plan developed, implemented, and reported on by state organs (i.e., provinces, district- and local municipalities) as per sections 11, 12 and 13 of the NEMWA. Monitoring and reporting on the implementation of the plan is required annually, while the plan needs to be reviewed and revised every five years (DEA, 2012).

Ideally, since the inception of IWMPs, municipalities should have implemented, reported on, and reviewed three IWMP generations (generation 1,2 and 3); and the fourth IWMP generation should be under implementation.

The first South African generation of IWMP, called for in 1999, was considered a short-term plan to achieve the 1999 NWMS. Since it was not a legal requirement to develop and implement an IWMP before the promulgation of the NEMWA in 2009, integrated development plans (IDPs) were identified as an implementation vehicle for IWMPs (as a sector plan) (Muswema, 2012). The development and implementation of IWMPs by South African organs of the state became a legal requirement in 2009 as per Chapter three, Section eleven of the NEMWA. The goal of IWMP ***"is to integrate and optimise waste management planning to maximise efficiency and minimise the associated environmental impacts"*** (DEA, 2009). It, furthermore, aims to transform the historical way of waste management, which only focused on linear waste management (from collection to disposal), to a more sustainable means of waste management that considers the circular economy, with different waste management alternatives and their related costs.

Waste management planning is not a linear process; it has a beginning and an end. The *European Union IWMP development guide* (2012) and *South African guideline for the development of IWMPs* (DEAT 2012) illustrate the process as a continuous circular process (Figure 1-1 shows the process). The process can be divided into various phases: definition of *status quo*, defining the desired end, identifying and evaluating alternatives, implementation, and, finally, monitoring and review (Godfrey and Dambuza, 2006). When one phase of the process ends, the subsequent one commences, promoting continual improvement. Continual improvement of waste management planning is necessary because waste streams and volumes are not static (Reid *et al.*, 1999), and legislation is continuously amended to promote sustainable alternatives.



**Figure 1-1: Integrated Waste Management Planning Process.**

Source: Guideline for the development of IWMPs (DEAT, 2012)

The development and implementation of waste management plans in South Africa are not void of challenges, and the challenges differ from municipality to municipality. According to Environment Sector Five Year Comparative IDP Analysis Report, in the 2016/2017 financial year, 190 out of 278 municipalities developed and incorporated their IWMP within their IDP's, 194 municipalities in 2017/2018 financial year, 195 municipalities in the 2018/2019 financial year and 197 municipalities in 2019/2020. Commonly reported concerns with IWMP development and implementation are the lack of waste management expertise, advanced technologies, inadequate infrastructure, and insufficient funding (Allaoui *et al.*, 2015; Fakoya, 2014; Sallwey *et al.*, 2017). Furthermore, the *Waste RDI Roadmap Status Quo Report* (CSIR, 2013) has stated that inconsistent monitoring and reporting on IWMPs (which play an essential role in adequately updating IWMPs) is cause for concern. Monitoring and review of IWMPs and reporting on IWMP implementation are also highlighted in the 2020 version of the NWMS (DEFF, 2020) as an aspect requiring attention.

### 1.3 Problem statement

The research findings by Alberts (2014) on municipal solid waste and governance strategies to address existing performance gaps and capacity constraints highlight the importance of IWMP evaluation, monitoring, and review. Similarly, Molaba (2019) concludes that there is generally a lack of evidence that supports the consistent monitoring of IWMPs in the Fezile Dabe Municipality

Fezile Dabe District Municipality in the Free State province of South Africa. In addition, Molaba (2019) has found that IWMP monitoring and review progress is generally not reported on, which may hinder the successful implementation of IWMPs. Finally, Radzilani (2019) has reviewed the quality of IWMPs of South African metropolitan municipalities using an adapted Lee and Colley review package, a suite of categories or identified areas used to evaluate environmental assessment reports (Lee and Colley, 1999). Review area 10 provided the evaluation, monitoring, and review of IWMPs. This area scored relatively poorly in the Radzilani (2019) study. The findings highlight omissions in reporting, monitoring, and reviewing deficiencies in the IWMP process. These studies all highlight the relatively poor performance of the monitoring and review phase of the IWMP process and justify the need for further research which focuses specifically on the monitoring and review phase of the IWMP process to explore the reasons for poor performance (if any).

#### **1.4 The rationale for the study**

Monitoring and review play an essential role in adequately implementing and updating IWMPs. Previous research on integrated waste management planning in South Africa highlights the importance of the IWMP monitoring and review process as part of the IWMP life cycle. For example, Muswema (2012) recommends further investigation to determine the extent to which projects identified during IWMP development and review are incorporated into revised integrated development plans (IDPs). To help close the knowledge gap in monitoring and reviewing waste management plans, this study seeks to critically evaluate the monitoring and review phase of the IWMP process in South Africa

Although some research has been done on the integrated waste management planning process and quality of IWMPs in South Africa (Molaba, 2019; Muswema, 2012; Radzilani, 2019; Theron, 2007), limited published research is available which explicitly focuses on the monitoring and review of IWMPs.

#### **1.5 Research aims and objectives**

The research aims to critically evaluate the monitoring and review phase of the IWMP process, using the Drakenstein Municipality as a case example, with the ultimate view of making recommendations for improvement.

To achieve the research aim, the following research objectives were formulated:

- **Research objective 1:** To evaluate the adequacy and performance of the monitoring and review of IWMPs (first to third generation); and

- **Research objective 2:** To determine the barriers and challenges during IWMP monitoring and review.

## 1.6 Research questions

In seeking to critically evaluate the monitoring and review phase of the IWMP process, using the Drakenstein Municipality as a case example, this study provides insight into the following research questions:

**Research question 1:** *How adequate are the monitoring and review processes of IWMPs (first- to third generation)? and*

**Research question 2:** *What are the barriers and challenges encountered during IWMP monitoring and review?*

## 1.7 Scope of the research

A case study approach is followed to address the research aim, where the Drakenstein Local Municipality in the Western Cape province of South Africa was selected as a case example. The Drakenstein Municipality was specifically chosen as a case example since it is implementing its third generation IWMP, with sufficient documentation to provide an overview of two monitoring and review phases (see Chapter Three). The research evaluated three IWMPs. Two were developed, adopted by the council, implemented, monitored, and reviewed; the third generation IWMP was developed, taken through the public participation process, and waiting for council adoption. By evaluating how the Drakenstein Local Municipality monitors and reviews the Integrated Waste Management Plans (IWMPs) of the Drakenstein Municipality, the study will unveil critical gaps in local government planning and implementation that influence environmental management sustainable national development. Although the research focuses on a specific case study, the findings may draw parallels with other similar municipalities in South Africa.

The evaluation of IWMPs focused on determining the *adequacy* (i.e., "fact of being enough or satisfactory for a particular purpose" and *performance* (i.e., "continually effectively achieving the preferred results") of monitoring and review by evaluating the IWMPs and related documents against specific review criteria (i.e., the requirements of Section 13 of NEMWA; the guideline for the development of IWMPs, review area 10 of the adapted Lee and Colley review package). Additionally, in evaluating the adequacy and performance of IWMP monitoring and review, the research also determined the *extent to which the outcomes of the monitoring and review phases of the IWMP* (first to the third generation) were incorporated into the *next generation/revised* IWMPs.

In addition to IWMPs, supporting documentation, such as *annual performance reports*, *integrated development plans (IDPs)* and *Service Delivery and Budget Implementation Plans (SDBIPs)* of the same period were also evaluated to determine the extent to which the monitoring and review phases of the IWMPs were addressed in these documents.

### **1.8 Assumptions and limitations**

This study was guided by the assumption that the council adopted two or three previous IWMP generations and that the IWMPs were implemented, monitored, and reviewed. The study limited its investigation to the evaluation of reports related to the IWMP in the period 1999 and 2020 because they provided details of how the previous implementation, reporting and monitoring of the IWMP was done.

### **1.9 Contribution of the research**

This research builds on previous studies (Radzilani, 2019; Molaba, 2019, Alberts, 2014, Muswena, 2012) that indicated a lack of monitoring and review and recommended a detailed evaluation of the monitoring and review phase of the IWMP. Thus, this research contributes to a growing body of literature and knowledge that provides insight into understanding the IWMP monitoring and review status within a specific South African local municipality. Furthermore, although the findings apply to the Drakenstein Municipality, they may be used to other similar municipalities in South Africa as an essential point of reference.

The research also identified the barriers and challenges that hinder the IWMP monitoring and review phase. When obstacles and challenges are identified, and the means to overcome them are recommended, it becomes easier to address these challenges, unlike the unknown (National Research Council, 1993).

### **1.10 Structure and outline of the dissertation**

The dissertation consists of five chapters that address the following issues:

**Chapter 1** introduces waste management planning, problem statement, research aim, and objectives.

**Chapter 2** provides the relevant literature related to the study, which focuses on integrated waste management, its evolution and principles and integrated waste management planning in South Africa. The chapter also reviews the legislative framework governing the development and implementation of IWMPs in South Africa, and at the local government level, the relationship between IDP, SDBIP and IWMP. The chapter also provides an overview of the IWMP process,

the Deming (PDCA) cycle and IWMP. Finally, it reviews the challenges related to IWMP development and implementation.

**Chapter 3** provides the research methodology, research design and elaborates on the rationale for selecting the data collection methods. This chapter provides a description of data collection, analysis, and interpretation.

**Chapter 4** provides the analysis and findings of the research based on the data collected related to the research objectives.

**Chapter 5** provides conclusions and recommendations based on the findings from the research. In addition, this chapter presents recommendations for improvement and recommendations for further investigation.

### **1.11 Summary**

This chapter presented a brief background on integrated waste management planning. It outlined the rationale, problem statement, aims and objectives, and the potential contribution of the research were discussed to provide the reader with an understanding of the reasons behind the chosen research topic. The next chapter presents the literature review related to integrated waste management planning.

# CHAPTER 2 LITERATURE REVIEW

## 2.1 Introduction

This chapter provides an overview of a literature review on integrated waste management planning and information on the IWMP process, focusing on monitoring and reviewing IWMPs.

The literature review aims to provide context on the research topic. The literature review was conducted by using the following keywords: "integrated", "waste", "management", "systems", "monitoring", "review", "evaluation" and "planning" in different combinations, using ResearchGate, Google Scholar and the NWU repository as the leading research platforms. The literature search produced 2 800 000 search results related to integrated waste management planning, and only 143 search results related to the monitoring and review of IWMPs. Of these 143 results, less than 50 were relevant to the research scope; seven were South African studies, and 30+ focused on the international studies context mainly from Europe, the United States and China. Therefore, this chapter portrays the critical issues that emerge in the literature, the themes, and identifiable gaps.

## 2.2 Integrated waste management

Integrated waste management (IWM), also referred to as integrated solid waste management (ISWM), “***refers to a strategic initiative for the sustained management of solid waste through the use of a comprehensive integrated format generated through sustained preventive & consultative approach to the complementary use of a variety of practices to handle solid waste in a safe and effective manner***” (UNEP,2009:10). It aims at comprehensively and effectively managing waste, considering a cradle-to-grave approach (from generation to final disposal) to waste management (US EPA, 2002; Pharino, 2017; DEA, 2012). Moreover, instead of focusing on a single method of waste management, it considers the combination of waste management methods (Memon, 2010).

IWM incorporates the waste management hierarchy and enables waste generators to utilise their waste streams more efficiently, focusing on alternatives to waste disposal (Seadon, 2006). The waste management hierarchy is a universally recognised approach to maximise upstream waste management and move away from the less favoured waste treatment and disposal options (Seadon, 2006), reducing environmental damage due to poor waste management (Clarke et al., 1999). IWM, therefore, emphasises waste avoidance and minimisation, practising segregation, promoting the reduction, reuse, and recycling of waste (3Rs), implementing safe waste

transportation, treatment, and disposal in an integrated manner, with an emphasis on maximising resource use efficiency (Pharino, 2017).

### **2.3 The evolution of integrated (solid) waste management (IWM/ ISWM)**

The aim of this section is to provide an overview of the evolution of integrated waste management (IWM) over time, using some countries as illustrative examples. Solid waste management (SWM) precedes integrated solid waste management (ISWM) (Memon, 2010). According to Memon (2010) and Shekdar (2009), SWM aimed to reduce risks to public health, with the environmental aspect only becoming critical in later years. Palm Beach County in Florida (USA) was one of the first areas to consider waste management in an integrated manner, in 1975, by proposing that waste management programmes integrate solid waste transportation, processing, recycling, resource recovery and disposal technologies (Seadon, 2006). ISWM is suggested to define a holistic approach to solid waste management as it applies a systematic approach to SWM by considering the problem as a whole and as an interconnected system of component operations and functions by integrating all the elements of a waste management system (Asefi *et al.*, 2019)

Previously, integrated solid waste management (ISWM) was introduced to streamline all the stages of waste management (Memon, 2010). ISWM in the USA currently comprises regulatory, administrative, market, technology, and social sub-components, and waste is managed and disposed of through landfills, incineration, recycling, and composting. However, in many countries, especially in the developing world, waste management is still synonymous with traditional (non-integrated) municipal solid waste management (Seadon, 2006; 1328).

Over the decades ISWM continued to evolve, driven by changes in legislation in different countries. Asia, Japan, South Korea, Taiwan, and Singapore have shown a rapid improvement in ISWM systems over the past 20 years, intending to eliminate landfills from their waste management systems (Shekdar, 2009), whereas Malaysia, Thailand, and Indonesia have no specific ISWM regulations (Terazono *et al.*, 2005).

ISWM remains a challenge in Africa, as governments struggle with regulatory compliance concerning waste management (Onibokun, 1999:9; Godfrey *et al.*, 2019). According to Achankeng (2003), cited by Okot-Okumu (2012), municipalities in African countries have primarily focused on waste collection while neglecting other aspects of waste management. As a result, most cities (urban areas) receive fair waste collection services. In contrast, suburbs and the peri-urban regions usually get poor service, and the rural areas, many times, receive no waste services at all (Godfrey *et al.*, 2019).

Transitioning from basic waste management systems to integrated solid waste management may be expensive and take time. ISWM requires capital injection, a constant revenue scheme, investment in equipment, skilled workers, continuous staff training, and staff development (The Open University, 2016). In addition, to support a cost-effective ISWM system, the number of locations of the system's components, such as transfer stations, recycling, treatment and disposal centres, and truck routing within the system's components, need to be improved (Asefi *et al.*, 2019).

To ensure that the ISWM maximises the benefits of the cost incurred, considering and balancing the integrated waste management principles discussed below is essential.

## **2.4 Principles of integrated solid waste management**

Van de Klundert and Anschutz (2001) and Bhada-Tata (2012) recommend four basic principles that any development of an ISWM framework should adapt as follows:

- (1) Equity for all citizens to access waste management systems.*
- (2) Effectiveness of the waste management system to safely dispose and treat the waste.*
- (3) Efficiency to maximise benefits, minimise costs, and optimise the use of resources; and*
- (4) Sustainability of the system from technical, environmental, socio-cultural, economic, financial, institutional, and political perspectives.*

These principles align well with the rights of access to services and the environmental rights provided for in the South African Constitution (1996) and the objects of the National Environmental Management Waste Act (59 of 2008). The sub-sections below provide an overview of these principles and what they entail.

### **2.4.1 Equity**

The concept of equity is subject to a broad interpretation. For example, in waste management, the idea of equity deals with determining the alternative waste management collection systems to afford citizens their environmental rights (Constitution of South Africa, 1996; Murray and Davis, 2001). As a result, affordability and accessibility need to be considered when planning a waste collection system and selecting collection vehicles (CSIR, 2005). For example, a door-to-door collection method will not work in an informal settlement but will work in a suburban area compared to the communal collection. However, both collection methods can afford citizens the service. Litman (2013) identifies horizontal and vertical equity as the two fundamental principles of equity, where horizontal equity considers that everyone has similar needs and must be treated equally. Vertical equity considers favouring poor people over the rich. Since balancing the two equity fundamentals may be challenging, it is crucial to consider various equity objectives and

impacts when planning. Van de Klundert and Anschütz (2001) believe that equity goes beyond moral imperative because pollution is spread through air and water supply.

#### **2.4.2 Effectiveness**

According to the CSIR (2005), a waste collection service is effective when all waste is removed from storage and collection points and disposed of safely. Litman (2013) states that effective planning must correctly define problems through in-depth enquiries and must not be limited to the first solution suggested or the concerns of people participating in planning. In some instances, one solution within a system will not be effective on its own but will require collaboration (hybrids). Effectiveness for waste management in general means that all waste is removed, as planned and all recoverable materials are recovered (van de Klundert and Anschütz, 2001)

#### **2.4.3 Efficiency**

In the waste management context, efficiency means increasing output for a given input or minimising input for a given result, taking into account equity, effectiveness, and sustainability (van de Klundert and Anschütz, 2001). Efficiency is vital in ISWM because many municipalities identify a lack of resources as a cause for failing to implement IWMPs or deliver waste services (Radzilani, 2019; Molaba, 2019; Alberts, 2014; Muswena, 2012). Therefore, resource, time and cost efficiency must be considered during the IWM system planning as it influences waste management options (Passarini *et al.*, 2011). An efficient waste management system is equal and effective while making the best use of the available resources (staff effort, equipment, and cost) (The Open University, 2016).

#### **2.4.4 Sustainability**

In the context of ISWM, a sustainable waste management system is defined as a suitable system to the indigenous circumstances from a technical, environmental, socio-cultural, economic, financial, institutional, and political perspective, and capable of continuing over time without draining the resources it needs (van de Klundert and Anschütz, 2001). During planning for ISWM, aspects to consider includes:

- Technical aspects such as waste treatment options that are dependent on the characteristics and quantities of waste (Abdoli *et al.*, 2016);
- Environmental aspects to evaluate the environmental impact of the preferred options;
- Socio-cultural aspects, which include the buy-in of the proposed systems by citizens (Abdoli *et al.*, 2016);
- Financial and economic aspects, which include the accuracy of the cost-benefit analysis of the waste system (Abdoli *et al.*, 2016); as well as

- Political and institutional aspects, which consider the legislative framework and the technical knowledge available to support the development and implementation of the system.

In short, a sound ISWM system will balance the economic, social and environmental aspects without compromising the other (Goodland, 1995). According to Bosman (2009), environmental sustainability is attainable if energy and resources are conserved by reducing waste and if natural resources are protected by prevention and pollution control. She further states that the objective for sustainable ISWM is to promote waste prevention, waste reduction, resource recovery and waste treatment whilst reducing the waste that is discharged into the environment (disposed).

Sufficient *planning* forms the backbone towards achieving these principles within ISWM (Bosman, 2009). The following section defines the concept of integrated waste management planning (referred to as IWMP) and elaborates on IWMP in the South African context.

## 2.5 Integrated waste management planning

The United States Environmental Protection Agency (US EPA) defines an integrated waste management plan (IWMP) as a **"document that outlines various aspects of waste management, including the collection, storage, and disposal of waste, source reduction, recycling and composting, facility management, and budgeting and financing"** (US EPA, 2009: 3). The US EPA (2009:3) continues by stating that IWMP **"identifies existing solid waste systems, assess needs, and design, implement and monitor a more effective and sustainable solid waste management plan"**. The first IWMPs to ever be developed is traced back to London's 18<sup>th</sup> and 19<sup>th</sup> centuries (Velis *et al.*, 2009). Velis *et al.* (2009) believe that London's 19<sup>th</sup>-century waste management system is like the informal sector collection and recycling strategies in developing countries today. Godfrey and Oelofse (2017:57) support this statement by mentioning that **"South Africa and other developing countries are often said to be 20 to 30 years behind Europe in the management of waste"**. The following section will focus on integrated waste management planning within the South African context.

### 2.5.1 Integrated waste management planning in South Africa

IWMPs are policy implementation instruments following the command-and-control approach (Roos, 2020). The United Nations (1997) defines the command-and-control approach as an environmental management approach that relies on regulation, including permissions, prohibitions, standards-setting, and enforcements instead of financial incentives (Zhang, 2013).

In South Africa in 1999, before the promulgation of the National Environmental Management Waste Act (59 of 2008) (NEMWA) (in 2009), the first generation of IWMP was considered a short-term plan to achieve the goals of the 1999 National Waste Management Strategy (NWMS). Since

it was (then) not a legal requirement to develop an IWMP, integrated development plans (IDPs) were identified as an implementation vehicle for IWMPs (Muswena, 2012). After the promulgation of the NEMWA in 2009, the development of IWMPs in South Africa became a legal requirement as per Chapter 3, Section 11 of the Act, which requires specific state organs to prepare integrated waste management plans (IWMPs). Therefore, provincial departments and municipalities are legally required to develop IWMPs. Provinces need to submit their plans to the national department and municipalities to provincial departments for endorsement (NEMWA, 2008). The goal of IWMP is to transform the historical way of waste management, which only focuses on collection to disposal, into a more sustainable way that considers different alternatives and their related costs. DEA (2009:14) views IWMP as a way *"to integrate and optimise waste management planning to maximise efficiency and minimise the associated environmental impacts"*. IWMPs are implemented for five years and monitored annually by providing progress reports in municipal annual performance reports. At the end of the fifth year of implementation, the IWMP must be reviewed to develop a new plan that municipalities implement for the next five years.

NEMWA requires municipalities to include the provisions of their IWMP in the IDPs, as stipulated by Section 5 of the Municipal System Act, 32 of 2000. The inclusion allows streamlining waste management with other essential basic services to ensure that waste management gets a stake from the equitable share funding (DEA, 2012).

The National Waste Management Strategy (NWMS) of 2011 Goal 5 was to achieve integrated waste management planning by having all municipalities have integrated IWMPs in the IDPs and meet all the IWMP targets by 2016. Similarly, the NWMS of 2020 Pillar 2 of the strategy highlights integrated waste management planning as one of the focus areas. The focus area aims to support the local government in implementing integrated waste management plans and services that better address the constraints and varying circumstances faced by the local government (NWMS, 2020).

### **2.5.2 Developing IWMPs**

To assist municipalities in developing IWMPs that will address NEWMA requirements, the national Department of Environmental Affairs (DEA) (now the Department of Forestry, Fisheries and Environment or DFFE) developed guidelines for the development of IWMPs (DEA, 2012), which are available as an online toolkit and portal.

There has been notable progress made in developing IWMPs in South Africa. By 2011 (only two years after the promulgation of the NEMWA), 80% of municipalities in South Africa had started with the development of IWMPs (DEA, 2011). According to the NWMS (2020), the overall

performance for Goal 5 (to achieve integrated waste management planning by having all municipalities have integrated IWMPs in the IDPs and meet all the IWMP targets by 2016) was 52%, and performance integration of IWMPs with IDPs and achieving targets was at 40%. Poor performance was due to little monitoring and reporting on IWMP. The NWMS highlighted a need to prioritise waste management services as part of IDPs. A lack of data was identified as a challenge during the development of the South African State of Waste Report (2018) because “*established mechanisms such as IWMPs for collecting the required data were not being used to their full potential*” (SoWR, 2018:85).

## **2.6 Overview of the legislative framework governing the development and implementation of the IWMP in South Africa**

This section aims to provide an overview of legislation that provides for the development of IWMPs, the process to be followed, how the IWMPs fits into the overall planning of municipalities, reporting, monitoring and review requirements.

The *Constitution of South Africa* (1996) (The Constitution) under the Bill of Rights, Section 24, provides that everyone has a right to an environment that is not harmful to their health and well-being (The Constitution, 1996). The government's (national, provincial, and local) responsibility is to protect the environment from pollution and ecological degradation for current and future generations through reasonable legislative and other measures. Warnich (2018) believes that the inclusion of the Environmental Right in the Constitution strengthened environmental law in South Africa, as it provided the foundation to the promulgation of the National Environmental Management Act (107 of 1998) (NEMA). Taaljaard (2011) stated that the National Environmental Management Act 107 of 1998 (NEMA) provided an enabling framework for future environmental legislation through specific environmental management Acts (SEMAs) such as the NEMWA.

### **2.6.1 The National Environmental Management, Waste Act 59 of 2008 (NEMWA)**

The NEMWA reforms the law regulating waste management to protect health and the environment by providing pollution prevention measures (DEA, 2012). Several sections are relevant to this study in providing a legislative context:

- a) Chapter 2, Part 1, Section 6 of the NEMWA gives the minister powers to establish the national waste management strategy (NWMS). The first NWMS was published for implementation in 2011 to promote the waste hierarchy. Waste hierarchy “is a set of priorities for the efficient use of resources,” and it is aimed at waste avoidance and resource recovery (EPA, 2017). The hierarchy has the preferable options at the top and the least preferable options at the bottom. The second NWMS, built on the success of the

first one, was published in 2020 for implementation; its focus is on promoting a circular economy. Provinces and municipalities must align their IWMPs to the NWMS targets to contribute to realising the goals and targets set in the NWMS (sub-section 4).

- b) Chapter 3, Section 11 of NEMWA obliges all state organs, such as municipalities, involved in waste management to develop IWMPs. The municipality must submit the IWMP to the Member of Executive Committee (MEC) (Provincial government) for endorsement. The MEC may, within 30 days of receiving the plan, request the municipality to adjust the plan if it does not meet the requirements of NEMWA or if it conflicts with the NWMS or requests the municipality to comply with a specific provision of the NEMWA or approve the plan (NEMWA, 2009).
- c) Section 12 of NEMWA provides the contents of the IWMP. An IWMP should contain a situation analysis providing the details as per section (12) (1)(a) (i to iv). In addition, the section requires municipal plans to indicate how they intend to give effect to NEMWA and address the delivery of waste management services to residential premises, establish targets for the collection, minimisation, re-use, and recycling of waste. Furthermore, the plans must indicate the financial resources required to give effect to the plan.
- d) Section 13 of the NEMWA provides for the reporting on the implementation of the IWMP. Subsection 3 requires municipalities to prepare annual performance reports [as per the requirements of Section 46 of the Municipal Systems Act, providing the information stipulated in subsection 2 (a-j)].

### **2.6.2 Municipal Systems Act 32 of 2000**

Municipal Systems Act 32 of 2000 provides the service delivery mandate of municipalities. Section 25 of the Act gives municipalities an order to develop an IDP to advance the municipality. The plan must align the resources and capacity of the municipality with the implementation of the plan. The Act further outlines developing and adopting the plan and the public participation process. An IDP is an essential tool for municipal service delivery (Karani and Jewasikiewitz, 2007) because it outlines the activities and projects implemented in a specific year and the budget allocated. In addition, the IDP requires the inclusion of sectoral environmental plans, e.g., IWMP. The inclusion of the IWMP requires municipalities to ensure sufficient resource allocation to achieve the targets set in the respective plans.

Section 46 requires municipalities to prepare for each financial year, an annual report which reflects the following:

- a) The municipality's performance during that financial year. The performance should be compared with targets of the year under review and with the performance of the previous financial year.
- b) The development and service delivery priorities and the performance targets set by the Municipality for the following financial year.
- c) Measures that were or are to be taken to improve performance
- d) An audit on financial statements and the report on audit on the audit performed in terms of sec 45(b) and
- e) Any other reporting requirements in terms of other applicable legislation.

Reporting requirements in terms of other applicable legislation, in this case, it refers to the provisions of section 13 of the Waste Management Act, which is discussed later in this Chapter.

### **2.6.3 Municipal Finance Management Act 56 of 2003 (MFMA)**

Municipal Finance Management Act (56 of 2003) (MFMA) provides for funding and implementation of the IWMP through the financing and implementation of the IDP. Chapter 4, Section 15 of this Act requires that a municipality only incur expenditure in terms of an approved budget unless provided otherwise in the Act. Such spending must be within the limits of the amounts appropriated for the different votes in an approved budget. Section 16(1) requires the council of a municipality for each financial year to approve an annual budget. According to subsection (2), the municipality's mayor must, before each financial year, table the annual budget at a council meeting at least 90 days before the start of the budget year. Subsection 1 does not prevent the appropriation of money for capital expenditure for a period not exceeding three financial years, provided a separate allocation is made for each of those financial years according to Medium Term Revenue and Expenditure Framework (MTREF) (discussed in section 2.6.5 of this dissertation).

Chapter 4, Section 19 of the MFMA dictates that municipalities spend money on a capital project that has been approved by the council and have been allocated budget in the capital budget. If a plan is not adopted in the case of an IWMP, it will not be budgeted for and not implemented. Section 21 allows revising IDP and budget-related policies to ensure that the tabled budget and any revisions are mutually consistent and credible.

The Act further stipulates how and when municipalities prepare the annual reports. Section 72 requires the accounting officer to assess the performance of the municipality. The assessment compares the yearly reporting against the approved IDP and the corresponding budget. The annual reports are to be prepared following Chapter 12, Section 121, which requires that the

municipal council deal with the municipality's annual report within nine months after the end of a financial year. The purpose of a yearly report is to provide a record of the activities of the municipality, to give a report on performance against the budget of the Municipality, or to promote accountability to the local community for the decisions made during the financial year to which the report relates (Municipal Finance Management Act, 1999). Section 46 of the Municipal Systems Act also support the preparation of the annual performance report of the municipality.

#### **2.6.4 Municipal Planning and Performance Management Regulations (MPPMR) of 2001**

Regulation 7(2) of the Municipal Planning and Performance Regulations (MPPMR) require municipalities to ensure that their Performance Management System (PMS) complies with the regulations. It further requires municipalities to:

- a) Demonstrate how it will undertake the planning stage, implementation and up to performance review and reporting stage.
- b) Clearly state the roles and responsibilities of each role player.
- c) Make the processes of implementing the system within the framework of IDP processes clear.
- d) Have the frequency of reporting and the lines of accountability for performance.

Regulation 11 of the MPPMR provides for the regular review or assessment of performance, including measurement of cost, resources and time used. Regulation 12 (2) prescribes that performance targets must be practical, realistic, commensurate with available resources and the municipality's capacity, be consistent with the municipal development priorities and the objectives of the IDP. One of the principles of a PMS provided by the MPPMR of 2001 is that the performance indicators must be measurable, relevant, objective, and precise (Munzhedzi, 2011).

#### **2.6.5 The relationship between IDP, SDBIP, MTREF and IWMP**

In terms of Section 25 of Municipal Systems Act 32 of 2000, each municipal council must adopt an inclusive and strategic plan, the IDP, for the municipality's development within the prescribed period after the start of its elected term. IDP is an all-inclusive city-wide strategy that must incorporate departmental sector plans (including IWMP), policies, and plans of municipal entities focused on developmental initiatives; it is also meant to achieve the optimal allocation of resources (Phago, 2009; Vatala, 2005). It is the principal strategic planning instrument that guides planning and development and informs budgeting and management decisions in local authorities over five years (Sowman and Brown, 2006; Valeta and Walton, 2008). According to Vatala (2005), everything starts with an IDP, which means no service or priority can be funded if not included in the plan. Environmental management and sustainable development must be considered to

prepare IDPs (Snowman and Brown, 2006). Furthermore, in Chapter 5 of the Municipal Systems Act 32 of 2000, the municipal council is expected to annually review its IDP according to an assessment of its performance measures.

The Service Delivery and Budget Implementation Plan (SDBIP) details the implementation of service delivery and the budget for the financial year in compliance with the Municipal Finance Management Act (MFMA) 56 of 2003. The SDBIP is a plan that converts the IDP and budget into measurable criteria on how, where, and when the municipality's strategies, objectives, and everyday business processes will be implemented (Drakenstein Local Municipality, 2017). The mayor must approve the SDBIP within 28 days after the approval of the budget. It serves as a contract between the administration, the Council, and the community, expressing the objectives set by the Council as quantifiable outcomes that the administration can implement over the next twelve months. It also allocates responsibility to directorates to deliver the services. Furthermore, it facilitates the process of holding management accountable for their performance. Finally, it provides the basis for measuring performance in the delivery of services. The MFMA requires quarterly projections of each vote's service delivery targets and performance indicators in the SDBIP, followed by quarterly reports that will indicate how the municipality performed concerning the set targets.

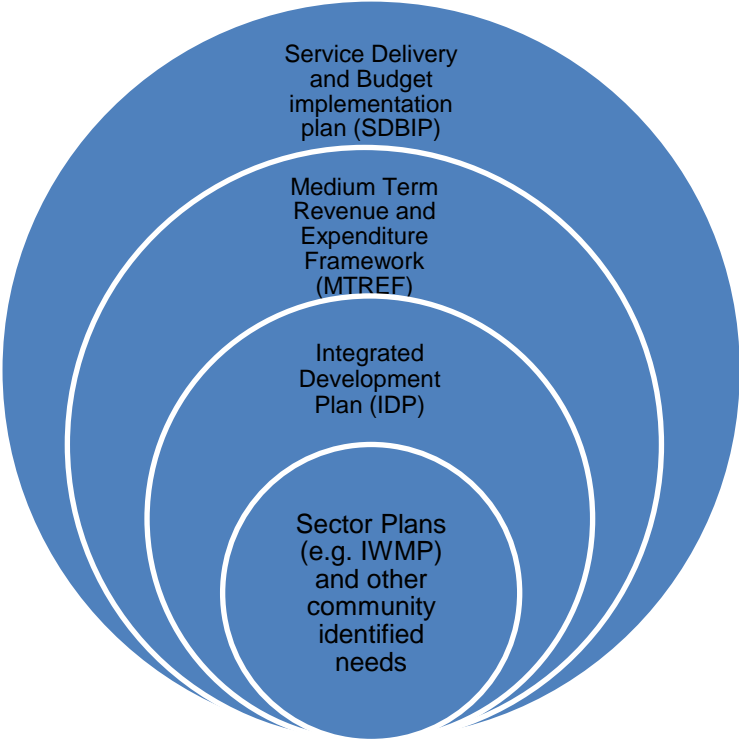
Medium Term Revenue and Expenditure Framework (MTREF) is described by the MFMA as an overview of revenue and projected expenditure for the budget year plus two outer financial years. Once an IWMP is approved and included in the IDP, the project's budget reflects on the MTREF, which can be adjusted once every year during the mid-year budget review or special council budget as stipulated by the MFMA. According to Skhosana (2007), MTREF serves as a foundation for the integration of planning and budgeting. Visser (2005:20) recommends that strategic planning and budgeting in the public sector should not be developed in isolation and without taking the imperatives of one another into account.

IDP and IWMP are plans required by different legislation, as explained earlier. IDP is a requirement of Section 25 of MSA and IWMP is a requirement of NEMWA Section (11) (12) (13). In addition, SDBIP and MTREF are provided for by the MFMA in terms of sections 26(h) and (53) (c) (ii) and 26(h), respectively.

The National Framework for Sustainable Development was developed to integrate environmental sustainability issues on the development planning agenda (Snowman and Brown, 2006). One of the questions that the National Framework recommends that the IDP must answer in the analysis phase is "What are the major environmental laws, policies and programmes that must be considered?" (Snowman and Brown, 2006). Snowman and Brown (2006) believe that

departmental environmental management plans (including the IWMP) can be possible sources of information to address the question. In addition, the Municipality must review its IDP annually; reviews allow the municipality to expand upon and refine plans and strategies, include additional issues, and ensure that the plans and strategy inform institutional and financial planning (Valeta and Walton, 2008).

An annual budget is an instrument for implementing IDP (Fourie and Opperman, 2007), and implementation monitoring is done through the Service Delivery and Budget implementation plan (SDBIP) (Valeta and Walton, 2008; Bokwana, 2019). The SDBIP requires that each objective in the IDP be converted into performance targets allocating a budget to each performance target (MFMA,2003). Thus, SDBIP is linked to the budget to monitor the expenditure and revenue, promoting accountability. In addition, SDBIP highlights service delivery targets and performance indicators for each quarter, this build-up to the annual service delivery targets of the IDP and ultimately IWMP. The alignment between IDP and SDBIP is a prerequisite for municipalities in terms of MSA 32 of 2000 and MFMA 56 of 2003 (Mashamaite *et al.*, 2016). IWMP fits into IDP by including sector plans budgeted through the MTREF and translated into the SDBIP. However, the successful implementation of the IWMP contained in the IDP through the SDBIP is dependent on the realities of resource allocation (Valeta and Walton, 2008). Figure 2-1 below illustrate the relationship between IDP, IWMP and SDBIP.



**Figure 2-1: Relationship between the IDP, IWMP, MTREF and SDBIP**

Source: Researcher’s own compilation, 2021

The following section elaborates on the integrated waste management planning (IWMP) process.

## **2.7 The integrated waste management planning process**

This section provides an overview of the integrated waste management planning process. The process includes conducting a situational analysis (status quo), defining the desired end state, identification, evaluation of alternatives and selection of alternatives, approval process and implementation of the IWMP and finally, the reporting on implementation, monitoring and review as illustrated in **Figure 1-1** in Chapter 1.

### **2.7.1 Situational analysis (*status quo*)**

This stage involves profiling municipal demographics, waste quantities and types, current waste generation future projections, existing waste management options and services offered and the available resources (DEA, 2012). The status quo phase aims to analyse and quantify all aspects of waste management in each municipality (DEA, 2012) and therefore assist the municipality in identifying trends, forces, and conditions that will influence waste management (Huser *et al.*, 2008). Section 12 of the NEMWA requires municipalities to indicate the number of people who do not receive waste collection services. Furthermore, the municipality must demonstrate their organisational structure to determine the availability of human resources to deliver waste management services and evaluate gaps for new functions that must be performed to fulfil the NEMWA requirements (DEA, 2012). Therefore, accurate information should be provided as far as possible to avoid a flawed process where planning is based on inaccurate information.

### **2.7.2 Defining the desired end state**

This stage entails setting up municipal waste management priorities, goals, and targets in the five years of implementing the IWMP. Identifying a gap between the current state and the desired state of waste management in the future will assist in identifying goals. For example, if a municipality collects 10% of generated waste and wants to do more, increasing the collection rate becomes a goal. Then, the municipality must determine and elaborate on how it will reach its goals and targets. During the municipal end-state definition, priorities and targets of the IWMP should address the local needs whilst also addressing the targets and priorities of the NWMS and the requirement of the NEMWA (DEA, 2012). The goals and targets can be divided into the immediate (achievable within a year), short-term (achievable within two to three years), medium-term (achievable within three to five years) and long-term (achievable within five to ten years).

### **2.7.3 Identification, evaluation of alternatives and selection of alternatives**

Different alternatives that will lead a municipality to reach the set goals need a detailed evaluation. It can be done in brainstorming without attaching any importance to the identified alternatives. Once the brainstorming is completed, each alternative's advantages and disadvantages are considered and ranked according to preference concerning the policy requirements, costs, resources, and benefits. It is important to note all reasons for favouring one alternative.

Once the selection of alternatives is concluded, an implementation plan that summarises the IWMP is developed. According to DEA (2012), the implementation plan details how targets set in the goals will be attained and the resources required to achieve the targets in the next five years of the IWMP implementation. DEA's guideline for developing IWMP provides a clear example of how to draft an implementation plan that will assist municipalities to have an IWMP implementation plan that will be easy to monitor and report.

Section 11 (7) of the NEMWA stipulates that the development of an IWMP must follow a consultative process per Sections 72 and 73 of the NEMWA. The process can be done separately or together with the IDP process provided in Section 29 of the Municipal Systems Act. Section 72 and 74 of the Municipal Systems Act can assist in getting maximum participation through ward committees. The consultative process is not limited to a specific phase of the IWMP (the monitoring and review phase is also included) development; stakeholders can be engaged at any stage. The success of any plan lies in the full participation of all stakeholders.

### **2.7.4 Approval process and implementation of the IWMP**

Municipal Council's IWMP adoption of IWMP confirms that the municipality takes responsibility for providing the required resources to achieve the goals in the IWMP. Once the Council approves the plan, it must go to the provincial department for endorsement as provided in Section 11 (4) and further satisfy the requirements of Chapter 3 Section 11 (4)(a)(ii) of the NEMWA by including the approved IWMP in the IDP. The municipality must consider different implementation instruments such as public-public partnerships, public-private partnerships and Non-Governmental Organisation/Community based organisations for their goals and targets (DEA, 2012). Municipalities need to develop an implementation plan that will indicate the targets, the resources required to achieve targets in the next five years. Implementation commences after endorsement, and care should be taken not to deviate from the plan.

## **2.7.5 Reporting on implementation, monitoring and review.**

Section 13 (3) of the NEMWA requires an annual report to be prepared (following the requirements outlined in Section 46 of the MSA) containing information on implementing the IWMP. IWMP development guidelines advocate developing a framework that will monitor the IWMP implementation. In the framework, each task or target must be allocated to the responsible person to ensure implementation (DEA, 2012). It is generally known that a task that is not assigned to anyone is never completed because everyone assumes that somebody is doing it. A description of the evaluation and review process to be instituted for the IWMP plan should be given.

### **2.7.5.1 Reporting**

Section 13 (3) of the NEMWA requires that annual performance reports be prepared in terms of Section 46 of the Municipal Systems Act. Annual performance reports should evaluate the progress of the IDP implementation through the SDBIP. The municipality should ensure that it does not lag in reaching the goals and targets set out in the implementation plan. The performance reports must include the requirements of Chapter 3, Section 13 (2) (a) to (j) of the NEMWA as follows:

- a) the extent to which the plan has been implemented during the period;
- b) the waste management initiatives that have been undertaken during the reporting period;
- c) the delivery of waste management services and measures taken to secure the efficient delivery of waste management services, if applicable;
- d) the level of compliance with the plan and any applicable waste management standards;
- e) the measures taken to secure compliance with waste management standards;
- f) the waste management monitoring activities;
- g) the actual budget expended on implementing the plan;
- h) the measures that have been taken to make any necessary amendments to the plan; and
- i) any other requirements as may be prescribed by the MEC.

After preparing the annual report, the municipality should determine if it has complied with the reporting requirements. The report should indicate how the municipality met the set goals and targets. The report has to be submitted to the MEC of the environment or delegated person.

### **2.7.5.2 Monitoring and review**

The national government considers monitoring and evaluation essential to improving performance. In 2005, the cabinet approved the policy framework for Government-Wide Monitoring and Evaluation Systems (GWMES) (DPME, 2011). The National Evaluation Policy

Framework (NEPF) forms part of the GWMES, and it "*provides the basis for a minimum system of evaluation across government*" (DPME, 2011: 5). It further "*promote quality evaluations which can be used for learning to improve the effectiveness and impact of government, by reflecting on what is working and what is not working and revising interventions accordingly*" (DPME, 2011).

Section 195 of the Constitution, Public Finance Management Act, Public Service Act, and the Municipal Finance Management Act are the frameworks that provide a legal basis for undertaking different types of evaluations (DPME, 2011). The DPME (2011) stated performance improvement, improving accountability, generating knowledge, informed decision making as the reasons for evaluation:

Monitoring and evaluation should be considered at the end of implementing the plan. To ensure the success of the evaluation process, DPME (2011) recommends the following:

- Plans must identify good quality measurable indicators, accompanied by clear targets
- Each indicator must have baseline information.
- Each indicator must be monitored during implementation.

Failure to identify the desired results, how such results will be achieved and how they will be measured makes the evaluation of plans complicated (DPME, 2011).

Monitoring and review in municipalities are mandatory. Municipal managers must establish a monitoring and evaluation system (Presidency, 2007). Monitoring the implementation of the IWMP provide stakeholders accountability by sharing results and lessons learned that might be applied in the future. According to Rowley and Sherman (2002), this phase of implementing a plan provides an objective and systematic collection of information and data to help determine the extent to which the plan was implemented and if the plan's goals were achieved. In some instances, it is believed that plans are submitted for box-ticking. For example, in a study to determine the efficacy of waste management plans (WMPs) in Australian commercial construction refurbishment projects, the submission of WMPs before commencing construction was mandatory (Hardie *et al.*, 2007). The study assessed the efficacy of waste management plans. Some respondents regarded the submission of WMPs as mere compliance paperwork that did not affect outcomes (Hardie *et al.*, 2007). The study further revealed an absence of formal verification or monitoring process by regulators to assess the efficacy of the plans.

Monitoring and evaluation improve the efficiency, effectiveness and sustainability of programs or policies by indicating issues that need attention (Presidency, 2007 ; Seasons, 2003) and promoting continuous improvement (Dekker, 1999). Efficiency determines how the plan performed, what caused non-performance and why, and improve the plan. Dekker (1999) asserts

that if the plan's implementation were successful or partially successful, it would still require some adjustments.

An IWMP monitoring framework must be developed and used to monitor the plan's implementation. According to DEA (2012), the monitoring framework should cover the following:

- *Strategic issues*: Delivery on goals and objectives;
- *Performance*: Municipal progress concerning the implementation of the entire plan;
- *Public accountability*: Engagement of area stakeholders in the implementation of the plan;
- *Institutional plan*: Formulate an institutional plan to indicate human resource development, communication and public participation plan, financial plan and waste management implementation plan.

IWMPs must be reviewed every five years according to the IDP requirements (DEA, 2012). IWMPs are reviewed to ensure that it is implemented successfully. The review process is part of developing the subsequent IWMP by following the same IWMP development process. Presidency (2007: 8) recommends that monitoring and evaluation should embody the following key elements:

- *Inputs*: All resources such as finances, personnel, equipment and buildings that contribute service delivery outputs;
- *Activities*: Actions or process that input to produce the desired outputs and ultimately outcomes;
- *Outputs*: What was delivered, e.g. waste collection;
- *Outcomes*: What did the inputs and activities achieve, e.g. increasing waste collection to community members; and
- *Impacts*: The results of achieving specific outcomes, such as reduced illegal dumping.

## **2.8 The importance of monitoring and review of IWMPs**

Monitoring gives information on where a policy, program or project is at any given time relative to the respective targets and outcomes (Kusek and Rist, 2004) and is a mechanism used by municipalities to determine how far a municipality is with regards to attaining the goals and targets (DEA 2012). Monitoring uses a set of core indicators and targets to provide timely and accurate information to inform progress and performance reviews, and decision-making processes (O'Neill *et al.*, 2016). Since monitoring is done against the set plan or policy, good evaluation information help clarify the realities and trends noted during the monitoring process (Kusek and Rist, 2004). A sound monitoring system will provide early warning signals for corrective action to be taken timeously (Govender and Reddy, 2014). Improved service delivery and increased accountability

are the most significant benefits the monitoring and evaluation system offers to the municipality (Govender and Reddy, 2014).

Monitoring alone is not sufficient and has to be combined with evaluation. Evaluation builds upon the monitoring data, but the analysis goes much deeper because additional data are often needed to consider contextual changes and determine if the difference is attributable to services (O'Neill *et al.*, 2016). In addition, evaluation has to provide credible and beneficial data, enabling incorporating lessons learned into the decision-making process (O'Neill *et al.*, 2016). Thus, monitoring and evaluation promotes internal learning and improve performance (Guijt *et al.*, 1998).

According to O'Neill *et al.* (2016), the evidence gathered through monitoring and evaluation processes is essential to the review process. They allow organizations to assess the overall progress and performance, identify problems, and take corrective action. In addition, the review of plans is vital for feasibility analysis in plans designing (Hill, 1997), and successful monitoring and evaluation is where good quality performance information and findings are used at one or more stages of the policy cycle (Lopez-Acevedo *et al.*, 2012).

The purpose of review in the IWMP process is to ensure that the IWMP is implemented successfully. Implementing the IWMP without monitoring and review can cause the municipality to lose track of what has been implemented and what still needs to be implemented.

The importance of monitoring and review is also highlighted as part of the "Deming" or PDCA cycle. Jagusiak-Kocik (2017) defines the Deming cycle as a sequence of actions that aim at system or process improvement by solving quality problems and implementing new solutions. The cycle is a never-ending process used to make changes that lead to continuous quality improvement (Best and Neuhauser, 2006). The Deming Cycle (or PDCA cycle) has four stages:

- *Plan*: identify the problem, discover where it started, plan for improvement and create a plan of action.
- *Do*: Involve everyone and execute the plan
- *Check*: Analyse to see if everything went according to the plan and if the expected results were achieved.
- *Act*: If it works- share the lessons and standardise the process and if it did not work, reflect on what can be changed and restart the cycle.

According to DEA (2011), the waste sector's mission is to adopt a continuous quality improvement approach to municipal waste collection services in South Africa that incorporates the "Plan-Do-Check-Act" fundamentals. The PDCA is not only adopted in the waste sector; the ISO 14001,

Environmental Management System (EMS), is also based around the PDCA (Alexander *et al.*, 2008). The structured sequence of steps in the PDCA cycle represents a logical approach to process improvement that should successfully implement continuous improvement initiatives for most organizations (Reid *et al.*, 1999).

The PDCA model ensures that environmental issues are systematically identified, controlled, and monitored according to an organisation's environmental policy/plan, periodically reviewed and updated (Croner: 2020). The PDCA cycle highlights the importance of checking (or monitoring and review) as a core step towards continually improving the system.

Because monitoring and reviewing IWMPs is achieved through the broad scope of monitoring and evaluating the municipal performance through IDP implementation, the next section will focus on the challenges faced by monitoring and evaluation in municipalities.

## **2.9 Monitoring and evaluation challenges in municipalities**

Not much is published on the challenges of monitoring and reviewing IWMPs in South African municipalities. The Western Cape provincial first-generation IWMP was developed and implemented between 2011-2015; the 2nd generation IWMP's implementation started in 2017 and will be due for review in 2022 (Western Cape province IWMP, 2017). The review of the first IWMP revealed several challenges that relate to the rapid increase in urbanisation, limited institutional capacity, financial sustainability, coordination and participation, stakeholder inclusivity, resource inefficiency and limited integrated waste management infrastructure (Western Cape IWMP, 2017). Challenges led the provincial department to fail to achieve the targets of the first IWMP; however, such activities are included in the current IWMP. The province plans to expand waste management services by providing an integrated waste management infrastructure to improve waste material recovery and drive the circular economy (Western Cape province IWMP, 2017) to address challenges. The review also noted an improvement in the quality of municipal IWMPs received for endorsement.

Since the study aims to evaluate the monitoring and review phase of the IWMP, implemented at local government, it is essential to consider the challenges municipalities face with monitoring and assessing IDPs and overall municipal performance. The monitoring and evaluation challenges at the local government are considered because they directly impact the review of IWMPs. After all, IWMPs is not implemented as an isolated plan but as part of the broader municipal plan, the IDP. The challenges affecting the monitoring and evaluation of municipality IDP or performance affect the monitoring and review of the IWMPs. Below are some of the challenges relating to monitoring and evaluation in municipalities.

- Jili and Mthethwa (2016) researched the challenges in implementing monitoring and evaluation of municipal structures, systems and processes in line with the IDPs, service delivery outcomes and operational plans to implement the budget in Mfolozi municipality. One of their key findings was that knowledge, skills and competence required for those aspiring and performing duties related to monitoring and evaluating public projects are limited. Jili and Mthethwa (2016) acknowledge the achievement of providing services to most South Africans but recommend training, workshops, dialogue on monitoring and evaluation and how suitable systems can be implemented at the local government level to enhance service delivery (Jili and Mthethwa, 2016).
- Govender and Reddy (2014) conducted an empirical survey to evaluate Monitoring and Evaluation (M&E) activities in KwaZulu-Natal municipalities. They found that monitoring and evaluation are impacted by numerous aspects such as:
  - Lack of human resources and capacity,
  - The use of numerous templates, frameworks and meeting of deadlines create the perception that monitoring and evaluation are exclusively about reporting and compliance, and lastly,
  - Lack of buy-in from senior managers; change management issues; feedback from plan owners; and developing the correct performance indicators.
- Mello (2018) argues that lack of capacity and poor oversight within and outside municipalities are some of the underlying reasons for the poor performance of some municipalities. Mello (2018) believes that many municipalities in South Africa are not performing as expected because of a host of problems that include weaknesses in monitoring and evaluation systems.

## **2.10 Chapter summary**

Chapter 2 outlined the literature review relating to the monitoring and review phase of the IWMPs. The importance of monitoring and review was also discussed in this chapter, with the key finding revolving on measuring the set targets against the outcomes or actual results of implementing the plan. The chapter also focused on monitoring and evaluating the IDP performance in municipalities, and underlying reasons for poor performance were identified. The next chapter provides the research methodology used in the study.

# CHAPTER 3 METHODOLOGY

## 3.1 Introduction

The purpose of this research study, as outlined in Chapter 1, is to critically evaluate the monitoring and review phases of the IWMP process for the Drakenstein Municipality. This chapter explains the research design adopted in the study, the method used in data collection, a description of the study area, and how data were analysed to reach conclusive answers to the questions posed in achieving the study’s stated objectives.

## 3.2 Research design

Research design outlines a clear plan for assembling data to answer the researcher’s questions (Hopf, 2004; Babbie, 2007). Jang (1980) maintains that research studies should be adequately and carefully designed to address the investigated questions. Failure to sufficiently answer investigated questions renders the research a futile exercise. This research has followed a two-phased approach, which comprised document analysis (phase 1) and a self-administered questionnaire (phase 2) to collect mainly qualitative data (Table 3-1). Qualitative research usually focuses more on *words* rather than on numbers, and it is broadly inductive, constructive, and interpretive (Bryman, 2012). Table 3-1 below summarises the research design employed in this study.

**Table 3-1: Research design**

Research objective	Data collection	Data analysis
<b>RO1:</b> To evaluate the adequacy/performance of the monitoring and review of IWMPs (first to the third generation)	Document review and evaluation against evaluation criteria adapted from Radzilani (2019) using review area 10 (as adapted from the Lee and Colley review package), which addresses the requirements of NEMWA section 13, as well as alignment with IDPs and SDBIPs: <ul style="list-style-type: none"> <li>• Three IWMPs (two implemented, monitored and reviewed and one under implementation)</li> <li>• Fifteen municipal annual performance reports;</li> <li>• Fifteen IDP and SDBIP reports</li> <li>• Public participation reports.</li> </ul>	Performance trends per category were observed through the allocated assessment symbols (using an adapted version of the Lee and Colley review package).
<b>RO2:</b> To determine the barriers and challenges	Self-administered questionnaire distributed to purposefully selected role-players within the	Thematic analysis was utilised to analyse the

Research objective	Data collection	Data analysis
during IWMP monitoring and review	Drakenstein Municipality as well as relevant role-players within the provincial and national departments responsible for environmental affairs: Two municipal officials from the Drakenstein Local Municipality; one official from the Western Cape Provincial government; and two officials from the National Department of Forestry, Fisheries and Environment.	data provided in the script. It allowed the researcher to identify common themes and patterns that are repeated (Caulfield, 2019).

### 3.3 Case study selection

South Africa has 278 local municipalities. Because of the number and spatial distribution thereof, this study could not pursue a representative sample approach. Instead, a case study approach was preferred. The research applied so-called ‘replication logic’, commonly used in case study research, that generalises results for a particular context and not for a representative sample (Yin, 2014). Therefore, the results could reasonably be expected to replicate similar comparable contexts (i.e., other, similar municipalities in South Africa).

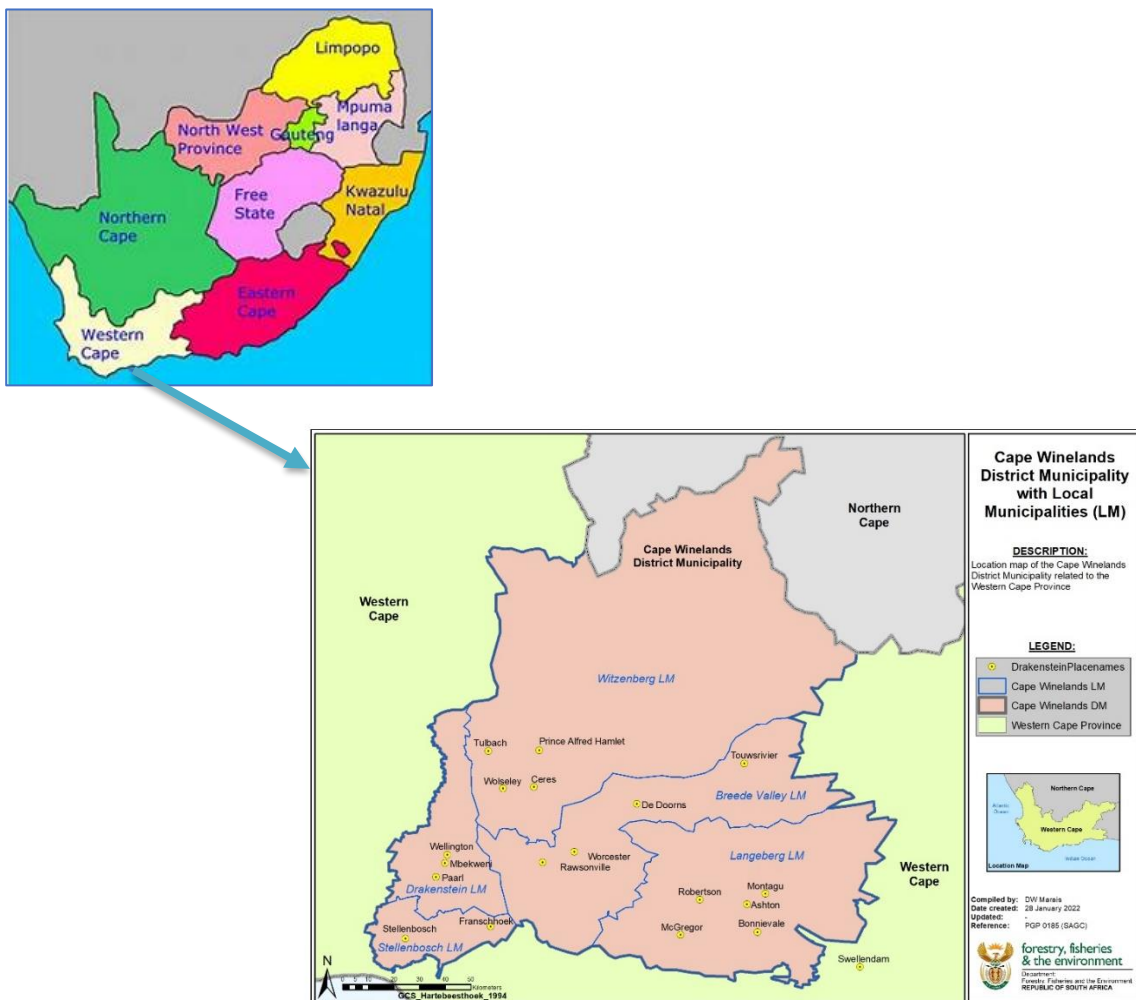
Ultimately, the case study chosen was the Drakenstein Municipality, located in the Western Cape, South Africa. Its selection as a case study for this study followed a purposive sampling founded on the following criteria:

- **Well-established (mature) IWMP system:** To address RO1 of the study, the selected Municipality needed to have a “mature” IWMP system with enough monitoring and review cycles of the IWMP to make reasonable conclusions on a large enough sample of documents. The Drakenstein Municipality started developing its IWMP in 2004. Its third generation IWMP is currently under implementation, with two previous IWMPs having gone through formal monitoring and review cycles. As a result, three IWMPs, fifteen annual reports, fifteen IDP documents, and fifteen SDBIP documents were generated over the 15 years of implementing the IWMP. All documents were included in the review to address RO1. Initially, a municipality with four generations of IWMPs were identified as a possible case study for this research. However, the municipality did not provide access to all required documents on time.
- Its IWMPs had to be adopted by the municipal council and implemented;
- Its available IWMPs and supporting documents: The municipality had to make IWMPs and supporting documents available to the researcher. All documents had to be complete, available as a hard or electronic copy, and in English.
- It is a municipality with sufficient human resources to participate in the research.

- Its willingness to participate in research and consent and permission to conduct research: The Municipality agreed to participate and provided authorisation and access to documentation.

### 3.3.1 Description of the case study area

The Drakenstein Municipality (WC023) qualified as a suitable case study by meeting the above selection criteria. The Municipality is located within the Cape Winelands District Municipality, in the Western Cape Province of South Africa. Drakenstein is the north-eastern neighbour of the City of Cape Town (DLM IWMP, 2021:20). It is one of five municipalities in the Cape Winelands District Municipality covering 1 538 km<sup>2</sup> (Figure 3-1).



**Figure 3-1: The locality of Drakenstein Municipality.**

(Source: DFFE, 2022)

The Community Survey conducted by Statistics South Africa in 2016 indicated that 71 686 households with a population of 284 475 reside in the Drakenstein Municipality (Stats SA, 2016). Approximately 90% of households in Drakenstein have access to refuse removal. Refuse removal

occurs weekly through a collection programme compiled by the municipality. Refuse removal services by the local authority is the leading source of refuse removal for households. On average 42 000, refuse removal service points are serviced weekly. Drakenstein Municipality operates only one landfill facility to dispose of general waste, garden refuse and builder's rubble (Drakenstein Local Municipality, 2019).

The municipality has to date, developed, implemented, and reviewed two generations of the IWMPs, with the third IWMP generation being implemented (2004,2009 and 2020) (DLM IWMP, 2020).

### **3.4 Data collection**

Brink (1996: 148) argues that stock must be taken of information needed to answer the research questions in research. As indicated in Table 3-1, secondary and primary data were collected in two phases through different document analysis methods (secondary data related to RO1) and self-administered questionnaires (preliminary data related to RO2).

Document analysis is an organised method of identifying, studying, or assessing published and electronic papers to investigate, understand and evaluate information and collect data related to the research objectives (Bowen, 2009). The grouping of data drawn from different sources and at other times, in different places or different people is referred to as triangulation, in this case being (1) documents and (2) self-administered questionnaires (Hopf, 2004; Bryman, 2016). Creswell and Miller (2000) describe triangulation as a *validity process* where researchers seek similarities from multiple sources of information to form themes or categories in a study. Data collection through document evaluation and questionnaires is further explained in Sections 3.4.1 and 3.4.2, respectively.

#### **3.4.1 Document review and evaluation**

Document evaluation is not only a low-cost way of accessing secondary data; it also provides background information and enough data that helps the researcher to investigate (Bowen, 2009). Moreover, it can be combined with other qualitative research methods like self-administered questionnaires for verification and data extraction (Denzin, 1970).

The Drakenstein Local Municipality provided previously developed and implemented documents to the researcher for investigation, which included: two generations of adopted IWMPs, the third draft IWMP, fifteen municipal annual performance reports, IDP documents and other relevant documentation that are the source of data for evaluation such as SDBIPs.

The researcher conducted document evaluation through the IWMP review package adapted by Radzilani (2019) from the Lee and Colley review package. The review package, traditionally used for environmental impact assessment (EIA) report quality review, assigns performance scores to indicate adequacy/performance against specific review criteria. The review package was preferred because its foundation is tried, tested and succeeded in other countries (Mounir, 2015; Momtaz and Kabir, 2013; Talime, 2011); it is a pioneer for similar review instruments that followed (Pöder and Lukki, 2011) and it is quick and easy to understand (Talime, 2011; Radzilani, 2019). The same scoring system was also applied to evaluate the adequacy/performance of additional evaluation criteria (outlined in Sections 3.4.1.2 to 3.4.1.4). Further details on the document evaluation process are provided in the sub-sections below.

#### 3.4.1.1 Developing review criteria

The document review criteria used for this research (related explicitly to RO1) is discussed in this section. Performance evaluation (using “performance scores”) applied to evaluate the adequacy and performance of documents against the review criteria are outlined in Section 3.4.1.2.

##### 3.4.1.1.1 Document review using review area 10 of the adapted Lee and Colley review package

Lee *et al.* (1999) developed a package to review the United Kingdoms' Environmental Impacts Assessments (EIA) reports. The review package has evolved through testing and reviewing to correct ambiguities through independent reviewers (Lee *et al.*, 1999). It is generally used to review project-level of EIA reports and adapted to the EIA procedures of many countries (Talime, 2011; Mounir, 2015; Sandham *et al.*, 2020). It is also being used increasingly in the environmental appraisals of other policies, plans, and programmes (Lee *et al.*, 1999) and can be adapted to review waste plans (Lee *et al.*, 1999; Radzilani, 2019).

Radzilani (2019) developed an IWMP evaluation package following the Lee and Colley Environmental Impact Statement (EIS) review package guideline. Razilani's adapted review package retained most of Lee and Colley's evaluation topics and added some sub-categories to cover the requirements of IWMP evaluation. Although the general approach of the Lee and Colley review package, as adapted by Radzilani (2019), was followed, only review area 10 (focusing on IWMP monitoring and review) were retained for this research. Review area 10 included the following evaluation areas (specifically applicable to IWMP monitoring and review):

- Reporting;
- Monitoring;
- Strategic issues;

- Performance;
- Public accountability;
- Communication and public participation;
- Financial plan;
- Waste management implementation programme; and
- Review of IWMPs.

Review area 10 of Radzilani's review package addressed the requirements of the guideline for the development of IWMPs. The guideline was developed by the national Department of Environmental Affairs (DEA, 2012) to support the development and implementation of IWMPs. The guideline illustrates the different phases of the IWMP process and details what aspects should be considered at each stage. For example, reporting on the implementation, monitoring and review steps of the IWMP process requires a framework by which the plan will be monitored. In addition, the plan must indicate targets, actions, and roles and responsibilities to ensure implementation.

Since the requirements of the IWMP development guideline as well as NEMWA Section 13, sub-sections (1), (2a to j), (3) and (4) were already included in review area 10 (Radzilani, 2019), no additional evaluation criteria from the IWMP development guideline and NEMWA Section 13 were added for this research. Review area 10 is included as **Area 3** in the consolidated review criteria (see Table 3-2).

According to Section 13 of NEWMA, municipalities must ensure that the annual performance reports, prepared as per Section 46 of the Municipal Systems Act, contain information on implementing the integrated waste management plan. However, other evaluation criteria (outlined in Section 3.4.1.1.2 and 3.4.1.1.3 of this dissertation) were added to focus more explicitly on IWMP monitoring and review, to evaluate alignment and incorporation of the IWMP with other municipal documents such as the IDP and SDBIP, since these were not expressly addressed by Radzilani's (2019) review area 10.

Before the inclusion of the IWMP into the IDP is assessed, it will be essential to evaluate the general IWMP implementation plan's compliance with Section 12 of NEMWA and DEA's IWMP development guidelines.

**Table 3-2: Evaluation criteria and documents evaluated against the criteria**

Evaluation criteria	Description	Document(s) evaluated against evaluation criteria
<b>Area 1: NEMWA Section 12 requirements (refer to Section 3.4.1.1.2)</b>		
<i>1.1. Details in the IWMP implementation plan</i>	Did the IWMP's implementation plan provide sufficient details indicating what, when, how, and by who will the projects of the IWMP be implemented?	IWMP
<b>Area 2: IDP and SDBIP considerations (refer to Section 3.4.1.1.3)</b>		
<i>2.1 Yearly IWMP targets in IDP and SDBIP</i>	Determines the inclusion of the yearly IWMP targets into the SDBIP	IDP and SDBIP
<i>2.2 Yearly financial allocation in the IDP and SDBIP</i>	The budget is allocated to IWMP activities in a given financial year.	IDP and SDBIP
<b>Area 3: Review area 10 from adapted Lee and Colley package (adapted from Radzilani, 2019) (refer to Section 3.4.1.1.1)</b>		
<i>3.1 Reporting (10.1)</i>	The annual performance of the IWMP should be provided. The content should include: the extent to which the IWMP was implemented; waste management initiatives; waste management delivery services and compliance of the IWMP to the applicable waste management standards; how the Municipality performed in achieving the targets; any amendments to the plan	Annual performance reports from 2005 to 2020.
<i>3.2 Monitoring (10.2)</i>	The monitoring framework with which the plan will comply is developed. The framework should include the issues listed in 10.2.1 to 10.2.6	Annual report or monitoring framework or public participation minutes from 2005 to 2020.
<i>3.2.1 Strategic issues (10.2.1)</i>	Indication of how short-term to medium-term goals will be achieved and objectives will be delivered	Annual reports monitoring framework in the IWMP
<i>3.2.2 Performance (10.2.2)</i>	How the municipality is performing concerning the IWMP targets and objectives	Annual report or monitoring framework in the IWMP
<i>3.2.3 Public accountability (10.2.3)</i>	Did the municipality show accountability to the public, and was the public informed throughout the process?	Annual report or monitoring framework in the IWMP or public participation minutes

<b>Evaluation criteria</b>	<b>Description</b>	<b>Document(s) evaluated against evaluation criteria</b>
<i>3.2.4 Communication and Public participation (10.2.4)</i>	A communication plan that indicates how the stakeholders will be informed and how the feedback regarding the progress of the IWMP will be communicated.	Annual report or monitoring framework in the IWMP
<i>3.2.5 Financial plan (10.2.5)</i>	Annual budget allocation and medium-term finance and how funds were raised should be discussed.	Annual report or Monitoring Framework in the IWMP
<i>3.2.6 Waste Management implementation programme (10.2.6)</i>	The delivery milestones; target; activities undertaken; Municipality's responsibilities, and schedules of projects related to IWMP implementation should be included in the programme	Annual report or Monitoring Framework in the IWMP
<i>3.3 Review of IWMPs (10.3)</i>	To measure how successful the implementation of the IWMP was, the plan should be reviewed. Therefore, the IWMP should be reviewed every five years aligned with the IDP requirements. Annual performance reports can also be considered as a reviewing mechanism.	Subsequent IWMP or IWMP review document

#### 3.4.1.1.2 Section 12 of NEMWA and DEA's guideline for the development of IWMP

As mentioned earlier, Section 12 of NEMWA addresses the contents of integrated waste management plans (IWMPs). The contents of IWMP include:

- Situation analysis comprises the description of population and development profiles, assessment of waste quantities and types, description of existing waste services (collection, disposal) and the number of persons not receiving waste collection services.
- The municipality must indicate how it will fulfil the general duty of providing waste management services, addressing pollution caused by waste, implementing waste minimisation (re-use, recycling and recovery), implementing relevant international agreements, and giving effect to the best waste management practices.
- Setting waste management priorities and objectives.
- Establishing targets for waste collection, minimisation, reuse and recycling.
- Plans for any new waste disposal facilities and decommissioning of existing facilities.
- Indicate financial resources required to give effect to the plan.

Upon satisfying the contents of the IWMP, the municipality must translate all the information into an IWMP implementation plan. The implementation plan provides a description of what needs to be done (indicator), how many of such indicators must be done (targets), how it will be done (human and financial resources) and by when it should be done (timeframes). Thus, Section 12 requirements were evaluated as details in the IWMP implementation plan, which is review **Area 1** in the consolidated review criteria (Table 3-2). The situation analysis of the IWMP will later form part of the situation analysis phase of the IDP when services and sectoral plans are discussed. The IWMP implementation plan informs yearly projects that must be included in the IDP.

#### 3.4.1.1.3 IDP and SDBIP requirements

An integrated development plan (IDP) provides a framework for developing within a specific municipal area and includes sectoral development plans to ensure coordination. The budgets related to sectoral plans (like IWMPs) are allocated funding through the IDP of the municipality. For this research, the IDP and the Service Delivery and Budget Implementation Plan (SDBIP) of a specific year were perused to evaluate the inclusion of IWMP elements (especially aspects related to monitoring and review) in the IDP and SDBIP. The evaluation specifically focused on the following review criteria only (since other criteria associated with IDP and SDBIP alignment was addressed by Razilani's Review Area 10):

- Yearly IWMP targets in IDP and SDBIP and
- Yearly financial allocation in the IDP and SDBIP.

IDP and SDBIP-related review criteria are included as **Area 2** in the consolidated review criteria (Table 3-2).

The researcher utilised municipal annual performance reports to review the IDP and SDBIP performance. Municipal annual reports provide municipal sectoral (waste, electricity, water) performance in a given financial year by comparing the targets against what was delivered in the year (Municipal Systems Act 46 of 2000). The reports also indicate the performance targets and priorities of the next financial year.

#### 3.4.1.1.4 Consolidated document review criteria

Table 3-2 provides the consolidated review criteria (as outlined in Sections 3.4.1.1.1 to 3.4.1.1.3), used for document review and evaluation purposes. In addition, a consolidated collation sheet was developed to assign performance scores for data analysis purposes (**Annexure A**).

### 3.4.1.2 Performance evaluation

Performance rating scores proposed by Lee and Colley, as adapted by Radzilani (2019), were used to “score” the adequacy and performance of the documents evaluated against the review criteria in Table 3-2, as:

- *A*: Well-performed;
- *B*: Satisfactory;
- *C*: Just satisfactory (minor omissions/ insufficient information);
- *D*: Not satisfactory (insufficient information provided, but task reasonably attempted);
- *E*: Poorly performed (not satisfactory, inadequately attempted); and
- *F*: Not attempted/not applicable.

Alphabetical symbols are deliberately selected to discourage addition and subtraction, which is typically related to numerical values, which may distort performance results (Lee *et al.*, 1999).

### 3.4.2 Self-administered questionnaire

Initially, the research design planned interviews with selected participants to determine the barriers and challenges related to IWMP monitoring and review (RO2). Targeted respondents, however, indicated that they have time constraints and would prefer to complete questionnaires (sent in preparation for interviews) at their own time.

Questionnaires, in this case, were not the primary source of data collection but were instead utilised as a triangulation method to supplement the data collected from document evaluation. Even though a self-administered questionnaire lacks the comprehensive aspect of an interview, Dalati and Gomex (2018) consider it an efficient instrument for data collection. The two main advantages for utilising the self-administered questionnaires are:

- The respondents are given time to consult and consider answers before submitting the questionnaire to the researcher.
- It is more convenient for respondents as they can answer at their most convenient time, unlike zoom interviews that must be scheduled to suit the interviewee.

The self-administered method was compared to other methods such as the telephone-administered method and was discovered to be equivalent and valid (Garcia *et al.*, 2005). The absence of the interviewer was compensated by clarity seeking questions where needed, and the researcher had to send follow up questions via email.

A semi-structured self-administered questionnaire (**Annexure B1-4**) (with a combination of closed and open-ended questions) was used to gather information related to RO2 (barriers/challenges with IWMP review). The questions included in the questionnaires were informed by the outcomes of the document evaluation to allow for comprehensive probing (Newcomer *et al.*, 2015).

The question of how many questionnaires are enough is answered by Baker and Edwards (2012: 9), who stated that ***“simply gather data until empirical saturation reached even though it is not always possible or practical.”*** Therefore, questionnaires were forwarded to five participants as outlined in **Table 3-2**.

#### 3.4.2.1 Developing the questionnaire

Agee (2009) believes that poor interview/questionnaire questions can potentially affect other stages of the study and may compromise research outcomes. The questions included in the self-administered questionnaire (related to research objective 2 of this study) were informed by the results of the document evaluation process and were continually refined and improved, as mentioned earlier.

Questions specifically aimed to determine the barriers and challenges of IWMP monitoring and review by focusing on three aspects:

- Annual reporting of IWMP implementation;
- Monitoring of IWMP implementation; and
- Review of the IWMPs.

#### 3.4.2.2 Piloting the questions

Part of developing the questionnaires included a piloting phase. The process was not meant for collecting data but to improve the quality of the questions (Harvey, 2012). The questions were piloted by e-mailing the questionnaire to three colleagues in the City of Ekurhuleni municipality's Waste Management division and Strategy and Planning within the Environmental Resources and Waste Management Department. These participants were selected for piloting because they emulated the characteristics of the respondents at the Drakenstein Local Municipality, as proposed by Castillo-Montoya, (2016). Piloting aided the refinement of questions and gave the researcher an idea of the potential interpretation of the questions and determining if they would serve the purpose. The responses of the piloting phase were not included as research results.

### 3.4.2.3 Selection of participants

Like selecting the study area, the researcher selected participants through purposive sampling. This selection method has an inherent bias contributing to efficiency (Etikan *et al.* 2016). Etikan *et al.* (2016) and Guarte and Barrios (2006) suggest that to ensure the quality of data collected, the researcher has to ensure the reliability and competence of the respondents. The researcher purposefully selected five officials, as indicated in **Table 3-3**.

The respondents from the municipality were chosen based on knowledge and experience in IWMP reporting, monitoring and review. The respondents from the provincial, national, and COGTA departments were selected based on their support role in reporting, monitoring, and reviewing IWMP. One of the selection criteria for the inclusion of participants was the number of years they have been working in their specific position. A minimum of five (5) years working in a position was used as the selection criteria to include participants who could provide sufficient information for implementing a single IWMP (5-year phases).

The five participants are IDP manager (Drakenstein Municipality), Director: Municipal Support and Capacity Building Department of Local Government Western Cape Government, Principal Engineering Technician: Solid Waste & Landfill Management (Drakenstein Municipality), Department of Forestry, Fisheries and Environment: Youth Environmental coordinator and Assistant Manager: Waste Management Planning (Provincial department). For the purpose of reporting in this dissertation, the respondents will from hereon be presented anonymously to promote confidentiality and anonymity. The profile of the five respondents (years of experience and highest qualification) is included in **Table 3-3**.

**Table 3-3: Self-administered questionnaire participants**

Job description/title of participant	Years of experience in the respective field (Waste management)	Highest qualification
Respondent 1	1-5 years	Degree in Construction Management
Respondent 2	6-10 years	BA Honours degree in Anthropology
Respondent 3	11-15 years	MPhil Environmental Management
Respondent 4	11-15 years	DPhil Local Government Capacity
Respondent 5	1-5 years	BA Degree in Development and Environmental Studies

#### 3.4.2.4 Distribution of the questionnaire

The researcher was responsible for circulating the questionnaire via e-mail. The researcher also distributed and facilitated the process of having consent letters signed. The respondents were informed about promoting confidentiality and anonymity before responding to questionnaires, and informed consent was provided (**Annexure C**). Because of the COVID 19, engagements with the participants were done via email to lessen the viral infections from one person to another. The questionnaire was circulated to the respondents between August and October 2021, and follow-up questions were sent to the relevant respondents via e-mail after receiving the completed questionnaires.

### 3.5 Data analysis

Data collection was also done between July and October 2021. The researcher analysed data from document evaluation by observing performance trends per category provided in the assessment tables. The data were grouped to allow the researcher to provide a narrative on year-on-year performance and evaluation criteria category performance. Questionnaire data were thematically analysed by reading the self-administered questionnaire scripts to identify common responses. The reading of scripts allowed the researcher to identify common themes and repeated patterns (Caulfield, 2019). The document evaluation was presented in tables and narrative notes that substantiated the information in the tables. The questionnaires data was presented in themes and supported by respondents' quotes.

### 3.6 Ethical considerations

According to the North-West University (NWU, 2018), ethical considerations should be acknowledged and considered during research. The study was conducted based on an evaluation of documents and semi-structured questionnaires. The study involved human respondents but did not include any sensitive respondents (i.e., children, persons with disabilities). The research proposal was submitted to the Scientific Committee of the Environmental Management sub-programme in the Unit for Environmental Sciences and Management of the North-West University, Potchefstroom Campus. The scientific committee has found that the project proposal followed the scientific method and adhered to the standards set out in the Academic Rules for masters and Doctoral Students at North-West University. The Scientific Committee concluded that the proposed methodology posed a minimal ethical risk and was recommended for expedited review by the Faculty of Natural and Agricultural Sciences (FNAS) ethics committee. The FNAS ethics committee approved the application with an ethical approval number NWU-00474-21-A9.

The researcher was granted permission by the Municipal Manager of the Drakenstein Local municipality to utilise the municipality as a case study. The researcher also received written informed consent from the respondents before the self-administered questionnaires were completed after information about the study was provided. Anonymity and confidentiality assurance was given to the participants, and they were also informed about their right to withdraw from the study at any point without prejudice.

### **3.7 Methodological assumptions and limitations**

The adapted Lee and Colley review package was developed to review the quality of EIA reports, and in this study, it was used to evaluate IWMP. The study did not cover the entire review package but only focused on Area 1: Section 12 requirements, Area2: IDP and SDBIP considerations, and review Area 3: Monitoring and review proposed by Radzilani (Area 10), due to the scope of the research being limited to the IWMP monitoring and review phases.

At the beginning of the research, it was anticipated that three IWMP documents, fifteen IDP documents, fifteen SDBIP documents and fifteen annual reports would be available. All documents were not provided because the development of IDP and requirements of yearly reports were still at their infancy stage, and records were not adequately managed. Therefore, the research was conducted using three IWMPs, thirteen IDPs, fourteen SDBIP and twelve annual reports.

There was a lag in developing the 3rd generation IWMP on or before the fifth year of implementing the 2009 IWMP, making the 2009 IWMP implemented for more than five years. The third generation IWMP was not developed until 2019. Thus, for evaluating the second generation IWMP, the IDP, SDBIP and annual reports of the following years were considered: 2014/2015, 2015/2016, 2016/2017, 2018/2019 and 2019/20.

Self-administered questionnaires have an inherent limitation of respondents not clearly understanding the questions. There is no opportunity to probe the respondent to elaborate, especially in open-ended questions (Dalati and Gomez, 2018). Another limitation is that the researcher can never determine who completed the questionnaire (Dalati and Gomez, 2018).

### **3.8 Chapter summary**

The chapter outlined the research design, approach, and justification for the study's approach to access data and analyse to ensure that the research objectives are addressed accordingly. The chapter also described the evaluation criteria used for document evaluation as proposed by Lee and Colley (1999) and adapted by Radzilani (2019) for IWMP review, NEMWA Section 12 and

the IWMP development guideline and IDP and SBIP considerations. The next chapter will focus on the results obtained.

# CHAPTER 4 RESULTS AND DISCUSSION

## 4.1 Introduction

This chapter outlines the interpretation and analysis of the reviewed IWMPs, IDPs, SDBIPs and annual reports of the Drakenstein Municipality – as part of the study’s research objectives. The chapter systematically present the findings and discuss these given the objectives intended to achieve.

## 4.2 Results related to RO1: To evaluate the adequacy/performance of the monitoring and review of IWMPs (first to the third generation)

The study considered the projects and activities listed in the IWMP implementation plan against projects and activities in the IDP and SDBIP and the performance of the projects in the municipal annual reports. The IWMP implementation plan is critical to measuring the performance of the IWMP. Plans should identify good quality measurable indicators which will be monitored during implementation. Again, failure to collect baseline information on these indicators and monitor and record changes to the indicators during implementation makes evaluation difficult (DPME, 2011).

The document review and evaluation focused on the monitoring and review phase of the IWMP. This chapter provided the evaluation findings for the three generations (2004, 2009 and 2019, respectively) of the Drakenstein Municipality IWMPs. The collation sheet used in evaluating documents is attached as **Annexure D**.

### 4.2.1 Monitoring and review of the first generation IWMP (dated 2004)

The sections below discuss the evaluation results of the monitoring and review of the first generation IWMP (2004) per Review Area.

#### 4.2.1.1 Area 1: Section 12 requirements

Category 1.1 (details in the IWMP implementation plan) performed **not satisfactory (D)** (Table 4-1). The details provided in the implementation plan were inadequate and did not meet the requirements of Section 12 of NEMWA and guidelines for developing IWMPs.

**Table 4-1: Performance of Area 1 for the first generation IWMP**

Area 1: Section 12 requirements					
Category	Year 1 (5/6)	Year 2 (6/7)	Year 3 (7/8)	Year 4 (8/9)	Year 5 (9/10)
1.1 Details in the IWMP implementation plan	D	D	D	D	D

Complying with the requirements of Section 12 of the NEMWA is essential for successful implementation of the IWMP. The projects and the set targets verify how far the plan was implemented. The IWMP implementation plan is the cornerstone of an IWMP; a poor IWMP implementation plan result in poor performance of the IWMP.

#### 4.2.1.2 Area 2: IDP and SDBIP considerations

Category 2.1 (inclusion of yearly IWMP targets in the IDP and SDBIP) and Category 2.2 (yearly financial allocation in the IDP and SDBIP) were **not satisfactory (D)** in the five years of IWMP implementation, as shown in Table 4.2 below.

**Table 4-2: Performance of Area 2 for the first generation IWMP**

Area 2: IDP and SDBIP considerations					
Category	Year 1 (5/6)	Year 2 (6/7)	Year 3 (7/8)	Year 4 (8/9)	Year 5 (9/10)
2.1 Yearly IWMP targets in the IDP and SDBIP	D	D	D	D	D
2.2 Yearly financial allocation in the IDP and SDBIP	D	D	D	D	D

The D scores were allocated because the IWMP implementation plan did not meet all the requirements of Section 12 of NEWMA. This affected the information that is included in the IDP and SDBIP. Some of the projects in the IDP and SDBIP differed from the projects identified in the IWMP.

Section 12 of NEWMA requires municipalities to set targets for collection, minimisation re-use and recycling waste. Section 12 further requires municipalities to indicate financial resources needed to give effect to the plan. The guideline for developing IWMP explains clearly that an implementation plan must provide details of how the targets set in the goals will be attained and what resources will be required to attain the targets in the five years of implementation. The Drakenstein Municipality's IWMP implementation plan only listed activities that will be done and the year that the activity would be done without indicating the targets that the municipality planned to achieve, and the resources needed to assume the activity.

#### 4.2.1.3 Area 3: IWMP toolkit and Section 13 requirements

An evaluation of the IWMP (category 3.1) reporting indicated that the first two years of IWMP implementation were **not applicable (F)**, as shown in Table 4-3 below. The annual reports were not available for evaluation purposes. It could not be determined if the activities and projects included in the IDP and SDBIP were accomplished or not. Even if the annual reports were made available, there is a high probability that the area would not have performed satisfactorily because of the lack of details in the IDP and the SDBIP (refer to Section 4.2.1.2 above).

**Table 4-3: Performance of Area 3 for the first generation IWMP**

Area 3: IWMP Toolkit and Section 13 requirements (Review area 10 from adapted Lee and Colley package as adapted from Radzilani, 2019)					
Category Sub-categories	Year 1 (5/6)	Year 2 (6/7)	Year 3 (7/8)	Year 4 (8/9)	Year 5 (9/10)
3.1 Reporting	F	F	D	D	D
3.2 Monitoring					
3.2.1 Strategic issues	F	F	D	D	D
3.2.2 Performance	F	F	D	D	D
3.2.3 Public accountability	E	E	E	E	E
3.2.4 Communication and Public participation	E	E	E	E	E
3.2.5 Financial plan	E	E	E	E	E
3.2.6 Waste Management implementation programme	E	E	E	E	E
3.3 Review of IWMPs	F	F	F	F	F

The remaining three years' performance was **not satisfactory (D)**. The report was available and aligned with the information provided in the IDP and the SDBIP. However, because of the misalignment between the IWMP and IDP and SDBIP, the reporting did not have much impact on the IWMP.

As indicated in **Table 4-3**, monitoring (category 3.2), sub-categories 3.2.1 (strategic issues), and 3.2.2 (performance) **scored F (not applicable)** for the first two years of 2004 IWMP implementation. As noted in the limitations of the research - the implementation of both the IWMP and IDP were at an early stage; the municipal officials indicated that record-keeping was fragmented as the responsibilities kept moving between departments.

Therefore, there were no annual reports available to evaluate how the implementation of the IDP and SDBIP performed. For the remainder of the 2004 IWMP implementation years (2007 – 2010),

the performance was **not satisfactory (D)** because of the misalignment between the IWMP and IDP and SDBIP.

For all the 2004 IWMP implementation years, subcategories 3.2.3 to 3.2.6 performed **poorly (E)** (Table 4-3).

- For sub-categories 3.2.3 (public accountability) and 3.2.4 (communication and public participation), the score is attributed to the poor public participation process of the IDP because sector plans are presented and made available for public consumption before the IDP can be finalised and adopted by the council. Besides the account of public participation in the IDP, there is no evidence of any other public participation. Once-off public participation cannot enhance the implementation of an IWMP; the process needs to be repeated when amendments of the IWMP and IDP are done to ensure that the stakeholders know their responsibilities towards the successful implementation of the IWMP.
- For sub-category 3.2.5 (financial plan), there was no financial allocation for waste in the implementation plan. The financial plan was only indicated in the IDP and SDBIP for the first three years of implementation.
- For subcategory 3.2.6 (waste management implementation programme), Section 12 of the NEMWA requires that the implementation plan indicate the resources (human, equipment, and funds) utilised to carry out the activities. The 2004 IWMP implementation plan (2005-2009) only shows the activities, the priority of the activity and whether it is a short/medium/long term activity. The implementation plan does not indicate how much it will cost, and the human resources needed to carry out the activity.

Review of IWMPs (category 3.3) was **not attempted (F)** by the municipality (Table 4-3). The IWMP was approved and implemented but was never reviewed during the five years of implementation. It is evident in the five IDPs that were evaluated that there was a need to review the IWMP first to ensure that the IWMP implementation plan met the requirements of Section 12 of the NEMWA. The annual review is needed to track progress and amend initially unrealistic goals due to resource constraints; otherwise, targets would remain unachievable. Still, because the implementation plan did not have targets, it was impossible to revise the targets. The subsequent IWMP (2009) also failed to include a review of how the 2004 IWMP performed.

#### **4.2.2 Monitoring and review of the second generation IWMP (dated 2009)**

As mentioned in the methodological limitations (Section 3.7) of this dissertation, there was a lag in developing the third generation IWMP on or before the fifth year of implementing the 2009

IWMP. As a result, the third IWMP generation was not developed until 2019. Thus, for the second IWMP generation evaluation, the IDP, SDBIP and annual reports of the following years were evaluated: 2014/2015, 2015/2016, 2016/2017, 2018/2019 and 2019/20. The evaluation is justified because the IWMP implementation plan indicates that projects implemented between 2014 to 2020 are medium-term projects, and those for the period 2019 to 2025 were long term projects. Because the next IWMP was first drafted in 2019 and not adopted until 2021, the 2014 to 2020 projects were evaluated as part of the second generation IWMP.

#### 4.2.2.1 Area 1: Section 12 requirements

Like Area 1 of the 2004 IWMP, the performance of Category 1.1 (details in the implementation plan) was **unsatisfactory (D)** because it lacked critical information, and a detailed IWMP implementation plan from 2010 through 2020 (Table 4.4).

**Table 4-4: Performance of Area 1 for the second generation IWMP**

Area 1: Section 12 requirements										
Category	Year 1 10/11	Year 2 11/12	Year 3 12/13	Year 4 13/14	Year 5 14/15	Year 6 15/16	Year 7 16/17	Year 8 17/18	Year 9 8/19	Year 10 19/20
<i>1.1 Details in the IWMP implementation plan</i>	D	D	D	D	D	D	D	D	D	D

The successful implementation of the IWMP is dependent on the quality of the implementation plan, and a good quality implementation plan needs to meet the requirements of NEMWA. Like the evaluation results of the 2004 IWMP, the 2009 IWMP's implementation plan does not address the requirements of NEWMA. The provisions of NEMWA on the implementation plan were simplified in the guideline document for ease of reference. Only activities, timeframes, and activities' ranking are captured in the implementation plan. The resources required to implement the activities were not captured.

#### 4.2.2.2 Area 2: IDP and SDBIP considerations

In the first two years of IWMP implementation, category 2.1 (yearly IWMP targets in the IDP and SDBIP) was **not applicable (F)** because the IDP documents were not available for evaluation. The score was C (just satisfactory) in the third to fifth years because sufficient information relating to projects was provided. In the sixth to the tenth year, the performance was **not satisfactory (D)**, mainly due to the misalignment of the IWMP and the IDP. The wording of projects/activities in the IWMP differed from the projects appearing in the IDP. In some instances, two to four projects in the IDP and SDBIP address one project in the IWMP. For example, the IWMP referred to "The construction of engineered waste disposal facilities", while the IDP and SDBIP referred to

“fencing a landfill, extension of a landfill with geomembranes”. Another example includes the 2015/16 financial year, where one of the activities in the IWMP was “the monitoring of a waste disposal facility”. For the same year, the IDP project was “submit a report annually on the available solid waste airspace are existing landfills”, while the SDBIP did not provide for either of these projects (Table 4-5).

**Table 4-5: Performance of Area 2 for the second generation IWMP**

Area 2: IDP and SDBIP considerations										
Category	Year 1 10/11	Year 2 11/12	Year 3 12/13	Year 4 13/14	Year 5 14/15	Year 6 15/16	Year 7 16/17	Year 8 17/18	Year 9 18/19	Year 10 19/20
2.1 Yearly IWMP targets in the IDP and SDBIP	F	F	C	C	C	D	D	D	D	D
2.2 Yearly financial allocation in the IDP and SDBIP	F	D	D	C	C	C	C	C	C	C

For Category 2.2 (Yearly financial allocation in the IDP and SDBIP), the first-year score was **not applicable (F)** because the SDBIP document was not available for review. The second-and-third year’s performance was **not satisfactory (D)** because the IDP and the SDBIP projects were misaligned with the activities appearing in the IWMP implementation plan. Performance was **just satisfactory(C)** in the fourth to the tenth year. Minor omissions are attributed to the IWMP implementation plan that did not meet all the requirements. Overall, the IDP and SDBIP were consistent with each other but not always aligned with the IWMP.

#### 4.2.2.3 Area 3: IWMP toolkit and Section 13 requirements

For category 3.1 (reporting), the first three years of implementation were **unsatisfactory (D)**. The reports were available but provided insufficient information on the projects identified in IWMP. The main contributing factor is the misalignment of projects from the IWMP into the IDP and SDBIP. The fourth year of implementation was not applicable because the annual report was not available for review. Reporting was also **not satisfactory (D)** from 2014 – 2020 (Table 4-6). The waste management reporting in the annual reports of this period were detailed, but because of the misalignment, the detailed information does not impact the implementation of the IWMP.

**Table 4-6: Performance of Area 3 for the second generation IWMP**

Area 3: IWMP Toolkit and Section 13 requirements										
Category Sub-categories	Year 1 10/11	Year 2 11/12	Year 3 12/13	Year 4 13/14	Year 5 14/15	Year 6 15/16	Year 7 16/17	Year 8 17/18	Year 9 18/19	Year 10 19/20
3.1 Reporting	D	D	D	F	D	D	D	D	D	D
3.2 Monitoring										
3.2.1 Strategic issues	C	C	C	F	C	C	C	C	C	C
3.2.2 Performance	C	C	C	F	C	C	C	C	C	C
3.2.3 Public accountability	E	E	E	E	E	E	E	E	E	E
3.2.4 Communication and Public participation	E	E	E	E	E	E	E	E	E	E
3.2.5 Financial plan	E	E	E	E	E	E	E	E	E	E
3.2.6 Waste Management implementation programme	E	E	E	E	E	E	E	E	E	E
3.3 Review of IWMPs	C	C	C	C	C	C	C	C	C	C

Monitoring (category 3.2), sub-categories 3.2.1 (strategic issues), and 3.2.2 (performance) were **just satisfactory** (C) for all the years, except for the fourth year of implementation. This relatively higher score was allocated because of the more detailed information provided in the annual report. The details have a significant bearing on the performance of the IWMP. The fourth year of implementation was not applicable because the IDP document was not available for review.

For sub-categories 3.2.3 (public accountability) and 3.2.4 (communication and public participation), performance was **not satisfactory** (E). Except for public participation during the development of the IDP and publishing an annual report on the municipal website, there is insufficient evidence of continuous public engagement in the IWMP monitoring and review process. This is despite the fact that education and awareness was identified as one of the activities in the IWMP Plan.

Communication and public participation of the IWMP were done during the plan's development and once in a year during implementation when the IDP was presented to stakeholders. The municipality has joined hands with the district municipality in enhancing stakeholders' participation. It has also implemented community-based planning to develop ward development plans through public meetings held in the wards. Ward development plans are based on the principle that ward committees must lead and own to promote mutual accountability between the municipality and the community. The IWMP and other sector plans form part of the IDP, but it is not known how many details of the sector plans are presented during the IDP consultation

process. There is also little evidence of public accountability shown to stakeholders' consultation during the development of the IDP.

Sub-category 3.2.5 (financial plan) and 3.2.6 (waste management implementation programme) also performed **unsatisfactory (D)**. This was mainly because the implementation plans lacked key details such as the resources required to give effect to the IWMP plan. It is also unclear what details informed the budget that was allotted in the IDP and SDBIP. This is attributed to the omission of the financial resource in the IWMP implementation plan. However, the plan indicated the funding sources (revenue and grants), and the IDP and SDBIP did indicate a financial plan (even though not informed by the IWMP). The annual report also showed the actual budget expended on the activities of the implementation plan. The implementation plan must indicate the resources required for implementing the IWMP. The determined resources arise from evaluating the identified alternatives based on the inherent costs and related benefits. In response to the requirements of Section 12 of NEMWA, the DEA developed a guideline that municipalities must follow during the development of the IWMP. According to the guideline, the municipality must develop an implementation plan that details targets that will be attained and the resources that will be required. The 2009 IWMP lacked details and resources (equipment, human and financials) needed to achieve the targets.

In category 3.3 (Reviews of IWMPs), performance was **satisfactory (C)** because sufficient information was provided. In addition to the annual reports that are a requirement of Section 13 (3) of NEMWA and prepared in Section 46 of the Municipal Systems Act, the development of the third generation of IWMPs provided a detailed assessment of the second generation of the IWMP. The review focused on omissions in line with legislative requirements and specific provisions. The review could have been better if the IWMP implementation assessment had been done every year.

#### **4.2.3 Monitoring and review of the third generation IWMP (dated 2019)**

Even though the council still had to adopt the plan, the municipality commenced implementing the third generation IWMP in the 21/22 financial year. As a result, there is no adequate information available to evaluate Area 3. Thus, this section will only focus on providing results on Review Area 1 and Review Area 2.

##### **4.2.3.1 Area 1: Section 12 requirements**

Category 1.1 (details in the IWMP implementation plan) **performed well (A)**. The implementation plan satisfied all of the requirements of Section 12 of NEMWA and the DEA's guidelines for developing IWMP (Table 4-7).

**Table 4-7: Performance of Area 1 for the third generation IWMP**

Area 1: Section 12 requirements					
Category	Year 1 (20/21)	Year 2 (21/22)	Year 3 (22/23)	Year 4 (23/24)	Year 5 (24/25)
1.1 Details in the IWMP implementation plan	A	A	A	A	A

The performance could be attributed to the assessment report of the second generation IWMP, wherein many shortcomings were identified and reflected in the IWMP review report.

#### 4.2.3.2 Area 2: IDP and SDBIP considerations

For Category 2.1 (Yearly IWMP targets in IDP and SDBIP), the performance was **satisfactory (B)** for the first three years (2020 – 2023). The inclusion of the IWMP projects into the IDP and SDBIP was adequately addressed. It was **just satisfactory (C)** in the last two years (2023 – 2025). The score is ascribed to the inclusion of the IWMP projects into the IDP documents; the inclusion of the projects into the SDBIP only ends in the third year of the IWMP implementation.

**Table 4-8: Performance of Area 2 for the third generation IWMP**

Area 2: IDP and SDBIP considerations					
Category Sub-categories	Year 1 (2020/21)	Year 2 (2021/22)	Year 3 (2022/23)	Year 4 (2023/24)	Year 5 (2024/25)
2.1 Yearly IWMP targets in IDP and SDBIP	B	B	B	C	C
2.2 Yearly financial allocation in the IDP and SDBIP	B	B	B	C	C

For Category 2.2 (Yearly financial allocation in the IDP and SDBIP), the first three years also scored **satisfactory (B)** because the financial budget in the IDP and SDBIP correlates to the information provided in the implementation plan of the IWMP. In the last two years, the yearly financial allocation in the IDP and SDBIP was **just satisfactory (C)**. The score is ascribed to the inclusion of the IWMP projects into the IDP documents; however, the inclusion of the projects into the SDBIP ends in the third year of the IWMP implementation.

#### 4.2.4 Summary of document evaluation

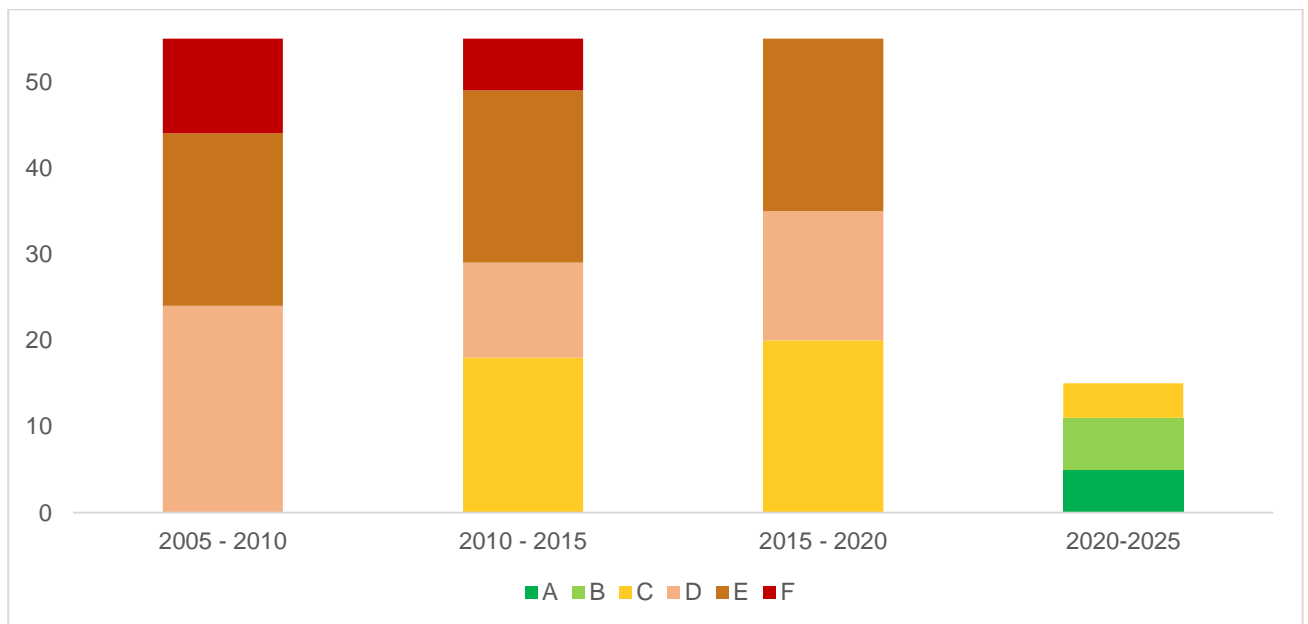
The sections below reflect on the overall document evaluation of the three generations of IWMPs. Section 4.2.4.1 provides a reflection on year-on-year performance, while Section 4.2.4.2 reflects performance per review area category.

#### 4.2.4.1 Year-on-year performance of IWMP monitoring and review

This section provides an overall summary of the document evaluation results over time. **Figure 4-1** below shows the 2005 to 2025 implementation period trends. Trends highlights a general improvement in IWMP monitoring and review over time.

IWMP monitoring and review from 2005 to 2010 scored Ds Es and Fs, indicating relatively poor performance. In the 2010 to 2015 years of IWMP implementation, the overall performance improved somewhat, with C scores also allocated for specific criteria. The overall performance ranged between C and E in the 2015 to 2020 years of IWMP implementation.

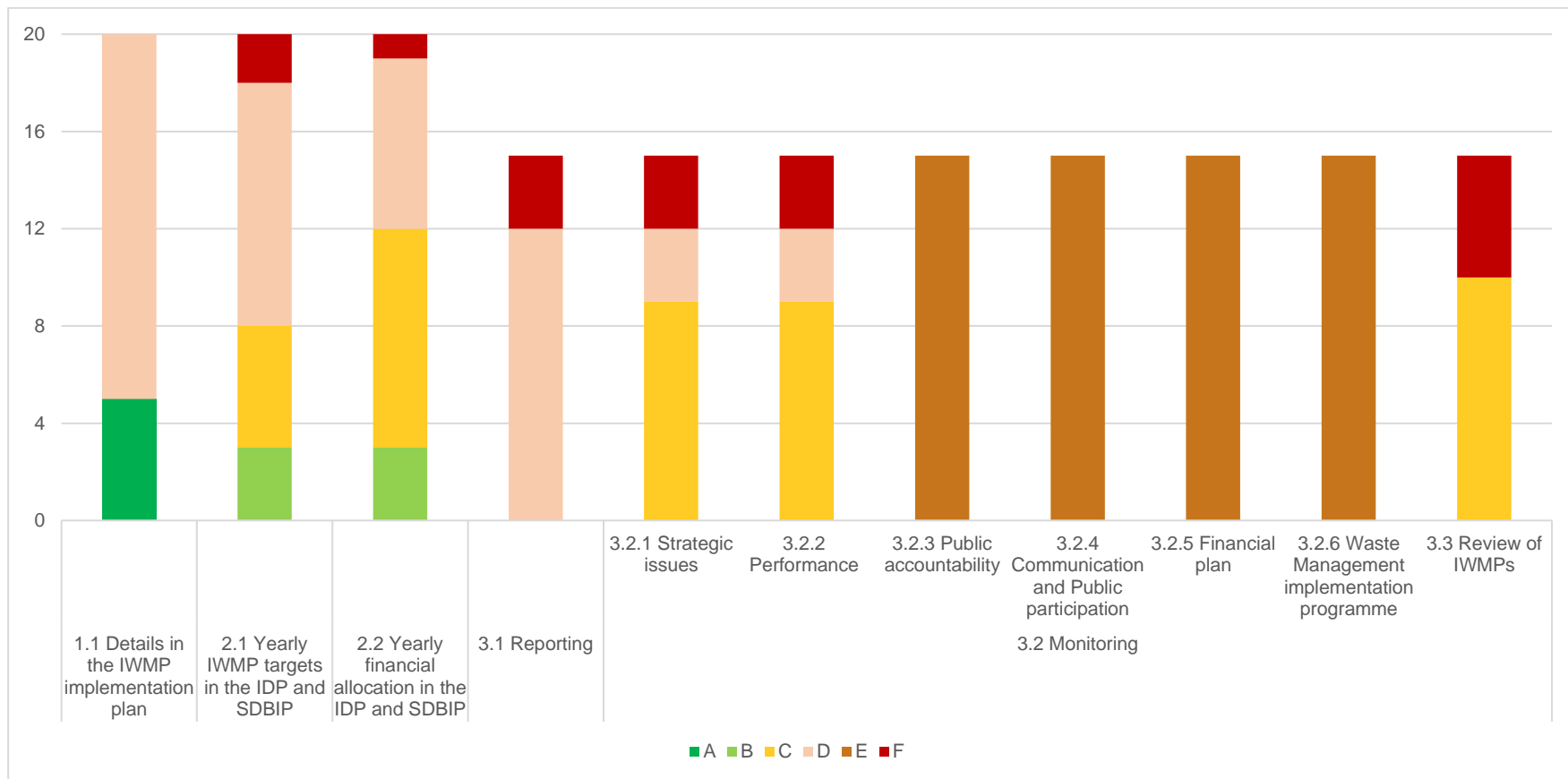
In the 2020 to 2025 years of IWMP implementation, the overall performance seemed to have improved significantly, with performance scores ranging between A and C. In these years, the IDP included projects identified in the IWMP. The significant change was caused by reviewing the previous IWMP at the end of the implementation period.



**Figure 4-1: Trends in IWMP implementation from 2005 to 2020**

#### 4.2.4.2 Performance of IWMP monitoring and review per review category

Figure 4.2 summarises the performance of IWMP monitoring and review per review category. Detailed results are discussed in Sections 4.2.1, 4.2.2 and 4.3.2.



**Figure 4-2: Trends in IWMP implementation per review category**

From Figure 4-2, it is clear that certain review areas performed poorer than others. For instance, sub-categories 3.2.3, 3.2.4, 3.2.5 and 3.2.6 consistently **scored poorly (E)**. It should, however, be noted (as mentioned earlier) that Review Area 3 was not included in the third generation review (because it was only implemented in 2021). These areas may also improve, like Review Areas 2 and 3, which improved for 2020 to 2025.

#### 4.2.4.2.1 Details in the IWMP implementation plan

The overall performance in this review criteria performed just satisfactorily, scoring D in the first fifteen years of implementation. The performance was satisfactory in the last five years of implementation. The lack of a detailed IWMP implementation plan was the reason for the performance in 15 years. The remaining five years performed satisfactorily because of the improved IWMP plan. Radzilani' s (2019:61) findings showed that most IWMP evaluated performed poorly because they did not have the implementation plan.

The poor performance in this review criteria in the two subsequent IWMP is evidence of a poor review process that was supposed to identify shortcomings of the previous IWMP to improve the following one.

#### 4.2.4.2.2 Yearly IWMP targets in the IDP and SDBIP

This review area performed unsatisfactorily in the first five years, followed by two years that performance could not be evaluated due to the non-availability of documents. In the following three years, performance was just satisfactory, followed by five years of unsatisfactory performance. This was mainly influenced by the previous review criteria, the IWMP implementation plan that lacked sufficient details. The situation could have been avoided if the DEA's IWMP development guidelines had been followed. The findings confirm what Muswema (2012: 5) said: *"It was apparent that in some cases not all of the budget items from the IWMP were adopted into the IDP"*.

#### 4.2.4.2.3 Yearly financial allocation in the IDP and SDBIP

This review area performed unsatisfactorily in the first five years of implementation, followed by a year without documents to evaluate, two years of unsatisfactory performance and the remainder (seven years) of the years being just satisfactory. As highlighted earlier, most activities identified in the IWMP were omitted from the IDP. This is mainly because no service or priority can be funded if not included in the IDP (Vatala 2005).

#### 4.2.4.2.4 Reporting

In the first two years of the IWMP implementation, annual reports were not available for evaluation. In the following six years, the performance was unsatisfactory. Though the yearly reports were developed (reasonable attempt), the reports did not meet the requirements of Section 13 of NEMWA. In addition to not meeting the requirements, the provincial department indicated that the municipality had not submitted an IWMP implementation report in the past eleven years.

#### 4.2.4.2.5 Monitoring

The performance of the sub-categories related to monitoring is discussed in the sub-sections below.

#### 4.2.4.2.6 Strategic issues

According to DEA's guideline for IWMP development, this review area addresses delivery goals and objectives. In the first two years, there were no annual reports to evaluate. In the following three years, the strategic issues performed unsatisfactorily, followed by three years of just satisfactory performance, another year without documents, and six years of just satisfactory performance. Very few goals and objectives were reported because the report focused on the activities included in the IDP and those not included were excluded from the report.

#### 4.2.4.2.7 Performance

Like the strategic issues, there were no annual reports to evaluate in the first two years. In the following three years, the strategic issues performed unsatisfactory, followed by three years of just satisfactory performance, another year without documents, and six years of just satisfactory performance. The guideline requires performance to report on the overall implementation of the entire IWMP, including financial matters. The reports highlighted revenue generated and spent on the activities and projects included in the IDP.

#### 4.2.4.2.8 Public accountability, communication and public participation

The public accountability, communication, and participation review area performed poorly for all the evaluated years. The only evidence in all the years was when the IDP and the sector plans were taken out of public comments. This area showed weakness because there were no other means of verifying if the communication and public participation were done outside the IDP development process. As indicated earlier, communication and public participation were limited to the IDP process only. In a study to determine the role of community participation in the IDP

process, it was revealed that the community only participated in the first of five phases of the IDP (Tshabalala and Lombard 2009: 1). The municipality did not create an enabling environment for meaningful community participation, limiting community engagement on the IDP (Tshabalala and Lombard 2009: 1). Molale (2019:1) believes that *“community members are passive participants in municipal IDP process as their involvement is only limited to being informed about what would happen or what had already happened”*.

#### 4.2.4.2.9 Waste Management implementation programme

The waste management implementation programme review area performed poorly for all the evaluated years. The implementation programme lacks essential details that will assist in reporting, monitoring, and reviewing the IWMP.

#### 4.2.4.2.10 Review of IWMPs

Annual performance reports act as reviewing mechanism to be used by municipalities to evaluate progress on the goals and targets set out in the implementation plan (DEA. 2012:84). This review area performed poorly in the first five years of IWMP implementation, followed by ten years of just satisfactory performance. According to the DEA’s guideline, IWMP should be reviewed every five years in line with the IDP requirements and annual performance review, which assist the municipality in ensuring that goals and targets are met.

### **4.3 Results related to RO 2: To determine the barriers and challenges during IWMP monitoring and review.**

To answer RO2, self-administered questionnaires were circulated to five respondents (Table 3-2). The researcher distributed different questionnaires to the two municipal officials (Annexure B1), the provincial official (Annexure B4), the Department of Cooperative Governance’s official (Annexure B2) and the official from the Department Fisheries Forestries and Environment (Annexure B3). Different questionnaires were necessitated by different roles played by various departments in the reporting, monitoring, and reviewing of IWMPs. All of the targeted respondents completed the questionnaire.

#### **4.3.1 IWMP monitoring and review questions (Section B of the Questionnaires)**

The purpose of the section was to investigate the challenges and barriers related to the reporting, monitoring, and reviewing of the IWMP and the recommendations to improve the process. To determine the challenges and barriers, the researcher had to establish the roles played by each of the respondents. The analysis of the questions was divided into different themes as follows:

#### 4.3.1.1 Roles played in the reporting, monitoring and reviewing of IWMP

Each respondent plays a different role in monitoring, reviewing, and revising the IWMP.

Respondent 1 ensures alignment between the IDP and programmes, key initiatives and capital projects identified in the IWMP and other sector plans. Respondent 1 forms part of the Steering Committee that reviews IWMP to ensure alignment between the IWMP and the IDP. According to Respondent 1, each municipal department is responsible for developing sector plans and must ensure that their sector laws are applied. *“Otherwise, they will be found to be non-compliant by the Auditor General (AG) and relevant Provincial and National Departments who also assess the plans on an annual basis during the Provincial IDP Assessment week”.*

Respondent 2 investigates the current state of solid waste operations and monitors waste minimisation. Reports on waste statistics, monitoring waste streams received and the quantities diverted from landfills and reviewing and reporting on projects.

Respondent 3 monitors implementation by reviewing municipal annual reports. The respondent’s department reviews and provides comments on the draft municipal IWMPs during their public participation process. Once the IWMP is finalised, *“our department will consider endorsing the IWMP based on the outcome of our assessment”.*

Respondent 4’s department sits in a Joint District and Metro Approach (JDMA) that guides planning and monitor implementation.

Respondent 5 has a key performance indicator that requires the IDP analysis of the Drakenstein Municipality. Reviewing various sector plans, including the IWMP, forms part of the analysis process.

#### 4.3.1.2 Records of submission of reports to Provincial departments

According to Respondent 5, the municipality reports to the provincial department, complying with Section 13 of NEMWA. However, the provincial Department of Environmental Affairs respondent indicated that the municipality submitted its annual reports in the past. Still, it did not specifically and clearly report on its implementation as per Section 13 (2) requirement of the NEMWA. When the researcher made a follow-up question to the provincial department to reflect on the past 11 years, the department indicated that *“the municipality had not submitted a report to the Department over the past 11years”.*

#### 4.3.1.3 Challenges in the reporting, monitoring and reviewing of the IWMP

One of the municipal officials highlighted challenges related to a shortage in human resource capacity and insufficient budget allocation within the municipality. Secondly, it was reported that financial problems, public awareness programmes and vacancies that are not filled, affect the implementation of desired plans to achieve the stated goals. The issue of staff shortage is not unique to Drakenstein municipality. As indicated in Section 2.9 of the literature review, Govender and Reddy (2014) identified a lack of human resources and capacity as a barrier to the general monitoring and evaluation in municipalities of KwaZulu-Natal.

Muswema (2012:1) indicated that even when the council approves IWMPs, the lack of sufficient details of projects and budgets, which are not carried forward into the IDP, was a potential barrier to implementing the IWMP. Muswema also reported that not all budget items in the IWMP were adopted into the IDP, which is similar to what was found in this research.

Respondents 3 and 5 highlighted that IWMP implementation plans are not being incorporated into annual reports, making monitoring efforts ineffective, as the department will not know if objectives are achieved.

Respondent 5 indicated that late reporting is a challenge.

#### 4.3.1.4 Recommendations to improve the reporting, monitoring and reviewing of IWMP

Four of the respondents provided recommendations. One of the officials from the municipality recommended the **provision of adequate budget and competent personnel** as one of the key recommendations for improvement.

Respondent 3 recommended a **standardised reporting template, standard operating procedures, and frequent monitoring** to review and revise IWMPs.

Respondent 4 recommended utilising the **Joint District and Metro Approach (JDMA) model**, identifying IWMP as a common focus area. JDMA aims to advance co-planning, co-budgeting and co-implementation, which will accelerate sustainable service delivery and development of local government underpinned by good governance.

Respondent 5 recommended an **annual review** of IWMP to ensure that **changes in technology, policy and waste related changes are updated** because such information may be omitted due to the document not being updated annually. The official further recommended that the IWMP should consider including area-based waste management strategies.

#### **4.4 Chapter summary and key findings**

The chapter discussed the results related to RO1 and RO2. Three IWMPs, with associated IDPs, SDBIPs and annual municipal performance reports, were evaluated against three review areas and allocated performance scores (A-F). Monitoring and review of the first- and the second generation IWMPs was not satisfactory because of the misalignment of the IWMP, IDP and SDBIP. The misalignment arises from the IWMP implementation plan that does not address the requirements of NEMWA. The third generation IWMP's monitoring and review were not concluded because the IWMP is yet to be monitored and reviewed. However, from details reviewed in Area 1: section 12 requirements and Area 2: IDP and SDBIP considerations, the monitoring and review are likely to be satisfactory because the IWMP implementation plan meets the needs of NEMWA and DEA's guidelines.

The key finding of the research is that reporting, monitoring and review of the IWMP for the past fifteen years was not done adequately. Even though the reporting, a process that aid monitoring and review of the IWMP, was done, because of the misalignment and omission of important information, the process could not satisfy the objectives of the IWMP monitoring and review phase.

Shortage of staff and insufficient funding seem to be common reasons that impact the implementation of IWMPs. A lack of human resource capacity, inadequate budget allocation, and failure to utilise the implementation plan were identified as barriers to reporting, monitoring and reviewing the IWMP. For instance, Radzilani (2019: 70) reported that financial provision towards actions identified in the IWMP implementation plan was inadequate to render waste services and comprehensively implement the IWMP. Molaba (2019), on the other hand, highlighted that skills and capacity at local municipalities need to improve to enhance the implementation of IWMPs.

In conclusion, the Drakenstein Local Municipality's monitoring and review phases of IWMPs were inadequate in certain instances and performed poorly in some Review Areas. It is, however, encouraging to note an overall improvement in Area 1: section 12 requirements and Area 2: IDP and SDBIP considerations that influence the IWMP monitoring and review over time.

# CHAPTER 5 CONCLUSIONS AND RECOMMENDATIONS

## 5.1 Introduction

The study aimed to critically evaluate the monitoring and review of IWMPs in Drakenstein Municipality. The preceding chapters have set out the context of the study, the literature review conducted, what questions the study aimed to answer to achieve its study objectives and the findings yielded from the collection of data.

This chapter provides critical conclusions and recommendations on monitoring and reviewing IWMPs based on the case study of Drakenstein Local Municipality. The chapter also takes note of research gaps in the body of knowledge on integrated waste management planning for effective service delivery.

## 5.2 An overview of the research

Integrated waste management planning is essential for designing or improving a waste management system. It allows municipalities to evaluate current waste management practices; and consider waste management options that suit their desired end state, budget, and demographics. The need to develop and implement an integrated waste management plan (IWMP) is a legislative requirement provided for by Section 12 of the National Environmental Management Waste Act (59 of 2008) (NEMWA). In essence, an IWMP is a 5-year plan that provides for a municipality's waste management planning needs. It is implemented through an implementation plan, which needs to be incorporated into the municipality's integrated development plan (IDP) as a sector plan.

The monitoring and review phase is one of the essential steps that municipalities must undertake to evaluate how the IWMP is performing. The process must be done yearly and at the end of the five years of the implementation period. Monitoring through annual reports determines if the identified projects and the set targets are achieved, and it informs the review process as to whether targets must be adjusted or not.

This research aimed to critically evaluate the monitoring and review phase of the IWMP process, using the Drakenstein Municipality as a case study. The research was conducted through document review, which focused on the IWMP document, IDP, SDBIP and annual reports, supported by self-administered questionnaires.

A mixed-methods approach was applied to address the research aim, document review and self-administered questionnaire were used to gather data. The Lee & Colley review package

(traditionally applied for Environmental Impact Assessment report quality) was applied for the document review to determine the suitability and adequacy of the IWMP monitoring and review process. Self-administered questionnaires were used to determine the barriers and challenges experienced during IWMP monitoring and review.

The document evaluation revealed gaps in the IWMP implementation plans, which is the primary driver of IWMP implementation. The implementation plan lacked the necessary details to monitor and review the IWMP. Although the IDP and SDBIP contained waste management projects, most of the projects could not be traced back to the IWMP. Subsequently, annual reporting had little impact on the IWMP performance. The self-administered questionnaire revealed that though reporting is done according to Section 46 of the Municipal Systems Act, it does not meet the requirements of Section 13 of NEMWA. Insufficient budget and human resource capacity were identified as barriers to reporting, monitoring, and reviewing the IWMP.

### **5.3 Research objectives and conclusions drawn**

This section is an outline of the critical conclusions based on the study's research objectives. The study had two specific research objectives, namely:

**Research objective 1:** To evaluate the adequacy/performance of the monitoring and review of IWMPs (first to the third generation); and

**Research objective 2:** To determine the barriers and challenges during IWMP monitoring and review.

The following conclusions were reached through document analysis (RO1) and the self-administered questionnaires (RO2).

#### **5.3.1 Conclusions on RO1: Evaluating the adequacy/performance of the monitoring and review of IWMPs**

This study can conclude that the monitoring and review phases of IWMPs of the Drakenstein Municipality were inadequate in certain instances and performed poorly in some Review Areas. The poor performance could be ascribed to the following reasons:

- a) The 2005 and 2009 IWMP implementation plans did not provide sufficient details required by Section 12 of NEMWA and the simplified version of the DEA's IWMP development guideline. The lack of adequate information hampers proper monitoring as it is difficult to measure what is not clearly defined. As it appears in the situation analysis of all the three IWMPs (2004, 2009, 2019), evidence suggests that the municipality meticulously carried out this phase of the IWMP development. The municipality ensures that IWMP

implementation plan details are fully included in the applicable IDP without leaving any essential details.

- b) The misalignment of the municipality's IDP and the SDBIP also affects monitoring and reviewing the IWMP. Because the annual reports are compiled based on the commitments made in the IDP and SDBIP, if a project or an activity is not financially committed to in the IDP and SDBIP, it will not be reported in the annual report. Though the yearly reports were drafted according to the requirements of Section 46 of the Municipal Systems Act, the reports failed to address the requirements of Section 13 of NEMWA in terms of the reporting details required. Section 13 of NEMWA requires reports to include details highlighted in 2.7.5.1. As a result, the reports did not address or impact the implementation of the IWMP since they did not address the activities/projects of the IWMP. The reasons mentioned above that contribute to poor performance on monitoring and reviewing IWMP were also highlighted by Radzilani (2019:61). She states that "most plans failed to include implementation plan" (Radzilani, 2019:61) although the guideline provides the expectations for an implementation plan.

### **5.3.2 Conclusions on RO2: Determining the barriers and challenges during IWMP monitoring and review**

In respect of the barriers and challenges encountered when monitoring and reviewing the IWMP, the study participants highlighted the following areas as challenges for the reporting, monitoring, and reviewing IWMPs, with specific reference to the Drakenstein Municipality:

- a) Two out of the four respondents raised budgetary constraints at the municipal level.
- b) Insufficient human resource capacity was also raised as a challenge by municipal officials directly involved in the monitoring and review phases of the IWMP.
- c) Failure to utilise the implementation plan was submitted by the respondent on the annual reports. Failure to use the implementation plan was also evident in the document evaluation. It was revealed that the plan lacked the necessary details and that it was challenging to track progress or performance; and
- d) Failure to incorporate projects and budgets into the IDP impedes IWMP implementation.

These challenges concur what other authors have found regarding other phases of the IWMP and IWMP implementation, as well as what other authors have found regarding monitoring and review of other municipal processes, as discussed in Section 2.9 of this dissertation (Govender & Reddy, 2014; Jili & Mthethwa, 2016; Mello, 2018).

## **5.4 Recommendations**

The research concludes by providing recommendations towards improving the monitoring and review phases of IWMP, which will enhance the quality of IWMPs and, ultimately, enhance the IWMP performance of the IWMP IDP and the overall municipal waste management performance. Recommendations for further research are provided in this section. Key recommendations, including those raised by the study respondents, are outlined as follows:

### **5.4.1 Recommendations related to the research objectives**

The following recommendations are made to ensure that monitoring and reviewing of IWMP meet legislative requirements:

#### **5.4.1.1 Recommendations drawn from the document evaluation of the Drakenstein Municipality**

From the document assessment, it is evident that the reporting, monitoring and review of the IWMP are linked to the quality of the IWMP implementation plan. Therefore, it is crucial to ensure that the implementation plan is developed as stipulated in DEA's guidelines for developing IWMPs.

- a) When the municipality develops the implementation plan, they must be realistic about what they can achieve within the limited available resources and set attainable targets. It does not help to include projects within an immediate timeframe when no immediate resources are available to implement such projects.
- b) When transferring projects from the IWMP implementation plan into the IDP and SDBIP, it is advisable to use the same names and projects description to be easy to identify when reporting and tracking progress.
- c) It is recommended that the municipality consider a long-term plan for staff capacity. The plan should consider making jobs in the waste management field attractive and competitive. It is also recommended that research be conducted to determine the staff turnover in the waste management sector in municipal government and to identify the causes.
- d) Considering the administrative measures recommended by the provincial department, it is recommended that the province avoid implementing additional administrative actions in the form of documents but consider regular meetings meant to track the implementation of the IWMP.

- e) It is recommended that public participation should not be a once off process during (during IWMP and IDP adoption process). Public participation process should be done when the IWMP document is reviewed and when there has been significant amendment to the IWMP document.

#### **5.4.1.2 Recommendations for improvement based on the questionnaire**

The following recommendations were made by questionnaire participants on how to improve monitoring and review of the IWMP in Drakenstein municipality IWMP:

- a) Provision should be made to allocate adequate budget and competent personnel in response to the challenge of insufficient funding and shortage of human resource capacity.
- b) A standardised reporting template and standard operating procedures need to be developed to review IWMPs.
- c) Utilising the Joint District and Metro Approach (JDMA) model, identifying IWMP as a common focus area was advised. JDMA aims to advance co-planning, co-budgeting, and co-implementation, accelerating sustainable service delivery and developmental local government underpinned by good governance.
- d) An annual review of IWMPs was suggested to ensure that changes in technology, policy and waste related changes are updated because such information may be omitted due to the document not being updated annually.
- e) Finally, it was recommended that the IWMP document needs to be concise and updated as regularly as possible. The inclusion of area-based waste management strategies was also proposed.

#### **5.5 Recommendations for further research**

The following are the recommended areas for future research:

- a) Monitoring and reviewing IWMPs in the municipalities is a complex undertaking. There is a need for more in-depth analysis at the district and local municipal level to provide a more comprehensive overview of how monitoring and review of IWMPs are performing in South Africa. In the case of Drakenstein municipality, a comparative analysis with another similar municipality in size, per capita GDP and other critical social and economic indicators would provide a basis to assess the extent to which the challenges encountered in monitoring and reviewing IWMP promote service delivery or not.
- b) The skills required at the local municipal level is critical for effective development, implementation, monitoring and reviewing of IWMPs. A study to determine the capacity

needed at different municipalities to ensure that staffing is adequate for rendering waste management, including planning, monitoring, reporting, and reviewing, is recommended.

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## ANNEXURE A: UNPOPULATED COLLATION SHEET

### 1<sup>st</sup> Generation IWMP (2004 IWMP)

Area 1: Section 12 requirements					
Category Sub-categories	Year 1 (5/6)	Year 2 (6/7)	Year 3 (7/8)	Year 4 (8/9)	Year 5 (9/10)
<i>1.1 Details in the IWMP implementation plan</i>					
Area 2: IDP and SDBIP considerations					
Category Sub-categories	Year 1 (5/6)	Year 2 (6/7)	Year 3 (7/8)	Year 4 (8/9)	Year 5 (9/10)
<i>2.1 Yearly IWMP targets in the IDP and SDBIP</i>					
<i>2.2 Yearly financial allocation in the IDP and SDBIP</i>					
Area 2: IWMP Toolkit and Section 13 requirements {Review area 10 from adapted Lee and Colley package (adapted from Radzilani, 2019)}					
Category Sub-categories	Year 1 (5/6)	Year 2 (6/7)	Year 3 (7/8)	Year 4 (8/9)	Year 5 (9/10)
3.1 Reporting					
3.2 Monitoring					
<i>3.2.1 Strategic issues</i>					
<i>3.2.2 Performance</i>					
<i>3.2.3 Public accountability</i>					
<i>3.2.4 Communication and Public participation</i>					
<i>3.2.5 Financial plan</i>					
<i>3.2.6 Waste Management implementation programme</i>					
3.3 Review of IWMPs					

## 2nd Generation IWMP (2009 IWMP)

Area 1: Section 12 requirements										
Category Sub-categories	Year 1 (10/11)	Year 2 (11/12)	Year 3 (12/13)	Year 4 (13/14)	Year 5 (14/15)	Year 6 (15/16)	Year 7 (16/17)	Year 8 (17/18)	Year 9 (18/19)	Year 10 (19/20)
1.1 Details in the IWMP implementation plan										
Area 2: IDP and SDBIP considerations										
Category Sub-categories	Year 1 (10/11)	Year 2 (11/12)	Year 3 (12/13)	Year 4 (13/14)	Year 5 (14/15)	Year 6 (15/16)	Year 7 (16/17)	Year 8 (17/18)	Year 9 (18/19)	Year 10 (19/20)
2.1 Yearly IWMP targets in the IDP and SDBIP										
2.2 Yearly financial allocation in the IDP and SDBIP										
Area 3: IWMP Toolkit and Section 13 requirements										
<i>{Review area 10 from adapted Lee and Colley package (adapted from Radzilani, 2019)}</i>										
Category Sub-categories	Year 1 (10/11)	Year 2 (11/12)	Year 3 (12/13)	Year 4 (13/14)	Year 5 (14/15)	Year 6 (15/16)	Year 7 (16/17)	Year 8 (17/18)	Year 9 (18/19)	Year 10 (19/20)
3.1 Reporting										
3.2 Monitoring										
3.2.1 Strategic issues										
3.2.2 Performance										
3.2.3 Public accountability										
3.2.4 Communication and Public participation										
3.2.5 Financial plan										
3.2.6 Waste Management implementation programme										
3.3 Review of IWMPs										

### 3<sup>rd</sup> Generation IWMP (2019 IWMP)

Area 1: Section 12 requirements					
Category Sub-categories	Year 1 (2020/21)	Year 2 (2021/22)	Year 3 (2022/23)	Year 4 (2023/24)	Year 5 (2024/25)
<i>1.1 Details in the IWMP implementation plan</i>					
Area 2: IDP and SDBIP considerations					
Category Sub-categories	Year 1 (2020/21)	Year 2 (2021/22)	Year 3 (2022/23)	Year 4 (2023/24)	Year 5 (2024/25)
<i>2.1 Yearly IWMP targets in IDP and SDBIP</i>					
<i>2.2 Yearly financial allocation in the IDP and SDBIP</i>					

### Colour coding for ranking allocation

Ranking Symbol	Description	Colour coding
A	Well-performed	
B	Satisfactory	
C	Just satisfactory (minor omissions/insufficient information)	
D	Not satisfactory (insufficient information provided, but task reasonably attempted)	
E	Poorly performed (not satisfactory, inadequately attempted)	
F	Not attempted/not applicable.	

# ANNEXURE B 1-4: QUESTIONNAIRES

## QUESTIONNAIRE B1 FOR MUNICIPAL OFFICIALS

### QUESTIONNAIRE ON EVALUATING THE MONITORING AND REVIEW OF THE INTEGRATED WASTE MANAGEMENT PLANS (IWMPs) OF DRAKENSTEIN MUNICIPALITY

#### Instructions:

- Please use an **X** to indicate your selection
- Please elaborate where necessary

#### SECTION A: BACKGROUND OF MUNICIPAL EMPLOYEE

A.1 What is your highest level of qualification?

Certificate	BSc/ BA	MSc/ MA	PhD	Other

Kindly elaborate on your qualification details:

A.2 In which department are you working? Select more than one where applicable.

Waste Management Department	Planning and Strategy Department /IDP Section

Kindly state your position in the department:

A.3 How long have you been working in your occupational field?

1-5 years	6-10 years	11-15 years	16 years and longer

#### SECTION B: IWMP MONITORING AND REVIEW QUESTIONS

B.1 What role do you play in monitoring, reporting, and reviewing Drakenstein Municipality's IWMP?

**B.2** What would you consider as challenges to monitoring, reporting and reviewing the Drakenstein Municipality's IWMP?

**B.3** Are there any recommendations you have to improve the monitoring, reporting and reviewing of IWMP?

**---Thank you for your participation---**

# QUESTIONNAIRE B2 FOR PROVINCIAL OFFICIAL

## QUESTIONNAIRE ON EVALUATING THE MONITORING AND REVIEW OF THE INTEGRATED WASTE MANAGEMENT PLANS (IWMPs) OF THE DRAKENSTEIN MUNICIPALITY

### Instructions:

- Please use an **X** to indicate your selection
- Please elaborate where necessary

### SECTION A: BACKGROUND OF PROVINCIAL DEPARTMENT EMPLOYEES

**A.1** What is your highest level of qualification?

Certificate	BSc/ BA	MSc/ MA	PhD	Other

Kindly elaborate on your qualification details:

**A.2** Kindly state your position in the department:

**A.3** How long have you been working in your occupational field?

1-5 years	6-10 years	11-15 years	16 years and longer

### SECTION B: IWMP REPORTING, MONITORING AND REVIEW QUESTIONS

**B.1** What role do you play in reporting, monitoring, and reviewing Municipal IWMPs?

**B.3** According to your records, does the Drakenstein Municipality submit the required annual performance reports? **IF so**, do the reports meet the stipulated requirements in terms of Section 13 of the Waste Act?

**B.4** What would you consider as challenges to monitoring, reporting, and reviewing the Drakenstein Municipality's IWMP?

**B.5** Has the provincial department ever requested Drakenstein Municipality to submit any additional information when submitting the report? **If so**, was the additional report submitted and to the department's satisfaction?

**B.6** Are there any recommendations you have towards improving the monitoring, reporting, and reviewing of IWMP?

**---Thank you for your participation---**

# QUESTIONNAIRE B3 FOR COGTA OFFICIAL

## QUESTIONNAIRE ON EVALUATING THE MONITORING AND REVIEW OF THE INTEGRATED WASTE MANAGEMENT PLANS (IWMPs) OF THE DRAKENSTEIN MUNICIPALITY

### Instructions:

- Please use an **X** to indicate your selection
- Please elaborate where necessary

### SECTION A: BACKGROUND OF COGTA DEPARTMENT EMPLOYEE

**A.1** What is your highest level of qualification?

Certificate	BSc/ BA	MSc/ MA	PhD	Other

Kindly elaborate on your qualification details:

**A.2** Kindly state your position in the department:

**A.3** How long have you been working in your current designation?

1-5 years	6-10 years	11-15 years	16 years and longer

### SECTION B: IWMP REPORTING, MONITORING AND REVIEW QUESTIONS

**B.1** What role do you play in reporting, monitoring, and reviewing Municipal IWMPs?

**B.2** According to your records, does the Drakenstein Municipality submit the required annual performance reports? **IF so**, does the reports section about waste management meet the stipulated requirements in terms of Section 13 of the Waste Act?

**B.3** What would you consider as challenges to the annual reports concerning waste management of the Drakenstein Municipality's IWMP?

**B.4** Are there any recommendations you have towards improving the monitoring, reporting, and reviewing of IWMP?

**---Thank you for your participation---**

# QUESTIONNAIRE B4 FOR DFFE OFFICIAL

## QUESTIONNAIRE ON EVALUATING THE MONITORING AND REVIEW OF THE INTEGRATED WASTE MANAGEMENT PLANS (IWMPs) OF THE DRAKENSTEIN MUNICIPALITY

### Instructions:

- Please use an **X** to indicate your selection
- Please elaborate where necessary

### SECTION A: BACKGROUND OF DFFE EMPLOYEE

**A.1** What is your highest level of qualification?

Certificate	BSc/ BA	MSc/ MA	PhD	Other

Kindly elaborate on your qualification details:

**A.2** Kindly state your position in the department:

**A.3** How long have you been working in your occupational field?

1-5 years	6-10 years	11-15 years	16 years and longer

### SECTION B: IWMP REPORTING, MONITORING AND REVIEW QUESTIONS

**B.1** What role do you play in reporting, monitoring, and reviewing Municipal IWMPs?

**B.2** According to your knowledge, does the Drakenstein Municipality submit the required annual performance reports? **IF so**, does the reports section on waste management meet the stipulated requirements in Section 13 of the Waste Act?

**B.3** What would you consider as challenges to the annual reports concerning waste management of the Drakenstein Municipality's IWMP?

**B.4** Are there any recommendations you have towards improving the monitoring, reporting and reviewing of IWMP?

**---Thank you for your participation---**

# ANNEXURE C: INFORMED CONSENT



**Institution:** North-West University

**Campus:** Potchefstroom

**Field of Study:** Master of Environmental Management

**Mini-dissertation title:** Evaluating the monitoring and review of the integrated waste management plans (IWMPs) of the Drakenstein Municipality.

**Student Name:** Motlanalo Mautla

**Email Address:** [motlanalomautla@gmail.com](mailto:motlanalomautla@gmail.com)

**Contact number:** 083 447 1826

**Supervisor:** Dr Claudine Roos ([claudine.roos@nwu.ac.za](mailto:claudine.roos@nwu.ac.za))

**Ethics number:** N W U - 0 0 4 7 4 - 2 1 - A 9

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**FOR ATTENTION:** [Name]

## RE: INVITATION TO PARTICIPATE IN RESEARCH STUDY

### Introduction

You are being invited to participate in a research study conducted by Motlanalo Mautla with student number 35666536 under the supervision of Dr Claudine Roos, a lecturer in environmental management at the North-West University. The study is entitled “*evaluating the monitoring and review of the integrated waste management plans (IWMPs) of the Drakenstein Municipality*” and aims to evaluate the adequacy/performance of the monitoring and review of IWMPs (first to the third generation) and to determine the barriers and challenges during IWMP monitoring and review. You were purposively selected as a possible participant in this study because of your involvement in monitoring, reporting, and reviewing the IWMP of the Drakenstein Municipality. The research will form part of a master’s dissertation, which will be submitted in partial fulfilment of the degree Master of Environmental Management requirements at the North-West University.

### Interview procedure

If you agree to participate in this study, you would be requested to do the following:

- Indicate a time and date when you will be available for an interview. The interview should take no more than 30 minutes of your time.
- Indicate whether you would prefer to be interviewed in person, telephonically or via a technology such as a Zoom or Skype or Microsoft Teams.
- Agree to the recording (audio only) of the interview to ensure that it can be accurately transcribed. The recording will be deleted as soon as it has been transcribed. However, you will have the right to review and edit the audio recording if you so choose.
- Read through this consent form which is to be signed on the day of the interview.

### Confidentiality

The records from this study will be kept as confidential as possible. No individual identities will be used in any reports or publications resulting from the study. All transcripts will be given codes (e.g. Participant 1) and stored separately from any participants' names or other direct identification. The information obtained through the interview will be used exclusively for this study and for no other purpose.

**Potential risks and discomforts**

No risks or discomforts are foreseen. In the event that a risk is identified, or discomfort is experienced, the interview will be stopped. You further have the right to end the interview at any time and for any reason.

**Potential benefits to the interviewee and/or society in general**

Data obtained from the officials of Drakenstein Municipality will aid in reaching the study's objectives. It will contribute to IWMP research and improve the quality of the IWMP development process in South Africa. Participation in the study will take place voluntarily. Furthermore, the anonymity, privacy and confidentiality of participants are guaranteed.

**Compensation**

No compensation can be offered for participation in the research.

**Withdrawal**

You may withdraw from the study at any time and do not have to provide a reason.

**Ethical clearance**

This research has obtained ethical clearance N W U - 0 0 4 7 4 - 2 1 - A 9 from the Faculty of Natural and Agricultural Sciences Ethics Committee (FNASREC). If you have any concerns or questions in this regard, please contact Prof. Roelof Burger (roelof.burger@nwu.ac.za).

**Contact details of the researcher**

If you have any questions or concerns about the research, please feel free to contact Motlanalo Mautla 083 447 1826 or Dr Claudine Roos 083 204 8703.

**INTERVIEWEE CONSENT**

I \_\_\_\_\_ confirm that the above information was explained to me in a language and in manner that I understood. I further confirm that I am older than 18 years of age and hereby volunteer to take part in the study.

Signature \_\_\_\_\_ Place \_\_\_\_\_ Date \_\_\_\_\_

**RESEARCHER CONFIRMATION**

I \_\_\_\_\_ hereby confirm that the contents of this document was explained to the participant in a language and manner that he / she could understand.

Signature \_\_\_\_\_ Place \_\_\_\_\_ Date \_\_\_\_\_

## ANNEXURE D: POPULATED COLLATION SHEET

### 1<sup>st</sup> Generation IWMP (2004 IWMP)

Area 1: Section 12 requirements					
Category Sub-categories	Year 1 (5/6)	Year 2 (6/7)	Year 3 (7/8)	Year 4 (8/9)	Year 5 (9/10)
1.1 Details in the IWMP implementation plan	D	D	D	D	D
Area 2: IDP and SDBIP considerations					
Category Sub-categories	Year 1 (5/6)	Year 2 (6/7)	Year 3 (7/8)	Year 4 (8/9)	Year 5 (9/10)
2.1 Yearly IWMP targets in the IDP and SDBIP	D	D	D	D	D
2.2 Yearly financial allocation in the IDP and SDBIP	D	D	D	D	D
Area 2: IWMP Toolkit and Section 13 requirements {Review area 10 from adapted Lee and Colley package (adapted from Radzilani, 2019)}					
Category Sub-categories	Year 1 (5/6)	Year 2 (6/7)	Year 3 (7/8)	Year 4 (8/9)	Year 5 (9/10)
3.1 Reporting	F	F	D	D	D
3.2 Monitoring					
3.2.1 Strategic issues	F	F	D	D	D
3.2.2 Performance	F	F	D	D	D
3.2.3 Public accountability	E	E	E	E	E
3.2.4 Communication and Public participation	E	E	E	E	E
3.2.5 Financial plan	E	E	E	E	E
3.2.6 Waste Management implementation programme	E	E	E	E	E
3.3 Review of IWMPs	F	F	F	F	F

Area 1: Section 12 requirements										
Category Sub-categories	Year 1 (10/11)	Year 2 (11/12)	Year 3 (12/13)	Year 4 (13/14)	Year 5 (14/15)	Year 6 (15/16)	Year 7 (16/17)	Year 8 (17/18)	Year 9 (18/19)	Year 10 (19/20)
1.1 Details in the IWMP implementation plan	D	D	D	D	D	D	D	D	D	D
Area 2: IDP and SDBIP considerations										
Category Sub-categories	Year 1 (10/11)	Year 2 (11/12)	Year 3 (12/13)	Year 4 (13/14)	Year 5 (14/15)	Year 6 (15/16)	Year 7 (16/17)	Year 8 (17/18)	Year 9 (18/19)	Year 10 (19/20)
2.1 Yearly IWMP targets in the IDP and SDBIP	F	F	C	C	C	D	D	D	D	D
2.2 Yearly financial allocation in the IDP and SDBIP	F	D	D	C	C	C	C	C	C	C
Area 3: IWMP Toolkit and Section 13 requirements										
<i>{Review area 10 from adapted Lee and Colley package (adapted from Radzilani, 2019)}</i>										
Category Sub-categories	Year 1 (10/11)	Year 2 (11/12)	Year 3 (12/13)	Year 4 (13/14)	Year 5 (14/15)	Year 6 (15/16)	Year 7 (16/17)	Year 8 (17/18)	Year 9 (18/19)	Year 10 (19/20)
3.1 Reporting	D	D	D	F	D	D	D	D	D	D
3.2 Monitoring										
3.2.1 Strategic issues	C	C	C	F	C	C	C	C	C	C
3.2.2 Performance	C	C	C	F	C	C	C	C	C	C
3.2.3 Public accountability	E	E	E	E	E	E	E	E	E	E
3.2.4 Communication and Public participation	E	E	E	E	E	E	E	E	E	E
3.2.5 Financial plan	E	E	E	E	E	E	E	E	E	E
3.2.6 Waste Management implementation programme	E	E	E	E	E	E	E	E	E	E
3.3 Review of IWMPs	C	C	C	C	C	C	C	C	C	C

## 2nd Generation IWMP (2009 IWMP)

### 3<sup>rd</sup> Generation IWMP (2019 IWMP)

Area 1: Section 12 requirements					
Category Sub-categories	Year 1 (2020/21)	Year 2 (2021/22)	Year 3 (2022/23)	Year 4 (2023/24)	Year 5 (2024/25)
1.1 Details in the IWMP implementation plan	A	A	A	A	A
Area 2: IDP and SDBIP considerations					
Category Sub-categories	Year 1 (2020/21)	Year 2 (2021/22)	Year 3 (2022/23)	Year 4 (2023/24)	Year 5 (2024/25)
2.1 Yearly IWMP targets in IDP and SDBIP	B	B	B	C	C
2.2 Yearly financial allocation in the IDP and SDBIP	B	B	B	C	C

### Colour coding for ranking allocation

Ranking Symbol	Description	Colour coding
A	Well-performed	
B	Satisfactory	
C	Just satisfactory (minor omissions/insufficient information)	
D	Not satisfactory (insufficient information provided, but task reasonably attempted)	
E	Poorly performed (not satisfactory, inadequately attempted)	
F	Not attempted/not applicable.	