



UNIVERSITY OF  
KWAZULU-NATAL™  
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**COLLEGE OF LAW AND  
MANAGEMENT STUDIES**

**Framework for Sustainable Facilities Management Practices in eThekweni  
Metropolitan Municipality**

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**A dissertation submitted in partial fulfilment of the requirements for the degree of**

**MASTER OF COMMERCE IN LEADERSHIP**

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**Durban**

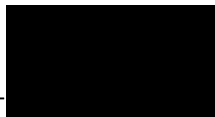
**June 2024**

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## **Acknowledgements**

I am deeply grateful to the Almighty for bestowing upon me the strength, courage, and perseverance to navigate this journey successfully. My heartfelt thanks go out to the following individuals:

To my supervisor, Professor Jobo Dubihlela, thank you for your clever advice, unwavering guidance, steadfast support, encouragement, and profound understanding throughout this endeavour.

To my husband, thank you for affording me the time off and being an unwavering source of support and motivation. Your encouragement and prayers have been a constant pillar of strength.

To my church family and friends, your uplifting words of encouragement and fervent prayers have sustained me. Love you all dearly, and I thank the Lord for your presence in my life.

To my colleagues at the eThekweni Municipality who encouraged me, voluntarily taken part in my research study and shared valuable resources, I extend my sincere gratitude. Your contributions have been invaluable, and I am forever grateful to you.

## **ABSTRACT**

Sustainable Facilities Management is crucial in managing facility infrastructure and equipment. The eThekwini municipality suffers from an ageing infrastructure and poor urban management. The steady supply of Facilities Management services is important to reduce the downtime of employees and for the organization's image as well as to ensure successful service delivery to the public. Sustainable Facility Management practices foster a culture of continuous improvement, drive innovation, adopt new technologies, and contribute to facilities' resilience and risk management. The study investigates current sustainable facilities management practices and examines existing challenges.

The case study uses exploratory design and interpretivism paradigms to construct and generate meaning. The study adopted a qualitative research method to generate a new perspective on sustainable facilities management through in-depth Interviews. The target population comprises eThekwini Municipality employees who contribute to the sustainability of facilities management. The sample was selected through a judgemental sampling method.

The study adopted thematic analysis and the findings categorized into themes. The findings project standard operating procedure "SOP" as a dominant theme in answering research questions. Findings show that sustainability practices emerge within the SOP and management strategies. The study uncovers benefits identification methods and key factors that drive SFM. Lack of awareness is a dominant barrier that influences the availability of funds, departmental coordination as well as the implementation of sustainability initiatives.

eThekwini centralized building services to one department, however, the findings suggest prioritization of facility management structures throughout the units to improve coordination within the departments. The study recommends using computer systems to streamline the municipality's inventory tracking, budgeting, and asset management. The study encountered limitations in governance and ethical concerns.

Keywords: eThekwini Municipality, Facilities management, Sustainability, SFM practices

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## LIST OF ACRONYMS

- DoE- Department of Energy
- FM- Facility Management
- GBCSA- Green Building Council of South Africa
- IDP- Integrated Development Plan
- MFMA- Municipal Finance Management Act
- SANS- South African National Standards
- SDF- Spatial Development Framework
- SAMP- Strategic Asset Management Plan
- SOP- Standard Operating Procedure
- SCM- Supply Chain Management
- SDG- Sustainable Development Goal
- SFM- Sustainable Facilities Management
- UN- United Nations

## CHAPTER 1

### 1 INTRODUCTION AND BACKGROUND

#### 1.1 Introduction

In today's rapidly changing and resource-constrained world, sustainable facilities management is quickly becoming a considerable priority for organisations and municipalities. According to Baaki et al. (2016), the future of workplace performance measurement and management systems is shifting toward the viability of sustainability and facility management. Sustainable Facilities Management (SFM) is a practice that deliberately incorporates future demands into present ones without compromising current needs (Olaniyi et al., 2014).

The study researched current SFM practices within the eThekweni Municipality to reinforce the significance of the SFM framework. eThekweni suffers from an ageing infrastructure and poor urban management (eThekweni Municipality, 2015). Facilities management (FM) is internationally recognised as a significant division within the work environment, enabling organisations to positively influence processes (Olaniyi et al., 2014; Opoku & Lee, 2022).

The eThekweni Municipality has undertaken a crucial step towards ensuring sustainable practices within its facilities management operations using a framework for asset and infrastructure (eThekweni Municipality, 2015). A framework for sustainable FM practice provides a systematic approach for managing facilities to improve the economy, minimise negative environmental impact, and encourage social accountability (Elmualim et al., 2009b).

The FM industry is relatively undeveloped and demonstrates most of the qualities of an immature industry: not highly organised, poorly represented, and not generally recognised (Baaki et al., 2016). Facilities management is an organisational function that integrates people, places, and processes within the built environment to improve the quality of the core business (Atkin & Brooks, 2021).

FM positions the sustainability of the business through various techniques such as strategic procurement, contract management, space planning, health and safety, security and risk management, soft services, and hard services (the latter being a technical term used to categorise technical services such as mechanical maintenance

work including Heat Ventilation and Air Conditioning, lifts, and electrical maintenance) (Okoro, 2023).

FM strategically integrates people, places and processes (ISO 41001, 2018). The SFM Framework aims to bring about best practices and principles by incorporating FM strategy, policy, and plan. SFM supports organisational values, vision, and mission (ISO 41001, 2018; Okoro, 2023). This study incorporates processes of people, technology, workplace, and procedures in order to recommend a Sustainable Facility Management Framework.

## **1.2 Background of eThekwini Municipality**

The eThekwini Metropolitan Municipality is in the KwaZulu-Natal Province of South Africa. The city has a population of 3.9 million people and a diversified economy that contributes significantly to the provincial GDP (eThekwini Municipality, 2023a). The metro faces socio-economic challenges including high poverty rates and limited access to education. The Municipality envisions becoming Africa's most caring and liveable city, emphasizing sustainability, economic success, social welfare, and technological advancement (eThekwini Municipality, 2023a).

The city manages a diverse portfolio of facilities known as infrastructural assets (eThekwini Municipality, 2015). FM plays a significant role in ensuring steady service delivery to the stakeholders of the eThekwini organisation. The core values of eThekwini Municipality are sustainability, smart city, and economic success (eThekwini Municipality, 2023a). Sustainable FM practices can reduce costs and provide long-term value (Elmualim, et al., 2009a). The city intends to align the intended infrastructure developments with the global Sustainability Development Goals (SDGs) (eThekwini Municipality, 2023b).

According to the SDF, the Municipality is determined to address the SGD (eThekwini Municipality, 2022). The Municipality uses the Spatial Development Framework (SDF) as a tool to respond to SDGs and targets (eThekwini Municipality, 2022). From SDF, the city develops the Integrated Development Plan (IDP), which contains an asset management plan (AMP) (eThekwini Municipality, 2023b). The Integrated Infrastructure AMP is a process that combines Sustainable Infrastructure Asset

Management and legislative requirements (i.e. Municipal Finance Management Act (MFMA) (Act 56 of 2003) (eThekwini Municipality, 2015)

eThekwini has identified key projects to promote strategic objectives such as infrastructure development, trade ports, and tourism (eThekwini Municipality, 2023a). SFM integrates core business processes such as maintenance, procurement, engineering designs, equipment specifications, and energy management of the infrastructure and buildings to increase the organisation's efficiency and work towards achieving green building ratings in the facilities. The framework will enable eThekwini Municipality to evaluate the infrastructure and facility services and to identify areas of improvement. This framework will ultimately enable the planning and sustainability of integrated facility processes.

### **1.3 Problem Statement**

There is a deterioration of infrastructure assets and equipment in the facilities of the city of Durban (eThekwini Municipality, 2023b). Asset deterioration reduces performance below an acceptable level, which can lead to non-compliant buildings (Pressreader, 2017). The lack of SFM strategies and dedicated funds to pursue sustainable FM practices encourages ongoing asset deterioration (eThekwini Municipality, 2023b). This can lead to disruptions in the supply of numerous services in a work environment and the community.

Currently, there is no standalone FM department at the national or municipal level in SA, as a result, the eThekwini operates without a framework for FM (eThekwini Municipality, 2022) (eThekwini Municipality, 2023b). Instead, SFM responsibilities are distributed across various departments, leading to a lack of integration and potential conflicts of interest. The municipality often relies on outsourcing and out-tasking resources to maximise the use of existing facilities through FM (eThekwini Municipality, 2015).

There is a need for the municipality to represent the government image with sustainable buildings and a well-kept infrastructure throughout the city. Protecting business operations from disasters is crucial to maintaining continuity and avoiding potential disruptions and continuity of service delivery. FM encompass the sustainability of work components of facility services including facilities and equipment

such as air-conditioning and ventilation, lighting, lifts, water pumps, CCTV, and other machinery infrastructure.

Sustainability measures can be endorsed in an attempt to solve the problem at a municipality level. SFM is part of business continuity measures that increase the organisation's ability to withstand disruptions while ensuring the continuity of Facility Management services. Sustainability encourages the use of energy-efficient systems for ventilation controls, lighting, and power supply. Constant changes are guaranteed in a work environment; people change, and people's needs change. Therefore, a well-designed SFM framework will encourage adaptation to a culture of continuous improvement.

SFM offers learning of best practices and staying up to date with emerging sustainable technologies and FM practices. SFM direct the city towards financial efficiency, encouraging economic sustainability. SFM expenditures to align sustainability goals with eThekweni's strategies and practices. The Municipality SFM framework supports facility management resource planning and efficiently manages the work environment. The Framework assist in developing FM policy in eThekweni and align SFM capital expenditure budget.

#### **1.4 Rationale and significance of the study**

SFM is crucial in the multifaceted planning of facility infrastructures and equipment. The municipal buildings may experience downtime due to the inefficient use of resources and poor coordination. Therefore, a steady supply of FM services is essential to eliminate employee downtime and ensure successful service delivery to the public. There is a high demand to maintain office buildings in the eThekweni Municipality work environment through facilities management.

The building sustainability agenda speaks to waste management, water management, reduced carbon emissions and clean energy. Business continuity measures eliminate equipment failures and empower the organisational core values. Sustainable FM resolution includes the reduction of energy consumption and applying energy-efficient designs and facility equipment. This research supports eThekweni's integrative effort to address Sustainable Development Goal (SDG) 7, affordable, renewable, and clean energy, and SDG 12, which is responsible consumption (United Nations, 2023).

The SFM framework will inspire innovation and explore opportunities for collaboration and partnerships to advance SFM, SDG 17 (Okoro, 2023). SFM practices intend to minimise the environmental impact of buildings and energy equipment to optimise resource efficiency, health, and safety (Opoku & Lee, 2022). SDG 9 focuses on innovation and infrastructure, and SDG 11 supports sustainable cities and communities through energy-efficient resources and applications (United Nations, 2023). Sustainability practices in energy-efficient applications will positively influence the city's expenditure, leading to economic success (eThekweni Municipality, 2020).

The framework ensures the alignment of building equipment with the organisation's commitment to sustainable FM practices. SFM aids stakeholders in evaluating FM services or equipment's procurement requirements and examining procurement based on precise environmental impact and everyday challenges such as energy consumption (economic and environmental concerns) and safety (social factors). Sustainable FM practices foster a culture of continuous improvement, drive innovation, adopt modern technologies, and contribute to facilities' resilience and risk management.

A usable SFM Framework enhances the efficiency of FM systems. It can help alleviate the impact of energy price volatility and supply disruptions, improve the organisation's ability to recover and withstand disruptions and ensure the continuity of FM services. The framework positively impacts the green economy of renewable energy, and the infrastructure portfolio and potentially increases the environmental imperatives in the eThekweni region, KZN tourism, and the livelihoods of communities within its jurisdiction.

## **1.5 Research Objectives**

This study of the SFM framework aims to address work environment efficiency by investigating current SFM applications and resource sustainability from facilities management's perspective. The research examines elements of sustainability, drivers of SFM, and benefits of SFM and, in the end, the study proposes an SFM framework to assist departments in achieving sustainable facilities. The outcome of the study intend to find the best practices to integrate SFM practice and the green economy in eThekweni Municipality. The following are the main objectives of the study.

- To evaluate the current SFM practices in eThekwini Municipality
- To determine the key drivers of SFM practices in eThekwini Municipality
- To explore the potential benefits of SFM practices for eThekwini Municipality
- To determine the existing barriers to effective SFM practices in eThekwini.
- To propose a usable framework for SFM practices for municipalities such as the eThekwini Municipality

## **1.6 Research Questions**

The research aimed to answer the following questions.

- What are the current SFM practices in eThekwini Municipality?
- What are the key drivers of SFM practices within eThekwini Municipality?
- How are the potential benefits of SFM practices identifiable at the eThekwini Municipality?
- What are the existing barriers to SFM practices in eThekwini Municipality?
- What is the proposed SFM framework for local municipalities such as eThekwini?

## **1.7 Justification of the study**

The research aims to propose an SFM Framework for eThekwini Municipality. A framework is a basic structure, a fundamental arrangement, or a procedure. Framework provides a consistent approach across FM activities within eThekwini (Atkin & Brooks, 2021). Sustainability is a multidimensional concept that requires an integrated approach to address the complex challenges faced by the world. In 2015, the South African Department of Energy (DoE) released a National Energy Efficiency Strategy draft. The Draft paper is a legislative means of establishing implementation instruments and setting energy efficiency targets from a broader perspective (Department of Energy, 2023).

The paper has been adopted by the eThekwini municipality through the eThekwini Energy Strategic Roadmap (2019) and eThekwini Integrated Resource Plan (eThekwini Municipality, 2020) as a guide in developing measures to promote saving energy, reduce the negative impact of energy use on the environment, reduce energy

costs to the economy, contribute towards sustainable development, and work towards achieving targets set by national energy policy.

Elmualim et al. (2009), investigated the knowledge of sustainability FM practices and FM practitioners in various construction organisations and industries. The majority of the respondents raised energy efficiency as a concern in recycling and waste reduction (Elmualim et al., 2009a). The paper concluded with recommendations for sustainability education and training to supply effective structures and processes to apply sustainability practices. Identification of SFM drivers provides insight into issues that impact infrastructure and support good sustainable FM practices.

Opoku and Lee (2022) agreed that SFM can help address global challenges, such as climate change and energy efficiency through the development of innovative solutions for organisations and society. Similar research in Malaysia proposed a framework for SFM performance management with a specific focus on waste management of a healthcare facility (Baaki et al., 2016). Likewise, Okoro (2023) reviewed SFM in the built environment to ensure maximal benefits. The review explored facilities management research and the evolving focus on sustainability over the past decade (2012-2022).

The above studies provide valuable insight leading to the identification of the research gap of the study. There is a lack of focus when it comes to the management of facilities using sustainable practices to improve the green economy of the metropolitan area. There is a research gap in integrating FM-related equipment's efficient utilisation, application, and energy consumption. Okoro (2023) stated that there is no general agreement regarding the SFM practices of any organisation. Therefore, research conducted in the SFM sector can be used to develop a framework that best suits the organisation's needs. There is a need to investigate a framework in line with SA regulations and applicable to the eThekweni Municipality.

## **1.8 Definition of key concepts**

This section discusses the key concepts of the study. These terms are the core ideas that bring understanding to the development of a Sustainable FM framework for local government/municipalities in the South African setting.

**Municipality** represents the extension of the government, purposed to reach the needs of the surrounding communities of a set boundary. Municipalities are often referred to as local governments (Naidoo & Ramphal, 2018).

**Facilities management** is a profession that incorporates operations and strategies to safeguard the functionality of the built environment through the integration of people, places, and technology (Joseph, et al., 2021).

**Sustainability** is the ability to endure or improve the condition of the ecosystem over time. Sustainability meets the needs of the present and simultaneously considers future demands (United Nations, 2023).

**Sustainable Facilities Management** is a strategic approach to advocate the continuity of facilities using sustainable practices (Sabrina, et al., 2017).

**Framework** is a basic structure, a fundamental arrangement, or a procedure (Atkin & Brooks, 2021).

**SFM Framework** is a fundamental arrangement that offers a consistent approach across sustainable practices and activities within the built environment.

## **1.9 Limitations**

Limitations are the boundaries that the researcher encounters that have a direct effect on learning outcomes (Creswell, 2014). The findings are specific to the eThekweni Municipality and may have limited transferability to other municipal settings with different infrastructure portfolio characteristics, organizational cultures or policies. The study experienced limitations with sample size, research design, sampling technique, governance and ethical concerns.

The study relied on in-depth interviews with employees from eThekweni Municipality, these are not the entire stakeholders of SFM. The information received is based on participants' personal experiences, perspectives and interpretations. Small sample size, qualitative studies typically have smaller sample sizes compared to quantitative studies, recommendations could have been collected from larger sample sizes. The participants were selected through a judgmental sampling method, which introduces potential selection bias. The views and experiences represented may not be fully representative of the entire population of municipal employees.

Existing SA National policies, rules and regulations hinder the study from recommending possible international SFM solutions. The study cannot be generalised to other organisations as it is a case study of the eThekweni Municipality work environment. Existing practices channel the SFM framework towards applicable practices instead of best practices. The confidentiality of information and policies of eThekweni municipality hinder the reporting of specific information from the research dissertation.

Deficiency in the integration of knowledge hinders the consolidation of the SFM framework, for example. Integration of knowledge from the expected participants as FM comprises of a combination of health and safety, civil, mechanical, and electrical segments. Silo working within the technical staff, asset management, accounting, and SCM limited participants from engaging in the SFM topic. I.e. SFM strategies require system thinkers, collaboration, and awareness of sustainability measures. Practices and policies may change at any time within the municipality and nationally, affecting the credibility of the research. The study is at risk of reporting outdated information.

### **1.10 Outline of the dissertation**

Chapter 1: Introduction to SFM research provides a background of SFM and its importance in the workplace. The study links global sustainable development goals and the eThekweni Municipality work environment FM. The chapter presents the research problems and questions. The research aims, and objectives are discussed. This section justifies the study and explains the gaps. Lastly, the chapter outlines key concepts and discusses the limitations of the study.

Chapter 2: presents a literature review on SFM practices and application. The chapter presents a theoretical framework and later identifies research gaps in the SFM framework. This section outlines the relationship between sustainability practice and FM's functions in a work environment. It discusses the sustainable development concepts, principles, and the benefits of SFM framework. The literature review explains the three pillars of sustainability (economic, social, and environmental). This section discusses the benefits of SFM practices for the eThekweni Municipality work environment facilities. The chapter investigates the drivers of SFM and barriers to the development or implementation of a conceptual framework for SFM.

Chapter 3: Methodology. This chapter discusses the methodology adopted in this study. The study uses a qualitative methods research approach. The chapter outlines the research design, research paradigm, data collection method, data collection instruments, data coding, and data analysis method. The section discusses the sampling methods that can be used to guarantee the representation of individuals. The chapter concludes by reflecting on ethical measures followed by the researcher to safeguard participants' privacy and anonymity in all study phases.

Chapter 4: Qualitative data analysis. This chapter presents findings from the primary data collected from participants. The chapter describes qualitative data analysis approaches and analysis. The section describes steps taken to fulfil thematic data analysis. This section discusses the results and compares them with the literature review of this study. The discussion section finishes with a recommendation for SFM framework for the eThekweni metro.

Chapter 5: Conclusion. The chapter presents key findings and a framework proposal. The section provides a brief discussion of the findings, the literature and the themes identified. The researcher proposes a usable tool for Sustainable Facilities Management to overcome the identified challenges and drivers for improvements. The chapter concludes and summarises the findings and validates the application while presenting recommendations and limitations of the study. The last section suggests future research and areas of development.

### **1.11 Chapter Summary**

This Chapter supplies the background and overview of the dissertation. It details the purpose of FM and the sustainability agenda. It introduces the city's integrated infrastructure asset management plan. The chapter explains the problem and justifies the study by exhibiting FM stakeholders. The objectives of the study are outlined to propose SFM framework to efficiently align SDG, SDF, SIAM, and legislative requirements. The following chapter is a literature review of SFM practices. The chapter defines sustainability concepts, explains the benefits of SFM, and identifies drivers. It investigates the governance structure of the municipality facilities management system while assessing the barriers of SFM.

## CHAPTER 2

### 2 LITERATURE REVIEW

#### 2.1 Introduction

The previous chapter provided the study's overview and background comprising of clarification of the research problem, and the roadmap of the study. This chapter reviews existing literature on concepts and settings for Sustainable Facilities Management (SFM). The literature review provides insights for eThekweni Municipality into the benefits of SFM, existing challenges within SFM, and the prospect of creating environmentally and socially responsible built environments. The section covers the drivers for advances in SFM.

The review demonstrates the relationship between sustainability practice and FM's functions in the eThekweni Municipality work environment. SFM is a developing expedition of awareness toward environmental and social impacts in the built environments (Baaki, et al., 2016). These impacts lead to adverse effects on the economy. SFM is an emerging field that focuses on integrating environmental, social, and economic considerations into the management of built environments (Okoro, 2023).

SFM encompasses strategies, practices, and processes aimed at optimizing the performance of facilities while minimizing their environmental impact. The below literature review explores the key concepts, trends, and challenges in sustainable facilities management as identified in the existing body of research. The literature investigates the alignment of governance and sustainability goals.

The city battles with finances to maintain and extend facilities to meet the growing demands of the city (eThekweni Municipality, 2023b). Lack of effective SFM practices leads to workplace interruptions due to the failure of the components of a facility system. Municipal buildings are affected by a lack of proactive maintenance and poor facility design (eThekweni Municipality, 2015). Facility systems require the integration of sustainability measures, leading to the development of a sustainability FM framework.

Organisations have embarked on initiatives to reduce the ecological footprint and improve operational efficiency by identifying, evaluating, and interpreting existing

records (Chien, 2022). Likewise, eThekwini has proposed an infrastructure strategy to improve operational effectiveness and productivity, reduce losses and waste, and refocus the asset management unit (eThekwini Municipality, 2023b). The city aims to increase focus on renewing existing facilities for revenue and reduce lifecycle costs.

## **2.2 Theoretical framework**

Grounding theory provides the lens through which the research method is organised and the interpretation of results (Saunders et al., 2019). The theoretical framework for this study focuses mainly on existing theory in a field of inquiry related to the hypotheses of the research. Whilst the conceptual framework “describes the relationship between the main concepts of the research” (Adom et al., 2018, p. 439), showing key variables that were under investigation. This section discusses the study’s fundamental theories and their link to the current research. The key theories are discussed in the following sections.

### **2.2.1 Stakeholder Theory**

Stakeholder theory states that stakeholders must be involved in corporate decisions to benefit from competitive advantages (Freeman et al., 2021). The theory posits that “the long-term value of the firm and enhanced performance can be fulfilled by sustainability activities by fulfilling the firm’s social responsibilities” (Campbell 2007, p. 949), enabling responsibility for the environment and the company’s standing (Drempetic, et al., 2020). Ashrafi et al. (2020) and Haigh and Griffiths (2009, p. 351) reasoned that the “natural environment could be seen as a primary stakeholder”.

Freeman et al. (2021) observed the importance of collaborating with stakeholders in developing strategies to reduce negative impacts on the climate. The role of stakeholders is essential for corporate sustainability and improved corporate performance as it often reduces corporate risk. Cultivating relationships with stakeholders (such as shareholders, investors, employees, customers, suppliers, governments, and communities) creates more value and ensures a firm’s sustainable success (Ketprapakorn & Kantabutra, 2019).

A stakeholder is a group or individual that can influence the organisation (Mansell, 2013). The stakeholders’ theory advocates management with consideration of all

stakeholders within an organisation (Valentinov, 2023). Stakeholders' theory encourages organisations to strategize value creation to safeguard sustainability (Mahajan et al., 2023).

### **2.2.2 Institutional Theory**

The Institutional theory confides the central question of “why organisations in a field tend to look and act the same” (DiMaggio & Powell, 1983, p. 152). Delmas and Montes-Sancho (2010, p. 578) used a “multinomial logit model to show that different institutional pressures lead to different firm behaviours: non-cooperation, symbolic cooperation and substantive cooperation behaviour”. According to Galbreath (2010), European companies were pressurised to address climate change issues and coercive pressures played a significant role in those decisions.

Spencer (2017) observed increased institutional pressure on greenhouse gas disclosures by oil and gas companies and the automotive industry (Spencer, 1990). In contrast, Escobar and Vredenburg (2011, p. 42) observed that external pressures influence a company's strategies in addressing climate issues. Institutional theory suggests that to enable sustainability, companies' procedures and practices should be institutional (Meyer & Rowen, 1977). In 1983, in line with Meyer and Rowen (1977), DiMaggio and Powell (1983) elaborated on the importance of companies following the norms and social expectations in their operating areas.

This research is grounded in the stakeholders' theory combined with institutional theory. The combination of the theories enabled the study to define the institution in which the organization operates. The research questions were used as a guide to examine the underlying theory grounding this study. The study objectives is to identify drivers, barriers, and benefits of SFM within eThekweni stakeholders. Mansel (2013) addresses stakeholders as employees, service providers, the local community, and society (Mansell, 2013, p. 2). Elmualim et al. (2010) commend a collaborative approach when probing SFM competencies. Stakeholders' theory holds much weight in business ethics and management (Mahajan et al., 2023).

SFM research in a work environment aims to consider the interests of employees, where the organisation takes on the concept of corporate social responsibility (Valentinov, 2023). The stakeholders' theory recognises role players in a business and

balances each player's interests to maximise organisational value. The two theories contribute to identifying FM stakeholders within eThekweni municipality and propose an SFM framework considering and acknowledging the stakeholders' needs.

## **2.3 Definition of Sustainable Facility Management**

SFM is the intentional integration of people, places, and processes that consider social, environmental, and economic (Alfalah & Zayed, 2020; Okoro, 2023). SFM is a strategic approach to address the continuity of facilities using sustainable best practices (Sabrina et al., 2017).

### **2.3.1 Sustainability**

To serve the purpose of this study, SFM combines sustainable development and facility management practices (Opoku & Lee, 2022). Sustainability is a multidimensional concept that requires an integrated approach to address the complex challenges faced by the world (Alfalah & Zayed, 2020). Sustainability is "development that meets the needs of the present generation without compromising future generations to meet their own needs" (Sabrina et al., 2017, p. 444). Sustainability encompasses the responsible use of natural resources to meet present needs without a negative impact on future generations (Global Compact, 2023).

Facilities sustainability refers to the ability of a facility to continuously function with minimum effort (Atkin & Brooks, 2021); therefore, sustainability refers to the ability to endure or improve the condition of the ecosystem over time. It minimises negative social, economic, and environmental impacts and ensures equitable distribution of resources and benefits (United Nations, 2023).

For example, the possibility of facility maintenance at a minimum duty makes the facility sustainable. Sustainability for an organisation refers to keeping every part to work efficiently (Joseph et al., 2021). Sustainability is perceived from three angles: social, economic, and environmental, also known as the three-pillar model (Moghayedi et al., 2023).

The economic pillar refers to managing facility costs that favour the organisation's current and future profitability (Moghayedi et al., 2023). The social pillar refers to the influence and contribution of the facility into the lives of occupants (Baaki et al., 2016).

Factors such as human rights, health and safety standards, and worker productivity are considered (SAFMA, 2023).

The environmental pillar considers the ecological footprint of the facility. The application of natural resources such as sunlight to brighten the workspace and support the overall functioning of the business.

### **2.3.2 Facilities Management**

There is a growing demand to align all efforts in building systems such as design, planning, construction, furniture, equipment, and infrastructure management. A facility is defined as a tangible structure with systems (Joseph et al., 2021). FM is “an organisational function which integrates people, place, and process within the built environment to improve the quality of life of people and the productivity of the core business.” (ISO 4000, 2020, p. 1).

According to South African Facilities Management (SAFMA), FM refers to a tool that empowers the performance of an organisation through lifecycle management of effective workspaces and sustainable business support services (SAFMA, 2023). Outsourcing FM service providers is a common tendency for organisations when it comes to FM services. Outsourcing of FM is a strategy that reduces short-term operational costs, offer competitive capabilities and shares resources and manpower between the demand organisation and service provider (Wang et al., 2020).

Joseph et al. (2021) and Wang et al. (2020) have listed evolving definitions of FM, the definition of project evolution of the FM profession. This leaves FM with no comprehensive definition. Therefore, FM is a profession that incorporates operations and strategies to safeguard the functionality of the built environment through the integration of people, places, and technology.

FM is an extension of various disciplines and a supplement to business operations. As a result, FM guides the management of infrastructure (Wang et al., 2020). FM supports the core business operation by strategically positioning building systems and services. SFM delivers reliable support, which adds long-term value to the business (Okoro, 2023)

### **2.3.3 Sustainable Facilities Management**

SFM is the intentional integration of people, places, and processes in a manner that considers social, environmental, and economic (Okoro, 2023). SFM is a strategic approach to address the continuity of facilities using sustainable best practices (Sabrina et al., 2017).

SFM approach is used in a workplace to increase the organisation's long-term productivity, improve the workers' quality of life, and support the environment. SFM creates an environment that fully supports the mission and value of the organisation (Elmualim et al., 2009b). As a result, the organisation achieves a competitive advantage and enhances the probability of prosperity (Opoku & Lee, 2022)

Researchers have discussed the benefits of SFM (Alfalah & Zayed, 2020). SFM stands in the gap between FM and construction demands (Elmualim et al., 2010). SFM is encouraged to support high energy demands by encouraging renewable energy sources and reasonable use of energy (eThekwini Municipality, 2020). The main objective of SFM is to facilitate the integration of global Sustainable Development Goals (SDGs) into Facilities Management Practices (Ikediashi et al., 2012).

## **2.4 Current Practices in eThekwini Municipality**

Municipalities represent government at a local level (eThekwini Municipality, 2022). The eThekwini Municipality faces socio-economic challenges, including prevalent poverty rates and limited access to education. The municipality is the extension of the government to reach the needs of the surrounding communities. The eThekwini Municipality envisions becoming Africa's most caring and liveable city, emphasizing sustainability, economic success, social welfare, and technological advancement (eThekwini Municipality, 2023a).

Municipalities are often referred to as local governments administered by local authorities. municipalities are categorised under the public sector umbrella, the local public sector (Hungwe & Mukonza, 2023). eThekwini municipality is a metropolitan municipality and the third largest city, the city of Durban in South Africa (eThekwini Municipality, 2023a). The city faces “infrastructure development challenges and historically financially unsustainable development practices” (eThekwini Municipality, 2023b, p. 1016).

eThekwini holds perceptible ageing infrastructures, including municipal office infrastructure (eThekwini Municipality, 2023b). The work environment of eThekwini consists of libraries, sports centres, beaches, community halls, clinics, customer service centres, and office complexes. However, the focus is set on an office-type infrastructure instead of all the municipality infrastructures and facilities. The aim is to evaluate the sustainable facilities management measures applicable to the office buildings.

The leadership of the local government in South Africa is divided into two sections, administrative and political. The political leadership depends on the winning political party (eThekwini Municipality, 2022). The political leaders are elected every five years through the Electoral Commission of South Africa as part of the legal framework and in alignment with the Local Government: Municipal Structures Act, 117 of 1998 (Naidoo & Ramphal, 2018). It can be deduced that the leadership of the municipality is influenced by public participation through voting for the ruling party.

Each municipality has unique characteristics fuelled by the local challenges experienced (Gluch et al., 2023). The municipality's administrative subdivisions consist of skilled employees (eThekwini Municipality, 2022). The two divisions work hand in hand to meet the needs of the community. The infrastructure of eThekwini consists of office complexes and public access facilities such as libraries, schools, clinics, parks, pools, halls, and not excluding those not mentioned (eThekwini Municipality, 2023a).

As observed by the researcher in the administration employment circular known as DPSA, the national government does not have a stand-alone facilities management department. FM practitioners are staff members who work below other departments. The municipality structure takes after the national government structure. The institutional structure has not yet established an independent FM department that best incorporates people, workspaces, and business operations.

The employment positions that consist of FM responsibilities are distributed throughout departments. Therefore, there is a lack of integration of FM services within the public sector. The problem is the autonomous department has different priorities, which may jeopardize the best practice of facilities management and eventually sabotage the sustainability of the business.

There is a conflict of interest within various departments, for example, the project department will possibly prioritise completing the task using the low-cost process possible. The lowest cost may call for sooner maintenance demand or reduced lifespan expectancy. On the other hand, the maintenance department is highly likely to prioritize reliability of work instead of cost-saving.

The city aims to maximize the use of existing facilities through FM (eThekweni Municipality, 2023b). FM services in municipalities consist of outsourcing and out-tasking, increasing reliance on procurement policies. This set the emphasis on integrating facility services to work towards a united goal of building sustainable facilities. The research aims to propose an SFM Framework for eThekweni Municipality. The framework for SFM is recommended to provide guidelines for navigating the sustainability of workplaces.

The framework considers other governing structures such as the Municipal Financial Management Act (MFMA) and the National Treasury. According to the national treasury and MFMA, the mandate is to facilitate reasonable spending and other national economic agendas instilled by collective government. As a result, the study is grounded on integration or joint action of stakeholders.

#### **2.4.1 Governance on Sustainability FM**

The main objective is to propose a usable framework to enhance SFM practices in the municipality. The passage under governance investigates the issues entangled when dealing with public facilities. The study analyses contributions made by the relevant bodies to the SFM practice and policies involved. SFM practices are vital to cater to the increasing demands of the population (Moghayedi et al., 2023).

Local municipalities are governed and regulated by the national government and in accordance with the country's mandate and other coalitions in place (Hungwe & Mukonza, 2023). The National Governance Act is a guideline for all municipal operations (eThekweni Municipality, 2023a). Exceptions are granted to each local government to decide what would best serve the community (Gluch et al., 2023). As a result, the municipality has integrated resource planning and an Integrated Development Plan (IDP) outlined in the municipal Spatial Development Framework

(SDF). SDF is a five-year outline to guide the vision and plan of the city (eThekweni Municipality, 2022).

#### **2.4.2 Integrated Development Plan**

The municipality uses the Integrated Development Plan (IDP) to transform the vision from SDF into action (Naidoo & Ramphal, 2018). IDP aims to promote sustainable economic and social development whilst eliminating wasteful expenditure (eThekweni Municipality, 2022). The IDP is an approach aimed at project refining, strategy, budget, and resource priorities. IDP integrates sustainability issues from the global level (SDGs) together with the local needs of the community.

IDP is a five-year plan reviewed by the committee annually for alignment with the current state of the municipality (eThekweni Municipality, 2023b). The IDP thoroughly outlines the situation analysis of the municipality, progress, and challenges. Subjects such as natural environment, climate change, greenhouse emissions, economic infrastructure, asset management, and good governance are addressed by the IDP (eThekweni Municipality, 2023b). Those subjects directly relate to SFM objectives.

IDP follows the National Treasury and other institutional agreements strategies for various applications. Concerning SFM, the eThekweni IDP had adopted the “Cities Infrastructure Delivery and Management System (CIDMS)” to approach the management of assets infrastructure, which includes facilities (eThekweni Municipality, 2023b, p. 1014). The IDP commend the prioritisation of projects that improve the financial sustainability of the municipality (eThekweni Municipality, 2022). The performance measure of the municipality includes long-term sustainability, therefore SFM serves the objectives of the IDP (eThekweni Municipality, 2023b).

The IDP addresses facilities management through a Strategic Asset Management Plan (SAMP). According to SAMP, there is increased pressure to meet social development needs; however, there are challenges in managing the long-term cost and risk associated with the performance of the infrastructure (eThekweni Municipality, 2023b). The objectives of SAMP that are in line with SFM are as follows:

Plan 1: environmentally sustainable city. This plan aims to develop and sustain the spatial, natural, and built environment.

Plan 2: creating sustainable livelihoods. This is part of socio-economic development, which aids in reducing unemployment. Plan to develop a prosperous and diverse economy.

Plan 3&4: accessible city and safe city: creating a quality living environment, fostering a socially equitable environment.

Plan 5&6: socially cohesive city: creating a platform for growth, empowerment and skills development for a vibrant, creative city.

Plan 7: good governance. Socially cohesive city with good governance and responsive local government.

Plan 8: financially sustainable city. Responsible spending, financial accountability and sustainable city.

### **2.4.3 Sustainability Development Goals**

The relevant body at the heart of sustainability is the global Sustainability Development Goals (SDGs) formulated by the United Nations (UN) SDGs (United Nations, 2023). SFM practices seek to integrate social, economic, and environmental factors through sustainability practices. The UN stipulates 17 SDGs; the following passage discusses SDGs that the SFM practices directly influence in no order.

SDG 11 focuses on sustainable cities and communities. According to the Global Compact, this SDG denotes safe, sustainable, and resilient cities (Global Compact, 2023). This encourages effective facility management to employ measures that produce resilient infrastructure and secured communities.

SDG 12 applies responsible consumption and production. SFM advocate resource efficiency waste and energy management by facilitating the business's productivity in an optimised manner (Okoro, 2023).

SDG 13 focuses on climate action. Climate action involves factors that contribute to the climate change. Factors such as facility design and building energy demand contribute to increased energy production requirements leading to CO<sub>2</sub> gas emissions. SFM can help strategically position facilities that support less greenhouse gas emissions, using renewable energy sources and adopting energy-efficient technology (GBCSA, 2017).

SDG 7 emphasises affordable and clean energy. Affordability of energy is enabled by energy saving, reduced energy demand and efficient use of energy. SFM professionals can strategize to support sustainable facilities and transition to clean energy—more details under benefits of SFM passage.

SDG 9 focuses on industry innovation and infrastructure. SFM contribute to the use of innovative technologies such as building management systems (BMS). BMS is used to maintain or improve existing facilities and for efficient management (Moghayedi et al., 2023). SFM support innovative infrastructure development for businesses.

SDG 15 attends to life on land. SFM is responsible for the landscaping of the environment. Planting the correct plants reduces carbon dioxide produced by the facility and aids the indoor ventilation system (GBCSA, 2017).

SDG 17 concentrates on the partnership for the goals. Partnership in SFM involves mobilization of resources, integration of services, procurement, and sustainable financial management. Partnership plays a vital role in governance, eventually promoting SDG 16. This yields high accountability and responsible fiscal management (United Nations, 2023).

## **2.5 Key Drivers of SFM Practices**

What drives the SFM is the objective to meet corporate goals through SFM practices, which escalates the competitive advantage (Joseph et al., 2021). SFM combines sustainable development and facility management practices (Opoku & Lee, 2022). FM is a support function to the business and highly influences building utilisation (Ikediashi et al., 2012). Management of facilities and sustainability agenda positively impacts business processes and profitability (Elmualim et al., 2010). Therefore, the integration of the two concepts is commended.

### **2.5.1 Environmental drivers**

Climate change influences sustainability practices in commercial buildings (Elmualim et al., 2010). Climate change results from greenhouse gasses, industrial waste and various industrial productions, including power generation (Chien, 2022). Climate change refers to extreme weather conditions that sometimes occur out of season

(eThekweni Municipality, 2020). Climate conditions such as floods or global warming/ high temperatures occur in the region of eThekweni.

High temperatures demand high energy consumption for cooling the work environment and alternatively demand an increase in power generation. eThekweni recently suffered severe damage to infrastructure due to floods in April 2022, which has been noted as a challenge by the SAMP (asset management team) (eThekweni Municipality, 2023b). SFM attend to the contributing factors of weather conditions that negatively impact the infrastructure and develops resilient infrastructure towards climate change.

### **2.5.2 Economic drivers**

Reviews on SFM drivers indicate that economic demands, directly and indirectly, drive Facility managers to integrate sustainability into business. Okoro (2023), stated that constant changes enforce change in FM practices. Due to the population growth of eThekweni residents, the municipality is driven towards sustainable development of infrastructure. There is a demand for infrastructure investment, supply management and planning (Elmualim et al., 2012).

The current study aims to explain and identify the benefits of SFM practice in the eThekweni municipality work environment. The main purpose of SFM is to facilitate the integration of global Sustainable Development Goals (SDGs) into Facilities Management Practices (Ikediashi et al., 2012). Baaki et al. (2016), endorsed that facilities management comprises several interrelated expertise, resulting in a broader scope of work.

The economic drivers of SFM practice are concurrent with the benefits of SFM. Sustainability is a support function that encourages the continuity of systems (Baaki et al., 2016). Sustainability in facilities management is a strategy for achieving economic success and environmental and social responsibilities (Opoku & Lee, 2022). SFM minimizes financial losses in assets and facilities and encourages business continuity (eThekweni Municipality, 2023b).

### **2.5.3 Significance of SFM**

Few benefits have been identified with the FM industry and sustainability. A study conducted in Cape Town, South Africa, evaluated the impact of innovative

technologies on energy consumption on commercial properties. The study discovered a high usage of energy in commercial buildings (Moghayedi et al., 2023). The study unveiled poor practices on energy usage and a lack of knowledge from the occupants and emphasized action from facility managers. This endorses that FM is responsible for implementing energy efficiency in the workplace.

Opoku and Lee (2022) detailed the importance of SFM connecting to the global SDGs in a paper published in the Sustainability Journal titled “The Future of Facilities Management: Managing Facilities for Sustainable Development”, while Chien (2022) explored a link between SDGs and improved energy efficiency which act as a mediation of the reasonable use of energy resources and energy cost reduction.

Fulfilment of SDGs has become a requirement in different aspects (Chien, 2022). Sustainability in facilities speaks to waste, water usage, and energy. However, energy usage significantly and directly impacts the economy (Elmualim et al., 2009a). Energy production is acknowledged to pollute the environment through the burning of fossil fuels. Everyone is responsible for being mindful of energy usage in every way possible (GBCSA, 2017). The adoption of SFM practice positively impacts the global goal. The scope of SFM varies from one organisation to another. However, the objectives speak to and are not limited to the below.

#### **2.5.3.1 Compliance**

FM Supports the wellness of people in the workplace through compliance assessment and management of risk. This is done by ensuring the condition of the work infrastructure is safe. Monitoring the safety of the work environment from damage and external trespassers. Health and safety policies are a work environment requirement and a compliance act per the Department of Labour in SA. In addition, the compliance of the building includes space standards which regulate the acceptable number of occupants, privies, and ventilation requirements of a building.

#### **2.5.3.2 Space planning**

space planning refers to the structuring and allocation of the building and its contents. FM caters to the effective use of space, focusing on user requirements, ergonomics, and building assets inventory (Atkin & Brooks, 2021). Effective utilization of space considers possible future use of space and asset re-evaluation. Sustainable FM in

space planning speaks to the future use of space options such as convertible spaces. SFM coordinates user needs with obtainable resources (Joseph et al., 2021). Further, the interactions of colleagues in a work environment depend on the organisation's space planning. As a result, SFM produces an excellent working environment which contributes to the individual's overall well-being.

#### **2.5.3.3 Organisational image**

SFM is positioned to contribute to the image of the organisation. The physical appearance of the infrastructure demonstrates the commitment of the organisation to the business—the municipal offices influence stakeholders' perception of the organization. The condition of the organization's image affects behavioural change and strategically influences organisational culture (Joseph et al., 2021). The FM function in a workplace influences the attitudes of staff and stakeholders towards SFM (Ikediashi et al., 2012). SFM can be viewed as an investment that influences the future image of the organisation (Wang et al., 2020).

The work environment contributes to knowledge management strategies and strategically gives the organisation a competitive advantage by creating a conducive work atmosphere. The environment plays a role in stakeholders' engagement and participation, which shapes the organisation's culture. Through resource integration, SFM contributes to the physical appearance of the work environment in terms of maintenance, refurbishment, security, cleanliness, landscape, etc.

#### **2.5.3.4 Resource efficiency**

SFM offers optimal deployment of capital resources such as building systems, plants, and facilities (Gluch et al., 2023). Sustainability measures are implemented to optimise resource consumption, such as energy-efficient lighting systems, HVAC controls, water-efficient fixtures, and waste management programs (Okoro, 2023). FM incorporates the management of support resources within the infrastructure. These include budget allocation, lifecycle costing, inventory management, and proactive and reactive property management (Joseph et al., 2021).

SFM promotes partnership and Integration of knowledge, experiences, and resources. This resulted in the incorporation of green building standards such as GBCSA (Green Building Council of South Africa), LEED (Leadership in Energy and Environmental

Design), and BREEAM (Building Research Establishment Environmental Assessment Method)

## **2.6 Potential Benefits of SFM**

The following passage explains the potential benefits of SFM practices to eThekweni Municipality.

### **2.6.1 Energy efficiency**

The benefits emphasize energy efficiency due to the impact it carries on business and the country of SA. Energy efficiency advocates a reasonable use of energy resources in a facility or equipment. Energy efficiency aims to reduce energy costs, lower energy usage, and enhance energy resource efficiency (Chien, 2022).

Energy efficiency from the sustainability standpoint, is a catalyst for CO<sub>2</sub> reduction, energy conservation, and economic improvement through reduced energy costs (Sun et al., 2023). Energy efficiency requires users to have functioning monitoring systems to track the modification. The paper titled *“The Practice of Sustainable Facilities Management: The Design Sentiments and The Knowledge Chasm”* investigated the knowledge of sustainability FM practices and the knowledge of FM practitioners in various construction organisations and FM industries (Elmualim et al., 2009a).

As a result, many respondents raised energy efficiency as a concern among recycling and waste reduction. The paper concluded with recommendations for sustainability education and training to provide effective structures and processes to apply sustainability practices (Elmualim et al., 2009a). Effective structures include policies, regulations and frameworks to aid in sustainability governance.

### **2.6.2 Resource Efficiency**

FM integrates the use of resources in various operations to support business objectives. The focus is set on enhancing energy resource efficiency through applying sustainability practices such as utilising renewable energy sources. Facilities can reduce the consumption of resources and lower operation costs through FM space planning (Atkin & Brooks, 2021). Enhanced energy resource efficiency is a mediator

for the organisation to meet SDGs (Chien, 2022). This includes implementing measures to withstand electricity supply shortages (load shedding).

### **2.6.3 Resilience and Transformation**

FM incorporates the long-term sustainability of the building using maintenance. Maintenance planning ensures continuous business operations and mitigates disruptions. SFM is a mediator between the productivity of space and the life cycle cost of the facility (Opoku & Lee, 2022). SFM advocates continuous improvements through technology, data analysis, performance monitoring, and best practices. SFM protects work environment transformation and aids in adaptation to change.

### **2.6.4 Environmental**

Environmental sustainability advocates the use of materials that are nondamaging to the ecology. Environmental SFM involves practices that conserve natural resources and business needs in FM operations. Environmental SFM strategy advocates the use of clean energy for business operations, constructing facilities using environmentally friendly materials, and designing a facility that is not wasteful to the environmental resources.

The facility can be strategized in a manner that saves or produces energy. Environmentally friendly materials on buildings absorb less heat, reducing reliance on air conditioning for temperature adjustment (Sun et al., 2023). The design of a facility can boost natural lighting, natural ventilation, humidity control, and air conditioning. These strategies reduce dependence on electricity and reduce carbon emissions.

### **2.6.5 Green Building Certification**

Stakeholders have engaged in green-building initiatives offered locally by the Green Building Council South Africa (GBCSA) (GBCSA, 2017). GBCSA uses rating tools suitable for different buildings and applications. GBSA is an initiative that advocates sustainable development, designs, and operations of buildings. The certification encourages compliance with energy regulations, environmental regulations, and sustainability standards. As a result, buildings meet legal requirements that support

the well-being and health of occupants. SFM in work environment facilities enables green certification.

### **2.6.6 Social responsibility**

Facilities in a work environment impact the lives of employees, stakeholders and surrounding communities (Moghayedi et al., 2023). SFM awareness to employees promotes ethical business practices and benefits lifestyle outside of the work environment. Facility management supports occupants' physical and mental health through FM strategies appropriate to the work environment (ISO 4000, 2020). Therefore, the sustainable management of facilities in a workplace can contribute to understanding or awareness of the society and overall sustainability agenda.

### **2.6.7 Economic sustainability**

Economic sustainability refers to the ability to afford the current expenses and empower the future expenses to be met. SFM strategy, from an economic standpoint, involves positioning the business to meet the needs of the business both now and in the future (Moghayedi et al., 2023). Economic SFM encourages the management of facilities in a financial manner that encourages continuous financial provision or improvement.

Economic SFM in a work environment involves managing the value of the facilities, addressing facility demands, and identifying innovations that support a sustainability agenda (Moghayedi, et al., 2023). One of the leading sustainability agendas is directed towards energy efficiency, to overcome the energy crisis in South Africa (eThekweni Municipality, 2020). The economic SFM considers energy demands, manages the energy crisis and implements strategies to tackle the effects of the energy crisis (load shedding).

The economic SFM encourages the profitability of the business's continuous income flow. One of the strategies to increase income is to reduce expenses without compromising on the quality of the facility and productivity of the business. The economic pillar advocates sustainable FM practices such as preventative maintenance, which enable the facility to minimise breakdowns and downtime of

employees. Maintenance is the strategy that increases the facility's value and positions the business for longevity (Atkin & Brooks, 2021).

SFM is concerned with the life cycle costs of business operations (Baaki et al., 2016). These are operations costs over an extended period and considering future generations. The economic responsibility comes with expenditure monitoring systems, life cycle budget, and maintenance planning of the facility. Lifecycle budget beginning from the design stage to decommissioning. These practices are the bases that inspire the identification of cost reduction areas.

### **2.6.8 Strategic FM and Sustainability Agenda**

Strategic FM is an intentionally formulated process that analyses the business core function and all relevant factors such as business requirements, policies, stakeholders, risks, user requirements, legislation, resources audits, systems, assets, and processes (Atkin & Brooks, 2021). Strategic FM is a deliberate stream of decisions taken with the primary goal of positively influencing the profitability of the organisation (Ikediashi et al., 2012).

The FM strategy is the foundation of the management of facilities (ISO 41001, 2018). According to ISO 41014:2020 standard for Facility management: Development of a facility management strategy, define FM strategy as a "statement expressing the analysed needs of the demand organisation, proposed facility management solution(s) and outline plan for implementation" (Gluch et al., 2023, p. 53)

The sustainability agenda encompasses the responsible use of natural resources to meet present needs without negatively impacting future generations (United Nations, 2023). The sustainability agenda on infrastructure speaks to waste management, water conservation, reduced carbon emissions, and clean energy. Strategic SFM employs tools to defend against resource consumption in buildings through energy-efficient lighting systems, ventilation, water management, and waste management programs (United Nations, 2023).

From a facilities perspective, sustainability refers to the ability of a facility to continuously function with minimum effort based on life cycle assessment and cost (Atkin & Brooks, 2021), therefore, sustainability refers to the ability to endure or improve the condition of the ecosystem over time. It minimises negative social,

economic, and environmental impacts and ensures equitable distribution of resources and benefits (United Nations, 2023).

The SFM approach is used in a workplace to increase the organisation's long-term productivity, improve the workers' quality of life, and support the environment (Moghayedi et al., 2023; Dubihlela & Solomon, 2023). SFM is open to the adoption of technology initiatives to manage resource allocation (Wang et al., 2020). The social standpoint of sustainability in a work environment analyses the influence of SFM practices on society. The analyses begin with evaluating business practices versus the well-being of employees and stakeholders' value chains. Corporate social sustainability advocates the needs of current and future employees (United Nations, 2023). Therefore, it can be settled that SFM involves the management of occupational impacts on employees and identifying proactive ways to manage the impacts.

## **2.7 Barriers to SFM Practices**

This passage focuses on factors affecting the success of SFM practice and factors that hinder the implementation of SFM policy. It is imperative to analyse the social impact of a workplace on the employers and stakeholders (Ikediashi et al., 2012). Stakeholders of a municipality refer to, and are not limited to, service providers, clients, and the public. Research on sustainability development barriers highlights a lack of awareness (Baaki et al., 2016).

### **2.7.1 Human Factor**

Challenges and barriers converge towards the public sector work environment. The human factor plays a role in sustainability practice in a work environment. Human factors include the behaviour and attitudes of the employees (Joseph et al., 2021). Knowledge, skills, and awareness are still lacking towards sustainability (Global Compact, 2023). The FM industry is diverse and inconsistent (Joseph et al., 2021). In addition, outsourcing is the factor that deters the organisation from the knowledge and skills of FM by relying on the external service provider (Wang et al., 2020). Resistance to change is a general factor experienced by facility managers, and an additional factor is poor organisational culture (Baaki et al., 2016).

### **2.7.2 Management practices**

The enablers of SFM practice in the public sector are organisational structure. Facilities management is teamwork, and the success of SFM practice depends on SFM knowledge sharing and change management structures (Mewomo et al., 2022). The concern about the future drives the government into investment, planning and supply management (Sun et al., 2023). Sustainability balances the three aspects of ecology that cater to constant changes and the demand for change (Okoro, 2023).

Lack of stakeholders' relationship and public participation (Støre-Valen & Buser, 2017). Public participation is a process whereby affected parties can contribute to the outcome of a particular issue (Naidoo & Ramphal, 2018). The FM profession is complex (Elmualim et al., 2009b). The lack of a feedback mechanism is a factor that can hinder the success of implementing sustainability policy (Alfalah & Zayed, 2020).

FM activities vary from one municipality to another (Patanapiradej, 2006). Elmualim et al. (2010) investigated and recorded common barriers to SFM practice. The top three barriers were a lack of commitment by top management and a lack of understanding and focus by senior management (Elmualim et al., 2010). The study reported that the FM is undervalued and perceived least when it comes to priority rankings of organisations (Elmualim et al., 2010).

Later studies recognised a lack of understanding of the value and concerns surrounding the FM industry (Støre-Valen & Buser, 2017). The lack of understanding among senior executives produces a lack of involvement of senior management and alternatively affects stakeholder's perceptions. The inability of senior management to commit to SFM practices produces a lack of strategic leadership to overcome threats and indispensable change in organisations (Elmualim et al., 2009b).

Lack of senior management systems and support, including systems to keep facility conditions up to date (Radebe & Ozumba, 2021). This factor contributes to poor implementation of SFM policy and frameworks. The lack of tools such as policy and framework hinders successful SFM practices (Opoku & Lee, 2022).

### **2.7.3 Lack of Resources**

A South African study conducted in KwaZulu Natal province on factors affecting FM practices recorded twenty-two challenges amongst public buildings. The study concluded that finances play a significant role, adding that funds should be made accessible to facilities managers. Furthermore, the availability of funds appeared to be one of the factors affecting FM maintenance practices (Mewomo et al., 2022).

The most common barrier hindering the success of FM practice is fiscal provision (Elmualim et al., 2010). This is supported by several studies conducted in Norwegian local government institutions (Hopland & Kvamsdal, 2018). The eThekweni municipality has listed budget as one of the key challenges in asset management (eThekweni Municipality, 2023b). Insufficient funding and corruption or poor handling of finances are blockades on SFM practices (Okoro, 2023).

Lack of staff dedicated to FM and instability in leadership positions affect the implementation and prioritisation of SFM policy (Elmualim et al., 2010). Instability in senior roles affects the long-term planning and consistent approach towards service delivery (Naidoo & Ramphal, 2018). The limited timeframe of leadership hinders the implementation of the respective regulations or standards, leading to inadequate implementation of policies and procedures.

Wang et al. (2020) discovered a lack of monitoring and performance evaluation affect FM service quality. Procurement policies play a vital role in appointing service providers (Radebe & Ozumba, 2021). The inability of municipalities to use the go-green procurement policy hinders the success of SFM practice (eThekweni Municipality, 2023b). The success of SFM relies on incorporating FM into the strategic level to build a strong commitment toward a sustainability agenda.

Outsourcing of FM services is beneficial in the short term as it offers flexibility to the organisation through working on a contractual basis (Atkin & Brooks, 2021). Nevertheless, outsourcing is a barrier to the sustainability of FM knowledge in demand organisations. Outsourcing gives access to high-quality service and shifts the risk to the capable resource. However, it hinders the long-term growth of in-house FM (Wang et al., 2020).

The deficiency of infrastructure as recorded by the condition assessment report demands action from strategic asset management (eThekweni Municipality, 2023b). There is a need to bridge the gap between the FM demand, facility design and infrastructure construction (Olaniyi et al., 2014). The SFM practice encourages future planning, financial projections and integrated decision-making (Okoro, 2023).

## **2.8 Propose SFM framework**

A framework is a basic structure, a fundamental arrangement, or a procedure. Framework provides a consistent approach across sustainable practices and activities within SFM (Atkin & Brooks, 2021). According to Joseph et al (2021), the SFM scope keeps increasing and varies amongst units. According to Wang et al. (2020), it is difficult to formulate a benchmarking tool for service quality. A framework contributes to the FM operations and eases the formulation of benchmarking tools.

In research about *“Innovation in sustainable facilities Management practice: implementing a sustainability policy”*, Elmualim et al. (2009) aim to help organisations develop and implement a sustainability policy that supports a sustainability framework. The paper contributes to the approach aimed at reducing barriers to sustainable FM practices, which supports the objective of the current study.

2015 the South African Department of Energy (DoE) released a National Energy Efficiency Strategy draft. The Draft paper is a legislative means of establishing implementation instruments and setting energy efficiency targets from a broader perspective. The paper allows stakeholders to take part through the expression of opinions and comments and for organisations to apply to institutions (Department of Energy, 2023).

The paper has been adopted by the eThekweni municipality through the eThekweni Energy Strategic Roadmap (2019) and eThekweni Integrated Resource Plan (eThekweni Municipality, 2020) as a guide in developing measures to promote saving energy, reduce the negative impact of energy use on the environment, reduce energy costs to the economy, contribute towards sustainable development, and work towards achieving targets set by national energy policy. A functioning SFM Framework drives the enhancement of SFM practices and facility systems. It can help alleviate the impact of energy consumption and supply disruptions.

### **2.8.1 SFM framework in eThekwini**

SFM framework encourages preventive and corrective strategies. Concerning the governance of the SFM framework in eThekwini municipality, information is communicated through the IDP. The municipality uses political leaders to identify the needs of the society (Hungwe & Mukonza, 2023). The municipality appoints the IDP representative forums from the stakeholders to manage the integration of the council sustainability (eThekwini Municipality, 2022). The IDP representative forums play a vital role in setting up implementation strategies for the IDP (Naidoo & Ramphal, 2018).

Each unit of eThekwini is responsible for proposing future developments to the Spatial Development Framework. SDF incorporate policies and objectives of infrastructure and cascades to all units through the IDP (eThekwini Municipality, 2023b). All units are responsible for fulfilling the Integrated Development Plan (IDP) and to ensure that employees complete the required tasks outlined in the individual performance plan. SFM framework can improve the organisation's ability to recover and withstand disruptions to ensure the continuity of FM services.

The focus of the SFM framework is to develop efficient and strategic management that lifts the sustainability agenda (Wang et al., 2020). The eThekwini SAMP currently uses a life cycle approach strategy to manage facilities (eThekwini Municipality, 2023b). The life cycle approach assesses sustainable performance, service quality and life cycle costs (Moghayedi et al., 2023). Service quality is a tool used to benchmark service delivery, a method to measure quality (Wang et al., 2020)

According to Gluch et al., (2023), the execution of SFM practice requires planning and documentation. Benchmarking and performance measurement are essential for the success of the SFM framework in evaluating improvement areas and alignment with policies (ISO 41001, 2018). The implementation of the SFM framework can be subjected to trials and testing to be successful, and a contingency plan should be made available (eThekwini Municipality, 2023b).

According to Wang et al. (2020), the use of benchmarking tools to monitor performance support the organisation in achieving a sustainable competitive advantage (Wang et al., 2020). The SFM encourages innovation and adoption of

modern technologies that enhance the sustainability of the facilities and transform infrastructure into a resilient work environment (Elmualim et al., 2009a).

SFM aim to achieve minimum impact on natural resources and the environment (Alfalah & Zayed, 2020). SFM seeks to identify the relationship between concepts and link critical variables such as best practices, risk, and compliance management (Elmualim et al., 2009b). The framework enables effective decision-making, which safeguards the safety and compliance of facilities (eThekweni Municipality, 2023b).

A usable SFM framework reduces dependency on specific departments for facility management practices. The framework is valuable for overcoming some barriers to a successful SFM practice. A collaborative effort between SFM innovations and policymakers is necessary to drive the transformation required for sustainable facilities (Okoro, 2023). Framework fosters a culture of professionalism within the FM industry and the public sector.

The sustainability FM practices adopt specifications of relevant bodies such as ISO (International Organisation for Standardisation), SANS (South African National Standards) and Green Building Council SA. This gives room for facility managers to harness new strategies to overcome barriers and use technology to maximize the efforts or new approaches to enhance the sustainable management of facilities.

### **2.8.2 Facilities managers' responsibility on SFM**

Competencies and roles of facility management are of interest concerning SFM practices (Gluch et al., 2023). According to Elmualim et al. (2010), The integration of FM and sustainability requires facilities managers with people management and change management skills. FM services vary from organisation to organisation (Patanapiradej, 2006). SFM practice competencies demand the incorporation of strategic management levels and future projections (Okoro, 2023).

The executive leadership of the facility manager are in the best position to employ strategic consciousness of the core business. (Ikediashi et al., 2012). FM handles maintenance planning and the organisation's related infrastructure improvement (Joseph et al., 2021). The role of the facilities manager can be operational and strategic (Gluch et al., 2023). The facility manager manages finance reporting such as budgeting, accounting and decision-making (Mewomo et al., 2022).

Decision-making covers the in-house administration of aspects of FM in social, environmental, and economic terms (Alfalah & Zayed, 2020). In addition, the FM Manager is responsible for stakeholders' relationship management. Stakeholders' engagement is critical in identifying occupant satisfaction status. Risk management against operational activities is part of the Facility manager's responsibility (Elmualim et al., 2009a). SFM requires strategic activities such as the integration of business systems, operations and productivity (Gluch et al., 2023).

## **2.9 Chapter Summary**

The chapter presents a literature review of the complicated domain of sustainable facilities management (SFM). It begins with the theoretical underpinnings, drawing upon stakeholder theory and institutional theory. Attention is directed towards the municipal setting, with emphasis on eThekweni Municipality for the contextual backdrop for the study. The review examines the strategic dimensions of facilities management and alignment with the sustainability agenda. Furthermore, it scrutinizes the governance, encompassing integrated development plans, sustainability development goals, and the role of facilities managers in orchestrating effective SFM implementation.

The exploration extends to the driving forces behind the adoption of SFM practices, encompassing both environmental and economic catalysts. Concurrently, the review explains the benefits of SFM spanning resource efficiency, infrastructure resilience, green building certification, social responsibility, and economic accountability. Lastly, it also unveils the barriers to SFM practices including human factors, managerial practices, and resource constraints.

## CHAPTER 3

### 3 RESEARCH METHODOLOGY

#### 3.1 Introduction

The previous chapter presented the literature review for sustainable facilities management practices. This chapter focuses on the research methodology and will justify the chosen research method. Research method refers to the strategies and processes covering everything from general assumptions to detailed data collecting, analysis, and interpretation methodologies (Creswell, 2014). The study investigates current sustainable facilities management practices and examines existing challenges to attain valuable, sustainable, energy-efficient innovations. There are two types of research methods, namely qualitative and quantitative. This study will use a qualitative research approach to meet the objectives of the topic. `

Quantitative research provides numerical data such as percentages, occurrences, incidence, trends, and others (Saunders et al., 2019). Quantitative answers numeric statistic questions such as how many or how often. Qualitative research uses the events that emerge and the outcomes of the events from stakeholders' perspectives. This study adopted a qualitative research method to investigate the stakeholders of eThekwini

#### 3.2 Research Design

Research design refers to the categories of inquiry found in qualitative, quantitative, and mixed methodologies approaches that guide activities in a study design (Saunders et al., 2019). Creswell (2014) refers to research design as a strategy of enquiry (Creswell, 2014). Akhtar (2016) refers to the research design as the blueprint guiding the research outline. The research outline provides a margin for the research elements and aims to combine the research's purpose with the worldviews (Akhtar, 2016). The research designs are investigated to select the type that aligns with the problem statement and objectives. The purpose of the research can be categorized as exploratory, descriptive and explanatory (Saunders et al., 2019)

### **3.2.1 Descriptive research**

The descriptive research design type describes the existing phenomena. The purpose is to obtain information and identify the characteristics of a subject or matter concerning the research project (Akhtar, 2016). Saunders et al. (2019) remark that descriptive seeks to project accurate information about the matter or event in review and describe patterns in a research topic.

The method aims to portray the situation before data collection clearly (Saunders et al., 2019). This type of research comprises different kinds of fact-finding investigation tools, such as comparative and correlational surveys. Descriptive research can be used to report current issues and past acquaintances. Therefore, this method is used to report information and understand the topic (Mishra & Alok, 2022).

### **3.2.2 Explanatory Research Design**

Explanatory explain the “why” in a research topic. This type can be used to identify the causes and effects of a phenomenon, meaning the study analyses relationships or systems. This method also checks possible links between variables, such as whether a change in one independent variable produces a change in another dependent variable” (Saunders et al., 2019, p. 104). Akhtar (2016) suggests that the explanatory is for studies that aim to explore a new universe in a subject not previously researched. According to Saunders et al. (2016), a researcher can manipulate and investigate one variable. The manipulated variable can introduce the topic in a way that qualifies the research purpose as explanatory. Note that explanatory research must always convey concepts that guide the researcher to investigate accurate information (Akhtar, 2016).

### **3.2.3 Exploratory Research**

The method is used to discover what is happening and seek new perspectives by asking questions and gathering data from stakeholders. Exploratory research design aims to get a new perspective on a situation (Creswell, 2014). The design method is used when few or no previous research/studies can be referred to (Akhtar, 2016). Therefore, the exploratory research design aims to collect new insights that can be investigated in future research and used for continuous research processes.

Furthermore, exploratory research provides significant insight into a subject matter, which may enable decision-making in a status quo. The framework for SFM practices in municipalities in South Africa has little research. The knowledge and insights about the topic will allow future researchers to investigate SFM's further approaches towards the government sector. This research will adopt an exploratory study design to gain new insights into SFM and local government.

### **3.3 Research Paradigm**

Research paradigms guide the scientific researcher to investigate according to the shared beliefs that are already established. The adopted research paradigm underpins the research strategy and contains essential assumptions forming the research's foundation. The researcher must demonstrate an understanding of paradigm assumptions to examine discoveries that support scientific studies (Saunders et al., 2019).

The paradigm guides the research approach, data collection, and analysis (Creswell, 2014). Research paradigms consist of common beliefs, principles and reviewed agreements from social scientists that demonstrate an approach towards the research problem (Saunders et al., 2019). These common beliefs enable a researcher to choose research strategies that support scientific philosophies and develop research methodology.

#### **3.3.1 Pragmatism**

Pragmatism is a flexible approach which allows a researcher to explore applications of mixed methods. The researcher focuses on a problem and uses all endeavours to approach the solution. Pragmatic is not bound to a single system of inquiry; the inquiry applies both qualitative and quantitative methods to approach the research. This also means the researcher may apply various techniques or procedures that will produce the desired results. As a result, many approaches may be employed in data collection and analysis (Creswell, 2014).

### **3.3.2 Positivism**

Positivism advocates observation of reality through the application of an unbiased lens to the research variables. In this type of philosophy, knowledge can be gained by observing variables. Saunders et al. (2019) state that positivists work with an observable reality, a natural and physical science product. This means that one of the research phenomena can be observed to construct credible data.

This paradigm assumes that the researcher is not part of the research problem, and neither is the researcher affected by the research topic. This enables the researcher to observe reality without 'feelings' (Saunders et al., 2019). Positivism is characterised by determination, reductionism, measurement, and observation. Existing theories may be adopted to develop a hypothesis for the study, and the assumption will be later confirmed wholly or partially (Creswell, 2014).

### **3.3.3 Interpretivism**

Interpretivism is the opposite of positivism from the above paragraph; it proposes that reality is subjective to the surroundings. Surroundings refer to the participants' historical worldview, cultural interference, and personal experience (Creswell, 2014). In this paradigm, the researchers' beliefs, values and 'feelings' are part of the research because human beings create meaning in an in-depth analysis of information (Saunders et al., 2019). As a result, various realities depend on the participant's understanding and experience.

Data collection is characterised by open-ended questions that allow participants to express the meaning of the study setting per the subject's individual meaning and experiences. The background of the researcher influences the interpretation of the data collected. The focus of the research is on specific contexts of the study setting, which offers an in-depth understanding of the historical and cultural settings of the people.

This study adopts an interpretivism paradigm to approach the research method suitable for constructing and generating meaning from the data collected in the field. Characteristics of interpretivism are understanding of the study setting, various participants' meanings, and influence from social and historical and theory adaptation

and generation. The researcher understands and embraces differences from social actors (Saunders et al., 2019).

### **3.4 Research Approach**

A research approach is a plan that guides the procedure of the research, this plan propels several techniques used to study the topic (Creswell, 2014). The research problem, research questions and objectives guide the approach. There are three research approaches: qualitative, quantitative and mixed methods. According to Saunders et al. (2019), the research approach distinguishes information in terms of numeric and non-numeric data. The research approach channels data collection and analysis methods (Creswell, 2014).

#### **3.4.1 Mixed Research Approach**

A mixed research approach occurs in a single study comprising both quantitative and qualitative (Mishra & Alok, 2022). Qualitative and quantitative can be used simultaneously to reduce limitations or certain restrictions that come with using either research approach (Saunders et al., 2019). A combination of quantitative and qualitative methods assists in understanding specific contexts, intervention of complex systems, and manipulation of research variables (Mishra & Alok, 2022). According to Creswell (2014), combining research approaches offers a comprehensive understanding of the research topic. In conclusion, a mixed-method research approach means collecting quantitative and qualitative data and applying different data analysis tools to interpret the information (Creswell, 2014).

#### **3.4.2 Quantitative Research Approach**

Quantitative research involves collecting quantifiable data and using mathematical, statistical, or computational techniques to analyse it and produce research results (Saunders, et al., 2019). This is a research approach that uses numbers or numeric data to achieve the objectives of the topic. Quantitative research is used to identify patterns and trends, make predictions and test relationships. In addition, the results obtained from the quantitative research can be generalized to similar studies, which cannot be done with the use of qualitative methodology (Denzin & Lincoln, 2018).

Generally, the method can be adopted to study relationships among variables (Creswell, 2014). Mishra and Alok (2022) relate the study with variables that can be counted or expressed according to quantity. Variables within this research approach can be observed through statistics, mathematical manipulations or computer-aided software (Saunders et al., 2019). Data collection methods associated with quantitative research include but are not limited to surveys and closed-ended questionnaires. Quantitative research results can be analysed through graphs, percentages, charts and statistics. The results can provide answers to the question 'how often' and 'how many' (Akhtar, 2016)

### **3.4.3 Qualitative Research Approach**

Qualitative research is a type of research that seeks to understand complex phenomena through the collection and analysis of non-numerical data (Saunders, et al., 2019). According to Denzin & Lincoln (2018), this type of data includes things like interviews, focus groups, observations, and content. The Quantitative research approach explores and understands the variables aligned with socially related topics (Creswell, 2014). The qualitative research method extracts factual descriptions and informs readers about the topic.

Qualitative research offers a better understanding of the participants, study setting and contextual theories. This approach is usually descriptive and aims for in-depth analysis of the subject (Flick, 2014). Qualitative research examines the issue and defines the meaning of the unravelling solution. As a result, qualitative research is highly likely to use open-ended questions and in-depth interviews/focus groups (Creswell, 2014).

This study has adopted the qualitative research approach to achieve the SFM research objectives. The study aims to generate a new perspective on sustainable facilities management practices. SFM is still a developing practice (Okoro, 2023); therefore, the research depends on an in-depth analysis of the situation instead of a statistical analysis.

### **3.5 Research Strategy**

Research strategy enables a researcher to select the correct research tools to solve the problem, answer research questions, and obtain the objectives (Saunders et al.,

2019). It serves as a guide for the execution of the study. It forms part of planning data collection methods such as surveys, questionnaires, experimental approaches, and interviews. Various research strategies can be employed to carry out an investigation. Below are the research strategies considered before selecting the current study strategy.

### **3.5.1 Experiment**

The experiment examines variables to discover correlations and study causal links. The experimental approach involves the manipulation of variables to investigate the effects of change. The researcher investigates by providing a specific treatment to one variable group and then assesses the influence on the other (Creswell, 2014).

This type of research strategy occurs in the laboratory and on study sites referred to as field experiments. The experiment strategy usually adopts a quantitative research approach. Saunders et al. (2019) state that this strategy is not feasible for business management studies with sensitive variables that cannot be easily manipulated for ethical reasons. There are no limits to the number of experiments or study population.

### **3.5.2 Survey**

This research strategy enables the researcher to attain data using questionnaires and interviews. Surveys allow synchronized variables to be investigated at the same time. Surveys can be used with all research approaches; however, they are difficult to achieve in-depth insights. Depending on the subject topic, survey questions may be open-ended, closed or mixed. Structured Interviews may be used to answer survey questions (Saunders et al., 2019).

Survey questions have a tendency to describe the events to generalize from a sample or predict the outcomes. Survey research provides attitudes and measures knowledge, constructs, practices or behaviours, and population perceptions in a quantitative or numeric description (Creswell, 2014). A survey research strategy may be used to suggest probabilities within variables. Findings may be used to develop models of relationships amongst variables. The researcher is to ensure the study sample represents a significant population.

### **3.5.3 Grounded theory**

Grounded theory is a research strategy that arises from sociology science. The researcher uses it to derive a hypothesis from a theory of a process, action, or interaction of participants. These theory/theories have been developed from a set of historical data (Denzin & Lincoln, 2018). This includes studying shared patterns of action, common beliefs, and principles. Grounded theory refers to the technique of data in stages to refine and identify interrelationships.

Grounded theory is used to derive a theoretical interpretation of social interaction and processes of various contexts. The purpose of grounded theory is to explain, analyse, and interpret the constructs from social actors and make sense of experiences in specific situations (Saunders et al., 2019). Grounded theory is comparative and relies on simultaneous data collection and analysis. In the end, grounded theory contains strategies for constructing, examining, and strengthening the original analysis (Denzin & Lincoln, 2018).

### **3.5.4 Case study**

Case studies aim to understand a complex phenomenon by using multiple sources (Saunders et al., 2019). Case studies present variables of a specific organisation that exist in reality. The researcher has no control over variables and cannot be manipulated (Alfalah & Zayed, 2020). The participant of a case study shares personal experiences. This strategy is adopted to investigate a single case; therefore, it is not possible to generalize the results to other similar populations.

Case studies may adopt data collection techniques such as focus groups, open interviews, questionnaires, observation, and records analysis. As a result, this strategy offers an in-depth understanding of the study topic. Several factors, such as program, event, activity, process, or one or more individuals, may be analysed in relation to the study site. The disadvantage of this strategy is that findings are confined to one case study. The current study follows a case study strategy in order to review the case of SFM in eThekwini systematically

### **3.6 Research Methodology for This Study**

The current study applied an exploratory design, using interpretivism to approach the research. The researcher chose a case study strategy because it attends to detailed contextual analysis relationships among variables and a limited number of conditions. This study aimed to explore a detailed contextual analysis of sustainability in facilities management in eThekweni Municipality using a qualitative research approach. The study will answer the following research questions:

- What are the current SFM practices in eThekweni Municipality?
- Which factors are the key drivers of SFM practices within eThekweni Municipality?
- How are the potential benefits of SFM practices identifiable at the eThekweni Municipality?
- What are the existing barriers to SFM practices in eThekweni Municipality?
- What is the proposed SFM framework for local municipalities such as eThekweni?

### **3.7 Sampling Method**

Sampling is the method used to represent the entire target population with a small portion (Ntibane, 2018). In most cases, it is impossible to include every member of the target population, requiring the researcher to select sample participants carefully. Factors such as time and budget constraints encourage the adoption of the sampling technique (Saunders et al., 2019). The researcher's knowledge about the topic plays a role in the sampling method (Creswell & Creswell, 2018).

Sampling enables the researcher to reduce the size of information that needs to be collected by considering data from subgroups instead of the entire target population or case. Sampling strategy is vital for the success of the research, and sample size influences the quality of data collected (Saunders et al., 2019). Sampling can be accomplished using various strategies categorized into two main types: probability and non-probability procedures. Discussion on the target population and sample size follows.

### 3.7.1 Study Population

The study population is the target of the research inquiry, and the target population is a group of participants having similar characteristics required to participate in specific research (Saunders et al., 2019). The study follows an example by Saunders et al. (2019), therefore, the total population is employees of eThekweni municipality who work within a facility. The target population are the employees who contribute to managing assets and facilities. These individuals have the characteristics that strengthen the credibility of research (Denzin & Lincoln, 2018).

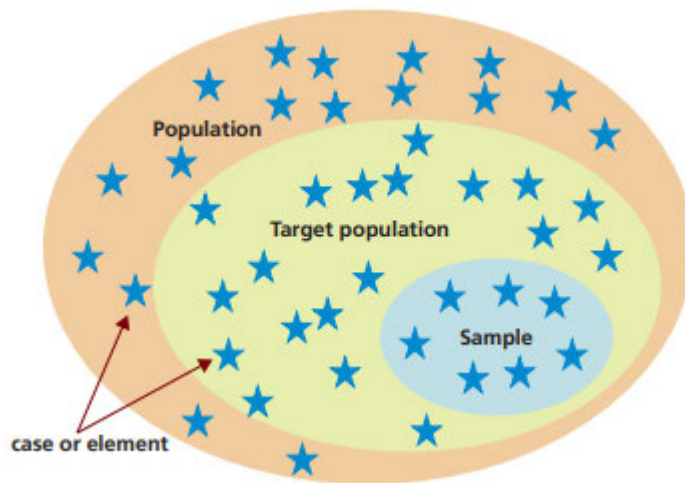


Figure 1: Population, target population, sample and individual cases (Saunders et al., 2019, p. 296)

The study's target population are selected from eThekweni Municipality employees. The target population has facilities management knowledge from a business management perspective, technical design and procurement aspects.

### 3.7.2 Probability Sampling

Probability sampling is a methodical approach to picking members or elements, where the likelihood of selection is predetermined and can be calculated (Saunders et al., 2019). Research questions and objectives are used as a guide in identifying the target population. Participants from the target population are given equal opportunity to be selected. Various techniques are found within probability sampling: simple, stratified,

cluster, and systematic (Creswell, 2014). The researcher is to ensure that the sample represents the target population.

### **3.7.3 Non-Probability Sampling**

In non-probability sampling, the possibility of selecting specific members or elements is indeterminate (Creswell & Creswell, 2018). Therefore, not everyone from the target population is allowed to participate in the study. Participants are selected based on convenience and preparedness. Characteristics of the population members be known before selection (Saunders et al., 2019).

This research utilised non-probability sampling to involve a reduced sample size. Denzin and Lincoln (2018) delineate the various strategies within the non-probability sampling technique. Convenience sampling is a technique in which the sample is chosen based on its ease of availability. Quota sampling involves the selection of a sample from a predetermined group, where the proportions of the sample represent the known characteristics of the full population.

Snowball sampling is a method in which interconnected individuals are sourced, and the sampling process expands in a manner akin to the growth of a snowball. The concept of maximum variation refers to the deliberate selection of diverse and heterogeneous elements within a sample or population. It is a method used to determine the necessary categories depending on the research topic and select subjects or elements that exhibit the widest possible range of variances within the studied phenomena (Denzin & Lincoln, 2018).

Judgmental sampling refers to the practice of researchers using their subjective judgment while selecting individuals to be included in a sample. This means selecting participants who will answer research questions and achieve objectives. This sampling technique, purposive sampling, is widely used in case study research. The judgmental sampling technique has been adopted for this research due to its benefit of selecting an informative sample amongst the target population (Saunders et al., 2019).

### **3.7.4 Sample size**

According to Saunders et al. (2019), non-probability sampling techniques have no definite rules concerning sample size. The selection technique relies on the purpose

and focus of the research. These are the research objectives and research questions. Therefore, the sample size is a matter of judgmental purposive procedures influenced by the target population, error margin, and analyses (Saunders et al., 2019).

The characteristics of the target population such as job description, office location, and position were considered. The study uses judgmental sampling to guarantee the representation of individuals. The eThekweni does not contain a stand-alone Facilities management department; therefore, the total number of the target population is unknown. The researcher adopted the sample size used by most researchers in qualitative studies. The sample size represents critical components of the FM in accordance with the purpose of the study. The researcher selected a total number of 17 participants and reached saturation of data with 12 interviews.

### **3.8 Data collection**

Data refers to raw facts collected for the research. This study uses primary data collection techniques and secondary data to meet the research objectives. Primary data refers to new data. Secondary data is information related to the previously collected topic (Saunders et al., 2019). Secondary data were in the form of data-based documents, statistics, and government publications. According to Denzin and Lincoln (2018), primary data can be collected in the form of surveys, questionnaires, interviews, observations, and focus groups.

#### **3.8.1 Collection Instruments**

Data collection instruments are used to collect primary data, they can be in the form of surveys, questionnaires, and interviews (Creswell, 2014). Surveys are used in the quantitative research approaches. Surveys usually consist of close-ended questions, and they are used in social research to gather information about a situation (Saunders, et al., 2019). Questionnaires are open-ended and close-ended questions, which are handed to participants to seek experiences pertaining to a specific topic. Questionnaires utilise a form to obtain responses (Creswell & Creswell, 2018). Interviews involve a conversation between two or more people. Interviews may be structured, unstructured or semi-structured (Denzin & Lincoln, 2018).

This study adopted semi-structured interviews to gain in-depth knowledge of facilities management and answer research questions. Interviews are used in a qualitative research approach to offer highly reliable historical information and comprehensive data gathering. Interviews may be performed via face-to-face, telephone, online and focus groups. For this study, Interviews were conducted face-to-face and using the Microsoft Teams online platform.

### **3.8.2 Data Preparation**

Semi-structured interviews were used to collect data with the guidance of an interview schedule. Participants were telephonically contacted for a brief recruitment to the study. A request to participate in the study accompanied by a consent letter, abstract and ethics letter sent to the selected sample via mail. The researcher used an acceptance of the request to participate in engaging with the participants concerning setting appointments for the interviews. The researcher scheduled interviews on the Outlook calendar for automatic reminders to the participants.

The interviews were not time-limited due to the research objective; the researcher encouraged participants to answer questions without time constraints. In search of clarity, additional questions were formulated depending on the responses of the participants. As permitted by the participant, the researcher recorded the interviews. The recording allowed for accurate data transcribes and analysis.

Due to the nature of the eThekweni work environment, the organisation strives for uniformity of standard operating procedures. Saturation was reached at approximately 12 interviews. All participant information is omitted from this report as all responses are treated as confidential.

### **3.9 Data analysis**

Data analysis is the process of interpreting, summarizing, and sorting the collected information in a way that identifies themes, correlations, trends, or patterns. Qualitative data is a piece of non-standardised information with meanings that are expressed in words (Saunders, et al., 2019). According to Saunders et al. (2019), qualitative data analysis requires the researcher to conduct conceptualization and creation of a conceptual framework.

The conceptual framework aims to link key concepts and variables (Wang, et al., 2020). As a result, the data collected have been scrutinized for validity and reliability through categorization, comparison and contextual description (Creswell & Creswell, 2018). Qualitative research consists of various methods of data analysis which offer a contextual interpretation of phenomena (Denzin & Lincoln, 2018). The researcher transmits the social reality in relation to understanding the subjective meaning of findings.

Presentation of findings in qualitative research depends on the ability of a researcher to engage rigorously with the information obtained. The study adopted thematic analysis, which identifies themes within the data collected (Creswell, 2014). Themes refer to the categorization of the contextual meaning of answers gathered (Blaikie, 2018). A theme presents the underlying issue covered in a response of the participants (Saunders, et al., 2019).

The thematic analysis method describes the significance of the study, answers the research objectives, and interprets raw data from various sources to gain valuable insights for the organisation. Thematic analysis examines components of the research to bring understanding and connection to the study. The significance of thematic analysis in the translation of participants' perceptions becomes evident in the discussion section of the report (Saunders, et al., 2019).

Saunders, et al., (2019) suggest that research analysis can be either a deductive or an inductive approach. A deductive approach uses an existing theory to analyse and process the research data (Blaikie, 2018). An inductive approach enables the building of concepts from the data into themes and patterns (Creswell & Creswell, 2018). Consequently, the two approaches can be used simultaneously to best achieve the purpose of the study (Saunders, et al., 2019).

An inductive approach analysis induces the researcher to work back and forth until the establishment of themes (Creswell & Creswell, 2018). Denzin & Lincoln, (2018) describe the process as an engagement between the researcher and the transcripts. The researcher seeks an understanding of the study setting and various participants' views of sustainable FM. The study used an inductive approach analysis to explore conceptual structures and to make sense of data.

The researcher thoroughly examined the transcripts to identify codes and assign themes. The researcher used computerized software to create codes. The created codes were exported to a Microsoft Excel sheet. From the spreadsheet, a clear and organized grouping of themes was achieved by utilizing varying coloured markers to distinguish between different themes. The researcher utilised NVivo software to categorize established themes for data analysis and presentation. After the analysis was complete, the researcher was able to draw conclusions based on the identified themes. The method delivered the interpretation of data and report findings accordingly, the following chapter explains step by step the outline of the analysis.

### **3.10 Validity and Reliability**

Establishing the trustworthiness of qualitative research requires the crucial consideration of reliability and validity criteria (Denzin & Lincoln, 2018). This critical evaluation process is essential to ensure that the results of the study are accurate, unbiased, and applicable to real-world situations. Wilson & Sharples (2015) define the concept of validity as “whether something measures what it claims to measure” (Wilson & Sharples, 2015, p. 26). Validity is a degree of measure that can be employed by a researcher to evaluate whether the answers received apply to the objective of the study.

Creswell & Creswell (2018) explain validity in qualitative as a procedure performed by the researcher to determine the accuracy of the answers for credibility. Therefore, the researcher needs to employ a validity procedure to confirm the results and provide reliable findings for assessment, for future research and decision-making. Reliability refers to the measure of adaptability when applied to similar situations.

The degree of consistency and replicability in data collection and analysis ensures reliable findings that can be trusted by other researchers (Saunders, et al., 2019). Reliability is a special sort of generalizability which specifies how usable is the method to other domains (Wilson & Sharples, 2015). A distinct research design and methodology were employed to enhance the reliability of this study.

The researcher invested extensive time in the field to gather supportive information and enhance the reliability of the interview data. The researcher also analyzed

documentary evidence, such as IDP, SOP, and Policies, to gain a comprehensive understanding of the current SFM practices and their benefits. As a result, the researcher is able to provide detailed insights into the site and participants. As the researcher gains more experience with the participants and the setting, the findings become increasingly accurate and valid (Creswell & Creswell, 2018).

### **3.11 Elimination of Bias**

Bias refers to exhibiting partiality or prejudice towards a particular thing, person or group over others, often in an unjust manner (Hammersley, 2021). To maintain impartiality throughout the study, the researcher refrained from using stereotypical language and used gender-neutral expressions. Moreover, no form of racism was tolerated, and only the English language was used. The study refrained from making any assumptions about individuals or specific age groups. All data collected from the participants was reported precisely as it was provided, without any manipulation of the results. This ensured that facts were analyzed instead of subjective perceptions.

### **3.12 Data storage**

Data storage is the process of organizing and preserving digital information in a structured manner (Creswell & Creswell, 2018). In this study, physical copies of notes were scanned and kept in a locked filing cabinet accessible only to the researcher and authorized personnel from UKZN. Soft copies were saved on OneDrive, password-protected, and shared only with authorized personnel. Raw data will be kept for a minimum of five years, after which hard copies will be shredded using an office shredder, and digital data will be destroyed by deletion.

### **3.13 Ethical Considerations**

Ethical considerations in research encompass principles and guidelines to ensure ethical conduct (Creswell & Creswell, 2018). Ethical considerations involve principles and guidelines that ensure ethical conduct, and protection of all parties involved. Adhering to ethical standards improves research integrity, credibility, and trust. This endorses professionalism and ethical principles in every component (deKlerk, et al., 2023). The ethical approval process for this study has been acquired in accordance with the guidelines provided by the Ethics Committee at the University of KwaZulu-

Natal (HSSREC). This ensures that all ethical considerations are reviewed and addressed. As part of compliance or pre-requisite from HSSREC, an informed consent form was utilised.

The participants in this study were completely informed about the objectives of the study. The researcher consulted with participants before the interviews to seek informed consent. The participants were given adequate time to consider contributing to the research. Before the interview, the researcher emailed a consent form with a summary of the topic to the participant. Participants were informed that participation was voluntary and could be withdrawn at any stage of the study.

Confidentiality of responses was maintained to protect the humanity and dignity of participants. Responses were presented anonymously; the rights of the participants were not violated. The researcher explained technical information within the SFM topic to better offer understanding to non-technical participants. Furthermore, the researcher obtained a gatekeeper's letter from the eThekweni municipality management. The gatekeeper's protocol further elaborated on the purpose of the study and utilization of findings. The study complied with all protocols in place.

### **3.14 Chapter Summary**

The chapter covered the research methodology which explained different research designs, strategies, data collection tools, sampling strategies and data analysis. The case study of eThekweni Municipality uses exploratory design and interpretivism paradigms to construct and generate meaning. The study applied qualitative research methods to generate a new perspective on sustainable facilities management through in-depth Interviews. The study utilizes a non-probability sampling technique. The total population consists of eThekweni Municipality employees selected through a judgemental sampling method. The study adopted thematic analysis and the findings were categorized into themes and sub-themes.

## CHAPTER 4

### 4 QUALITATIVE DATA ANALYSIS

#### 4.1 Introduction

Qualitative data analysis is the process of configuring meaning into the data obtained (Saunders, et al., 2019). The preceding chapter covered the research methodology which explained the research design, strategy, data collection tools, sampling strategy and data analysis. This chapter outlines the information gathered from the respondents, eThekweni municipality employees. The chapter later presents the analysis and discussion.

The study adopted thematic content analysis which analyses the information according to themes and subthemes. There are various ways to identify and conceptualise themes (Blaikie, 2018). The following section describes the approach used to simultaneously present data, analyse the data, coding of data and theme identification.

#### 4.2 Data Analysis Process

Qualitative data analysis in a research paper involves systematically organizing, interpreting, and making sense of non-numerical data (Flick, 2014). Qualitative data analysis refers to a systematic and thorough examination of data that involves categorizing, describing, and drawing connections between the collected data and the researcher's conceptual framework (Graue, 2015). Unlike quantitative research, which deals with numerical data, qualitative research focuses on the richness and depth of information obtained through methods like interviews, focus groups, observations, and open-ended surveys (Creswell & Creswell, 2018).

Data analysis provides conceptions to answer research questions (Wilson & Sharples, 2015). The researcher utilized self-memos as a means of documenting any thoughts or ideas that emerged in relation to the study. This approach provides a practical way to maintain a record of valuable insights and observations that may potentially contribute to the success of the research. The following subsections present steps were followed in the qualitative data analysis of this study

## 4.2.1 Background of the participants

Table 1: Profile of the participants

Participant Code	Gender	Experience in FM	Qualification Level	Task Grade
P1	Male	15 Years	Bachelors	14
P2	Female	12 Years	Honours	15
P3	Male	4 Years	Honours	14
P4	Female	8 Years	Masters	16
P5	Female	15 Years	Honours	14
P6	Female	9 Years	Masters	16
P7	Female	20 Years	Masters	17
P8	Male	12 Years	Masters	14
P9	Male	20 Years	Masters	17
P10	Male	13 Years	Masters	16
P11	Female	22 Years	Honours	17
P12	Female	9 Years	Masters	12

- Age of participants: 21-30 =1; 31-40 =5; 41-50 =3; 51-63 =3

A total number of 12 municipal employees were formally interviewed for the study. Demographical information was not used for data analysis however demographical information was collected for the benefit of the readers and future research. Obtaining an understanding of the backgrounds of study participants gives the reader an insight into the research outcomes (Denzin & Lincoln, 2018). Participants were required to have exposure to the relevant FM elements.

Task grades represent work positions or levels, T16-T17 represent senior and executive management, T14-T15 represent management and lastly senior technical T12-T13. Participants were selected based on significant contributions to the elements of FM that are deemed critical to the sustainability of office buildings. The executives including one management staff interviewed are part of the Technical Infrastructure Management Committee which is part of the Strategic Asset Management Plan

(SAMP). SAMP is a subsection covering all infrastructure matters in the IDP. The qualifications and work backgrounds of the participants include architects, engineers, technologists, asset management, finance management, and strategic project executives.

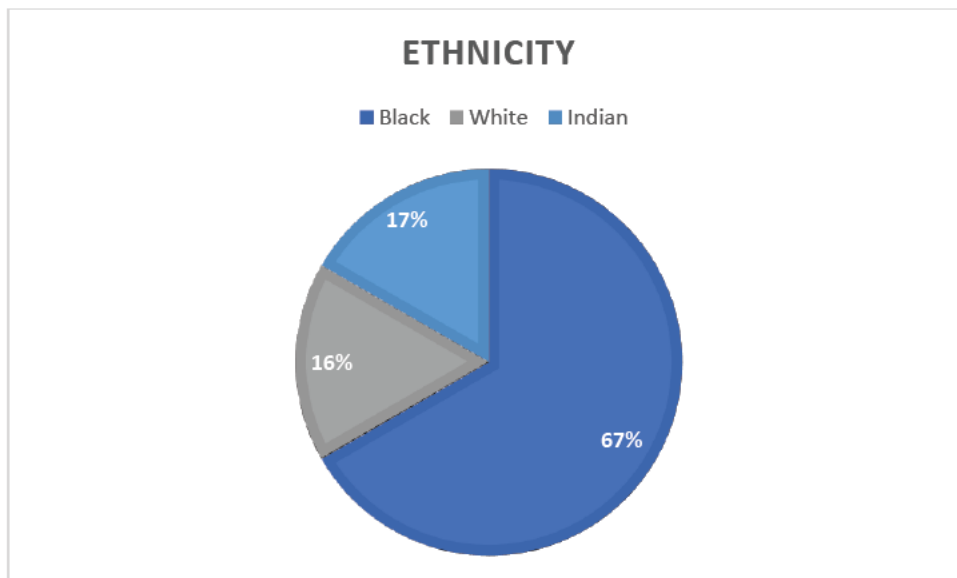


Figure 2: Ethnicity of participants

The figure above presents the race of the participants in percentages. The researcher used a collective representation of demographical information to preserve the confidentiality of the participants.

#### 4.2.2 Response rate

The response to participation was fourteen participants out of seventeen, however, saturation was reached with twelve participants. Factors that influenced the response rate include privacy concerns, the festive season and tight work schedule. Issues of awareness played a role, some members of the selected sample expressed that the topic was irrelevant or insignificant to the pertinent department personnel.

#### 4.2.3 Preparation of the data

The data analysis process for this study began simultaneously with the data collection process. As previously discussed in Chapter 3, the study collected data through in-

depth interviews. The researcher audio-recorded the interviews as a strategy to perform a thorough analysis of the data (Denzin & Lincoln, 2018). Audio recording afforded the researcher accurate transcribing and an opportunity to reflect on the meaning of words. The researcher analysed the tone and general ideas of participants. The following step from transcribing was data reduction or cleaning the data.

Unlike quantitative data analysis, qualitative data analysis may involve the process called “winnowing of data” (Creswell & Creswell, 2018). Winnowing refers to the method of selectively concentrating on specific portions of data while disregarding the remaining parts. This process enables the researcher to focus on relevant information and extract insights that are critical to the objectives of the study (Creswell, 2014). The current study collected rich and technical knowledge during the interview process. As a result, the researcher applied the winnowing process as a measure to clean the data.

#### **4.2.4 Generating codes**

Coding is the systematic process of sorting and categorizing data by enclosing specific sections within brackets and assigning descriptive labels to the categories (Graue, 2015). This method of organizing data allows for efficient retrieval of information and is used for data analysis (Adom, et al., 2018). The proper application of coding techniques ensures accurate and consistent data interpretation and analysis, which is essential for making informed decisions (Denzin & Lincoln, 2018).

The coding process allows for new interpretations of large amounts of information (Flick, 2014). Maintaining a neutral tone during coding is crucial to eliminate biased findings (Denzin & Lincoln, 2018). The researcher maintained a neutral tone, coding according to the responses of the participants while coding the keywords. Transcribing and reviewing data comprehensively is crucial for precise analysis and dependable results (Creswell & Creswell, 2018).

All interviews were transcribed into a Word document. In this study, the coding process began with reading transcript line-by-line coding. The researcher used the Microsoft word “bold” function and a colour green highlighter to mark the substantial wordings in a sentence for each script (figure 2). The image below is an example of the first step

taken. The coding process is the initial step that leads to the identification of research themes to answer the research questions.

How do you address sustainability?

**P1**

For infrastructure, **there isn't much** at the moment when it comes to the Sustainability of energy or water. We **are dependent on a service provider** or implementing **departments like architecture** for electrical or mechanical, energy rules. we are dependent on them to **advise**. we've requested an electrical **assessment on all our buildings** so that **we know where we stand**, for **compliance and improvement** in terms of **energy-efficient lighting**.

There are new light bulbs or fittings that save energy.

*Figure 3: Example of the highlighted substantial wording, Source: author's interview transcript*

Braun and Clarke's approach to data analysis comprises six steps, the first one begins with familiarization of the data and the last is producing the report (Byrne, 2022). The process of generating codes demands precision, discernment, and attention to detail (Creswell, 2014). The researcher re-visited the transcripts and audio recording paying attention to the tone of the responses. Paying attention to details strengthens the reliability and validity of themes (Roulston, 2014). The following sections present the theme-generating process.

### **4.3 Generating Themes**

Developing themes entails the organization of codes into relevant topics and gathering essential data (Dubihlela & Solomon, 2023). The following process follows Braun and Clarke's thematic analysis step 2 which is generating codes, followed by step 3, of generating initial themes (Byrne, 2022). Themes respond to the research questions and aid the researcher achieve the objective of the study.

#### **4.3.1 Open Coding**

Open coding enables researchers to develop a deeper understanding of complex phenomena and draw robust conclusions based on empirical evidence (Flick, 2014). Coding helps in separating data into categories or themes. The process of open coding is geared towards the identification of diverse concepts within a given dataset

(Creswell & Creswell, 2018). The open coding technique aims at generating relative concepts to easily organize and compare data (Saunders, et al., 2019).

In this process, the researcher identified categories by breaking down raw data into distinct groupings. The researcher categorised the bold and green-marked keywords by uploading all transcripts into NVivo software. NVivo is computerised software used to analyse data in various forms (Saunders, et al., 2019). In the software program, the researcher created codes by coding insightful information word line-by-line for each transcript. The below figure presents the thirty (30), most frequent words used according to the interview transcripts.



Figure 4: Frequently used word cloud, source: Author's extract from NVivo

The word cloud is a visual representation of raw data to provide a broad overview of the SFM topic. The researcher acknowledges the word cloud as aligned with the study and rationalises the presentation as follows;

“**Sustainability** is the core topic of this study. **property**, *eThekwini Municipality*, **Facilities**, is the setting, the study site. **Practices**, **changes**, **initiatives**, and **conditions**, describe efforts towards sustainability. **Management**, **actions**, **processes**, **structures**, **Systems**, **administration**, describe processes that contribute to sustainability. **Electricity**, **community**, **Mechanical**, **projects**, and **components**, are the factors that drive the sustainability of facilities. **issues**, **implementing**, **knowledge**, **client**, **thinking**, **information**, **challenges**, are the concepts that emerged in discussing barriers.”



The next task involves categorizing the codes into groups to develop initial themes (Byrne, 2022). the following research questions guided the data collection from the participants during the interviews.

- RQ1 What are the current SFM practices in eThekweni Municipality?
- RQ2 Which factors are the key drivers of SFM practices within eThekweni Municipality?
- RQ3 How are the potential benefits of SFM practices identifiable at the eThekweni Municipality?
- RQ4 What are the existing barriers to SFM practices in eThekweni Municipality?
- RQ5 What is the proposed SFM framework for local municipalities such as eThekweni?

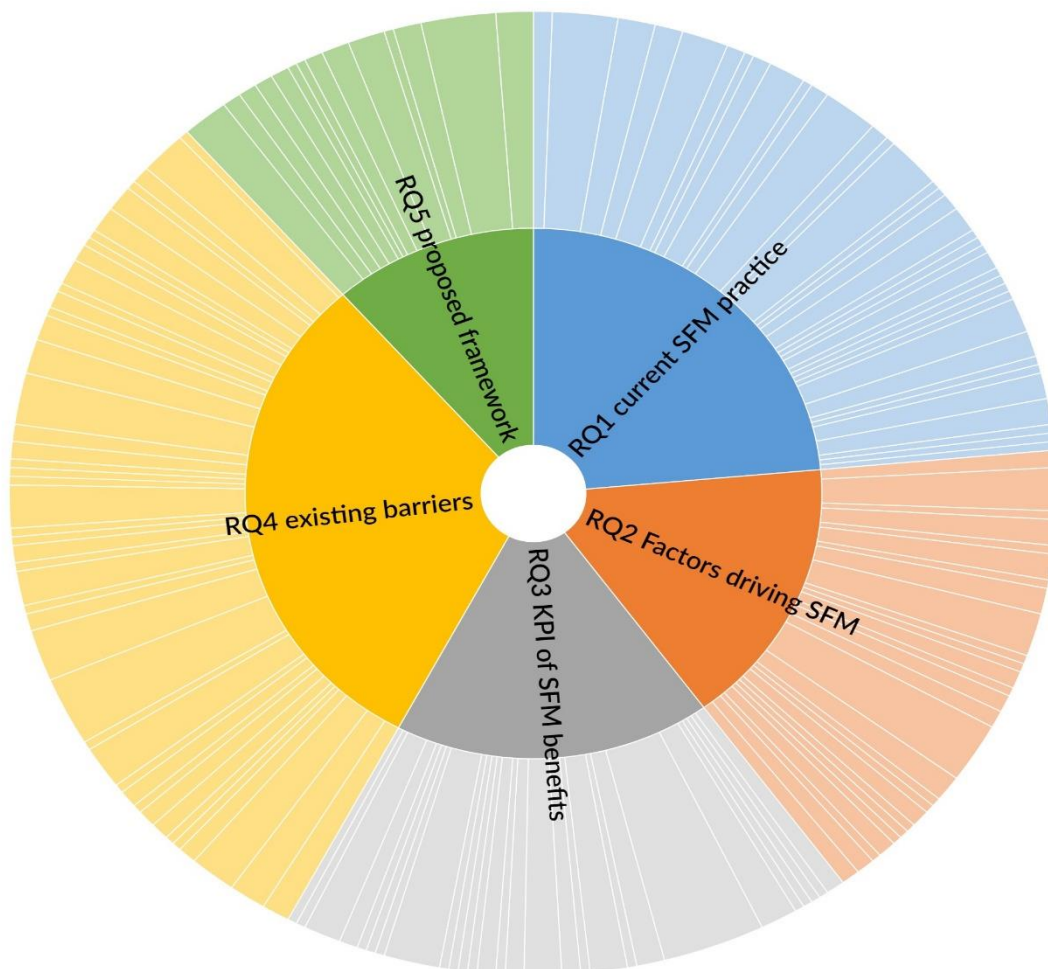


Figure 6: Codes generated per research question, Source: Author's extract from NVivo.

The researcher used themes to address the objectives of the study and answer the research questions in the process. The researcher grouped codes that answered a specific research question and categorized codes into initial themes. The figure above is a pie chart that represents the compared number of codes generated per research question, extracted from NVivo software.

The comparison of codes assigned to research questions gives an overview of the data analysis in terms of data distribution. The researcher categorised themes outside of NVivo to physically examine the links and relationships. Unlike open coding, axial coding uses contextual analysis of the raw data (Saunders, et al., 2019). The researcher makes connections of codes to form broad categories. The categorised codes are referred to as initial themes.

### **4.3.3 Initial themes**

The researcher grouped the responses from the participants according to the research question being addressed. Although the coding was open in the beginning. Codes were grouped according to the research questions. Initial themes have been identified following a similar pattern. The researcher achieved the grouping of codes through NVivo software.

The researcher used tables to visualize the compared quantity of codes contained by an initial theme. The bigger the size of a block the bigger the number of codes in that category. The researcher uses a table to present the initial themes. The researcher uses quotations from the transcript to support the themes and conduct the analysis. The overview of the initial coding is presented in the figure below.

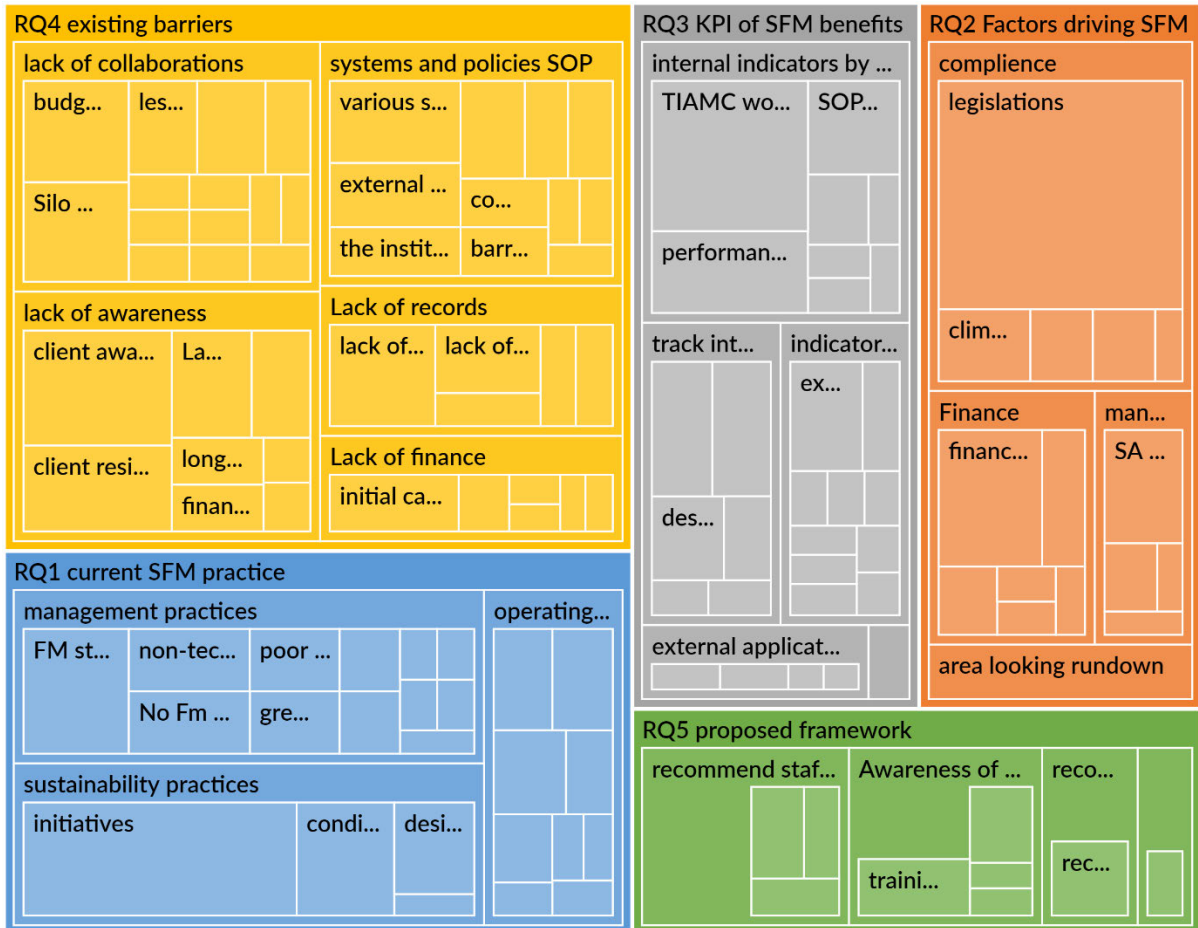


Figure 7: Initial themes Overview, Source: Authors NVivo extract.

#### 4.4 Objective-Oriented Findings

The researcher studied the relationships among the codes contained in each theme and sub-theme. The researcher constructed themes based on the meaningfulness of the data in answering the research question. This falls under phase three; theme generating of Braun and Clarke’s steps of the data analytical process (Byrne, 2022). The following sub-sections present themes according to the objective of the study.

##### 4.4.1 Current SFM Practices

The first objective of the study *is to evaluate the current SFM practices in eThekweni Municipality*. The following justifies the initial themes and sub-themes that emerged. Evaluating the current Sustainability practices of facility management involves questioning the status quo, fundamental practices and management practices

Table 2: SFM practice Initial themes

Themes and Subthemes	
Sustainability practices	Fundamental practices
	Emerging initiatives
Management practices	Operational procedure
	Strategy Committee
	Contingency strategy

In response to the fundamental practices of infrastructure, the following views were expressed:

*“from university studies, we are taught to design for the environment, our design approach is linear buildings e.g. cross ventilation to make sure that we designed for the climate, to verandas to make sure that people have those spaces outside that are shaded. rainwater collection trying to make sure that the rainwater that we collect can be reused in some other way in a building for watering plants or flushing toilets” Participant 6.*

*“Passive architecture was far more windows, natural lighting and ventilation. I mean, all architects are trained to do that” Participant 7*

*“...well-ventilated using high ceiling and natural lighting. you don't have to rely on mechanical ventilation but have mechanical ventilation as a backup” Participant 1, Participant 4*

According to the professionals of the built environment, infrastructures are designed and built for sustainability. Nevertheless, there are work environment spaces that are misaligned with sustainability measures such as passive architecture.

*“Reusing or repurposing some old building, which has a score of brownfields development rather than greenfield development, existing building reap the essence of sustainability” Participant 7*

According to the participant, city buildings are disadvantaged in sustainability practices due to the repurposing of buildings. A building must suit the needs of the users and accommodate change. People's needs change, and the expectations change. In response, there are emerging practices that the professionals have implemented to promote the sustainability of the work environment.

*“Currently replacing old bulbs with bulbs that are less consuming to power or electricity” Participant 12.*

*“Use appliances that use less energy, energy-efficient appliances” Participant 2.*

*“Benchmark the equipment that we are installing against current equipment internally” Participant 3.*

*“Energy efficiency has become a major requirement on new projects. It is now being applied in the specification of most mechanical equipment” Participant 8.*

*“We are dependent on implementing departments like architecture for electrical or mechanical, energy efficiency” Participant 1.*

Using energy-efficient appliances is an emerging initiative that is made by the internal built and environment staff to pursue sustainability. followed by the descriptions of operational procedures that promote sustainability. The various factions of facility management services are centralized. Services are placed in the capable hands of qualified disciples. Building offices rely on the Department of Architecture for all building services, including sustainability measures.

The eThekweni Municipality is without an accountable FM department, there are no standardised FM practices. Nevertheless, there are strategic measures that the city is working on to ensure sustainable facilities management. The municipality has an energy office department that consolidates reports to the city’s Chief Strategy office. The Chief strategy office is working strategically on the city’s infrastructure such as roads, stormwater and sanitation, buildings and electricity.

*“City managers have appointed an Energy Efficiency transition committee led by the Chief Strategy office” Participant 2*

*“... developing the asset management policy and operational projects. meeting asset management staff about putting in the asset performance management system and project management systems, in terms of facilities we have to develop the facility management strategy and standard operating procedures for the various facilities” Participant 9*

*“...workshop about identifying the city's strategic priorities and resultant spatial, economic and infrastructure plans. putting together matrices, showing all challenges,*

*the weaknesses, strengths, baseline issues, and critical issues that will prevent the implementation of infrastructure strategies” Participant 7*

*“The Old Fort complex has appointed a pilot project facilities management contract for facilities management services, the full scope of this contract includes the technical and non-technical services and business support part of the facilities management” Participant 5.*

The above quotes demonstrate that the city is aware of challenges and sustainability measures pertaining to the facilities. The management has taken action to improve the status quo as discovered. The city has capable departments to endorse sustainability practices however other systems affect the success of the management of facilities. The management of facilities is with various departmental branches in the city.

*“We don't have solar systems, for power backup we use a generator for the continuity of electricity equipment, water harvesting, it is encouraged. But we don't do it. we have the tank directly connected to the water mains, which is the municipal supply, and it stores water to last at least a week so that if maybe there's a water shortage in the area.” Participant 1*

*“...use generators for computers and services” Participant 4.*

The current practices uncovered poor practices that sabotage sustainability measures. For business continuity, the municipal uses generators and stores municipal supply water in water tanks instead of rainwater harvesting.

#### **4.4.1.1 Summary**

The current SFM practice that emerged includes repurposing buildings, replacing old components with sustainability consciousness, and procuring external pilot FM to assist incorporation of FM. The city offices run without sustainability measures such as rainwater harvesting, renewable energy, and waste management. The maintenance of the city is reactive, not proactive. The city relies on one department for the upkeep of facilities which offers inadequate SFM connections. The city has set up the energy efficiency committee and the technical infrastructure management committee to advance the SFM practices.

#### 4.4.2 SFM Driving Factors

The current practices take us into identifying ***which factors are the key drivers of SFM practices in eThekweni Municipality***. The dominating code under this research question was “people.” sustainability is all about people and their needs. Participants stated their experiences and opinions as follows.

*“People are just running off to the unions to complain about the building if the toilet breaks or there are no lights for a day” Participant 11.*

*“The staff, the community, and stakeholders are complaining about the deterioration of buildings” Participant 1.*

*“We need to give the administration component of service delivery right tools and the offices of the building are the tools,” Participant 9.*

The main purpose of a local Municipality is to meet the needs of the people, and service delivery. The municipal staff knows about their rights when it comes to the office facilities. In cases where the facility has faults, the staff involve union representatives to enforce a well-managed facility. This act drives the city to ensure that the facilities are taken care of in terms of sustainability measures such as cleaning and security. The main goal is service delivery to the public, the office building serves as a tool for the administration of service delivery.

*“Compliance with our IPP (individual performance plan), we do have sustainability as a key measure” Participant 3.*

*“There are laws, policies, and guidelines that the building needs to comply with” Participant P1.*

*“Sustainable conscious SOP which encourages condition assessment by internal staff. Condition assessment and price estimates before outsourcing the work.” Participant 12*

Professionals have institutional agreements that they need to adhere to as professionals. These are professional councils that endorse individual practices. As a result, a registered professional ensures that the building complies with professional standards. Standard operating procedures set by various disciplines promote economic and environmental sustainability. The individual performance plan (IPP) of the built

environment staff consists of sustainability practices as key performance indicators. Following compliance is the national challenge that affects South Africa and is driving sustainability practices.

*“Those elements include energy security, to reducing our consumption as a city. Power failures everywhere.” Participant 6*

*“Polycarbonate sheeting that allows for lights to come in the passageway in cases of load shedding, and a lot of big windows for light and ventilation.” Participant 4*

*“To overcome climate conditions in eThekweni area” Participant 2*

*“if you reduce the consumption of equipment in our buildings that has an effect on reducing the overall energy consumption in the world, which has a direct effect on pollution” Participant 3*

The conditions surrounding eThekweni contribute to the driving forces of sustainability measures. Participants emphasised the issue of electricity. The status of load shedding influences professionals to build energy consciousness. The weather conditions in the city have had a great impact, eThekweni experienced bad weather conditions in April 2022 floods, and Participant 2 works sustainably driven by the conditions of the climate. Weather conditions are a result of waste which is caused by pollution. As stated by Participant 3, the goal is to reduce energy consumption which will have a positive impact on world pollution. Participants stated that another driver of SFM is international agreements,

*“The international agreements that South Africa, the country is signed like your Montreal protocols, your Kyoto protocols where parts of Africa's committed to reduce the carbon footprint”. Participant 3*

The Kyoto Protocol is an agreement of the National Department of Energy which is currently adopted by the eThekweni Energy office. The agreements afforded eThekweni financial assistance for energy efficiency projects. Participants state that obtaining a budget for energy efficiency projects is not an easy task internally due to budget constraints.

*“We obtain funding from outside sources or stakeholders more than internal” Participant 2*

*“We've obtained funding, coming from the United Nations directly and they approached the city with the funding to implement these sustainability projects through these agreements” Participant 3*

Availability of funds drives the implementation of sustainable projects. The lack of financial provisions or limited funds in the city encourages sustainable practices to save on operational expenditures.

*“Barriers of SFM practices is limited finance provision from the client” Participant 4.*

*“The drivers of SFM practice is to save money for the municipality” Participant 12.*

Finances are drivers of sustainability practices in the city looking from a service delivery perspective. Participants 9 and 10 discussed the importance of effective management of public funds which involves managing assets. This encourages economic sustainability, both participants referenced the Municipal Finance Management Act (MFMA) while discussing the drivers of sustainable practices.

*“Municipal Finance Management Act, states that you are obliged to look after your properties” Participants 7.*

*“We need to effectively manage public funds to achieve the objective of service delivery” Participants 9.*

*“Asset management and budgeting is part of the MFMA framework” Participants 10.*

The professionals in the built environment perceive economic sustainability through evaluating components within their respective practices. They look for ways that offer greater financial sustainability such as routine maintenance. Routine maintenance is beneficial for financial sustainability and environmental sustainability.

*“We recommend centralized systems because they offer greater value in the long run in terms of maintenance operations” Participant 3*

*“The buyback period of those specific components must be taken into consideration” Participant 11.*

Professionals consider maintenance requirements of components and buyback periods in facilities. The knowledge about regular maintenance is available to the city professionals and it is part of the driving factor of SFM practices. The implementing department is responsible for implementing SFM upon an approved budget in the form of user requisition from the client (user/coordinator).

#### **4.4.2.1 Summary**

The key drivers highlighted by the participants include budget constraints, user complaints and international agreements. Compliance drives the city to implement

SFM practices in SOPs and KPIs. National regulations are the drivers of SFM through the execution of effective management of public funds and asset management. Routine maintenance being overlooked in the facilities acts as a driving force for SFM as well as electricity concerns such as limited supply, high consumption, and energy demand in facilities.

#### 4.4.3 Benefits of SFM Practices

The following theme was aimed **to explore the potential benefits of SFM practices for eThekweni Municipality and describe how are the benefits identifiable**. The management of the city has measures in place to track the SFM benefits such as workshops, performance plans of staff and the performance of the facility.

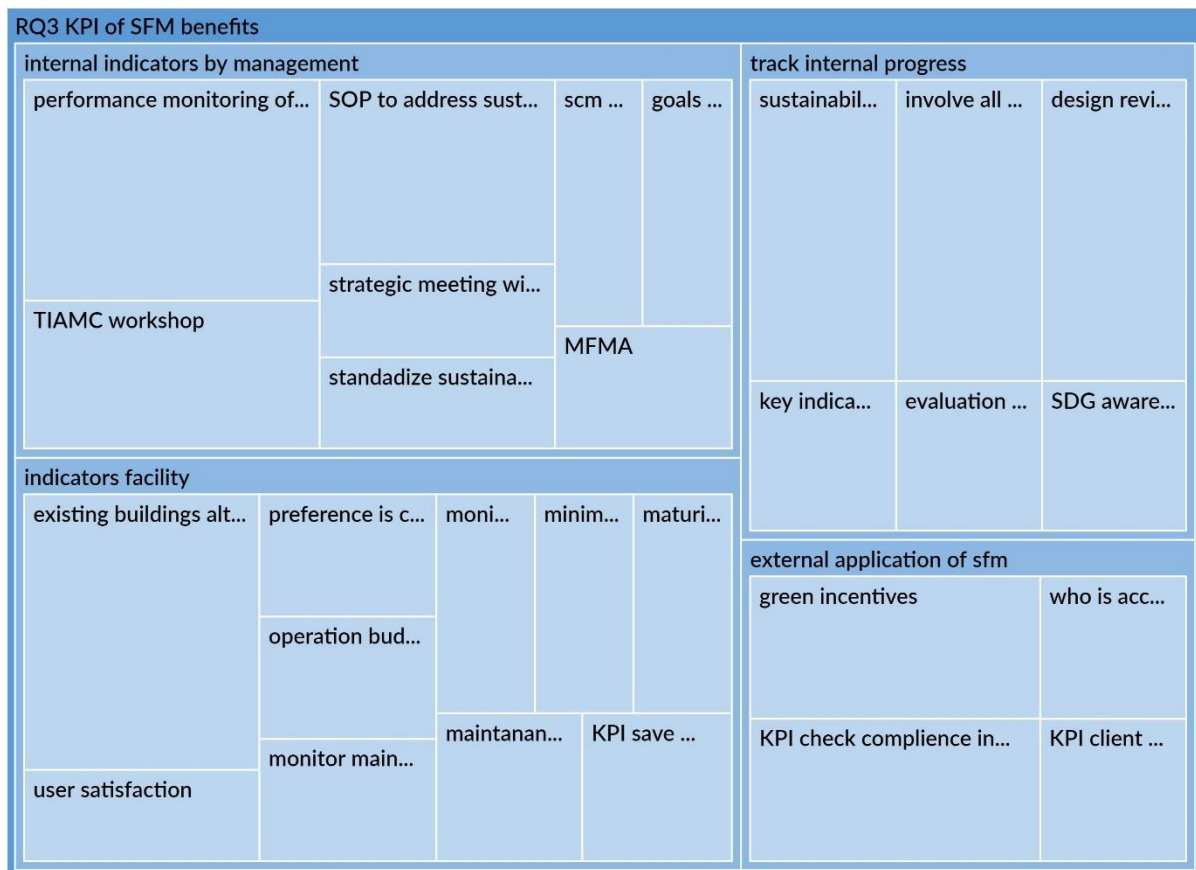


Figure 8: SFM practice themes overview, Source: Author's NVivo extract

The repurposing of the building has been identified as a driver in the previous subsection. In the current section, repurposing a building and performing alterations

are part of improving the performance of the building. As a result, such buildings are seen as modernised or upgraded which is a part of sustainability practice.

The figure above gives an overview of how the benefits of SFM can be identified. The participants expressed that sustainability is beneficial over time. Participant 7 discussed the benefits of preventative maintenance recouping economic sustainability.

*“So, if you attend to something quickly and regularly and routinely, it saves you money over time” Participant 7.*

*“The long-term outlook takes into consideration the functionality and value for money” Participant 9.*

The benefits will be identifiable through operating maintenance expenses. The finance department of the city records the book value of assets however the line manager has the power to manage the asset and make a requisition for funds. The benefits of sustainability can be identified physically in the facilities.

*“There are inspectors and assessors who assess based on SANS 10400a, check compliance on an annual basis, inspect the operational side according to Green Building Policy” Participant 2.*

*“The HQ was assessed, and we received our Certificate for compliance in terms of energy office ratings” Participant 1.*

*“We have rolled out maturity assessment on all individual asset types, the maturity assessment is an ISO accredited system” Participant 10.*

There are accredited evaluations that the city engages in to assess the sustainability of buildings. The energy office has inspectors who assess city buildings and recommend improvements in energy efficiency on an annual basis. This enables the city to track progress, compare consumptions and link to the budget. There are infrastructure evaluations that assess the condition of the buildings referred to as maturity assessment. The maturity assessment scale uses an ISO-accredited format, and it is part of the infrastructure improvement process. Annually or when required, the city can track the individual asset conditions and make improvements.

*“There are green incentives in the pipelines, to encourage the uptake of the green building policy, in the form of a rebate that compensates building owners according to green star ratings” Participant 2.*

*“...how clean Are you in terms of the new green policy, the building will be assessed including the equipment inside according to energy rating, and then you get the rebate for that” Participant 11.*

There are green ratings which is a category that clusters buildings according to water usage, energy consumption and CO2 emissions. According to participants P2 and P11, there are green incentives that can be benefited by building owners in the future. A sustainable building will receive a rebate on the electricity charges upon compliance with the green ratings. Participants stated that as the city evolves municipal buildings are highly likely to improve the current green ratings. Another way to identify the benefits of sustainable practice is the assessment of individual performance plans in the city.

*“Performance monitoring department set targets and goals, those targets are connected or are linked to individual performance plans in the city” Participant 1*

*“Greater emphasis should be taken into evaluating whether we actually meeting that goal or not” Participants 3*

*“Performance Management systems can be used to track sustainability and performance of sustainability goals” Participant 8*

The city has an individual performance management system, which is set from the IDP level down to unit heads, from the heads to deputy, senior managers and to the lowest level. The progress of sustainable infrastructure can be tracked from the perspective of performance plans to identifying sustainable projects. Another method is to track the performance of equipment from a mechanical perspective.

#### **4.4.3.1 Summary**

The participants emphasized that the benefits of SFM can be identified through the implementation of a performance management system across various organizational components. These components encompass both building performance and employee performance. Building performance refers to the assessment of components' efficiency, the acquisition of green incentives, and adherence to FM benchmarking standards. Notably, the overall physical performance of the building will be objectively observable including infrastructure maintenance.

#### 4.4.4 Existing Barriers

The study investigated the existing barriers that jeopardize effective SFM practices in eThekweni. The following diagram provides an overview of themes and sub-themes that emerged. The biggest block in the diagram is lack of awareness, inside the box client awareness dominates. Clients are the building owners in terms of accountability, this is the appointed coordinator of the facility and in some instances the user of the facility.

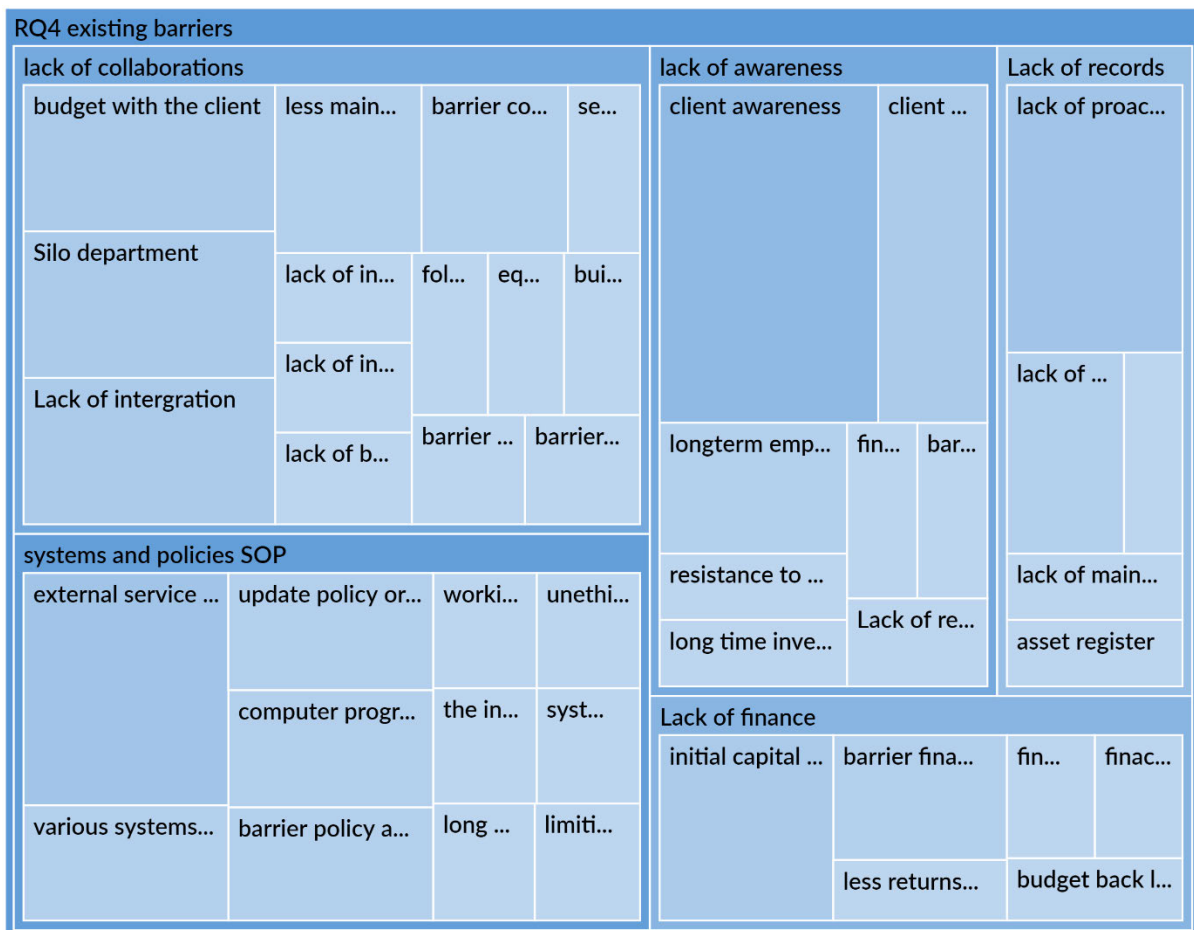


Figure 9: Barriers initial themes overview, Source: Author's NVivo extract

The quotes below demonstrate a lack of understanding towards sustainability practices. Considering that sustainability practices can be viewed as an investment; clients are urged to consider long-term sustainability practices such as maintaining components. Participant P12 expressed that a lack of awareness causes interferences between clients and professionals from the built environment.

*“Maintenance can be an issue, in that sense the client might have money to implement the initial design, but not maintenance. sustainability is seen over time” Participant 6.*

*“Interference with clients, for example, long-standing members who have who hold different or certain perspectives around certain equipment and are not willing to move to a certain direction which is beneficial from a maintenance point of view. people not willing to adapt to new things” Participant 12.*

*“Lack of understanding and comprehension of the benefit of sustainability” Participant 11*

Participants expressed a lack of interest in investment and a lack of business confidence. Employees who have long service in the municipality find it difficult to adapt to new practices. The implementing departmental staff find it difficult to implement sustainable projects due to unwillingness from the client’s side.

*“Lack of awareness from building owners to invest in sustainability practices” Participant 2*

*“Unwillingness from the client to pay for new technology or methodology” Participant 3*

*“Mindset and resistance to change from stakeholders” Participant 2, Participant 11*

However, participants also defend the lack of awareness to be not necessarily the client’s intention but due to lack of information generally. Participant P5 stated that some components of sustainability require expert maintenance which means that the user has to request the implementing department to maintain components. For example, water harvesting requires routine cleaning of the roof to ensure the free flow of water through gutters.

*“it’s very difficult to convince a client, people are misinformed or are not aware that infrastructure design has sustainability implications” Participant 4.*

*“Clients are more resistant to SFM initiatives because they know that they don’t have the right people to maintain those initiatives” Participant 5.*

The lack of the right people to maintain also speaks to the way maintenance is done in the city. The city outsources services from various contractors due to various reasons. From the diagram, the following dominant sub-theme is the lack of collaboration. The theme addresses the inability of clients to understand and accept

the implementing department to handle the project. The sub-theme also envelope issues of integration of resources within the city.

*“Mechanical technician, you will focus on the mechanical technicality of things. And then if you are electrical, you’ll focus on electrical processes” Participant 5.*

*“The challenge with the municipality is that we work in different silos, electricity departments will have their own challenges but there won’t be any engagements across departments to say these are the sustainability gaps that we see and then the other departments aren’t able to then collaborate or coordinate a response that might help improve that particular sustainability issues” Participant 6.*

The above quotations come from participants working in the implementing department. Participant 9 stated lack of collaboration in terms of project updates and having difficulty with following up with the implementing department. Lack of collaboration is clear amongst departments on the other hand, SFM is anchored in integration. Participants alleged a lack of evaluation and monitoring of various systems. Monitoring applies to continuous evaluation and protection of systems against vandalism. Due to a lack of collaboration, finances play a role in preventing SFM practices.

*“The budgets are not centralized in the people that are implementing it” Participant 7.*

*“Unable to maintain the initiatives that we put in buildings because of the way project money is handled” Participant 4.*

*“The maintenance budget is not with the implementing department” Participant 9.*

*“We are not owners of the budget” Participant 6.*

*“The implementer doesn’t hold the budget. It’s the client that holds the budget” Participant 1.*

Finances are a subtheme in barriers of SFM practice which is a result of a lack of awareness, understanding and willingness to adapt. However, there were instances where sustainability initiatives were aborted due to budget prioritization resulting in no funding and participants stated the below reasons.

*“Initial capital cost to implement sustainability project. the cost is a bit higher initially” Participant 3.*

*being green is not cheap, the sustainability initiatives have been stopped because of no funding” Participant 4.*

Participant 8 gave two reasons one being budgeting for maintenance and the second reason refers to implementation of emergency maintenance on the available funds. Due to other priorities of the budget, sustainability practices are neglected.

*“Finance and budget constraints. Client departments don’t always make provision for the maintenance of facilities or don’t adequate provision resulting in major maintenance being conducted on restricted budget” Participant 8.*

*“Backlog of FM maintenance due to budget constraints imposed by COVID and the floods, the buildings have not been maintained, so there is a lot of building rehabilitation” Participant 5.*

The finance department has admitted to the overloads of requisitions of funds since 2020 and as of 2023, the department is still recovering. The city funds are limited to attending to basic human needs such as water, electricity, and housing. The reason behind the lack of funds from the city is disaster management. The city experienced Floods (2022), COVID-19 (2020 – 2022), and Riots (which occurred in July 2021), and these events have impacted the funds provisioning.

*“Facility Management is always scheduled on a budget however depends on the availability of funds in the current financial year (July - June). The finance department draws a prioritization list to schedule all items on the budget. However, Items on the budget can be shifted according to priority” Participant 9.*

*The line manager or project manager does a condition assessment of a facility and provides an estimate to the finance department. The condition assessment report describes the project. The finance department then draws a budget, either capital or operating expenditure. Capital focus on new facilities, rehabilitation, and renewing of value process. Operating expenditure is used for maintaining the value of the infrastructure and it is usually below R200k. the finance department is now then responsible for obtaining funds from the City for the budget schedule. The finance department experiences challenges that affect the budgeting of the SFM expenditure*

*“Poor planning from project managers in terms of sending requests for maintenance to the finance department on time. There is a 3-year budget period as regulated by MFMA, facilities are budgeted for within 3 years. For the maintenance of the facility,*

*the line manager is to submit a maintenance plan with the estimate on a 3-year frequency basis” Participant 10.*

The following subtheme is systems and policies. The following diagram is an overview of what participants said about systems, the diagram is incomplete due to space constraints affecting visibility.

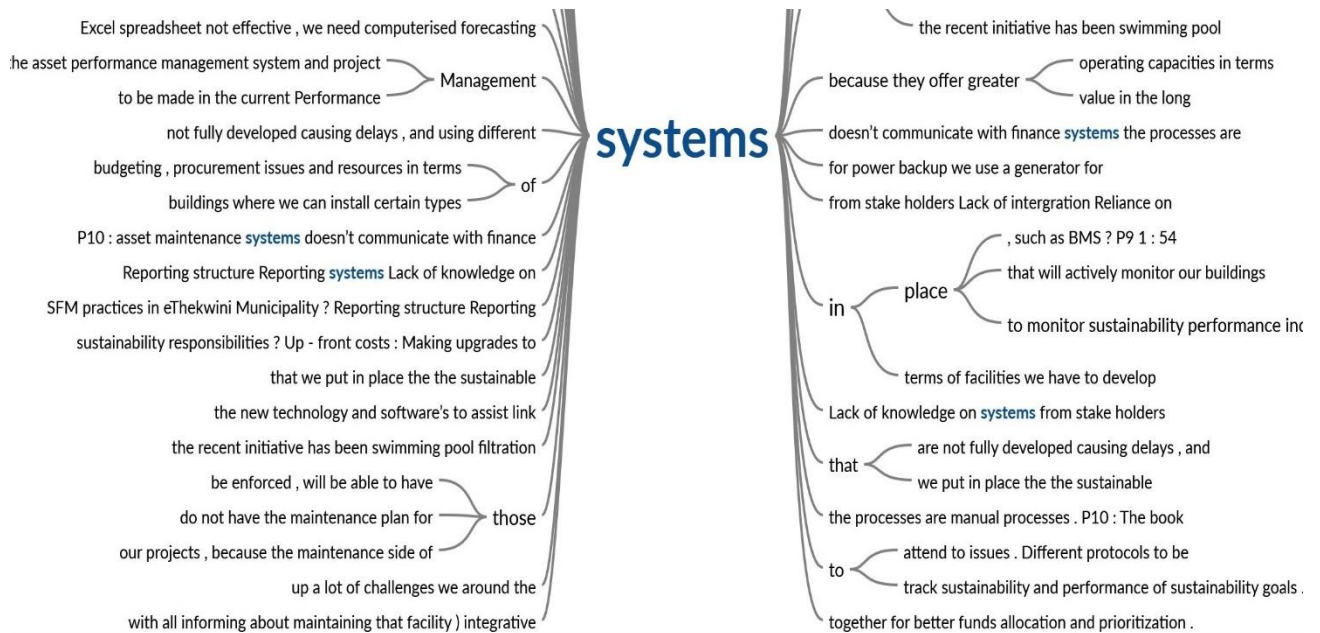


Figure 10: System word query overview, Source: Author's NVivo extract

The institution is unable to respond to the facility management problem in a very concise way. The institutional structure has issues in terms of budgeting, procurement issues and lack of resources in terms of systems and processes. The supply chain management systems play a role in the procurement of various services including SFM. Participants noted the misalignment of procurement policies with sustainable service practices as a concern.

*“Due to our public tender system, finding suitably qualified service providers is a barrier.” Participant 8*

*“unrevised processes such as procurement limiting sourcing fund limits are not adjusted annually even though the economy grows annually” Participant 5.*

*“Jumping into systems that are not fully developed causes delays and using different systems to attend to issues. Different protocols” Participant 11*

There are so many changes in the management structure that result in many systems and new SOPs utilised to manage facilities. The changes hinder the continuous

monitoring and evaluation of SFM in the city. There is a lack of facility managers on a technical level and a lack of skilled technical employees. The city relies on outsourcing services which leads to poor quality control. Participants below have expressed that reliance on external contractors for quality work without supervision or monitoring is a barrier.

*“Outsourcing is a barrier, contractors are not always sustainable cautious, and they prioritize profit” Participant 12.*

*“external service providers, whereby you may maintain the equipment, preventative, but instead of maintaining this equipment, external service providers do the bare minimum and sabotage the system in terms of poor-quality workmanship and material” Participant 3.*

Lack of computer systems is a major problem; participants have expressed various challenges regarding software and systems. The city has no building inspectors in the building to manually report FM issues in a proactive manner and no computer systems on the facility to report. The city relies on users to report any fault that needs to be attended to. The city utilizes Microsoft Excel spreadsheets for managing assets.

*“you are managing all assets with the Excel spreadsheet here. Excel spreadsheet is not effective, we need computerised forecasting systems” Participant 9*

*“asset maintenance records systems don’t communicate with finance systems, the processes are manual”. Participant 10*

A lack of computerized systems has resulted in inadequate record-keeping practices. The current inventory system, referred to as the asset register, utilizes terminology and metrics tailored to accounting and financial reporting purposes. This includes details such as depreciation values. While important for finance departments, these factors hold little relevance for building inventory and maintenance workflows.

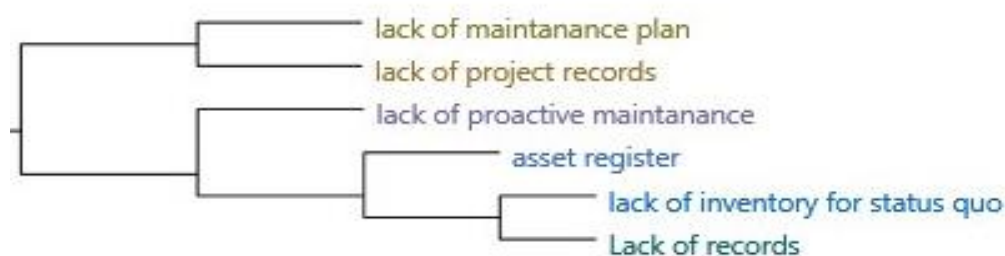


Figure 11: Codes under Lack of Computer, Source: Authors Extract from NVivo.

*“lack of inventory, we don’t know how many energy-efficient buildings, in terms of lighting, HVAC or smart equipment” Participant 2.*

*“inadequate handover process system, insufficient records such as drawings that guide plumbing, electrical cables and HVAC drawings inventory jeopardise the warranties and guarantees” Participant 5.*

*“There is limited knowledge about the facilities and their components. Insufficient records, or lack of building inventory, we don’t know whether to maintain or replace” Participant 11*

Participants discussed deficiencies in handover procedures and record-keeping have resulted in missing or incomplete documentation such as architectural drawings detailing plumbing, electrical, and HVAC systems. This lack of an accurate building inventory and component specifications inventory jeopardizes warranty and guarantee coverage. Without thorough as-built documentation and an inventory database listing all assets, their age, and maintenance requirements, the professionals struggle to determine appropriate maintenance versus replacement for ageing building systems.

*“We don’t have the maintenance plans and the right people to go and maintain these facilities” Participant 4*

*“We do not have the maintenance plan for those systems” Participant 1*

According to the participants for the facilities management organization, there is currently a lack of robust maintenance plans and dedicated personnel to perform the required maintenance. The absence of preventative maintenance plans or programmes is a barrier to SFM. The lack of in-house skills or staff trained to implement maintenance works has created challenges in sustaining assets and infrastructure in the city.

#### **4.4.4.1 Summary**

Participants stated client resistance and a lack of understanding or misinformation about the benefits of sustainable facilities management pose as a barrier. Silo working, lack of integration resources and poor collaboration among various departments within the municipality hinders the adoption of SFM practices. The absence of evaluation and monitoring frameworks can make it difficult to assess the effectiveness of sustainability

initiatives. Lack of initial funds and maintenance funds, the city funds were committed to disaster management over the past three years (2020-2023). There were instances where sustainability initiatives were prematurely terminated due to budget prioritization, leading to a lack of funding. Furthermore, lack of maintenance plans and a backlog of deferred maintenance due to financial constraints, as a result, the municipality prioritizes urgent infrastructure issues.

#### 4.4.5 Proposed Framework

The findings below present the recommendations from participants. The proposed framework will be discussed in the recommendations section of this study. The study aims to propose a usable framework/blueprint for SFM practices for municipalities such as the eThekweni Municipality. The below image is an overview of recommendations.

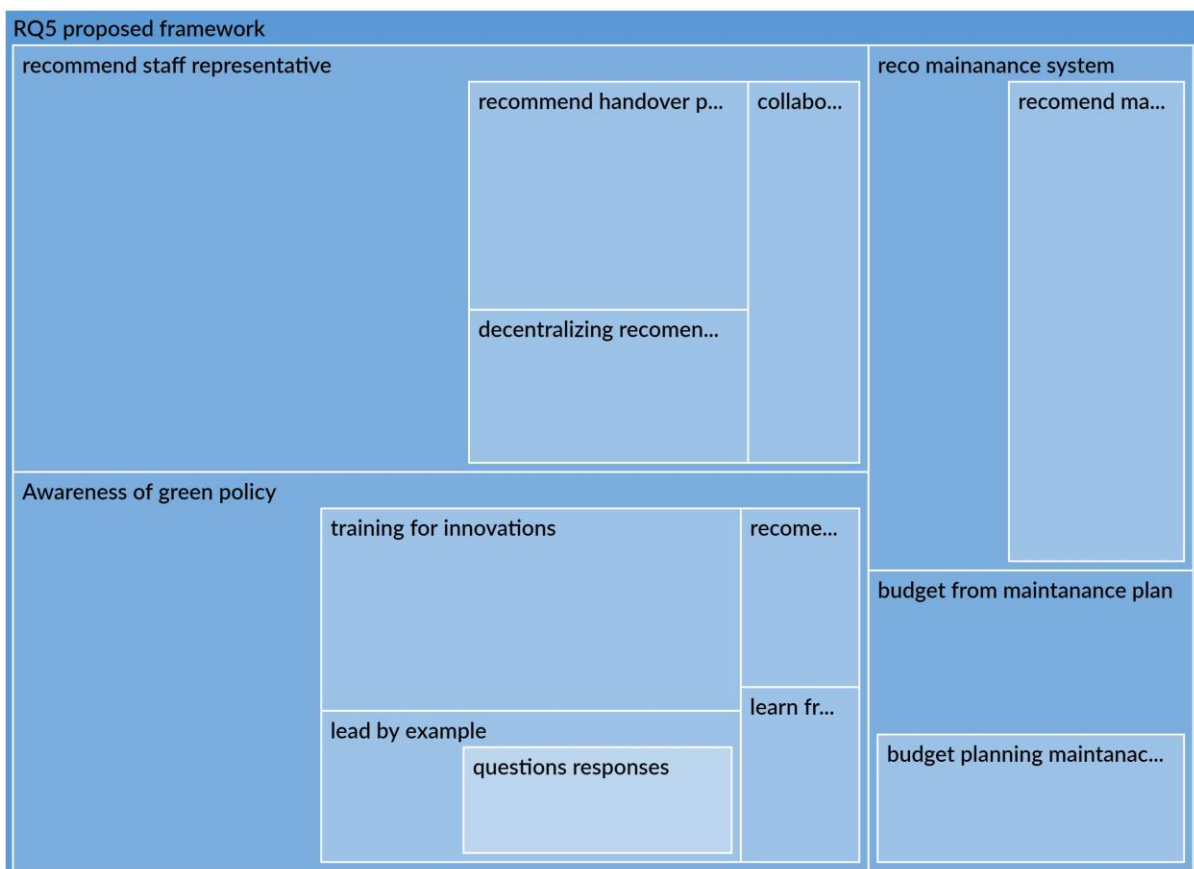


Figure 12: Proposals initial themes overview, Source: Author's NVivo extract

The dominant subtheme is staff representative which stands for in-house employee. This recommendation supports decentralization of services in the municipality,

collaboration with the implementing documents and correct handover processes. Lack of in-house resources has been identified as a barrier and the framework aims to find a solution to the challenges, including capitalizing on driving forces. The following participants encouraged internal staff.

*the client needs technical people or project managers who will liaise with the implementer to start the process from the client's side and engage the implementers. structure internal technical people who are going to implement or activate those maintenance plans Participant 4.*

*you need a permanent structure, someone who will drive those maintenance plans will work with the implementer. SFM is the client's responsibility because the implementors do not hold the budget and they are not responsible for those buildings. Participant 1*

*"Internal FM expect in-house with the best interest of eThekweni" Participant 5*

The participant recommend staff employed to look after the building, follow up on maintenance work and ensure the availability of funds from the finance department. Each building will have an internal technical representative who will engage with the implanting department and liaise with SFM practices or improvement programs. Participants also recommended equipping people with the necessary skills to adopt green building initiatives.

*"exposure to the Green Building Council's criteria and the different categories" Participant 7*

*"awareness of the green procurement policy" Participant 2*

*"the lack of awareness in terms of sustainability, what is sustainability and how is sustainable sustainability beneficial for the city" Participant 3.*

Participants recommended training to support adaptation to new technologies and sustainability innovations. This can be supported by a policy or SOP that reflects sustainability FM and enables adaptability to alternatives that are provided by the markets at that point in time. Participants recommend integrative systems (for mechanical, electrical, structure, or finance), to improve transparency and projections.

*“There is room for the municipality to invest in the new technology and software to assist link systems together for better funds allocation and prioritization. Participant 10*

*“You can benchmark using computer programmes for example model up your building on AutoCAD Revit” Participant 6*

*“System should be on the computer and mobile for easy capturing and to provide a maintenance plan with the budget allocated to that maintenance plan. FM services link on one another, pest control, electrical etc.” Participant 5*

To improve operational efficiency, participants recommend computer systems. system is expected to streamline inventory tracking, budgeting and analysis capabilities. Participants state that technology will enable better-informed maintenance decisions, ensure compliance, and facilitate tracking of assets across. Asset management system focused on lifespan forecasts, maintenance and strategic repair operations to strengthen asset management and reduce preventable equipment failures.

#### **4.5 Reviewing Themes**

The previous subsection demonstrated how themes emerged, the following subsection is the process of interrelating themes. In the previous section, the researcher grouped codes with familiar meanings together and generated initial themes from the codes. According to Byrne (2022), meaningful interpretation of the data requires revision. Revision is helpful to assess the quality of the theme relating to the research question.

The researcher has used quotations as primary data to support the initial theme-generation process. In data reviewing, the researcher reviews themes with multiple meanings or coherence in order to define the themes. The researcher used NVivo to revisit the codes and re-arrange and rename the themes.

Comparing the initial codes and the reviewed themes diagrams, it is evident that some codes were promoted, collapsed some codes into one, and some were demoted as deemed necessary. The researcher has filtered codes and themes that are not beneficial to the analysis of the study. After review, the study had five themes and seventeen sub-themes. The below diagram presents the five main themes. The following figure presents an overview of themes and sub-themes.

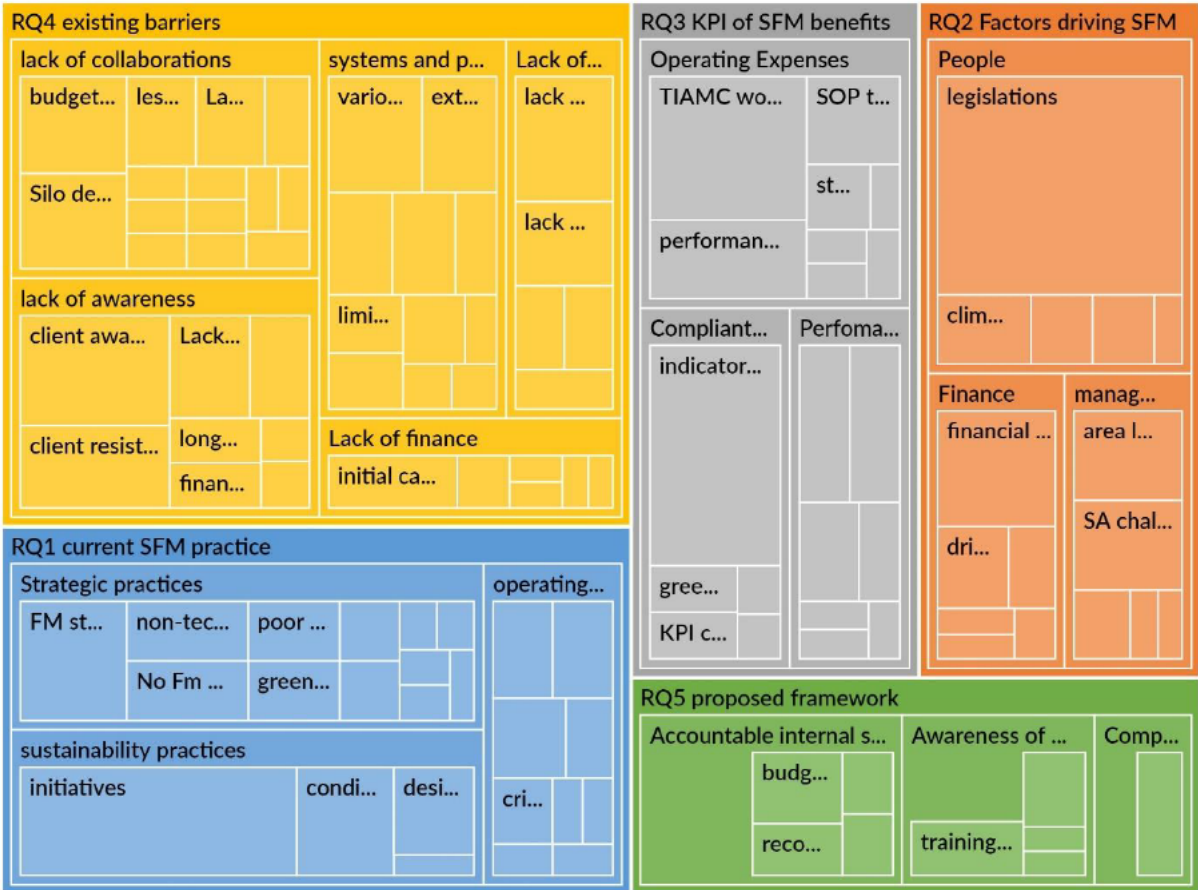


Figure 13: Reviewed themes overview, Source: Author's NVivo extract



Figure 14: Initial main themes, Source: Author's own

The researcher searched for relationships within the themes and discovered that the main themes interlinked with each other. Barriers feed into proposals, as a result,

proposals have been removed as a theme to be a code. The current practices are either the driving factors or the barriers. The current practices yield identifiable benefits, as a result identification of benefits has been removed as a theme and remains as a code that helps in answering the research question.

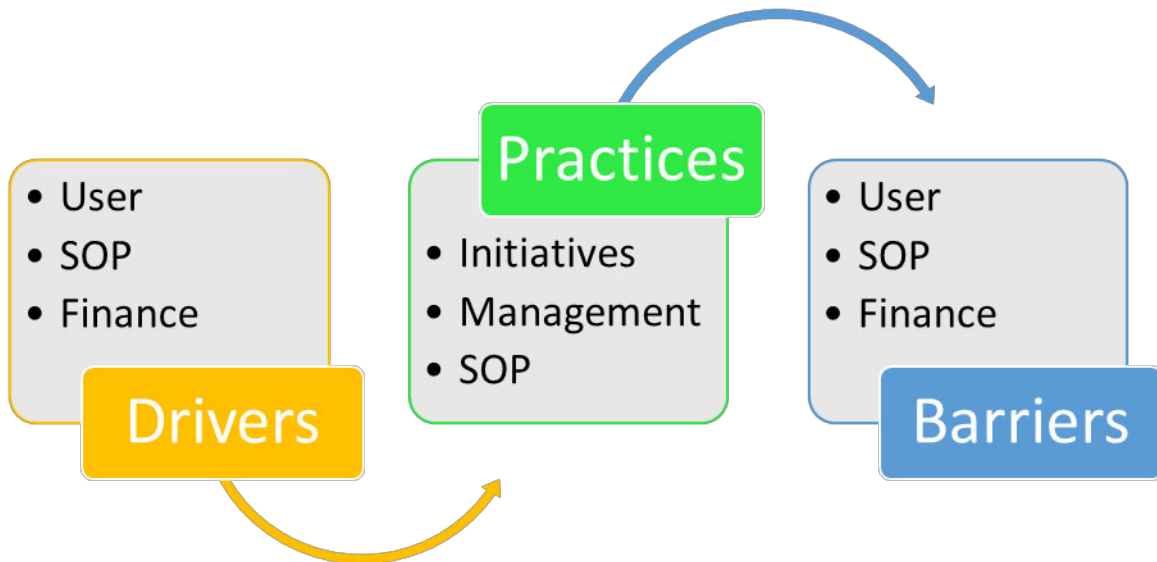


Figure 15: Final review themes, Source: Author's own.

The diagram above presents a summary of revised themes, and sub-themes indicating links in the form of common themes. The common theme in the study is “SOP” (“SOP stands for standard operating procedure”) which refers to Policy and Governance. The meanings of the themes are discussed in the discussion section.

#### 4.6 Discussion

The earlier section reviewed and renamed the themes. Resulting in three main themes and five sub-themes. The current section explains themes and connections between subthemes in the form of discussion. The researcher conveys the interpretation of the results and discusses the significance of the findings. The researcher discusses the findings in relation to the objectives of the study, and the research questions and provides a link of the findings to the body of literature review of the study.

**Objective 1: To evaluate the current SFM practices in eThekweni Municipality.**

Are there any practices in the city and to what extent are the practices? The literature review under this objective investigated the municipal setting, governance and SFM practices. In comparison to the literature and the result that emerged in response to the question “What are the current SFM practices in eThekweni Municipality” suggests poor SFM practices. Previous studies in the literature review explained how SFM practices contribute to the work environment and global sustainable development goals.

Participants discussed their capabilities in terms of experience and educational background however lack of collaboration stands in the way. The overall results of the practices presented the reason why the city is unable to effectively manage the facilities sustainably, reasons are discussed in objective 4 below.

Sub-themes under current SFM practices are initiatives, management, and SOP. Under this theme, “**SOP**” refers to fundamental practices such as the school curriculum of professionals, professional registration boards, various building standards, and work policies. “.... all architects are trained to do that” *Participant 7*. Professionals are trained to design buildings sustainably; however, the application seems to be a challenge observing the city offices. Participants expressed that sustainability was part of the school syllabus, highlighting practices applicable to the profession (*Participants 1, 4, 6, & 7*).

The practices investigate the initiatives towards SFM. The theme “**initiative**” covers various improvements in the facilities, sustainability consciousness, sustainability applications and engagement with stakeholders at various levels. Participants discussed repurposing the building (*Participant 7*) and space planning (*Participant 6*) as an initiative that enables the city to re-cycle infrastructure, Prioritizing existing assets over new infrastructure. Initiatives cover current practices which will also carry on to the future. These include the use of energy-efficient appliances when replacing the condemned components and in future projects (*Participants 1, 2, 3, 8, 12*). These sustainability initiatives align with the literature review of the potential benefits of SFM.

Proactive maintenance, looking after the building requirements and improvement (*Participants 5, 7, 9, 1, 11*). Participants discussed the Importance of proactive maintenance and lifecycle management for buildings and infrastructure. These include developing asset registers, maintenance plans with budget estimates and Integrating facilities management across city departments. This is part of the significance of SFM discussed in the body of literature.

**“Management”** Practices, this theme discusses strategic measures that contribute to SFM. The body of literature discussed the role of a facilities manager which aligns with the results of this study. Participants discussed various meetings that take place in the city to drive the SFM practices as well as to track the progress and benefits. Management practices envelop the identification of SFM benefits and proposals to improve SFM from a managerial perspective. This will ensure assets are fit for purpose means conducting regular assessments to guarantee the infrastructure meets current and future needs.

*“We have to develop the facility management strategy, develop the asset management policy, and operational projects. Develop standard operating procedures for the various facilities, etc.” Participant 9*

Management practices cover the actions that are currently in place to balance the workplace. In Chapter 2.8.2 of the literature review recommends strategic leadership and integration of business systems. The integration of FM and sustainability requires facilities managers with people management and change management skills. Participants proposed the implementation of asset performance management systems and project management systems in terms of facilities and link systems to CIDMS, SAMP and IDP. The participants recommended positions such as asset management coordinating staff. According to Participant 9, the municipality is working on Improving institutional structures and processes to ensure building efficiency and sustainability.

**Objective 2: To determine the key drivers of SFM practices in eThekweni Municipality**, under the research question that states “Which factors are the key

drivers of SFM practices within eThekweni?”. Results suggest the user, governance and the economic state of the municipality drive the SFM practice.

The “**users**” refer to occupants, the facility coordinators or the demand organisation. The condition of the facility prompts the user or demand organisation to take action. Occupants may request for sustainability FM practices to be exercised by the employer. According to Participant P5, the city relies on users to report faults within a facility. Users may be pro-active or reactive, the facility may provoke users into requesting SFM services which is a pro-active manner (Participants 1, 7, & 8).

Participants stated that people are complaining about the state of facilities, stating *“The staff, the community, and stakeholders are complaining about the deterioration of buildings” Participant 1.*

Participant 7 stated that users may involve unions in the demand to have the facility components fixed which pushes the management into attending to the needs of the user. The literature review in chapter 2.6.6 discussed the fulfilment of social responsibility as a driver. Stating that SFM improves the lives of the people and impacts the society. The previous studies suggest that employers strive to meet social responsibility, this study's findings advise that the users demand SFM.

“**SOP**” refers to mandatory standard practices. Professionals are registered to regulating boards which drives them to perform according to the standards of the profession which are sustainable. Sustainability practices are integrated with national standards which result in a sustainable work policy. Following national guidelines and standards includes actions such as adhering to building codes and incorporating best practices into operations. Project managers from the implementing department are driven by the code of practice to improve facilities to be more sustainable. The body literature aligns with the findings as discussed under the significance of SFM.

“**Finance**” is a common theme to enables and hinders the success of SFM. Finances required to initiate or maintain sustainability initiatives were taken into consideration. Having a set budget for a sustainable project enabled professionals to fulfil the project. *“We’ve obtained funding coming from the United Nations directly and they approached*

*the city with the funding to implement these sustainable projects through these agreements” Participant 3. Participant 3 have experienced projects that had sustainability measures as a requirement to obtain funding.*

The availability of financial resources plays a crucial role in facilitating SFM initiatives within the city. While previous studies have identified long-term financial sustainability as a key driver, the situation in eThekweni deviates from this norm. Rather than being propelled by a long-term outlook for economic sustainability, the city's SFM efforts are primarily driven by the availability of funds.

**Objective 3: To explore the potential benefits of SFM practices for eThekweni Municipality.** The study investigated the benefits of SFM and responded to the query “How are the potential benefits of SFM practices identifiable at eThekweni Municipality?” results on the benefits of SFM align with the body of the literature review in Chapter 2, however, findings suggest measures to identify these benefits. Findings present that the city is aware of the SFM benefits. Long-term functionality and value for money are also coded as advantages of sustainability.

Concerning the identification of energy saving, the city has an “Energy office” which is tirelessly working on energy efficiency. From the literature review, energy efficiency entails the reasonable use of energy resources in facilities and equipment. It aims to reduce costs, lower usage, and enhance efficiency. From a sustainability standpoint, energy efficiency can lower CO<sub>2</sub> emissions, conserve energy, and yield economic savings.

Results suggest an assessment of the energy efficiency of buildings on an annual basis utilizing building inspectors in the city. The building inspectors assess according to the green policy rating and relevant standards. Energy usage can be monitored to track progress over time. The electricity statement of consumption in a building can be used to monitor electricity consumption.

The body of literature review suggests that it takes a strategic approach to ensure the long-term continuity and productivity of facilities using sustainable best practices. SFM creates work environments that support organizational missions and values. Findings support the body of literature. Participants endorsed that facilities are tools that enable

service delivery in the city. Offices enable the administration side of service delivery and facilitate the integration of Sustainable Development Goals management.

The scope of SFM varies but generally includes compliance, space planning, shaping organizational image, and improving resource efficiency. This Study suggests that such benefits can be identified through observation over time and applying the infrastructure improvement system in place. The infrastructure improvement system is an evaluation that assesses the condition of the buildings according to maturity level. The maturity level is a scale that uses an ISO-accredited format, and it is part of the infrastructure improvement process. Through this method, the city can track the individual asset conditions and make improvements.

Compliance activities ensure infrastructure safety, security, and adherence to health policies. Space planning focuses on the effective use of space considering user needs and future requirements. SFM also influences organizational culture and stakeholders' perceptions. SFM promotes knowledge sharing and the adoption of green building standards. Participants suggested the use of individual performance plans to identify sustainability awareness, and sustainability projects according to the duties of the employee. Furthermore, the city regularly has workshops and service delivery “war room” to revisit and track the progress of infrastructure developments and improvements.

**Objective 4: To determine the existing barriers to effective SFM practices in eThekweni.** In chapter 2 of the study, the literature review identified general barriers to SFM. The response to the query “What are the existing barriers to SFM practices in eThekweni Municipality?” The sub-themes under the query include “Finance”, “User,” and “SOP” which corresponds with the body of literature. The subsections under barriers of SFM from the body of literature include “human factor, Management practices and lack of resources”.

Lack of finance was amongst the dominant codes under the sub-theme “Finance”. “**Finance**” refers to the unavailability of funds (participants P2, P4, P8, &P6), budget prioritization P5, funds requisition process P1, funds utilization strategy P3, and funds allocation P10. Participants raised a lack of support and understanding from senior management. The quote below emphasised a lack of understanding by senior management. *“Now the challenge is their understanding, they can't just give out*

*money to fix something that's not broken because they don't understand proactive maintenance” Participant 1.*

This theme interlinks with the theme “**user**”. Lack of skills, lack of awareness, lack of understanding and non-technical user were dominant codes that report the impact the user has on SFM practices (participants: P1, P2, P3, P4, P5, P6, P7, & P11). The “User” is the occupant of the facility which is represented by the line manager. The line manager is responsible for undertaking finance requisition and findings show a lack of support and understanding from management. Nevertheless, participants reported a culture of reacting to situations (Participants: P1, P3, P5, P7, and P11). This means that senior management lacks understanding due to the culture shift that is expected when implementing SFM practices.

*“The Council is used to fix something when it's broken. You know that it doesn't work like that.” Participant 1*

In addition to the literature review noted reactive maintenance strategy is a barrier to SFM. This is the same strategy experienced in funds utilization and it appears to be the “**SOP**” of the council. Whereby funds are requested to only fix something that is broken. The below extract narrates the mindset of the management of eThekweni.

*“Even with the envelope of the building you don't clean the roof because it's blocked. You clean it every 3 months to make sure that there are no leaves on the gutters. During the storm, most of the buildings were flooded because the pipes were blocked, and water didn't have anywhere to go. So, the water increased through the walls and all of that. But if there was proactive maintenance of cleaning the roofs or cleaning the gutter. so, if you just take out your tender of cleaning the roof, say I need R200,000 to clean the roof. It seems as if you are wasting money, or you are just creating projects for whatever reasons” Participant 1.*

This narrative has implications for SCM (Supply Chain Management) procurement processes. Participants have expressed concerns with the procurement policy of the city (participants P1, P3, & P8). Project managers undergo the SCM administration to procure service providers, in this process, a project is scrutinized to check validity.

This requires understanding and awareness from SCM staff to evade non-award of the project.

As a result, participants have raised issues with the centralization of municipal services (participants: P1, P7, & P12), supply chain policy (participants P2, P8, & P5) (adapted from the national level) and working procedures in the municipality. Participants stated that the quality of workmanship is reduced with the outsourcing of services to external service providers (Participants: P11, P3, and P5).

Results suggest that the centralization of building services is not working due to poor supervision, restrictions with the procurement policy and fund provisioning. In addition, lack of stakeholder relationships and focus, departments are struggling to work together. The response rate on the query recorded a high number of codes compared to other queries. All participants experience barriers in SFM practices. Overall, the findings agree with the body of literature under the subsection barriers to SFM practices.

**Objective 5: To propose a usable framework/blueprint for SFM practices for municipalities such as the eThekweni Municipality.** Participants were asked to discuss any recommendations/mechanisms/efforts to prioritise sustainability and mechanisms to overcome barriers to SFM practices. The body of literature presented the significance of a framework or a standardised tool for sustainably managing facilities. The below discussion presents the recommendation for the case of eThekweni municipality.

The dominant subtheme identified was having dedicated staff representatives or in-house employees responsible for facilities management (participant P1, P11, P5, P9, & P7). This aligns with recommendations for decentralization of services (participants P1 & P5). Participants highlighted the need for internal technical staff or project managers to liaise between clients and external implementers, activate maintenance plans, and ensure continuity.

The study suggests that having a technical staff responsible yields improved collaboration on implementation and improves proper handover processes within the

municipality. Lack of internal resources has been cited as a barrier, as a result, the proposed framework aims to address the barriers mentioned in the study and elaborate on the significance of the framework.

Management commitment is necessary to serve consistency in asset management policies and procedures. Employ staff to solely focus on overseeing buildings, coordinating maintenance, and securing budgets. The gaps in policies, procedures, and governance structures create loopholes that prevent SFM practices. Participants recommended alignment of procurement policies and green building adoption policies. The development of policies and strategies is the responsibility of the FM structure.

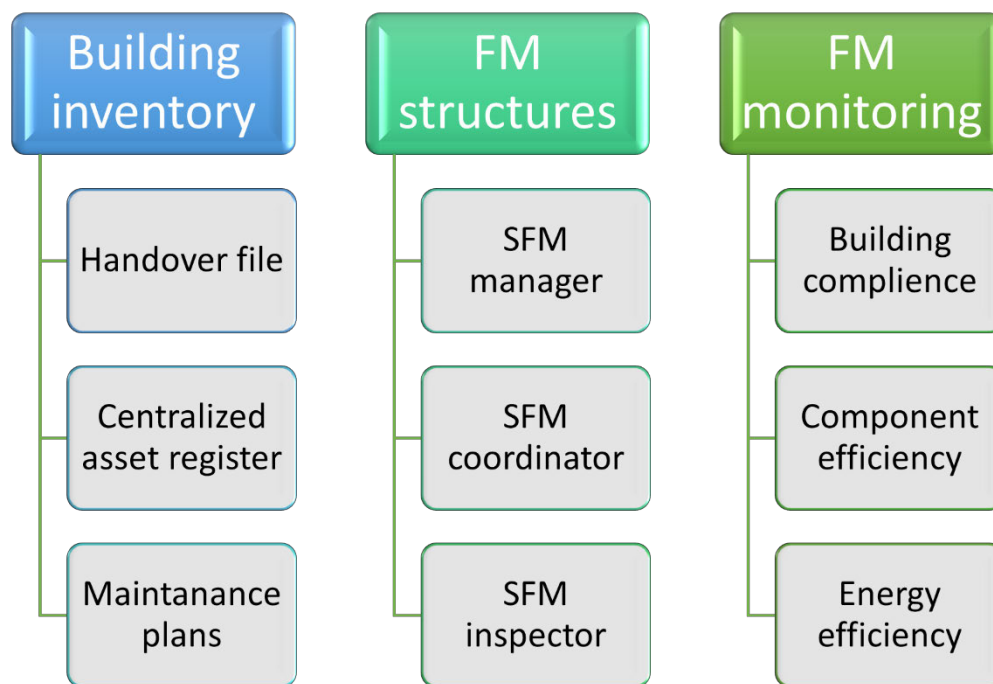


Figure 16: Framework Proposal, Source: Authors own

The image above shows the proposed framework. The driving factors for the framework are dedicated internal staff, building inventory and effective monitoring. The literature review on management responsibilities encourages organisations to train staff to improve skills in areas such as green building council criteria, green procurement policies, and sustainability principles to enable efficient adaptation to new sustainable practices and policies. Implementing ongoing training to support new

technologies and innovations is also recommended, paired with institutional policies to guide sustainable facilities management. Integrate individual staff performance management systems with the IDP, setting targets connected to sustainability goals. The IPP allows for performance tracking and accountability.

Technology can be adopted to monitor equipment functionality and lifecycle performance indicators to track resource utilization. Technology investments are expected to enhance inventory, budgeting, compliance tracking, lifecycle management, and data-driven decision-making.

Summary of key asset performance indicators that can show improvements over time include tracking asset availability, reliability evaluation, utilization rates, maintenance costs, customer satisfaction, backlog reduction, infrastructure maturity assessments, energy efficiency ratings, asset modernization rates, and lifecycle costs. Future proposals include potential rebates that incentivize compliance with green building standards and ratings, rewarding reduced energy and water consumption, and reduced carbon emissions.

#### **4.7 Theoretical implications**

This study is grounded on institutional theory and stakeholder theory. The institutional theory questions the adoption of the same practices among organizations that are within the same field (DiMaggio & Powell, 1983). Stakeholder theory is used to define the institutional boundaries or limitations of the organization. The results agree with stakeholder theory in emphasizing the collaboration of stakeholders. Findings showed that successful SFM practices require engagement with stakeholders defined. Stakeholder engagement in decision-making is a tool that can be used to reduce knowledge barriers in SFM practices.

Findings on factors that are driving SFM practices are used to explain the institutional logic in adopting sustainability practices. The results on SFM practices and benefits explain why the municipality adopts sustainability initiatives. The study uniquely investigated SFM to develop best practices on internal collaboration between finance, asset management, and facilities management roles within municipalities. The study contributes to the literature by investigating SFM practices in a city with infrastructure deterioration.

#### **4.8 Chapter Summary**

This chapter presented findings from the primary data collected from participants. The chapter introduced qualitative data analysis approaches and analysis. The study followed “Braun and Clarke’s approach to reflexive thematic analysis” in preparing the reporting of the section (Byrne, 2022). The researcher analysed the data manually and using the NVivo app, a computerised data analysing software. The findings project standard operating procedure “SOP” as a dominant theme. Sustainability practices were discovered within the SOP. Benefits identification and key factors that drive SFM were discovered. Lack of awareness is a dominant barrier that influences the availability of funds as well as the implementation of sustainability initiatives. The discussion section presented a framework recommendation for the municipality. The chapter concludes with theory implications from the literature review’s theoretical framework. The next chapter discusses and concludes the study results, the existing body of literature and recommendations.

## CHAPTER 5

### 5 CONCLUSION AND RECOMMENDATIONS

#### 5.1 Introduction

The previous chapter presented findings and illustrated the contextual meaning of the participants through qualitative data analysis. The results of the study were presented in the discussion section and the naming of themes through the interpretation of findings. The current chapter reports key findings, limitations of the study and future research suggestions. The last section of key findings presents the proposed framework followed by the research implications.

#### 5.2 Revisiting the Objectives

The objective of the study is to propose a framework for sustainable facilities management practices. The motivation for conducting the study stemmed from the deterioration of office buildings, inefficient utilization of resources, poor coordination of maintenance activities, and preventable equipment failures. The study attempts to bridge the knowledge gap of proactive, data-driven facilities administration to reduce equipment downtime, mitigate deterioration and leverage resources optimally. The study aims to support energy sustainability goals in the work environment and improve the public image of the city.

#### 5.3 Summary of Research Method

This study adopted the qualitative research method. The case study utilizes an exploratory research design and interpretivism paradigm to construct meaning from qualitative insights. The total participant population consisted of twelve (12) employees from eThekweni Municipality. The selection of participants followed a judgmental sampling approach. The selection was based on the participant's departmental roles and responsibilities. In-depth interviews were conducted to generate new perspectives on sustainable facilities management practices.

The in-depth interview format enabled the discovery of rich, contextual insights into current practices challenges, and potential solutions for optimized sustainable facilities

management. The study used a thematic analysis method to analyse data. The thematic analysis aims to provide an advanced understanding of improvement opportunities through the lens of frontline professionals. Chapter 4 detailed the qualitative data analysis process.

## **5.4 Key Findings**

The city of eThekweni is facing the deterioration of infrastructure assets and equipment components in municipal offices. Sustainability actions consist of making buildings energy-efficient and environmentally friendly by installing solar panels, efficient HVAC systems, and water conservation measures. The study investigated current, barriers and identified drivers and benefits of sustainable facilities management practices. The research examines existing challenges and possible solutions to overcome these challenges. The following discussions focus on findings that are aligned with the objectives of the study.

### **5.4.1 Current practices**

The body of literature defined and explained the characteristics of FM sustainability practices applicable to a work environment. The current state of sustainable facilities management (SFM) practices in eThekweni Municipality is inadequate according to the qualitative insights gathered compared to the body of literature. Participants acknowledged sustainability training as part of their professional education and standards. However, collaboration, awareness, management support, and policy prevent the application of these skills. Initiatives around repurposing, space planning, energy-efficient upgrades, and maintenance demonstrate sustainability consciousness, however, progress can be identified in silo-working rather than integrated.

The organizational structure of the municipality currently lacks a dedicated facility management department for overseeing the city's portfolio of assets and infrastructure. The absence of a centralized facility management function presents challenges in implementing standardized practices, strategic coordination, and economies of scale in sustaining the municipal built environment.

Practices are within various departments such as electrical, mechanical, finance, strategy, energy, health, water and sanitation, and architecture. However, siloed

departments and a lack of holistic facilities strategy undermine progress. The city's strategic unit, energy office, and architecture department are working on proposals to implement a sustainable asset management system.

Systems include conducting comprehensive condition assessments, recording building and component inventory, and improving institutional processes. Overall, findings project the current SFM practices are insufficient due to specified barriers.

#### **5.4.2 Driving factors**

The study identified three primary drivers of sustainable facilities management (SFM) practices within the municipality: users, governance, and finances.

Users are occupants and facility coordinators/managers. users report deficiencies and prompt action through complaints and requisitions. Governance refers to professional standards, building codes, and policies that induce SFM practices. Adhering to regulations and best practices drives sustainability improvements in the city. Reactive users draw attention to substandard facility conditions while regulations mandate minimum sustainability levels

the municipality's financial situation largely determines the scope for advancing SFM practices beyond the minimum. Availability or lack of funds both serve as a driver of SFM practices. The municipality receives funding from external stakeholders to encourage the implementation of sustainability initiative projects. Limited budgets constrain proactive maintenance and upgrades. Lack of funds encourages sustainable initiative that has low operating expenses or requires less ongoing maintenance.

#### **5.4.3 Benefits of SFM**

The study found that eThekweni Municipality is aware of the potential benefits of sustainable facilities management. The literature highlighted SFM benefits such as supporting organizational missions, shaping organisational culture and image, enabling compliance and service delivery, and driving resource efficiency. The municipality has building inspectors to assess green building ratings, maturity assessment programmes and performance plans which is a replica of the IDP.

The Energy Office demonstrates efforts around energy efficiency to reduce costs and emissions. However, the municipality does not consistently track building performance

over time to quantify savings. Findings showed emerging efforts like the infrastructure improvement system which evaluates asset maturity on an ISO-standardized scale.

Individual performance plans incorporate some sustainability factors which can be used to track sustainability benefits and progress. Asset and infrastructure workshops and meetings are aimed at closing the gaps and tracking progress on strategy development. Internal design review can be used to close knowledge gaps, equip staff, induce sustainability and track progress on sustainability projects.

#### **5.4.4 Barriers to SFM Practices**

The result of the study findings confirmed the literature review of existing barriers to sustainable facilities management practices within eThekweni Municipality. Financial constraints were frequently coded, counting insufficient budgets, restrictive allocation practices, and lack of support for proactive maintenance. Senior management poses as a barrier due to a lack of understanding, awareness, and reactive mindsets.

Users possess a reactive mentality, the prevailing culture of fixing components only when broken rather than preventive. This links to financial barriers as leadership does not see value in proactive maintenance. Standard operating procedures also hinder SFM practices, particularly centralized services, outsourcing, supply chain policies, and departmental siloes. Participants felt quality declined with outsourcing while procurement rules impede needed projects.

Poor collaboration between departments further undermines sustainable asset and facility management. eThekweni lacks a systematic approach including a lack of collaboration, strategy alignment, and systematization. The key findings on barriers reflect systemic challenges around finances, leadership, and operational processes.

#### **5.5 Recommendations**

For effective sustainable asset and facilities management, the researcher recommends municipalities follow the trailing blueprint below.

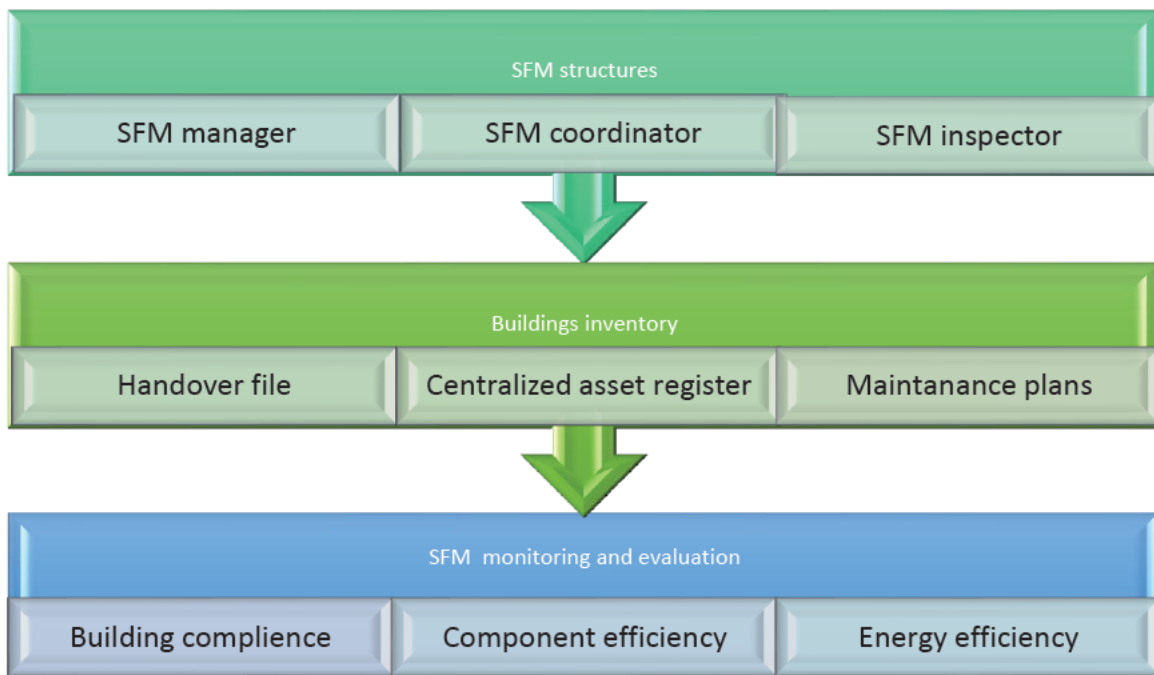


Figure 17: Revised Framework Proposal, Source: Authors own.

### 5.5.1 Building Portfolio

The first step is to develop building portfolios using centralized components/asset registers and building inventory to track all asset components. Build requirements for the handover of asset data into contracts. Custom asset hierarchy systems to extrapolate top-down data based on asset types and class materials. Building inventory provides information necessary to inform relevant stakeholders such as decision-makers, FM managers, finance planning, and support life cycle planning and maintenance needs.

The building register should be accessible by all departments and be updated timeously. Using the updated building inventory, evaluate for resource utilization efficiency, asses the needs of employees, and allocate or repurpose accordingly.

From the building component register, create comprehensive preventative and lifecycle maintenance plans and schedules to enable proactive maintenance. Develop integrated asset management plans and budgets. Partake in sustainable emergency or contingency plans in place to allow effective reactive maintenance. Prioritize existing assets over new infrastructure and allocate sufficient maintenance budgets focused on the long term. This is a strategy to upgrade or modernize old buildings.

### **5.5.2 SFM Structure**

Integrate facilities management responsibilities across departments to liaise stakeholder engagement and improve coordination. Develop integrated asset management policies procedures and standards to ensure alignment and consistency in asset management practices. Employ effective structures comprising of but not limited to SFM Manager, SFM coordinator, and SFM inspector. Literature review, section 2.6.3 provides details on the role of a facilities manager, this includes skills and responsibilities.

Create cross-departmental asset management working groups or committees for monitoring equipment functionality and lifecycle performance indicators and report on sustainability progress. Provide staff training and expertise development in sustainable facilities management and development to build effective structures. In addition, provide comprehensive asset management training across departments to build common understanding and awareness.

### **5.5.3 SFM monitoring**

Mandate sustainable practices to ensure systematic adoption across the municipality's asset and facilities management programs. Implement asset performance monitoring and benchmarking system to provide insight on progress. For tracking and accountability, integrate municipal staff performance management systems with the Integrated Development Planning, and set targets to connect to sustainability development goals.

Monitoring strengthens the management of infrastructure and built assets over the long term. SFM practices are renowned for recouping costs over time, demonstrating economic sustainability. Therefore, tracking operating maintenance expenses in financial records and physically inspecting facilities is recommended. Engage in SFM assessments focused on energy efficiency, green building compliance, and infrastructure maturity accredited and standardized methodologies.

## **5.6 Research Implications**

The current section discusses the implication of the findings to the existing theories, management practices, and policies.

### **5.6.1 Management implications**

The study results were discussed in relation to the management implications, findings agree with the previous studies of Elmualim, et al., (2010) on lack of senior management commitment and lack of understanding. However, findings add explanation or justify the action based on the government institution's practices. The results uncover the municipal structures and practices that influence SFM practices. This creates a prospect for managerial stakeholders to consider SFM best practices to address infrastructure deterioration.

The study contributes to the awareness of sustainability initiatives in municipalities. sustainability awareness is a tool to integrate day-to-day operations to accomplish effective SFM practices. findings highlight the importance of having dedicated staff and internal resources focused on facilities management within municipalities. The main objective of the study contribute to the management framework to be adopted for effective SFM practices.

### **5.6.2 Policy Implications**

Concerning policy, the results implicate the procurement policy of municipalities to enable sustainability practices. Findings suggest the development and alignment of institutional policies address the challenges and barriers of SFM. The study revealed the need to collaborate on departmental policies for improved decision-making. The study suggests SOP to encourage shifting the SFM responsibility to the capable department.

The study findings suggest a cultural shift towards the budget focused on the management of facilities. This study contributes to the overall change management strategies and specialised development programs that are required to facilitate the transition of municipalities towards sustainable facilities management mindsets and practices.

## **5.7 Research Limitation**

The study faced several key limitations that affected the research findings and recommendations. Existing South African governance policies and regulations also constrained the study to recommend local best practices. Due to the qualitative nature

of the study, the research experienced limitations with the research approach, sample size, sampling technique, governance and ethical concerns.

The research approach used relies on subjective participant experiences and perspectives, this introduces potential biases that cannot conclusively establish causality between factors influencing sustainable facilities management (SFM) practices. The sample size of in-depth interviews with eThekweni Municipality employees may not fully represent the SFM stakeholders. The judgmental sampling technique limits the representativeness and generalizability of the results.

The context-specific case study design at eThekweni Municipality means the findings correspond to the governance structure of the organization with different infrastructures, cultures or policies. Lack of SFM knowledge and sustainability alignment across departments was a limitation. Confidentiality restrictions prevented the reporting of certain specific municipal practices. The findings are also at risk of becoming outdated given the study captured perspectives applicable to the research time frame.

## **5.8 Future Research Suggestions**

The previous section discussed research limitations; the current section recommends future research with the limitations in mind.

Future research could consider findings with quantitative data sources, expand sampling across other municipalities or government structures, and potentially combine qualitative and quantitative research methods and utilize a mixed-methods approach. Further studies may investigate a consolidated SFM framework with cross-functional integration across all relevant domains like health, safety, engineering disciplines and supply chain management.

Investigate framework implementation and adoption challenges in municipalities. This suggests further research could explore effective models, training programs, and SOPs to support the recommended solutions. As frameworks and policies are developed, studying the compliance, monitoring and actual adoption rates of sustainable facilities management practices would provide meaningful insight.

## **5.9 Conclusion**

The study explored sustainable facilities management (SFM) practices and challenges within the eThekweni Municipality. The findings revealed that standard operating procedures (SOPs) and management strategies play a crucial role in integrating sustainability practices. The research identified methods for realizing the benefits of SFM and key factors that drive its implementation. However, a lack of awareness emerged as a significant barrier, influencing the availability of funds and the execution of sustainability initiatives.

The centralization of building services within a single department at the eThekweni Municipality highlighted matters related to poor planning and coordination among various departments. To address these challenges, the study recommends the implementation of computer systems to streamline inventory tracking, budgeting, and asset management processes within the municipality. While the research provided valuable insights into SFM practices and challenges, it encountered limitations in gathering relevant information due to ethical considerations.

Further research could explore strategies to enhance awareness, improve interdepartmental coordination, and integrate soft services into sustainable facilities management practices within the eThekweni Municipality and other similar organizations. The research reached the goal of proposing a framework outlining sustainable facilities management practices tailored for the eThekweni Municipality to improve services within the facilities management domain.

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## APPENDIX A: ETHICAL CLEARANCE LETTER



02 December 2023

Nkhensani Maluleke (222069593)  
Grad School of Bus & Leadership  
Westville Campus

Dear N Maluleke,

Protocol reference number: HSSREC/00006093/2023

Project title: Framework for sustainable facilities management practice in eThekweni Municipality

Degree: Masters

### Approval Notification – Expedited Application

This letter serves to notify you that your application received on 28 August 2023 in connection with the above, was reviewed by the Humanities and Social Sciences Research Ethics Committee (HSSREC) and the protocol has been granted **FULL APPROVAL**.

Any alteration/s to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through the amendment/modification prior to its implementation. In case you have further queries, please quote the above reference number. PLEASE NOTE: Research data should be securely stored in the discipline/department for a period of 5 years.

This approval is valid until 02 December 2024.

To ensure uninterrupted approval of this study beyond the approval expiry date, a progress report must be submitted to the Research Office on the appropriate form 2 - 3 months before the expiry date. A close-out report to be submitted when study is finished.

HSSREC is registered with the South African National Health Research Ethics Council (REC-040414-040).

Yours sincerely,



Professor Dipane Hlalele (Chair)

/dd

### Humanities and Social Sciences Research Ethics Committee


Postal Address: Private Bag X54001, Durban, 4000, South Africa

Telephone: +27 (0)31 260 8350/4557/3587 Email: [hssrec@ukzn.ac.za](mailto:hssrec@ukzn.ac.za) Website: <http://research.ukzn.ac.za/research-Ethics>

Founding Campuses: Edgewood Howard College Medical School Pietermaritzburg Westville

INSPIRING GREATNESS

## APPENDIX B: GATEKEEPERS LETTER



POD 7, GROUND FLOOR, INTUTHUKO JUNCTION, 750 MARY THIPHE STREET, UMKHUMBANE, CATO MANOR, DURBAN 4001  
TEL: 031 322 4513, FAX: 031 261 3405, FAX TO EMAIL: 086 265 7160, EMAIL: MILE@DURBAN.GOV.ZA, WEBSITE: WWW.MILE.ORG.ZA

**For attention:**  
**Chair of Research Ethics Committee**  
**College of Law and Management Studies**  
**School of Management, IT and Governance**  
**University of KwaZulu Natal**  
**Durban**  
**4001**  
**21 July 2023**

**RE: LETTER OF SUPPORT TO N.A MALULEKE, STUDENT NUMBER 222069593 - GRANTING PERMISSION TO USE ETHEKWINI MUNICIPALITY AS A STUDY SITE**


I am pleased to inform you that the **Architecture Department and Municipal Institute of Learning (MILE)** in eThekweni Municipality recently considered a gatekeeper request from **Nkhensani Angelic Maluleke** use eThekweni Municipality as a research study site leading towards a **Master of Commerce (Leadership Studies) degree**. The request is to conduct participant interviews with city officials for a research study entitled **"Framework for Sustainable Facilities Management Practice in eThekweni Municipality."**

We wish to inform you of the **ACCEPTANCE** of this request and hereby assure the student of our utmost cooperation towards achieving his academic goals; the outcome which we believe will help eThekweni municipality improve its evidence-base on facilities management.


The student is reminded of the data collection conditions, ethical considerations as well as the current health related regulations when conducting the research. The student must take all necessary measures to ensure her personal safety during the research period as eThekweni Municipality indemnifies itself from any incidental claims that may arise.

It is mandatory for the student to contact [Buyi.Ngubane@durban.gov.za](mailto:Buyi.Ngubane@durban.gov.za) to arrange a learning event where the researcher will share the findings and recommendations of the research output with the beneficiary unit prior to finalization.

Wishing the student all the best in her studies.

<b>Supported</b> ..... <b>Mr. Allan Shazi</b> Deputy Head: Architecture Department eThekweni Municipality .....	 <b>Dr. Collin Pillay</b> Program Manager: MILE eThekweni Municipality .....
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I .....**Nkhensani Angelic Maluleke**.....hereby accept as mandatory that I will comply fully as per the ..... stipulated above.

Signed:  Date: **21/07/2023**.....

## **APPENDIX C: INFORMED CONSENT**

### **School of Management, Information Technology, and Governance**

#### Information Sheet and Consent to Participate in Research

Date: 26 June 2023

Dear Valued Colleague,

My name is Nkhensani Angelic Maluleke from the Graduate School of Business and Leadership, Cell [REDACTED], email: 222069593@stu.ukzn.ac.za. My research forms part of my dissertation as a requirement for the completion of my Master of Commerce in Leadership studies. My supervisor's details are as follows;

Prof Jobo Dubihlela  
University of KwaZulu-Natal  
Graduate School of Business and Leadership  
Office No: 37 G-block  
E-mail: DubihlelaJ@ukzn.ac.za  
Tel: 031-260 1383

You are invited to consider participating in a study involving research into Framework for Sustainable Facilities Management Practice in eThekweni Municipality. The research investigates elements of sustainability such as current practices, drivers of SFM, benefits identification, and barriers, and proposes a SFM framework to assist the municipality in working toward achieving sustainable facilities. If you choose to enrol and remain in the study, the duration of your participation is expected to be twenty minutes for an interview with the study concluding by the end of March 2024. The study is funded by the researcher.

The study does not involve any risks and/or discomforts. We hope that the study will create benefits resulting in long-term financial sustainability for the organization.

In the event of any problems or concerns/questions, you may contact the researcher or the UKZN Humanities & Social Sciences Research Ethics Committee, contact details are as follows:

HUMANITIES & SOCIAL SCIENCES RESEARCH ETHICS ADMINISTRATION  
Research Office, Westville Campus  
Govan Mbeki Building  
Private Bag X54001  
Durban  
4000  
KwaZulu-Natal, SOUTH AFRICA  
Tel: 27 31 2604557- Fax: 27 31 2604609  
Email: [HSSREC@ukzn.ac.za](mailto:HSSREC@ukzn.ac.za)

Participation in this research is voluntary and participants may withdraw participation at any point. In the event of refusal/withdrawal of participation, the participants will not incur a penalty or loss of benefit to which they are normally entitled. The participants will not experience any negative consequences should the participant wish to withdraw from the study. The participant would need to send an email notification for an orderly withdrawal.

Confidentiality of personal information will be managed and maintained by the researcher in an access-controlled, with only the researcher and the supervisor having access to the information. As per university guidelines, research will be stored for five years and thereafter shredded and destroyed.

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CONSENT

I \_\_\_\_\_ have been informed about the study entitled  
Framework for Sustainable Facilities Management Practice in eThekweni Municipality

I understand the purpose and procedures of the study being to study ways to improve sustainable facilities management practices.

I have been allowed to answer questions about the study and have had answers to my satisfaction.

I declare that my participation in this study is entirely voluntary and that I may withdraw at any time without affecting any of the benefits that I usually am entitled to.

I have been informed that there is no compensation and that the study bears no risk of loss or injury.

If I have any further questions/concerns or queries related to the study I understand that I may contact the researcher at (provide details).

If I have any questions or concerns about my rights as a study participant, or if I am concerned about an aspect of the study or the researchers then I may contact:

HUMANITIES & SOCIAL SCIENCES RESEARCH ETHICS ADMINISTRATION

Research Office, Westville Campus  
Govan Mbeki Building  
Private Bag X54001  
Durban  
4000

KwaZulu-Natal, SOUTH AFRICA

Tel: 27 31 2604557 - Fax: 27 31 2604609

Email: [HSSREC@ukzn.ac.za](mailto:HSSREC@ukzn.ac.za)

Additional consent, where applicable

I hereby provide consent to:

Audio-record my interview / focus group discussion YES / NO

\_\_\_\_\_  
Signature of Participant

\_\_\_\_\_  
Date

## APPENDIX D: INTERVIEW SCHEDULE

### Framework for Sustainable Facilities Management Practice in eThekweni Municipality

#### Participant information

Name:									
Education Background:									
Position level:				Department:					
Work experience:									
Email:				Tel:					
Gender: M		F		Ethnicity:	Age	25-35	35-45	45-55	55+

1. Discuss the current SFM practices in eThekweni Municipality.
  - a. Tell me about sustainability objectives in your workplace
  - b. Your experience with the organization's sustainability goals and objectives
  - c. Discuss any sustainability FM initiatives or ideas.
  - d. How does your organisation address SFM practices?
2. Discuss the factors that are the key drivers of SFM practices within eThekweni.
3. How are the potential benefits of SFM identifiable in eThekweni?
  - a. Discuss the process in place to regularly review and update sustainable FM practices
  - b. Discuss any systems in place to monitor or measure sustainability performance
4. Discuss the existing barriers to SFM practices in eThekweni Municipality.
  - a. In your opinion what prevents your organisation from effectively managing its sustainability responsibilities
  - b. What are the existing barriers to the integration of sustainability and FM practices
5. SFM framework suggestions for municipalities like eThekweni
  - a. Describe any efforts to prioritize sustainability practices.
  - b. How can eThekweni implement performance indicators (KPIs) to track progress towards sustainability goals?
  - c. Discuss mechanisms to communicate sustainability achievements to stakeholders.
6. Any further actions or address questions you may have?