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Namanyane, Tseke Remed

2020

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Namanyane, Tseke Remed (2020) The practice of green procurement in the city of Tshwane Metropolitan Municipality in Gauteng Province, University of the Witwatersrand, Johannesburg, <http://hdl.handle.net/10539/31178>

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THE PRACTICE OF GREEN PROCUREMENT IN THE CITY OF TSHWANE METROPOLITAN MUNICIPALITY IN GAUTENG PROVINCE

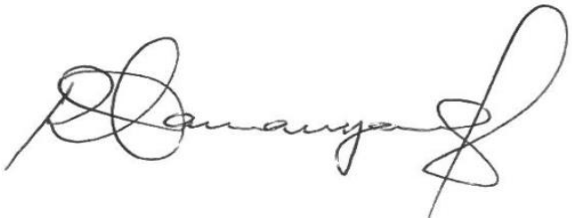
Tseke Remed Namanyane

A research report submitted to the Faculty of Engineering and the Built Environment, University of the Witwatersrand, in partial fulfilment of the requirements for the degree of Master of Science

Johannesburg, 27 October 2020

DECLARATION

I declare that this research report is my own, unaided work. It is being submitted for the degree of Master of Science at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination at any other University.



_____

(Signature of candidate)

27th day of October 2020 at Johannesburg

ABSTRACT

The persistent challenges posed by climate change require the formulation of strategies to protect natural resources at local levels of governance. Sustainable procurement has been identified as a tool to manage these challenges. The study aims to investigate the practice of green procurement at the level of metropolitan municipalities. A literature review was conducted to explore global trends and green procurement practices and aid in the development of a questionnaire for data collection. From the local context, green procurement is not a new concept. The five biggest departments in the City of Tshwane have been sampled to represent diversity in the target population.

The study employed document analysis and questionnaire to gather data. The questionnaire was web-based and distributed through an email generated from Qualtrics to participants in the City of Tshwane. The strengths, weaknesses, opportunities and threats (SWOT) approach was applied to analyse data by evaluating the status of the organisation, existing resources, skills and competencies to enable the municipality to become competitive in the area of sustainable procurement. Data analysis was preceded by literature review to develop secondary data on enablers and barriers impeding the practice of green procurement. The data was grouped into enablers and barriers impeding the practice of green procurement. The enablers represent strengths and opportunities while the barriers represent weaknesses and threats.

The results of the study indicate that the City of Tshwane has implemented a variety of strategies, policies, initiatives and outreach programmes to promote and improve on the practice of green procurement. The applicable legislation governing municipalities does not make it mandatory to incorporate green procurement in their Supply Chain Management (SCM) policy when procuring goods and services. The weakness of the Municipal Financial Management Act 56 of 2003 (MFMA) on green procurement has implications for the compliance of private entities providing goods and services to municipalities. In addition, elements of green procurement have been incorporated into the environmental policy and other strategies, instead of creating a standalone green procurement policy. The lack of awareness, education and training was rated top challenge that prevent municipalities from executing green procurement.

The study recommends that the national government consider amending MFMA to mandate municipalities to incorporate environmental requirements into their tender awarding criteria when procuring goods and services. The amendments should incorporate annual milestones, compliance monitoring and auditing. The study was limited to the City of Tshwane.

Keywords: eco-design, green procurement, green services, green supply chain management, sustainable procurement.

ACKNOWLEDGEMENTS

I would like to thank my wife, Kgathane, our beloved children, Clive, Karabo and Leago, as well as our extended families for their support during my persistent absence due to long hours of studying. The research study would not be possible without valuable inputs provided by respondents from the City of Tshwane who participated by answering the questionnaire. The dedicated and continuous guidance provided by my supervisor, Associate Professor Obinna Ozumba, throughout the study is greatly appreciated.

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ABBREVIATIONS

AU : African Union

BRT : Bus Rapid Transit

C40 : Cities Climate Leadership Group

CNG : Compressed Natural Gas

CoT : City of Tshwane Metropolitan Municipality

CRUE : Conference of Rectors of Spanish Universities

ECA : United Nations Economic Commission for Africa

EMS : Environmental Management System

EU : European Union

GDP : Gross Domestic Product

GHG : Greenhouse gas emissions

GLCN : Global Lead Cities Network on Sustainable Procurement

HDI : Historically disadvantaged individuals

IDP : Integrated Development Plan

KPAs : Key performance areas

KPIs : Key performance indicators

LICs : Low Income Countries

MFMA : Municipal Financial Management Act 56 of 2003

MIS : Mean item score

MSA : Municipal Systems Act 32 of 2000

MTREF : Medium-Term Revenue Expenditure Framework

OECD : Organisation for Economic Co-operation and Development

ORPF : Procurement and Fiduciary Services Department

SACN : South African Cities Network

SCM : Supply Chain Management

SMMEs : Small, Medium and Micro-sized Enterprises

SWOT : Strength, Weaknesses, Opportunities and Threats

TIDP : Tshwane Integrated Development Plan

TIEP : Tshwane Integrated Environmental Policy

TIEPIP : Tshwane Integrated Environmental Policy Implementation Plan

UN : United Nations

USA : United States of America

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1. CHAPTER ONE – INTRODUCTION

1.1 Premise

The recent emergence of extreme weather patterns and persistent increase in global population and economic growth has stimulated an increase in the consumption of energy and natural resources such as water (Ozumba and Aduda, 2015). These behavioural challenges exacerbate the negative impact on the environment and contribute to global warming when left unaddressed. The increase in consumption of natural resources requires strategic measures to be implemented by both private and public sectors. The public sector is expected to play a leading role on the formulation and implementation of such strategies. Green procurement has been distinguished as one of the strategies to minimise the impact of global warming.

1.2 Introduction to the research

Green procurement has been adopted by private and public bodies in various countries of the world (Nikolaou, Lerapetritis, and Tsagarakis, 2011; Amann, Roehrich, Essig and Harland, 2014). It was identified by Agyepong and Nhamo (2016) as an instrument that promotes the purchase of goods and services with minimal impact on the environment to enhance environmental sustainability. Many countries, particularly those

with developed economies, have instituted legislation and policies aimed at providing statutory backing to the issues of sustainability (Ikediashi, Ogunlana, Oladokun and Adewuyi, 2012). A study by Fuentes-Bargues, Ferrer-Gisbert and Gonzalez-Cruz (2018) listed the top seven countries for green procurement as Austria, Denmark, Finland, Germany, Netherlands, Sweden and the United Kingdom.

From the local context, Section 24 of the Constitution of the Republic of South African Act 108 of 1996 states that “everyone has the right (1) to an environment that is not detrimental to their health and (2) to have the environment preserved for the benefit of current and upcoming generations through the implementation of legislative and other reasonable measures that (a) prevent pollution and ecological degradation (b) preserve conservation; also through secure ecologically sustainable development, the utilisation of natural resources and the promotion of measures that enhance economic and social development” (RSA, 1996). The government is required to formulate legislation that promotes the preservation of the environment in accordance with the Constitution.

The formulation of legislation to protect the environment and to manage the consumption of resources cannot be isolated without addressing behavioural challenges emanating from society, organisations and industries in the public and private sectors. An increasing number of organisations are recognising their corporate responsibility towards environmental preservation as part of their mandatory business imperatives (Blome, Hollos and Paulraj, 2014). This assertion is confirmed

by Nikolaou et al. (2011) who state that several governmental, inter-governmental and non-governmental organisations have developed a series of policies, tools and standards to encourage private businesses to adopt strategies that promote minimal environmental impacts and address the challenges caused by their actions.

Similarly, public sector clients such as government departments, state-owned entities (SOEs) and municipalities are expected to adopt strategies that protect and promote environmental sustainability. Brammer and Walker (2011), citing a study by Evenett and Hoekman (2005), assert that public procurement in 106 developing countries accounts for 5.1% of their gross domestic product (GDP). It has been identified by Akenroye et al. (2013) as a powerful instrument that can be utilised to achieve the desired environmental goals. Public procurement has the potential to influence other sectors to adopt and develop strategies that protect the environment. Green procurement offers the public sector a vehicle through which to develop strategies and policies that support environmental sustainability.

Sustainable procurement is one of the measures identified in the Constitution that are aimed at protecting and preserving the environment against negative impacts generated by various sectors, for the welfare of future generations. Metropolitan municipalities play a critical role in the promotion of environmental sustainability.

1.3 Background to the research problem

A high proportion of studies have been undertaken gobally on sustainable procurement, particularly in developed economies. A study by McMurray, Islam, Siwar and Fien (2014) found that green procurement has been implemented effectively in a variety of countries throughout the world and recognised as an instrument for minimising negative environmental impacts. It was observed from extant literature that restricted proportions of research has been undertaken on the subject in countries with less economic activities, particularly on the African continent.

In addition, the literature on green procurement practices in the private sector in Malaysia is excessive in comparison with the public sector (McMurray et al., 2014). Michelsen and de Boer (2009) state that public institutions play an influential role in the fabrication and processing of products and services with little or no impact on the environment. The public sector has the ability to influence the private sector to promote green procurement. Buniamin, Ahmad, Rauf, Johari and Rashid (2016) have found government to be exemplary in the procurement practices of a country. The procurement functions of metropolitan municipalities present a window of opportunity to institute strategic measures that underscore the acquisition of greener goods and services with no impact on the environment.

Agyepong and Nhamo (2016) reiterate that climate change can be addressed through the purchase of products and services with little or no impact on the environment, particularly in the public sector. While the focal point of the scholars dwelled on the body of laws on sustainable procurement in metropolitan municipalities in South Africa, the magnitude of the practice in municipalities is not known. The three spheres of governance; national, provincial and local governments, function as clienteles to private firms offering a diversity of goods and services. The local government level, also known as municipalities, is mandated with the provision of quality basic services to various communities within their jurisdictions.

Due to its strategic location as the capital city of the Republic of South Africa and the largest municipality by land mass (Statistics South Africa, 2011), the City of Tshwane Metropolitan Municipality (CoT) was identified by the researcher as an appropriate location in which to conduct the study. It was ranked number 35 out of the 300 largest metropolitan areas globally and identified as one of the fastest-growing economies, with a GDP of 3.5% (Bouchet, Liu, Parilla and Kabbani, 2018). Its public procurement practices can play a prominent role in influencing society and private firms to procure greener products and services. The CoT covers 33.4% of Gauteng's 19,055km² geographical area, has a population of approximately 2.9 million, and an average population density of 455 inhabitants per km² (Statistics South Africa, 2011).

1.4 Research problem

There is inadequate practice of green procurement at the municipality levels of governance, which detracts from the quality of sustainable practices in the public sector.

1.5 Research question

What is the status of the practice of green procurement at the local levels of governance?

1.6 Research aim

To investigate the practice of green procurement at the level of metropolitan municipalities, with a view to understand the status, determine attendant challenges, and identify ways to address such challenges.

1.7 Research objectives

The objectives of this study are:

- To determine the practice of green procurement at the level of a metropolitan municipality.
- To determine the challenges that prevent metropolitan municipalities from practising green procurement.

- To identify approaches to address the challenges and improve the implementation of green procurement in metropolitan municipalities.

1.8 Assumptions

There is an element of green procurement practice at the local level of governance.

1.9 Research scope

The study investigates the execution of green procurement in the CoT, particularly in SCM and the Infrastructure and Environmental Departments. The researcher identified these departments as responsible for, inter alia, the solicitation of goods and services, the provision of quality basic services and the protection and preservation of the environment. All these elements are critical to the accomplishment of sustainable procurement in the municipality.

The study is limited to the local sphere of governance, particularly the City of Tshwane. The private sector and other public sector clients such as provincial departments, local and district municipalities and state-owned entities have been omitted from the research.

1.10 Justification for the research

Although the concept of practising sustainable procurement is not common in South Africa, it has been undertaken in some municipalities. A study by Agyepong and Nhamo (2016) found that the lack of desire to execute sustainable procurement in metropolitan municipalities can be ascribed to inadequate policy framework. In addition, the lack of desire to its practice is compounded by weak legislation (Nasiche and Ngugi, 2014). The scholars further found that there are adequate statutory provisions mandating environmentally sustainable procurement in South African metropolitan municipalities (Agyepong and Nhamo, 2016). This phenomenon indicates the existence of a gap between national legislation and municipal policies regarding the practice of environmentally sustainable procurement. In addition, it is not known whether the practice of green procurement is being implemented at the local sphere of governance.

In light of the identified gap and the lack of adequate knowledge regarding the current status of the practice, there was a need to conduct the study. The results of the study will build an initial understanding of the degree of sustainable procurement at the municipal level of governance and thereby highlight the influencing factors and possible approaches for attaining best practice. They will further be used to create a picture of what could be the case elsewhere in the country, and could be applied as a baseline for further exploration and studies in the wider country context.

1.11 Research structure

The study has been subdivided into six chapters. Chapter one outlines the introduction and background of the study. The problem statement, research question, aims and objectives of the study are described.

Chapter two reviews the extant literature to identify gaps that support the proposal to undertake the research. The global trends on green procurement practices are reviewed to explore the concept from the South African perspective empirically. The existing institutional frameworks relating to green procurement in the City of Tshwane are analysed.

Chapter three outlines the research design and methodology applied by the researcher in pursuit of answers to the research question. The methods used to collect and analyse data are described in the chapter. A SWOT analysis technique is adopted and applied to analyse data.

Chapter four discusses the methodology of how the data was collected, presented and analysed by the researcher. Chapter five discusses the findings of the study, relating them to the literature review. The conclusions of the study and suggestions for further research are discussed in Chapter 6. A schematic presentation of the research structure is illustrated in Figure 1.1.

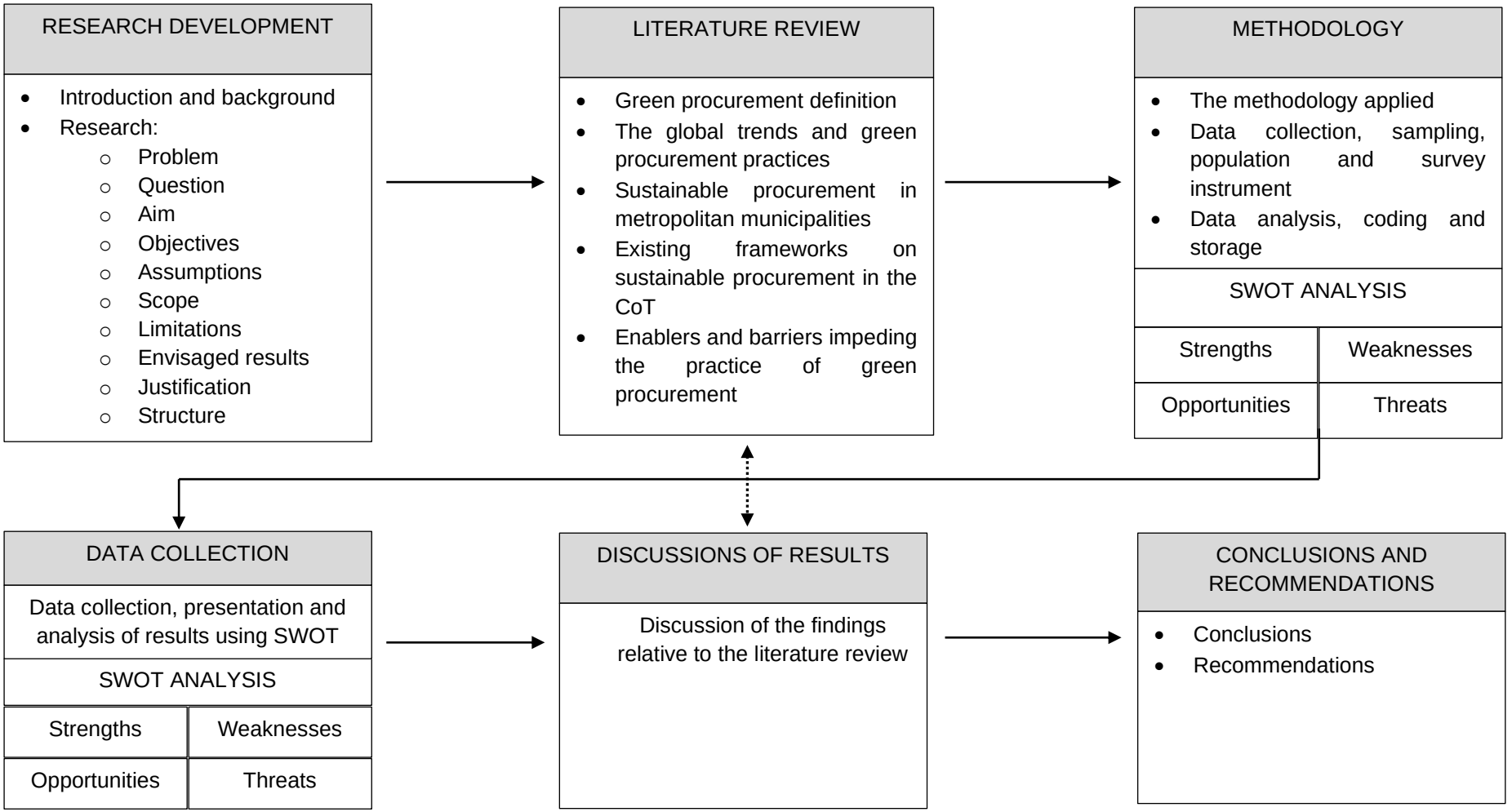


Figure 1.1: The structure of the research for this study. Source: Adapted from Nikolaou et al. (2011)

2. CHAPTER TWO – LITERATURE REVIEW

2.1 Introduction

The literature review examines the concept of green procurement by considering global trends and the practice of this phenomenon from the South African perspective. The study seeks to determine how the CoT is implementing green procurement and identify barriers, if any, that prevent the municipality from practising this concept. The website of the municipality was accessed to obtain relevant data on legislation, policies, strategies and plans related to green procurement, environment and supply chain management.

A wide search of the literature was conducted using keywords such as green procurement, sustainable procurement, green supply chain management, green services and eco-design. The keywords were used in combination with countries to search well-known databases such as Research Gate, Emerald, Science Direct, Taylor and Francis Online, Scopus and Ebscohost. The countries considered include Australia, Germany, Netherlands, Norway, Spain, Italy, Sweden, Denmark, the United Kingdom, Brazil, Malaysia, China, Ethiopia, Ghana, Kenya, Nigeria and South Africa.

2.2 Green procurement

2.2.1 Definition

The concept of green procurement originated at the 2002 Johannesburg World Summit which developed an action plan requiring all levels of governments to develop policy frameworks that promote the evolution and utilisation of environmentally friendly goods and services (UN, 2002 cited in Pacheco-Blanco and Bastante-Ceca, 2016). Consequently, metropolitan municipalities are required to develop policies that support the action plan. The study, citing Bala et al. (2008), states that public authorities are expected to play a crucial role in the promotion of green procurement by encouraging other sectors to maximise their consumption of greener products.

In order to define green procurement, it is necessary to unpack this concept. The literature refers to green procurement as sustainable procurement, green public procurement, green services, green purchasing, eco-procurement, environmentally responsible procurement, environmental product procurement or socially responsible public procurement. A service is considered green when it utilises predetermined ecological sustainability criteria (Cocca and Ganz, 2015). In addition, public procurement is aimed at maximising efficiency while promoting cost-effectiveness (Nikolaou, 2015, cited in Rainville, 2016). The concept of green public procurement emanates from the integration of public procurement and environmental concerns (Agyepong and Nhamo, 2015). The two concepts are combined to form green public procurement.

In view of the purpose of the study, green public procurement will be referred to as green procurement. Agyepong and Nhamo (2016) define green procurement as the acquisition of products and services with minimal impacts on the environment in order to address climate change. Pacheco-Blanco and Bastante-Ceca (2016) define it as procurement by public institutions which incorporates environmental criteria as part of tender awarding criteria. Rainville (2016) defines it as the purchasing of products and services which takes into consideration the long-term environmental impacts of such products and services.

The three definitions are concerned with products, goods and services which have minimal impacts on the environment. The principle of green procurement is primarily concerned with goods or services that do not yield negative impacts on the environment during their life cycle.

2.2.2 The broader global trends and green procurement practices

The earliest literature on green procurement was cited by academic scholars in the latter part of the twentieth century (Starik and Rands, 1998; Andersson Hogaas Eide, Lundqvist and Mattsson, 1998; Gungor and Gupta, 1999). It emerged in the literature that most European Union (EU) countries prioritising green procurement also form part of the 36-member Organisation for Economic Co-operation and Development (OECD) countries. One might question why the majority of OECD countries and those in Europe have adopted green

procurement. Rais et al. (2018) reiterate that the adoption of green procurement offers environmental and corporates benefits by reducing negative impacts on the environment and optimising on reduction and reuse of material particularly in the manufacturing businesses.

The OECD requires member countries to promote sustainable development through the formulation of legislation and policies at national and local government levels to provide guidance on this initiative. By 2014, about 84% of OECD member countries had already developed a national green procurement strategy to purchase green products and services with little or no impacts on the environment (OECD, 2015 cited in Lundberg and Marklund, 2017). Many of the OECD and European countries are members of the EU which emerges as the cornerstone in the promotion of green procurement practices among member countries. Whether or not the AU encourages member countries to practice this concept remains to be seen; the role of the AU with regard to green procurement does not, however, form part of the scope of the study.

Some OECD member countries outside Europe are prominent green procurement participants, such as the USA, Australia, Japan and Canada. A study by Agyepong and Nhamo (2015) citing Ho et al. (2009), highlights that the Green Purchasing Law was introduced and enforced in Japan in 2001, obligating all government institutions to practice green procurement, develop implementation plans and report on annual targets. In China, suppliers are required by law to incorporate green procurement in their production operations (Lai and Wong, 2012

cited in Tabesh, Batt and Butler, 2016). The adoption of green procurement legislation has contributed significantly to the reduction in resource consumptions in both China and Japan.

Similarly, the Australian Government Clean Energy Regulator was formed with the objective of regulating GHG emissions emanating from the manufacturing and agricultural sectors in Australia (Australian Government-Clean Energy Regulator, 2013 cited in Tabesh et al., 2016). The introduction of legislation and regulatory bodies on green procurement is an effective mechanism to influence businesses to develop strategies that support the mass production of environmentally sensitive goods and services. This fact has contributed to an increasing number of OECD and European countries adopting this approach. Legislation, environmental management systems, policies, multilateral agreements and directives have been identified as enablers of green procurement (Mather, 2010 cited in Peprah et al., 2018).

The term ‘enablers’ of green procurement refers to factors which enhances the production and consumption of green products to achieve the desired environmental goals (Lundberg et al., 2015). The study by Tabesh et al. (2016) emphasised that the provision and enforcement of legislation with punitive sanctions would force companies to adopt green procurement. The embedment of punitive sanctions in legislation should be viewed as an instrument to encourage corporates to practise green procurement.

Brammer and Walker (2011) sampled over 280 public sector organisations from 20 countries to examine the nature and extent of the practice of environmentally sustainable procurement. The study found that the practice in the UK is mainly focused on purchasing from small and local enterprises and on employees' safety, while Scandinavia, Western and Eastern Europe emphasise environmental matters such as commitment to reduce waste and packaging material. Although these countries are located on the same continent, it is evident they have different ways of practising green procurement.

Unlike in Europe, green procurement in the United States of America (USA) mostly entails purchasing from companies owned and operated by minorities and women (Brammer and Walker, 2011). Nikolaou et al. (2011) emphasise that several governmental, inter-governmental and non-governmental organisations have developed a series of policy instruments, standards and tools to encourage businesses to adopt environmental strategies to address the challenges posed by their actions. The formulation of policies on green procurement by public authorities is critical to its success in municipalities. Consequently, many scholars point out that the existence of green procurement policy in metropolitan municipalities enables its widespread adoption.

China, India, Indonesia, Malaysia, South Korea, Taiwan and Thailand are among the emerging Asian economies that have started adopting green procurement to address environmental challenges posed by the proliferation of industrial modernisation and economic growth in their countries (Geng,

Mansouri and Aktas, 2017). The migration of manufacturing businesses from the West to eastern economies has created a booming manufacturing sector in Asia which, in turn, has caused excessive carbon emissions in the region. With the exception of China, the majority of these countries have developing economies similar to South Africa hence the literature from these economies has been examined to strengthen undertaking of the study.

It is evident that the lack of legislation on green procurement in Asian countries has contributed to the rapid escalation of carbon emissions which is detrimental to the environment. These Asian firms are now accepting the urgency of adopting sustainable procurement as a blueprint to minimise the negative impact of their non-green products and services on the environment. A study by Amann et al. (2014) determined that, unlike in Asia, suppliers in four European Union (EU) states have systems in place to produce green products as prescribed by green procurement legislations in the region. This finding underscores the earlier statement that the establishment of green procurement legislation in Asia would go a long way to influencing businesses to develop strategies that support the production of environmentally sensitive goods and services in the region.

Geng et al. (2017) conducted a meta-analysis study to analyse the performance of 11,127 Asian manufacturing firms which were surveyed in 50 journals to establish the linkage between green procurement and firm performance. The study found that green procurement enhances better performance of firms,

particularly in their economic, environmental and operational aspects. This finding is reinforced by Majernik, Daneshjo, Chovancová and Sančiová (2017) who state that green procurement involves the integration of environmental, economic and social characteristics in the procurement process of commodities and services to minimise adverse environmental impacts. In addition, Cocca and Ganz (2015) reiterate that businesses offering sustainable goods and services contribute to social justice and quality of life. The contribution is made by the reduction of GHG emissions into the aerosphere during the production phase of products by manufacturing firms.

Blome et al. (2014) investigated the factors that motivate firms to incorporate green procurement into their daily activities and found that the commitment of top management plays a strategic role in promoting green procurement in organisations. Top management is ideally placed to allocate resources to realise the success of this concept. The commitment of top management, collaborative leadership styles and a conducive organisational approach to sustainability are factors that promote green procurement (Adams, 2013 cited in Young Nagpal and Adams, 2016). The role of top management is notable when it comes to inculcating organisational culture to practise green procurement.

Akenroye et al. (2013) determined five enablers of green procurement in Nigeria, namely (i) government and regulatory entities (ii) environmental and procurement professionals (iii) politicians (iv) corporate organisations and the media and (v) NGOs and civil society organisations. Okereke, Coke,

Gebreeyesus, Ginbo and Malugetta (2019) corroborate that the majority of these listed enablers are responsible for accelerating green procurement in Ethiopia. It is noteworthy that top management was not identified by these scholars as a driver of green procurement. Politicians cannot be classified as top management since they provide political leadership on the development of legislation at the national, provincial and regional level to guide the implementation of green procurement.

Pacheco-Blanco and Bastante-Ceca (2016), citing the Conference of Rectors of Spanish Universities (CRUE) (2005), found that public universities in Spain have made a commitment to becoming green procurement role models in public administration and society by incorporating environmental criteria as part of their supply chain management processes for the acquisition of goods and services. The metropolitan municipalities possess massive procurement functions, similar to those of universities. They have been identified as major role players in developing policies which promote the practice of green procurement in other sectors.

Majernik et al. (2017) developed a model for ascertaining whether or not suppliers meet environmental criteria. The model that may be applied to the evaluation of tenders during the procurement of goods and services. It takes into account eight evaluation criteria: (i) product life cycle (ii) the Environmental Management System (EMS) (iii) eco-labelling (iv) environmental performance (v) environmental policy (vi) environmental technology (vii) environmental accounting and

(viii) other aspects, such as packaging of products. However, the incorporation of EMS in the evaluation of tenders is contrary to Fuentes-Bargues, Ferrer-Gisbert and Gonzalez-Cruz (2018) who argue that possession of EMS certificates should be used for an evaluation of the technical solvency of tenderers rather than as a criterion for environmentally sustainable practice.

A cost and benefit analysis of green procurement conducted by the EU (2007) established that green products are cheaper than non-green products (Akenroye, Oyego and Eyo, 2013). The study was based on empirical evidence, taking into account the whole life-cycle costs associated with non-green products relative to green products, and came to the conclusion that green products are cheaper in the long term. This is contrary to a finding by Brammer and Walker (2011), who determined that green products are perceived to be more expensive relative to conventional products and identified this perception as a barrier impeding the practice of green procurement.

Further studies by Amann et al. (2014) and Lundberg and Marklund (2017) determined that the incorporation of environmental criteria into tender specifications results in bidders increasing their prices due to additional investments in greener technology and consequently premium prices being paid by contracting public authorities. The lack of supply of green products may be attributed to perceptions that costs will increase exponentially when green procurement is implemented in the manufacturing sector (Tabesh et al., 2016).

The conclusions by many scholars (Brammer and Walker, 2011; Amann et al., 2014; Tabesh et al., 2016; Lundberg and Marklund, 2017) were based on perceptions of premium transactional costs of green products rather than on empirical evidence and did not take lifecycle costs into account. It is well known that green products have long-term positive effects on the environment in comparison with non-green alternatives. However, due to this perception, green procurement presents SCM officers in the public sector with the challenge of choosing between green products and services, on the one hand, and the costs associated with such elements, on the other, during the procurement process (Michelsen and de Boer, 2009).

Scholars have found relationship between the magnitude of the municipality and the degree on green procurement. The literature shows that green procurement is prevalent in metropolitan municipalities which have adequate financial and human resources. These metros have SCM departments and strategies in place which are critical for the adoption of green procurement (Michelsen and de Boer, 2009). These municipalities are located in urban areas, while local and district municipalities are mainly situated in deep rural areas with limited human and financial resources.

Brammer and Walker (2011) determined that the practice of environmentally sustainable procurement is influenced by four factors, namely (i) informational aspects relating to organisational understanding of green procurement and associated policies (ii) financial viability of its implementation (iii) organisational culture and rewards for implementing it and

(iv) the availability of sustainable goods and services. The first three factors are related to intra-organisational characteristics while the fourth is an external factor outside the organisation.

Das (2017) conducted a meta-analysis study to derive a list of green procurement practices with the purpose of developing a scale for measuring the practice and its performance. Common green procurement practices which were validated through data collection from 255 organisations are (i) environmental management practices (ii) socially inclusive practices for employees (iii) operations practices (iv) supply chain integration and (v) socially inclusive practices for the community. The first four elements are related to intra-organisational practices while the fifth is an external factor outside the organisation. Municipalities should develop policies and strategies which enhance the full participation of employees, communities and suppliers in maximising green procurement both within and outside the municipality.

2.2.3 Green procurement in metropolitan municipalities in South Africa

A plethora of literature has been published on sustainable procurement in the public sector in developed economies. However, the literature on green procurement in South Africa, particularly in the public sector such as metropolitan municipalities, is lacking. This assertion is supported by Peprah et al. (2018) who found that although sustainable procurement has been identified as a powerful tool in managing the

environment in developed countries, its presence in developing nations is lacking. The literature published by scholars in other countries was reviewed to empirically explore green procurement from the South African perspective.

Public procurement in developing economies on the African continent accounts for approximately 10% of countries' GDP (Woodstock, 2008 cited in Akenroye et al., 2013). While this fact presents economic opportunities for businesses operating in this market, the literature has shown that public procurement policy and practice also has the potential to influence the private sector, particularly suppliers, to develop strategies that underscore the production of goods and services with no impact on the environment (Brammer and Walker, 2011; Lundberg et al., 2015; Pacheco-Blanco and Bastante-Ceca, 2016; Buniamin et al., 2016; Aragao and Jabbour, 2017). In order to achieve this goal, metropolitan municipalities have been identified as prominent players influencing suppliers through green procurement.

Unlike in first world countries, the introduction of green procurement on the African continent is at a nascent stage. Many African countries lack awareness and have no strategy, policy or plans for the implementation of green procurement (ORPF, 2014, cited in Peprah et al., 2018). With the exception of South Africa, Ethiopia and Kenya, there is limited literature on green procurement on the continent. Its adoption is characterised by a lack of institutional and legal frameworks as well as the absence of political commitment (Akenroye et al., 2013). Most countries are affected by poverty and classified as

low income countries (LICs), a fact which contributes to the lack of its implementation.

Ethiopia started executing green procurement in 2010 through the implementation of the Growth and Transformation Plan which recognises the urgency to minimise GHG emissions emanating from the industrial sector (Okereke et al., 2019). The plan prioritised the modernisation of industrial firms by implementing energy-efficient technology in the sector. In Kenya, the practice of green procurement was found to be lagging, compounded by weak legislation (Nasiche and Ngugi, 2014). However, the right to a neat and healthy environment is embedded in the constitution of the country (Walker, Spaling, and Sinclair, 2016).

Brammer and Walker (2011) emphasise that the endeavour to practise green procurement in any country is enhanced when the concept is embedded in the public sector through legislation and policy frameworks. Metropolitan municipalities should endorse policies that enhance the adoption and enforcement of green procurement. Agyepong and Nhamo (2016) found that all eight metropolitan municipalities in South Africa have green procurement policies in place. Based on these finding, it is clear that green procurement in metropolitan municipalities is supported by sound policies which have been developed and approved by councils in the metros. The legislation and policy frameworks will be discussed in subsequent sections of this study.

Although the metros have initiated policies, strategies and guidelines on green procurement, they are lacking when it comes to implementing and enforcing them. Despite the existence of green procurement policies in metros, its practice is characterised by a lack of enforcement by the authorities. This contention is supported by Peprah et al. (2018), who reiterate that green procurement should be supported by essential policies, legal frameworks and enforcement in order to thrive. In contrast, the corporate governance and financial management of municipalities are governed by the MFMA, which does not prescribe that green procurement should be incorporated in the SCM policy of municipalities.

This oversight of legislation has been observed as an external threat undermining the endorsement of environmentally sustainable procurement in municipalities. Further arguments by scholars reiterate that sustainable procurement in the public domain should be derived primarily from pressures placed on the organisation and existing policy frameworks to undertake it (Brammer and Walker, 2011 and Okereke et al., 2019). A typical example of pressure exerted on public organisations is the directive issued by the EU requiring all member states to develop policies and action plans that support the procurement of environmentally sensitive goods and services.

It is not clear from the literature whether the AU has issued similar directives to their member countries to support this phenomenon, which is a motivation for the undertaking of studies in developing economies such as South Africa. From the local context, Agyepong and Nhamo (2015) have determined

that South African law does not mandate public bodies to incorporate green procurement in their supply chain management processes. This contrasts with the situation in European and OECD countries where member countries are required to develop enforceable legislation and policies which promote green procurement at national and local government level.

In order to standardise green procurement, it is crucial to incorporate environmental criteria in tender documents of municipalities. However, the need for procuring authorities to incorporate green procurement standards should not affect the procurement objectives of these authorities (Wilts et al., 2013 cited in Rainville, 2016). Testa, Annunziata, Iraldo and Frey (2016) maintain that public authorities are beginning to incorporate environmental criteria as part of their purchasing requirements, which demonstrates some awareness of the need for green procurement. Fuentes-Bargues et al. (2018) determined that the average weight for environmental criteria was 6.5 points out of 100 in 316 tenders awarded during 2016 and 2017 by public universities in Spain. During this period, only 19.2% of tenders awarded used environmental criteria as part of their tender awarding criteria (Fuentes-Bargues et al., 2018). Unlike in South Africa, public authorities in Spain have made tremendous improvements on green procurement.

Public authorities on the African continent may be contributing indirectly towards negative environmental impacts simply by purchasing non-green products. Although the availability of green products may be challenging from the suppliers' side

(Brammer and Walker, 2011), this phenomenon presents an opportunity for the public sector to influence suppliers to develop strategies that underscore the manufacturing of environmentally friendly goods and services at competitive costs.

Peprah et al. (2018) determined that there is no comprehension of green procurement in western district assemblies in Ghana. The district assemblies operate similarly to municipalities in South Africa. Buttressing this finding, Ikediashi et al. (2012) found that there is generally low awareness level of sustainable procurement in Nigeria's corporate world due to the uncertainty of its outcomes and benefits. It is worth noting that Ghana, Ethiopia and Nigeria have developing economies similar to South Africa. The absence of knowledge and lack of standard guidelines are the main constraints hampering the execution of sustainable procurement in the public sector (Rais, Bidin, Bohari and Saferi, 2018).

The absence of knowledge and limited understanding and awareness on sustainable procurement identified by the scholars (Ikediashi et al., 2012; Peprah et al., 2018; Rais et al., 2018) may be attributed to a lack of training of personnel in organisations. Appropriate training of personnel would address this lack of knowledge and understanding and raise awareness levels in the private and public sectors. Although employees may be trained in green procurement, it is also imperative that they attain knowledge and skills on how to practise this concept. The formulation of green procurement guidelines

would enhance employees' capacity to improve on the practice of this concept in their organisations.

Training and knowledge of green procurement toolkits and guidelines increases the probability of practising green procurement (Testa et al., 2016) which in turn raises awareness levels in the organisation (Peprah, Brako and Akosah, 2018). The need for employees to increase their knowledge is endorsed by Ikediashi et al. (2012), who identified lack of knowledge as the main barrier to the practice of green procurement. Lack of training, lack of endorsement from top management, non-existance of environmental culture in the organisation, bureaucracy and economic factors are all barriers to green procurement (Aragao and Jabbour, 2017). A lack of knowledge and training have been identified by Testa et al. (2016) as more critical than economic and budgetary factors.

A study by Akenroye et al. (2013) identified five barriers to green procurement in Nigeria, namely (i) the absence of a legal framework (ii) the absence of political will (iii) a lack of awareness (iv) limited expertise and (v) a lack of availability of green products. It is noteworthy that lack of training and awareness emerged as common barriers to green procurement practices in Nigeria (Ikediashi et al., 2012; Akenroye et al., 2013); Ghana (Peprah et al., 2018) and Brazil (Aragao and Jabbour, 2017). As indicated above, these countries have emerging economies similar to that of South Africa. These barriers could be overcome by the provision of adequate training of employees (Testa et al., 2016).

Based on an analysis of green procurement challenges identified by Rais et al. (2018) from a review of the extant literature, the scholars grouped the challenges into ten categories, as follows (i) commitment (ii) knowledge (iii) awareness (iv) policy (v) training (vi) demand (vii) integration (viii) time (ix) cost and (x) availability. Lack of commitment was cited by seven scholars and was ranked the top factor by Rais et al. (2018). The absence of knowledge and lack of incentives for green procurement were ranked second. Lack of awareness, the absence of green procurement guidelines and the perception that green products are expensive were ranked third by the scholars.

The barriers and challenges discussed in the preceding paragraphs all fall within these ten categories identified by Rais et al. (2018). However, the finding on cost is contradicted by Nasiche and Ngugi (2014), who determined that the price difference between green and non-green products is marginal in Kenya.

2.2.4 Existing institutional frameworks relating to green procurement in the City of Tshwane

Municipalities are established and governed in terms of the Municipal Systems Act 32 of 2000 (MSA). Their governance and financial management are governed by MFMA. In meeting the requirements of the UN's 2002 Johannesburg World Summit on Sustainable Development, the CoT has been proactive in

developing strategies, policies and plans to support this initiative. These include City of Tshwane Vision 2055, Tshwane Integrated Development Plan (TIDP), Supply Chain Management (SCM) Policy, Tshwane Integrated Environmental Policy (TIEP), Tshwane Integrated Environmental Policy Implementation Plan (TIEPIP), Service Delivery and Budget Implementation Plan (SDBIP), Medium-Term Revenue Expenditure Framework (MTREF) and Climate Response Strategy. The strategies, policies and plans have been integrated with one another and are discussed in subsequent paragraphs.

2.2.4.1 City of Tshwane Vision 2055

The vision of the CoT is of a prosperous capital city that fosters fairness, freedom and opportunity (TIDP, 2018). Although it is essential for the municipality to articulate its vision, it should be supported by strategic plans to achieve its goals. The City of Tshwane Vision 2055 is one of the strategies which was developed in 2013 aimed at promoting sustainable economic growth by promoting natural resource usages and minimising negative impacts on the environment (Tshwane, 2013).

In pursuit of achieving its long-term vision, the municipality has identified priorities and strategic actions to be undertaken over the next thirty-six years and beyond. Sustainable land usage for development, protecting the City's biodiversity, preserving natural water resources and reducing and managing water and air pollutions are some of the green practices adopted by the

municipality to make the city liveable for its citizens (Tshwane, 2013).

2.2.4.2 Tshwane Integrated Development Plan (TIDP)

The TIDP is defined as a five-year strategic planning tool, reviewed annually, that outlines the operational and capital requirements of the municipality in its endeavour to fulfill the needs of the communities within its jurisdictions (TIDP, 2018). During the preparations of the TIDP, the municipality engaged with communities by conducting public hearings in various wards to determine their service delivery needs and articulate its goals of preserving the environment.

The municipality developed five strategic pillars with the objective of ensuring good governance values. One of the strategic pillars is to become a city that delivers excellent services and protects the environment (TIDP, 2018). The CoT has subdivided this strategic pillar into three priorities, namely (i) delivering high-quality services (ii) safeguarding water and energy security and protecting the natural environment and (iii) ensuring agriculture and rural developments (TIDP, 2018). The latter does not form part of the scope of this study and will, therefore, be omitted in subsequent discussions.

The CoT has been implementing the following green procurement practices as part of its priority to protect the

environment (i) the reduction of water and energy losses (ii) increasing the number of green buildings in the municipality (iii) reviewing and implementing the Green Building By-law (iv) facilitation of waste to energy project at one of its power stations (v) conducting energy audits at buildings owned by the municipality (vi) implementing an embedded generation policy (vii) the establishment of a compressed natural gas (CNG) bus depot to provide compressed natural gas to its bus fleet (viii) the reduction of waste to landfill sites by 10% by implementing separation of waste at source, particularly at schools and public buildings (ix) the protection of wetlands and (x) the initiation of green energy business strategy (TIDP, 2018).

2.2.4.3 Supply Chain Management (SCM) Policy

The CoT established the SCM Division which oversees the purchasing process of commodities and services on behalf of departments in the municipality. The practice of green procurement cannot be relegated to the SCM Division only but applies to other receiving departments of goods and services within the municipality. This argument is supported by Michelsen and de Boer (2009), who found that the existence of SCM department and an approved SCM policy does not guarantee the practice of environmentally sustainable procurement in the municipality.

The procurement of goods and services is regulated by SCM policy which was adopted and approved by council on 27 September 2007. The policy was amended and updated in 2011

in accordance with Section 111 of MFMA. It highlights that tender documents in the municipality were amended to indicate that price alone will not be the determining factor when awarding the contract (SCM, 2011). The tender awarding system uses an 80/20 and 90/10 points systems. For the first criteria, 80 points are for price while 20 points are for historically disadvantaged individuals (HDI), youth, women and persons with disability. This system is corroborated by Agyepong and Nhamo (2015) who state that the current bid evaluation criteria focus on price and previously disadvantaged individuals.

Green procurement means that public authorities should incorporate environmental parameters in the adjudication process of tenders during the acquisition of goods and services from external service providers (Testa et al., 2012 cited in Lundberg, Marklund, Stromback and Sundstrom, 2015). The authorities are required to review their tender specifications to take into account the long-term effects of goods and services on the environment, from production to the commissioning phase. In addition, procurement officers in the public sector are increasingly faced with persistent environmental pressure to develop environmentally friendly specifications for such goods and services (Thai, 2001 cited in Igarashi, De Boer and Pfuhl, 2017).

The SCM policy makes no mention of environmental criteria having to form part of the evaluation process for tenders and is silent on green procurement. The CoT acknowledges through the Climate Response Strategy that elements of sustainable

procurement are embedded in a number of policy frameworks, strategies, institutional supports and other initiatives (CoT, nd). However, the applicable legislation governing municipalities on corporate governance and financial management does not make it mandatory to incorporate green procurement in their SCM policy when enlisting goods and services. To remedy this, the municipality has committed to gradually integrating SCM policy with corporate environmental criteria as part of the procurement process, in accordance with applicable legislation (CoT, nd).

2.2.4.4 Tshwane Integrated Environmental Policy (TIEP)

The policy was approved in January 2005 with the aim of guiding plans, activities, developments and programmes of the CoT in an environmentally sustainable manner (TIEP, 2005). It provides regulatory mechanisms on the protection and management of the environment. In pursuit of achieving its long-term environmental sustainability goal, the municipality identified maximising the implementation of green procurement as one of its objectives in order to address environmental challenges. The top management and political heads of the CoT are required to sign a pledge to promote the practice, to allocate adequate financial resources and to ensure compliance to the policy by all stakeholders and role players in the municipality (TIEP, 2005).

The signing of the pledge and the subsequent allocation of financial resources by senior management is an indication that

the municipality is committed to achieving its environmental goals. This statement supports a finding by Brammer and Walker (2011) who identified support from senior management, legislation and organisational strategies and plans as important factors in the promotion of green procurement.

2.2.4.5 Tshwane Integrated Environmental Policy Implementation Plan (TIEPIP)

Following the approval of the environmental policy, TIEPIP was developed and approved by the municipality in January 2007. The plan was not developed in isolation but integrated with TIDP, TIEP, SDBIP and MTREF. TIEPIP is a strategic plan of action which outlines the best environmental practices and specific environmental targets to be achieved by the CoT (TIEPIP, 2007). The plan has identified green procurement guidelines, green building by-laws and guidelines for green infrastructure and facilities as part of twenty-three best environmental practices to be developed by the City.

The municipality has identified fifteen environmental targets with the aim of integrating them into its business planning, budgeting and scorecards to ensure the achievement of its desired environmental goals (TIEPIP, 2007). Among these goals are the reduction of waste disposal to landfill sites by 15% per capita; the reduction of water and energy consumption by 10% per capita employee; an increase of 3% in the utilisation of renewable and cleaner energy sources and the establishment of incentive schemes for developers incorporating best

environmental practices in their developments (TIEPIP, 2007). The CoT has conducted workshops with communities, non-governmental organisations and environmental groups to get buy-in on the implementation of the plan.

2.2.4.6 Service Delivery and Budget Implementation Plan (SDBIP)

SDBIP is a detailed blueprint outlining the planned delivery of services to the community, directly linked with the approved annual budget of the City (SDBIP, 2018b). It provides consolidated annual targets to be achieved by the municipality when delivering services to the community. These targets are also known as scorecards or key performance indicators (KPIs), with environmental targets forming part of the KPIs. The SDBIP is adjusted annually (SDBIP, 2018a) and integrated with TIDP and MTREF. During the 2017/2018 financial year performance reporting for quarter four, the CoT achieved 42 of 72 targets which represent a 58.3% target achievement for the quarter (CoT, 2018a).

It is not clear whether the municipality achieved its KPIs on green procurement in the 2017/2018 performance report. The City achieved 17 of 24 targets at the end of quarter one in the 2018/2019 fiscal year, which represents a 70.83% target achievement (CoT, 2018b). The overall performance of the municipality has improved by 12.53% compared to the fourth quarter of the previous fiscal year. Strategic pillar three in the 2018/2019 quarter one performance report incorporates KPIs

on green procurement. The municipality achieved four of six targets which represents a 66.67% achievement of KPIs for strategic pillar three (CoT, 2018b).

2.2.4.7 Medium-Term Revenue Expenditure Framework (MTREF)

The MTREF is a three-year strategic plan, updated annually, which outlines the municipality's operational and capital budgets in accordance with Section 24 of MFMA (MTREF, 2018). During preparation of budgets, service delivery needs identified during the IDP process are integrated into the MTREF. The framework provides a consolidated list of capital and maintenance projects to be implemented by the CoT to address service delivery needs. During the procurement stage for delivery of services, the municipality is committed to incorporating environmental criteria into the selection criteria in the tender documents.

2.2.4.8 City of Tshwane Climate Response Strategy and Plan

The City acknowledges that its GHG emissions per capita are high in comparison with other metropolitan municipalities in South Africa and world average figures (CoT, nd). In response to this fact, the municipality has developed the Climate Response Strategy and Implementation Plan to address the prevailing problems posed by climate change.

It was developed in earnest after the signing of the Covenant of Mayors for Energy and Climate in 2014 and the city's joining of the C40 (CoT, nd). The municipality has identified ten interventions to be implemented over a five-year period through the Climate Response Plan to mitigate the challenges. In 2016 the City developed and approved the Wetland Management Plan as one of its interventions to preserve wetlands within its jurisdiction.

2.2.4.9 Organisations promoting sustainability and good governance affiliated with the CoT

The CoT is an active member of local and international bodies which promote, inter alia, sustainability and good corporate governance. One of these bodies is the South African Cities Network which was established in 2002 and represents the largest municipalities in the country. It is mandated with promoting good governance and encouraging members to drive local and national economic development while recognising the emerging challenges posed by climate change.

The Global Lead City Network on Sustainable Procurement (GLCN) was established in 2015 with the objectives of accelerating the implementation of sustainable procurement through the setting of sustainable targets and reporting on achievements by their members (GLCN, nd). The CoT is among fourteen member cities across the world which form part of the

GLCN on SP and has been announced as its new chair city for 2018. As part of its commitment on sustainable procurement, the municipality has set the target that 40% of its bus fleet will be green by 2020 and that 10% of its procurement will be sustainable by 2021 (GLCN, nd). The latter corroborates the earlier observation that environmental criteria do not form part of its procurement process.

The C40 Cities Climate Leadership Group was established with the objective of encouraging cities and regions to develop strategies to mitigate climate change. The C40 represents megacities globally and accepted the CoT as its 70th member in September 2014. The municipality signed the C40 2016 Clean Bus Declaration which requires member cities to reduce emissions emanating from transportation by purchasing low- to zero-emission buses. At least 26 cities in the world have signed the declaration which demonstrates the high demand for cleaner buses (MPGCA, 2017).

At least 175 nations, including South Africa, ratified the 2015 Paris Agreement in pursuit of addressing the challenges posed by climate change (CoT, nd). The CoT supports the Paris Agreement and other commitments and pledges which have been ratified by the South African government.

2.2.4.10 Other initiatives and outreach programmes implemented by the CoT on green procurement

The municipality has implemented a number of initiatives and outreach programmes aimed at promoting sustainability. It built its headquarters in compliance with a 5-star green grading status and introduced electric vehicles as part of its fleet. Other initiatives and outreach programme include (i) the provision of sustainable public transport which utilises CNG to minimise carbon emissions into the atmosphere (ii) promoting green rides during the annual October Transport Month (iii) hosting the 2017 and 2018 annual Sustainability Weeks (iv) raising awareness about wetlands, particularly on World Wetlands Day, celebrated yearly on 02 February and (v) raising awareness campaigns to encourage communities and employees to be innovative in maximising the economic benefits of reducing and recycling waste to landfill site.

Although third-party certifications such as ISO 14001 are necessary to drive and influence the degree of green procurement in public and private sectors (Amann et al., 2014), it is not clear in the literature whether the CoT had obtained ISO 14001 accreditation at the time of conducting the study. Organisations with ISO 14001 accreditation take far more cognisance of the impact of their activities on the environment than those without accreditation. This contention is underscored by Geng et al. (2017), who state that environmental certification and programmes, green design and recycling are enablers of green procurement.

The policies, strategies, initiatives and outreach programmes implemented by the municipality discussed above are in line with the findings of Das (2017), who found that green procurement performance measures consist of five constructs, namely (i) environmental performance (ii) employee-centred social performance (iii) community-centred social performance (iv) operations performance and (v) competitiveness.

2.3 Summary of the review of relevant literature

Following an extensive literature review, elements of green procurement have been observed at the local levels of governance. The following elements have been cited in the literature where municipalities are performing well (i) procurement of bus fleet which utilises CNG to reduce carbon footprint (ii) identification and implementation of ten interventions over a five-year period to mitigate against high GHG emissions (iii) the reduction of water and energy losses and (iv) reducing and recycling waste to landfill site.

The incorporation of environmental criteria to form part of selection criteria during the awarding of tenders, education of employees and stakeholders on green procurement and ISO 14001 accreditation are some of the areas which require improvement at the local levels of governance. The municipality has made commitment to incorporate elements of sustainability

in 10% of its procurement by 2021. Although the target is relatively low, there is an area to improve the percentage.

Enablers and barriers to green procurement, identified from the review of literature, are presented in Tables 2.1 and 2.2. Fourteen enablers and thirteen barriers impeding the practice of green procurement were identified. The tables provide a summary of green procurement practices at the local levels of governance.

Table 2.1: Enablers of green procurement

Continent	Country	Enablers	Sources
Africa, Oceania	Kenya, Ghana, Nigeria, Australia	The establishment of an enforceable legal framework and sound policies have emerged as the foundation that enhances the adoption of green procurement.	Ikediashi et al. (2012); Young et al. (2016); Peprah et al. (2018); Okereke et al. (2019)
Africa, Asia, Oceania, Europe	Ghana, China, Australia, Belgium, Denmark, Germany	The commitment of top management plays a strategic role in promoting green procurement in the organisation.	Blome et al. (2014); Young et al. (2016); Geng et al. (2017); Peprah et al. (2018)
Europe, South America, Asia	UK, Sweden, Spain, Brazil, Malaysia	The government has an influential role to play in demanding and encouraging businesses to develop and procure environmentally friendly products.	Brammer and Walker (2011); Lundberg et al. (2015); Pacheco-Blanco and Bastante-Ceca (2016); Buniamin et al. (2016); Aragao and Jabbour (2017)

Continent	Country	Enablers	Sources
Europe, Asia	Italy, Germany, Spain, China	Awareness, training and knowledge of green procurement techniques and procedures are drivers of green procurement.	Cocca and Ganz (2015); Pacheco-Blanco and Bastante-Ceca (2016); Testa et al. (2016); Geng et al. (2017)
Europe, Oceania, Asia	Sweden, Australia, Germany, Netherlands, Spain, China	Environmental criteria form part of decision-making criteria during the procurement of goods and services.	Lundberg et al. (2015); Young et al. (2016); Rainville (2016); Pacheco-Blanco and Bastante-Ceca (2016); Geng et al. (2017); Majernik et al. (2017); Fuentes-Bargues et al. (2018)
Asia	China	Environmental certification and programmes as well as green design promote green procurement.	Amann et al. (2014); Geng et al. (2017)
Asia	China	Recycling promotes green procurement.	Amann et al. (2014); Geng et al. (2017)

Continent	Country	Enablers	Sources
Asia	China	Green procurement promotes a change in the behaviour of private businesses when initiated by public authorities.	Pacheco-Blanco and Bastante-Ceca (2016)
Oceania	Australia	Transparency, organisational culture and a clear strategy on sustainability are enablers of green procurement.	Young et al. (2016)
Europe	UK	The formulation of measuring and monitoring tools, as well as the provision of adequate resources on sustainable procurement, promote green procurement.	Young et al. (2016)
Europe	Sweden	Green procurement can have a direct effect on emission reductions when the public purchaser, such as a municipality, accounts for a large market share.	Aldenius and Khan (2017)

Continent	Country	Enablers	Sources
Europe	Spain; Slovakia	ISO 14001 certification promotes the adoption of external environmental practices involving suppliers and customers.	Amann et al. (2014); Geng et al. (2017); Majernik et al. (2017)
Africa	South Africa	Climate change can be minimised through the purchasing of green products and services.	Agyepong and Nhamo (2016)
Africa	Ghana	Green procurement helps organisations to improve their efficiency, reduce operational liabilities and gain global recognition.	Peprah et al. (2018)

Table 2.2: Barriers impeding the practice of green procurement

Continent	Country	Barriers	Sources
Asia, Oceania	China; Australia	Lack of enforceable laws and regulations hinder the adoption of green procurement.	Agyepong and Nhamo (2015); Young et al. (2016); Geng et al. (2017)
Africa, Europe, Oceania, Africa, Asia	Kenya, Sweden, UK, Australia, Ghana, China	Green products and services are perceived to be expensive.	Amann et al. (2014); Nasiche and Ngugi (2014); Testa et al. (2016); Agyepong and Nhamo (2016); Young et al. (2016); Tabesh et al. (2016); Lundberg and Marklund (2017); Aldenius and Khan (2017); Geng et al. (2017); Peprah et al. (2018)
Africa, Oceania, Europe	Ghana, Australia, Germany	A limited supply of green products and services.	Akenroye et al. (2013); Cocca and Ganz (2015); Young et al. (2016); Peprah et al. (2018)

Continent	Country	Barriers	Sources
Europe, South America, Africa, Asia	Sweden, Italy, Brazil, Nigeria, Malaysia	Lack of knowledge and training.	Ikediashi et al. (2012); Testa et al. (2016); Aragao and Jabbour (2017); Rais et al. (2018)
Europe, Africa, Asia	Belgium, Denmark, Germany, Nigeria, Malaysia	Lack of commitment from top management.	Ikediashi et al. (2012); Blome et al. (2014); Rainville (2016); Rais et al. (2018)
South America, Oceania, Asia	Brazil, Australia, Malaysia	Lack of support from senior management.	Young et al. (2016); Aragao and Jabbour (2017); Rais et al. (2018)
South America, Asia	Brazil, Malaysia	Limited proficiency on green procurement.	Aragao and Jabbour (2017); Rais et al. (2018)

Continent	Country	Barriers	Sources
Asia	Malaysia	Lack of green procurement guidelines.	Rais et al. (2018)
Africa, Asia	Ghana, Malaysia	Limited awareness level of sustainable procurement in the organisation.	Ikediashi et al. (2012); Agyepong and Nhamo (2016); Peprah et al. (2018); Rais et al. (2018)
Africa, Asia	Ghana, Nigeria, Malaysia	The absence of an appropriate legal framework.	Ikediashi et al. (2012); Peprah et al. (2018); Rais et al. (2018)
Africa	Nigeria	The uncertainty of outcomes and benefits of green procurement.	Ikediashi et al. (2012)
Oceania	Australia	Sustainability, environmental or social responsibility measures are the lowest-level key performance measures in operations of public institutions.	Young et al. (2016)

Continent	Country	Barriers	Sources
Asia	China	Green procurement is difficult to implement, has a lower priority and offers no financial return in comparison to other initiatives.	Geng et al. (2017)

The enablers extracted from Table 2.1 have been categories into five survey themes, as illustrated in Table 2.3 namely (i) environmental management and performance (ii) organisational performance and management (iii) legislation and policy (iv) environmental certification and (v) education and training. For the first theme, four enablers relating to environmental management and performance were identified. Organisational performance and management, and legal and policy have three themes each. Environmental certification and education and training have two themes each.

Unlike enablers, the barriers were categorised into three survey themes, as illustrated in Table 2.4, namely (i) education and training (ii) legislation and policy and (iii) environmental management and performance. Some scholars have referred to the same themes although their wording may have differed. A typical example is ‘certified EMS’ which refers to ISO 14001 certification. It may be noted that a lack of education and training emerged as the main barrier hindering the practice of green procurement at the local levels of governance.

The preparation of Tables 2.3 and 2.4 below was preceded by extensive literature review discussed in this Chapter. The tables have served as the baseline for preparations of questionnaire for fieldwork to collect primary data. The structure of questionnaire was linked to previous studies conducted by academic scholars.

Table 2.3: Survey themes categorised under enablers of green procurement

Themes	Enablers
Environmental management and performance	Environmental criteria to form part of decision-making criteria during procurement of goods and services.
	Recycling promotes green procurement.
	Green procurement can have a direct effect on emission reductions when the public purchaser, such as a municipality, accounts for a large market share.
	Climate change can be minimised through the purchasing of green products and services.
Organisational Performance and management	Transparency, organisational culture and a clear strategy on sustainability are enablers of green procurement.
	The development of measuring and monitoring tools, as well as the provision of adequate resources on sustainable procurement, promote green procurement.
	Green procurement helps organisations to improve their efficiency, reduce operational liabilities and gain global recognition.

Themes	Enablers
Legislation and policy	The establishment of an enforceable legal framework and sound policies have emerged as the foundation underpinning the adoption of environmentally sustainable procurement.
	The government has an influential role to play in demanding and encouraging businesses to develop and procure environmentally friendly products.
	Green procurement promotes a change in the behaviour of private businesses when initiated by public authorities.
Environmental certification	Environmental certification and programmes as well as green design promote green procurement.
	ISO 14001 certification promotes the adoption of external environmental practices involving suppliers and customers.
Education and training	The commitment of top management plays a strategic role in promoting green procurement in the organisation.
	Awareness, training and knowledge of green procurement techniques and procedures are drivers of green procurement.

Table 2.4: Survey themes categorised under the barriers of green procurement

Themes	Barriers
Education and training	The absence of knowledge and training.
	Lack of commitment from top management.
	The absence of support from senior management.
	Limited competency on green procurement.
	Low awareness level of green procurement in the organisation.
	Green products and services are perceived to be expensive.
	The uncertainty of outcomes and benefits of green procurement.
	Green procurement is difficult to implement, has a lower priority and offers no financial return in comparison to other initiatives.
	Lack of enforceable laws and regulations hinder the adoption of green procurement.

Themes	Barriers
Legislation and policy	Lack of green procurement guidelines.
	The absence of an appropriate legal framework.
	A limited supply of green products and services.
Environmental management and performance	Sustainability, environmental and social responsibility measures are the lowest-level key performance measures in operations of public institutions.

2.4 Chapter summary

The practice of green procurement in developing countries such as South Africa was found to be lacking. This lack is compounded by the absence of public procurement laws which obligate government institutions to incorporate green procurement as part of their procurement process for goods and services. The establishment of legislation and sound policies supporting green procurement have been identified as being among the critical factors that enhance the adoption of this concept and practice. At the same time, the literature reveals that green procurement policies exist at local levels of governance. However, the education and training of employees and stakeholders is lacking and emerged as the top barrier to its practice.

The presence of competent personnel and support from senior management in organisations has been identified as one of the elements that promote the practice of green procurement. From the literature, it is clear that the absence of knowledge, awareness, incentives, guidelines and commitment from senior management are key factors that impede the adoption of green policies. In summarising, the literature is replete with studies on sustainable procurement practices in the private sector, particularly in European and Asian countries, yet reveals little about the practice in South African municipalities, which supports the undertaking of this study in order to contribute to existing knowledge. Research design and methodology are discussed in Chapter 3.

3 CHAPTER THREE – METHODOLOGY

3.1 Introduction to methodology

This chapter outlines the methodology that was applied by the researcher to answer the research questions and achieve the desired objectives as set out in Chapter 1. The methodological choices available in research are discussed in some detail and are narrowed down to explain the techniques selected for the study. The sampling techniques, population and survey instruments are also described. The researcher applied the strengths, weaknesses, opportunities and threats (SWOT) analysis technique as an appropriate tool for data analysis, due to its flexibility to determine internal and external factors affecting the municipality on the practice of green procurement. The SWOT analysis technique is discussed in sections 3.4.1 and 3.4.2.

3.2 The methodology applied in this study

3.2.1 Research philosophy

The research philosophy is the external layer of the ‘research onion’, concerned with the development of knowledge to answer the research question (Saunders et al.,2016). An exploratory research into the practice of green procurement in the City of Tshwane was adopted to comprehend this phenomenon. It was used as a guiding tool to formulate data collection framework,

since it is suitable for research where there is little or no prior academic studies (Creswell, 2002 cited in Pacheco-Blanco and Bastante-Ceca, 2016). It offers the advantage of being flexible and adaptable to change (Saunders et al., 2016); hence its adoption for this study.

The research paradigms common in research are ontology, axiology and epistemology. Ontology involves determining the nature of reality (Khan, 2014), while axiology is concerned with ethics in research (Saunders et al., 2016). Nasser (2017) contends that axiology may be biased when applied in research due to its value-driven approach. Epistemology is described by Khan (2014) as being concerned with the manner in which information and knowledge are acquired and communicated to others. It is concerned with presumptions about knowledge, what may be accepted as sound and authentic knowledge and how knowledge is conveyed to others (Burrell and Morgan, 1979 cited in Saunders et al., 2016). The research adopted the epistemological paradigm to determine how the municipality attains knowledge on green procurement and communicates this to stakeholders.

Critical realism, interpretivism, postmodernism, pragmatism and positivism are five philosophies which are used in research. Critical realism is outlined by Saunders et al. (2016) as being concerned with explaining what we see and experience. The philosophy does not apply factual information and therefore was not suitable for the study. The interpretivist philosophy focuses on interpreting both the respondents' and the researcher's views on reality (Denzin and Lincoln, 2003 cited in Khan, 2014).

The interpretation of views may be subjective and may not be based on factual information and reasoning. Consequently, this philosophy was not appropriate for this study.

Saunders et al. (2016), citing Kilduff and Mehra (1997), describe the goal of postmodernist philosophy as aiming to challenge ways of thinking and knowing. Adopting this philosophy would have deviated from the objectives of the research. The pragmatic philosophy considers that theories, ideas, hypotheses and findings are only pertinent where they supplement an action (Saunders et al., 2016). The study does not use hypotheses and therefore the pragmatic philosophy was not appropriate for this study.

The positivist philosophy is objective and concerned with the gathering of facts by using existing theories to measure and predict human activity (Neuman, 2011 cited in Khan, 2014). Kahn (2014) describes it as suitable for hearing participants' 'hidden voices'. While the notion of sustainable procurement is common globally in developed economies, its presence in metropolitan municipalities in South Africa is limited or non-existent. Adopting the positivist philosophy enabled the researcher to conceptualise a theory that was generated globally and to comprehend green procurement from the local perspective. The positivism philosophy was therefore considered appropriate for the study.

3.2.2 Approach to theory development

The inductive and deductive approaches are two common approaches applied in research studies. The deductive approach starts with theory development through reading of literature and the design of a research strategy to test the theory (Saunders et al., 2016). These scholars further explain that the inductive approach starts at the opposite end, in that data is collected to explore a phenomenon from which to build a theory. Due to limited studies being available locally, the body of knowledge generated globally was used to test the existing theory on green procurement at the local levels of governance. The deductive approach was therefore used.

As part of theory testing, the researcher has applied document and thematic analyses to review existing strategies, policies and plans on green procurement which have been developed by the municipality. Document analysis is described by Bowen (2009) as a systematic procedure to evaluate the existing documentation which has been developed by a particular organization. The scholars describe thematic analysis as involving the development of themes from secondary data generated from organisations. The review of organisational data was relevant in determining the first objective of the study. The data was used in the generation of questionnaire to collect primary data and compared with literature review.

3.2.3 Methodological choice

The quantitative and qualitative methods are common methods applied in research, and the combined use of these two methods yields the mixed method research. Bless et al. (2016) indicate that qualitative research uses words to describe a phenomenon. It is defined by Saunders et al. (2016) as an information gathering technique that generates or uses non-numeric data. The survey technique was applied in this study to collect primary data, which was analysed using Qualtrics and Microsoft Excel. The qualitative method was deemed inappropriate for this study.

Quantitative research is dependent on measurement to compute, compare and analyse variables (Bless et al., 2016). Nasser (2017) determined that the researcher is required to be objective when conducting quantitative research, avoiding personal involvements with respondents. The method uses the analysis of numerical data to answer research questions such as ‘who’, ‘how much’, ‘what’, ‘where’, ‘when’, ‘how many’ and ‘how’ (Apuke, 2017). Based on the research question for this study, the researcher chose the mono method quantitative study approach.

3.2.4 Research strategy

Denzin and Lincoln (2011) describe the research approach as the connectivity between the research philosophy and the methods applied to collect and analyse data. Saunders et al.

(2016) concur, stating that the research strategy is governed by the research question and objectives, which are connected to the research philosophy, approach and purpose. To determine the appropriate research strategy for this study, some common strategies are analysed below.

The Ethnography strategy is outlined by Saunders et al. (2016) as being concerned with universally acceptable culture of a group or organisation. The strategy was deemed unsuitable for the study. The Grounded Theory strategy provides a systematic approach to collecting and analysing qualitative data (Saunders et al., 2016). The scholars have determined that adopting this strategy leads to other issues and implications concerning the collection of data and the use of the existing theory. The strategy uses the coding system. For this reason, the strategy was not adopted for the study.

Saunders et al. (2016) found that case studies are often criticised by scholars as a research strategy due to misunderstandings that arise when researchers attempt to produce generalisable, reliable contributions to theoretical knowledge from specific cases. This strategy uses small samples and is challenging due to its intensive and in-depth nature, and was therefore deemed inappropriate for this research.

The survey strategy uses questionnaires to answer research questions on ‘what’, ‘who’, ‘where’, ‘how much’ and ‘how many’ (Saunders et al., 2016). It is a popular strategy for research

and was adopted for the study. A questionnaire was developed following a review of the relevant literature on green procurement.

3.2.5 Time horizon

Due to the limited time available to conduct the study, the research adopted the cross-sectional study approach. Bless et al. (2016) reiterate that the cross-sectional research design applies when all the research data is collected at the same time. Saunders et al. (2016) concur that the cross-sectional research is normally associated with the survey strategy. The longitudinal study approach was deemed inappropriate for this research.

3.3 Data collection

3.3.1 Sampling technique

The probability and non-probability sampling are two common sampling techniques used in research studies. The latter is described by Bless et al. (2016) as having high probability of omitting elements of the population into the representative sample hence it becomes difficult to determine if the specimen is a substitude for the entire population. The scholars emphasise that the technique has weaknesses of computing and verifying if the representative sample has been included in the total population. The non-probability sampling was found to be unsuitable for the study.

The probability sampling, also known as random sampling, is defined by Bless et al. (2016) as having the likelihood of selecting the representative sample of the population. The technique is commonly known to yield high quality representative sample when applied with survey research strategy. The probability sampling technique has been found to be suitable and therefore adopted for the study. Saunders et al. (2016) reiterate that the sampling procedure for this method involves (i) identification of appropriate sample to answer the research question (ii) determining appropriate sample size (iii) selecting suitable technique among the five probability sampling techniques and (iv) verifying if the sample represents the population. The steps which have been taken to achieve the appropriate probability sampling technique are described in subsequent paragraphs.

The budget of the municipality was utilised as a sampling frame to delineate appropriate departments to answer the research question. Saunders et al. (2016) reiterate that the sampling frame incorporates all aspects in the target population. The municipality approved a budget of R36.4 billion for the 2018/2019 financial year (MTREF, 2018). The researcher identified the five biggest departments in the municipality as appropriate to determine the suitable sample to collect primary data. These departments, which are responsible for 66.1% of the budget, have been ranked as illustrated in Table 3.1. The departments are Utility Services (43.0%), Group Financial Services (8.2%), Roads and Transport (6.9%), Environmental and Agriculture Management (4.6%) and Housing and Human Settlements (3.4%).

The SCM and Environmental Divisions are critical in promoting the practice of green procurement in the municipality while other departments play a supplementary role in this regard. The Utility Services, Roads and Transport, and Housing and Human Settlements Departments account for 53.3% of the budget and were identified as critical to the success of green procurement in the municipality. They are responsible for infrastructure development and are referred to as infrastructure departments in the study. The Utility Services comprise the Electricity and Water and Sanitation Divisions; Group Financial Services incorporates the Supply Chain Management Division and Environmental and Agriculture Management incorporates the Environmental Division. Other departments were included to ensure that the sample represents the characteristics of the population as illustrated in Table 3.2.

The researcher has identified the simple random sampling technique as suitable for the study. It provides equal probability and opportunity of selection in the population (Bless et al., 2016). Consequently, 42 participants working in the departments have been randomly selected to respond to the questionnaire. The sample is in accordance with Saunders et al. (2016) who corroborate that a sample size of 30 participants or more provides reliable results that are close to normal distribution. Bless et al. (2016) contend that the minimum sample size is dependent on three aspects (i) confidence level (ii) variables requiring examination during data analysis and (iii) diversity in the target population.

The study has selected the 95% confidence level as corroborated by Saunders et al. (2016). The variables requiring examination during data analysis are ‘the practice of green procurement’ and ‘the local levels of governance’. The final step of probability sampling is to verify if the sample represents the entire population. The five biggest departments and ‘other departments’ in the municipality have been sampled to represent diversity in the target population as described in preceding paragraphs. Consequently, the reliability results computed under section 3.5 have yielded scores of 2.88 and 2.89 for the two groups of respondents. The researcher has deduced from similar reliability scores that the sample represents the entire population.

Table 3.1: The five biggest departments in the City of Tshwane according to budget (Source: MTREF, 2018)

		2018/2019 Budget			
Ranking #	Department (Division)	Operational	Capital	Total	% of Total Budget
1	Utility Services (Electricity and Water and Sanitation)	R 14 223 480 871	R 1 457 769 446	R 15 681 250 317	43.0%
2	Group Financial Services (SCM)	R 2 899 164 696	R 86 500 000	R 2 985 664 696	8.2%
3	Roads and Transport	R 1 511 525 174	R 994 160 445	R 2 505 685 619	6.9%
4	Environmental & Agriculture Management (Environment)	R 1 610 644 898	R 51 500 000	R 1 662 144 898	4.6%
5	Housing and Human Settlements	R 355 249 498	R 901 258 469	R 1 256 507 967	3.4%
Subtotal		R 20 600 065 137	R 3 491 188 360	R 24 091 253 497	66.1%
Total Budget for 2018/2019		R 32 416 976 797	R 4 022 197 060	R 36 439 173 857	-

3.3.2 Population

The potential participants were established and recruited within the municipality. The researcher identified Engineers, Technologists, Technicians, Project Managers, Environmental Practitioners, Supply Chain Management Officers, Deputy Directors and Directors within the top five departments in the CoT as potential participants. The participants were identified on the grounds that they were familiar with internal processes, systems and policies applicable in the operations of the municipality, particularly on green procurement. The distribution of the sample per department is illustrated in Table 3.2.

Table 3.2: Distribution of sample per department

Item	Department (Division)	Sample (No.)	Sample (%)
1	Utility Services (Electricity and Water and Sanitation)	4	10%
2	Group Financial Services (SCM)	10	24%
3	Roads and Transport	18	43%
4	Environmental & Agriculture Management (Environment)	1	2%
5	Housing and Human Settlements	1	2%
6	Other Departments (Divisions)	8	19%
	Total	**42**	**100%**

3.3.3 Survey instrument

A questionnaire was developed as an instrument for data collection, based on the plethora of information on green procurement available in the literature. The questionnaire was web-based and distributed through an email generated from Qualtrics to 42 participants in the City of Tshwane. The link to the questionnaire was opened from 07 to 21 November 2018, giving respondents fourteen days to participate in the survey. A reminder was distributed on 14 November 2018 informing participants of the deadline for completing the questionnaire.

The participants were requested to answer 24 questions. The first part of the questionnaire comprised general information, consent, a welcome note and a brief definition of green procurement. The remainder of the questionnaire was subdivided and grouped according to demographic profile and the three objectives of the study. The demographic profile comprised six questions, followed by objective 1 with ten questions; objective 2 comprised two questions and objective 3 comprised six questions. The structure of the questionnaire is presented in Table 3.3. Fifteen of the 24 questions were developed on the five-point Likert scale, ranging from ‘strongly disagree’ to ‘strongly agree’.

Two tables with a list of the benefits of green procurement and the challenges thereof were developed from the literature and were presented in the questionnaire. The participants were asked to rank the benefits and challenges of green procurement on a five-point scale, ranging from ‘not significantly important’

to ‘significantly important’. The respondents were asked to identify and list any additional benefits and challenges of green procurement practices in the municipality under two items in the questionnaire. In order to address objective three, participants were presented with four open-ended questions which they were required to answer, giving them an opportunity to articulate their own views on how the challenges hindering the execution of green procurement in the municipality might best be dealt with.

Table 3.3: Structure of questionnaire

Structure of questionnaire	No. of questions
General information	-
Consent	-
Welcome	-
Definition of green procurement	-
Section A: Demographic profile of respondents	**6**
Questions on the Likert scale	5
Role of at work	1
Section B: Objective 1: Green procurement practices	**10**
Questions on the Likert scale	8
Ranking of practices	1
An open-ended question on additional benefits identified by participants	1
Section C: Objective 2: Green procurement challenges	**2**
Ranking of challenges	1
Open-ended question on additional challenges identified by participants	1
Section D: Objective 3: Identification of approaches to address challenges and improve on green procurement	**6**
Questions on the Likert scale	2

Structure of questionnaire	No. of questions
Open-ended question on how to address and improve challenges	4
Total number of questions	**24**

Questions on the Likert scale	15

3.4 Data analysis

The data collection and analysis were applied concurrently to test the theory. This approach is confirmed as valid by Saunders et al. (2016) who state that data collection, analysis and the development and verification of propositions are interrelated processes in research. The researcher identified the SWOT analysis technique as appropriate for data analysis, as do Chang and Huang (2006) who view it as an appropriate technique to evaluate how an organisation conducts its internal processes. The application of a SWOT analysis enables transparency when making decisions and provides a platform for discovering overlooked or neglected perspectives (Pickton and Wright, 1998 cited in Mauree and Geneletti, 2017).

3.4.1 SWOT analysis technique

The SWOT analysis technique is applied extensively in research to determine the strengths, weaknesses, opportunities and threats faced by organisations, particularly in environmental management. Nikolaou et al. (2011), citing Geneletti et al. (2007), define the SWOT analysis as a strategic planning tool used in environmental management and policy formulation of

organisations. Chang and Huang (2006) define the SWOT analysis as a technique which is utilised to formulate external opportunities and threats, and to identify the internal strengths and weaknesses of the organisation. Weaknesses are attributes that can affect the achievement of organisational goals unless they are identified, addressed and improved (Bull et al. 2016).

3.4.2 The procedure applied for data analysis

Data analysis was preceded by an extensive literature review aimed at developing secondary data on green procurement. The secondary data was grouped into enablers and barriers impeding the practice of green procurement, as illustrated in Tables 2.1 and 2.2 respectively. The enablers represent strengths and opportunities while the barriers represent weaknesses and threats. The internal factors are elements within the organisation which may be managed and controlled to achieve the desired goals, while external factors are those outside of the organisation. Strengths and weaknesses are considered internal organisational factors, while opportunities and threats are generally external.

The secondary data was used as a baseline to generate the questionnaire which enabled the researcher to gather primary data. The questionnaire was compiled and forwarded to potential respondents to complete through Qualtrics, which was accessed through a link provided in the email. Responses to questions on the Likert scale were grouped according to their level of agreement or disagreement, as explained in Section 3.3.3; they comprised ‘strongly disagree’, ‘disagree’, ‘not sure’,

‘agree’ and ‘strongly agree’. The frequency of responses for each level of agreement or disagreement was computed using Microsoft Excel.

The green procurement benefits and challenges were scored by respondents and tabulated by the researcher on a ranking matrix. The procedure applied to rank the score is discussed in Subsection 3.4.3. The text data was analysed by applying content analysis, grouping themes, determining frequency of responses and tabulating on the ranking matrix. A theme was considered to exist when a suggestion was mentioned by one or more respondents (Bull et al., 2016). The next step was the ranking of the results on the SWOT analysis matrix. The results were categorised into strengths, weaknesses, opportunities and threats discussed under each objective of the study.

The internal analysis of the SWOT analysis matrix enabled an evaluation of the status of the organisation, revealing appropriate resources, skills and competencies that need to be developed in order for CoT to become competitive in the area of sustainable procurement. The external analysis assessed the market opportunities available for the organisation, as well as the current threats to green procurement. The strengths, weaknesses, opportunities and threats on the practice of green procurement were determined by comparing the results of the data analysis with the findings of the literature review discussed in Chapter 2. The results provide clarity on whether the analysis is consistent or contrary to the literature. It further provides details on the degree of green procurement practices

at the local levels of governance. The procedure applied for data analysis is presented in Figure 3.1.

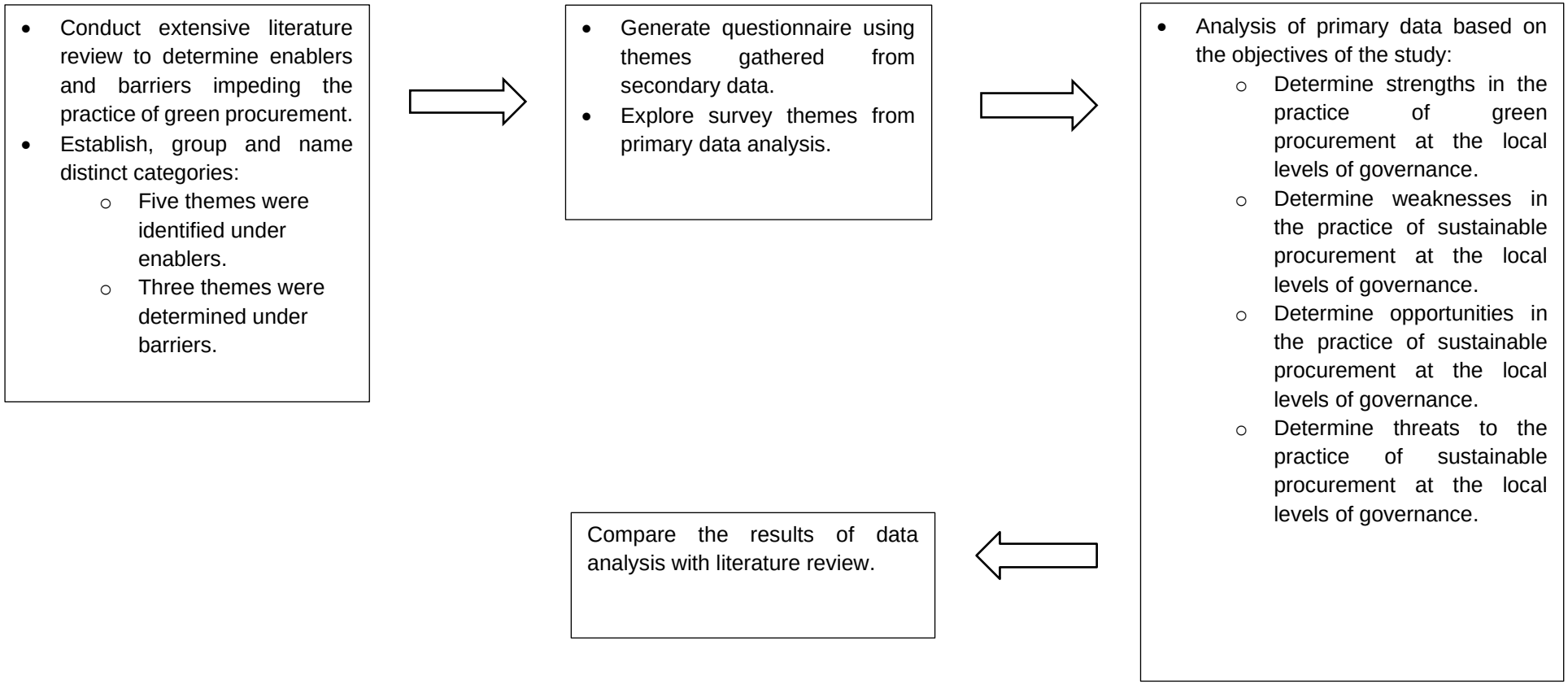


Figure 3.1: Schematic representation of procedure applied for data analysis

3.4.3 Ranking of data

The ranking of data provides a simple analogy of the sample responding to a particular question. O'Connor and Kleyner (2012) describe two methods of ranking data as (i) mean ranking and (ii) median ranking. The latter uses the cumulative percentage to rank the data with 50% confidence. The data is placed in an ascending order to determine the centre-point called the median value (Saunders et al., 2016).

Due to its dependence on the centre-point, the method was found to be unsuitable for the study. The mean ranking is determined by computing an average value of the population (O'Connor and Kleyner, 2012). The scholars emphasise that method uses the denominator (N+1) instead of the total population (N) to compute the cumulative percentage. The method was found to be appropriate for the study. The methodology applied in the study is described below.

3.4.3.1 Likert scale questions

Likert scales provide method to measure feelings, perceptions or attitudes by assigning rating scales to survey questions (Harpe, 2015). A five-point scale of measure was applied in the study ranging from "strongly disagree" to "strongly agree". One of the following procedures was applied to rank primary data (i) the percentage responses were calculated by dividing the score with the total responses or (ii) the mean score for each item

was computed, placed in descending order and ranked on a matrix.

3.4.3.2 Non-Likert scale questions

The frequency of responses for each non-Likert question was recorded on a table, arranged in descending order and ranked on a matrix.

3.4.4 Coding of data

A coding system was applied to preserve the anonymity of respondents. Respondents were labelled ‘R’, with respondent 1 being ‘R1’, respondent 2 being ‘R2 and so on up to respondent 23. Similarly, the question numbers were labelled “Q”.

3.4.5 Data storage

The researcher made efforts to keep the collected data safe and confidential. Since Qualtrics is web-based, the collected data was stored safely on the system. The researcher downloaded the data and stored it on a personal computer to perform data analysis. Login names and passwords, were required to access the data on personal computer and Qualtrics and were kept safe at the home of the researcher. The backup data was transmitted to a memory stick and stored in a lockable case.

3.5 Reliability and validity

These two elements are traditionally applied in academic studies to evaluate the quality of data in quantitative research. The linkage between reliability and validity is that of a trade-off (Fendler, 2016). When reliability is stronger, validity becomes weaker and vice versa.

3.5.1 Reliability

Reliability is an instrument applied to measure random and systematic error in research (Hyman and Sierra, 2015). It is aimed at determining the consistency and reliability of scores from participants post data collection and analysis. Bless et al. (2016) determined four common methods of testing reliability in research as (i) test and re-test (ii) equivalent-form (iii) inter-rater reliability and (iv) internal consistency. The first method applies when the questionnaire is redistributed to the same participants to complete within a reasonable time period. Participants tend to become non-responsive to a second exposure to the same questionnaire, and hence the method was not used in the study.

The equivalent-form reliability method uses additional questions which are added to the survey questions. The method tends to be problematic in that it makes the questionnaire longer which, in turn, may discourage participants from responding appropriately; hence it was not considered for the study. The inter-rater reliability involves some element of

judgment by at least two or more researchers and tends to be influenced by external factors (Bless et al., 2016). The method was found to be unsuitable for the study.

The internal consistency method uses groups of questions in the questionnaire to correlate responses (Saunders et al., 2016). It applies two methods; namely (i) split-halves reliability and (ii) item analysis. The latter involves an analysis of each response to eliminate unreliable data from the overall responses. The method was found to be inappropriate for the study. The split-halves reliability is concerned with internal consistency of the questionnaire by splitting a group of questions into two equal halves (Bull et al., 2016). The scholars contend that the method is applied extensively in research studies compared to other methods due to its reliability outcomes.

The split-halves reliability identifies a sample of questions in the survey to compute the overall reliability score from respondents. A group of questions on the Likert scale was selected to evaluate reliability using the split-halves method. For the first objective, most Likert-scale questions on the questionnaire compared well with other objectives. These questions are 7, 9, 10, 11, 12, 13, 14, 15 and 16. Questions 15 and 16 were omitted from the evaluation since they were considered non-Likert questions. For the second objective, two questions which were considered non-Likert questions were eliminated from the analysis. The third objective had two questions on the Likert scale, questions 21 and 23. The other

four questions were eliminated from the analysis since they were non-Likert questions.

Nine questions were therefore available to be considered for the reliability analysis. However, since the split-halves method allows for questions to be divided into two equal halves, the researcher randomly eliminated question 23. A total of eight questions were considered for the reliability test, as illustrated in Table 3.4. The respondents scored questions based on the following criteria:

- Strongly agree : 5 points
- Agree : 4 points
- Strongly disagree : 3 points
- Disagree : 2 points
- Not sure : 1 point

The mean item score (MIS) for each question was computed as the sum of scores divided by the number of respondents. MIS is the summation of individual scores divided by total items in the Likert-scale (Warmbrod, 2014). It is described by Bless et al. (2016) as an instrument that provides accurate measure of central tendency when applied in statistics. The scholars reiterate that MIS can be influenced by extreme values hence caution should be taken when computing the values. When the differences in score between groups of respondents are extreme, the results would be unreliable. Rushton, Brainerd and Pressley (1983) and Strube (2000) cited in Warmbrod (2014) emphasise that the summation of multiple-item responses of a group of Likert-scale questions yield reliable results than

single-item responses. The scores by respondents ranged from 1 to 5 and considered moderate to yield reliable results.

Warmbrod (2014) contents that the random measurement error emanating from multiple-item responses is insignificant compared to single-item responses. The reliability test was computed using the multiple-item responses as illustrated in Table 3.4. The MIS was computed as 2.88 points and 2.89 points for groups one and two respectively. Consequently, the difference in score between the first and second groups is 0.01 point which is insignificant as corroborated by Warmbrod (2014). The results, illustrated in Table 3.4, mean that the average scores for the selected items for the two groups of respondents is similar. Based on these results, the researcher concluded that the consistency of responses from participants was reliable. Respondents 9, 20 and 21 did not score questions 13 and 21 as illustrated with an asterisk in the table below.

Table 3.4: Reliability using the split-halves method

Respondent # (n=23)	Group 1: Scoring of questions by respondents				Group 2: Scoring of questions by respondents			
	Q7	Q9	Q10	Q11	Q12	Q13	Q14	Q21
1	4	4	1	4	4	4	4	5
2	4	4	5	5	4	4	4	4
3	4	4	5	1	4	4	4	5
4	1	4	4	1	1	1	1	2
5	1	2	2	3	3	3	3	3
6	5	5	5	5	5	5	5	4

Respondent # (n=23)	Group 1: Scoring of questions by respondents				Group 2: Scoring of questions by respondents			
	Q7	Q9	Q10	Q11	Q12	Q13	Q14	Q21
7	4	4	1	4	1	1	1	4
8	4	2	2	2	1	2	2	4
9	4	1	2	1	1	*	1	4
10	1	2	2	2	1	2	1	1
11	1	1	4	4	4	4	4	5
12	1	4	4	4	4	4	5	4
13	1	1	4	1	1	1	1	5
14	4	1	4	4	4	1	1	5
15	1	4	4	4	4	4	4	4
16	1	2	4	1	1	2	2	4
17	2	3	2	1	2	2	2	2
18	1	4	4	4	4	1	1	5
19	4	5	5	5	5	4	4	4
20	4	1	1	1	1	1	1	*
21	5	5	4	4	4	4	4	*
22	2	2	2	2	2	2	2	2
23	2	2	2	1	1	2	2	1
Total score	61	67	73	64	62	58	59	77
MIS	2.65	2.91	3.17	2.78	2.70	2.64	2.57	3.67
Average MIS	2.88				2.89			

3.5.2 Validity

Validity is described by Fendler (2016) as a criterion applied in all scholarly works to evaluate the degree of variation in responses from participants. Validity is also known as the

theoretical measure of variation. It is aimed at establishing the accuracy of responses from participants. Saunders et al. (2016) determined five types of validity common in research as (i) content validity (ii) criterion-related validity (iii) construct validity (iv) convergent validity and (v) discriminant validity. Content validity is concerned with the manner in which questions in the questionnaire are structured to collect adequate data to answer the research questions.

Bless et al. (2016) reiterate that when there are possible misconception of questions or terms in the questionnaire, the structuring of such questions should be described in the literature review. This argument is corroborated by Saunders et al. (2016) that questions should be supported by literature review. The research design was thoroughly described and supported by literature review. The design of survey questions was linked with the findings of previous studies conducted by a variety of scholars as described in the literature review. The definition of green procurement was provided in the questionnaire to aid respondents to understand the concept when responding to the questions. The content validity was adopted to define the concept of green procurement in the literature review.

The criterion-related validity requires sets of data to be obtained from the same population. Due to potential biases from respondents on answering the same survey twice, the method has not been considered for the study. Construct validity uses statistical analysis to determine the degree to which respondents have scored a group of scale questions in the

questionnaire (Saunders et al., 2016). The approach has been identified by Bless et al. (2016) as an important instrument to measure validity in research.

The scholars outline the following procedure for determining construct validity (i) identify variables to measure in the study (ii) statistically evaluate relationships between the variables and (iii) interpret the results to illustrate if construct validity exists or not. The procedure applied in the study is described in the next section. Although there are several test methods to determine construct validity test, the researcher has applied the Kolmogorov-Smirnov test which is based on the empirical cumulative distribution (Drezner, Turel and Zerom, 2010). The scholars reiterate that the test is applied to determine how far the sample differs from normal distribution by calculating the value of *D* statistic.

The test is described by O'Connor and Kleyner (2012) as easier to use in comparison with other statistical tools. The sample and population extracted from Table 3.4 was used to compute the Kolmogorov-Smirnov test using the procedures adapted from Saunders et al. (2016) and O'Connor and Kleyner (2012). The cumulative proportions were computed by dividing cumulative respondents with the total number of respondents (*n = 23*) as illustrated in Table 3.5 below. The cumulative proportions for group 1 are presented in the fourth column. Similar calculations were performed using data for group 2. The absolute difference in the eighth column is calculated by deducting cumulative proportions of group 1 from group 2.

The largest value of D statistic was determined as 0.049 as illustrated with an asterisk (*) in Table 3.5. Using the Kolmogorov-Smirnov table adapted from O'Connor and Kleyner (2012) in Appendix E, the critical value of D, also known as the critical K-S value, is 0.275 at $n = 23$ and 5% level of significance. The scholars emphasise that the 0.70 factor should be applied to the results when critical K-S value is high. Therefore, the adjusted K-S value is 0.275 x 0.70 = 0.193. The results mean that there is 19.3% likelihood of the sample differing from the population at 5% level of significance.

Based on the adjusted K-S value, the researcher has concluded that the degree of variation of responses from participants is less than 20%. Therefore, responses are empirically valid to be generalised to represent the results of the total population. The combination of content validity and construct validity were applied in the study. The definition of green procurement was provided in the questionnaire and described in the literature review. Consequently, construct validity was applied through the application of the Kolmogorov-Smirnov test to determine the degree of variations.

Table 3.5: Construct validity using the Kolmogorov-Smirnov test [Source: Adapted from Saunders et al. (2016); O'Connor and Kleyner (2012)]

Respondent #	Group 1: Questions 7, 9, 10 and 11			Group 2: Questions 12, 13, 14 and 21			
	Total score	Cumulative score	Cumulative proportions	Total score	Cumulative score	Cumulative proportions	Max. absolute difference
1	13	13	0.049	17	17	0.066	0.017
2	18	31	0.117	16	33	0.129	0.012
3	14	45	0.170	17	50	0.195	0.026
4	10	55	0.208	5	55	0.215	0.007
5	8	63	0.238	12	67	0.262	0.024
6	20	83	0.313	19	86	0.336	0.023
7	13	96	0.362	7	93	0.363	0.001
8	10	106	0.400	9	102	0.398	0.002
9	8	114	0.430	6	108	0.422	0.008
10	7	121	0.457	5	113	0.441	0.015
11	10	131	0.494	17	130	0.508	0.013
12	13	144	0.543	17	147	0.574	0.031
13	7	151	0.570	8	155	0.605	0.036

Respondent #	Group 1: Questions 7, 9, 10 and 11			Group 2: Questions 12, 13, 14 and 21			
	Total score	Cumulative score	Cumulative proportions	Total score	Cumulative score	Cumulative proportions	Max. absolute difference
14	13	164	0.619	11	166	0.648	0.030
15	13	177	0.668	16	182	0.711	0.043
16	8	185	0.698	9	191	0.746	0.048
17	8	193	0.728	8	199	0.777	0.049*
18	13	206	0.777	11	210	0.820	0.043
19	19	225	0.849	17	227	0.887	0.038
20	7	232	0.875	3	230	0.898	0.023
21	18	250	0.943	12	242	0.945	0.002
22	8	258	0.974	8	250	0.977	0.003
23	7	265	1.000	6	256	1.000	0.000
Total (*n=23*)	265	-	-	256	-	-	-

3.6 Ethical considerations

Ethics is concerned with the integrity and conduct of the researcher and the consideration of the population during research (Sobocan, Bertotti and Strom-Gottfried, 2018). Fendler (2016), citing Lincoln and Guba (1985), describes four basic ethical issues in research as (i) truth value (ii) applicability (iii) consistency and (iv) neutrality. The ethics clearance certificate authorising the researcher to conduct the study was approved by the Research Ethics Committee (REC) of the University on 18 September 2018. Further approval to conduct the study was sanctioned by the City of Tshwane.

A consent form requiring the participants to give their agreement to participate in the survey formed the first page of the questionnaire. A copy is shown under Appendix B. Upon clicking on the consent button, participants acknowledged that they had given consent to participate in the study and complete the survey. A lack of response to the survey was identified prior to data collection as a potential risk that could delay the research process. The risk was mitigated by forwarding an email generated through Qualtrics to remind participants to complete the survey.

The contribution to participate in the study was therefore discretionary and at no cost to the respondents. To enhance anonymity, participants were not asked personal information. No reimbursements were offered to respondents that might have affected participation and the outcome of the survey. The

conduct of the researcher during research was of a high moral standard. The researcher made efforts (i) to be consistent throughout the study (ii) not to be influenced by undesirable factors during data analysis and (iii) to keep personal data confidential and safe in a lockable storage case.

3.7 Chapter summary

This chapter described the research design which was applied in the study. The questionnaire was used to collect primary data. The sampling techniques applied are presented. The quantitative method was applied to analyse data. The reliability and validity of the study are discussed and presented. The chapter concludes by outlining ethical considerations taken into account by the researcher. The collected data is analysed and presented in Chapter 4.

4 CHAPTER FOUR – DATA COLLECTION, PRESENTATION AND ANALYSIS OF RESULTS

4.1 Introduction

This chapter describes the process which was applied by the researcher to collect data and present the results; it also presents the results and analyses them. The first stage of the study was to identify green procurement practices through a review of the literature. A questionnaire was then developed and distributed to participants in the CoT. Following the answering of the survey by the respondents, the data was collated, presented and analysed using the SWOT analysis technique, as described below.

4.2 Analysis of results from the survey

Qualtrics was used as an instrument to collate data from respondents. The respondents were requested to complete the online survey by sharing their measure of agreement to various items based on ‘strongly disagree’, ‘disagree’, ‘not sure’, ‘agree’ and ‘strongly agree’. Levels of agreement or disagreement were calculated as a percentage of total number of respondents to the question, as explained by Bull et al. (2016). The data was exported to Microsoft Office Excel 2010 to compute the analysis. An analysis of the strengths, weaknesses, opportunities and strengths of the organisation was then performed using the data, based on insights gained through the literature review, as discussed in Chapter 2.

4.3 General information sheet

The general information sheet appeared first on the questionnaire. The full names, email address and cellphone number of the researcher were incorporated in the information sheet to allow participants to contact the researcher regarding the study. The participants were advised of the title of the study, the expected time it would take to answer the questionnaire, their right to remain anonymous and the commitment of the researcher to keeping their personal information confidential should they decide to participate in the research. The telephone number and email address of the REC Administrator were made available to participants should they wish to take issue with the manner in which the researcher was conducting the study.

4.4 Informed consent

The informed consent page was placed on the second page of the questionnaire, allowing respondents to provide either their voluntary consent to participate in the survey or to decline to participate. The participants were required to click a button to acknowledge that they agreed to participate in the study voluntarily, were over 21 years of age, agreed to answer the questionnaire and agreed that they had perused, scrutinised and comprehended the information document provided for the study.

4.5 Sample characteristics

4.5.1 Response rate

Ten of forty-two sampled participants were Procurement Officers at SCM Division, representing 24% of the sample. However, only two responses were received from SCM Division. The reason provided by one anonymous Procurement Officer was that due to the sensitivity of information at SCM, they did not feel safe to answer an online questionnaire on Qualtrics and were concerned about the anonymity of answering the survey. It had been disclosed in the general information sheet and welcome section of the questionnaire that participants had the right to remain anonymous and that their confidentiality would be maintained.

However, an element of apprehension was evident during follow-up telephone discussions to determine the cause of the low response from these officials. Their low response generally - or rather lack thereof - had already been observed as a weakness in the municipality. It is noteworthy that no sensitive information on procurement was asked in the questionnaire. Some officials were adamant that they could not answer an online survey, citing the possibility of their personal information on Qualtrics being seen by others, which might have, in their views, caused some measure of victimisation at work. This reason seemed to apply to individuals in several divisions and departments.

The questionnaire was forwarded to 42 participants in the CoT. In total, 27 responses were received. Four participants provided partial or blank responses and were excluded from subsequent data analysis. The researcher therefore revised the responses to twenty-three, representing an overall response rate of 55%, as illustrated in Table 4.1. The response rate is an instrument that is applied in research to evaluate whether the findings can be generalised to the population. In addition, it is dependant on the willingness of participants to respond to the questionnaire.

Baruch and Holtom (2008) have conducted a meta-analysis of studies published during the period 2000 to 2005 on the response rate of data collected from individuals and organisations. The scholars came to the conclusion that generally a response rate of 50% is acceptable, and that 35% and 40% are both adequate for research studies that deal with individuals and organisational representatives respectively. The response rate of 55% was therefore in line with the recommendations of Baruch and Holtom (2008) and suitable for analysis. The response from Roads and Transport Department was 40%, followed by ‘other departments’ at 7% and SCM Division at 5%. The Environment and Water Division, the Sanitation Division and the Housing and Human Settlements Department did not respond to the survey.

Table 4.1: Response rate

Department (Division)	Sample size (No.)	Responses received (No.)	Partial responses not considered (No.)	Responses considered for data analysis (No.)	Response rate (%)
Utility Services (Electricity and Water and Sanitation)	4	1		1	2%
Group Financial Services (SCM)	10	3	1	2	5%
Roads and Transport	18	17		17	40%
Environmental & Agriculture Management (Environment)	1			0	0%
Housing and Human Settlement	1			0	0%
Other Departments (Divisions)	8	6	3	3	7%
Total	**42**	**27**	**4**	**23**	**55%**

4.5.2 Demographic profile

Seventy-seven percent of respondents were over 35 years of age, with the minimum age being 31 years and the maximum, 55 years. One participant did not disclose their age range as illustrated with an asterisk (*) in Table 4.2. The majority of participants possessed a degree as their highest academic qualification, at 57%; 17% had a Master's degree and 13% had an undergraduate diploma from a tertiary institution. Only one participant had an undergraduate certificate as their highest academic qualification. The participants possessed a diversity

of skills and knowledge on procurement, management and the implementation of infrastructure projects. Seventy-nine percent of participants had at least ten years' experience in their professions.

The respondents occupied a variety of positions. At least 30% occupied management positions, such as Director or Deputy Director. One Director responded to the questionnaire. The majority of participants were Deputy Directors, at 26%, followed by Project Managers and Civil Engineering Technologist at 22% and 17% respectively. The participants possessed adequate experience, skills and knowledge to contribute to the study during data collection. The age, academic qualifications, experience and occupation of respondents are presented in Table 4.2.

Table 4.2: Demographic profile

Age	Responses (%)	Highest academic qualification	Responses (%)	Years of experience	Responses (%)	Occupation	Responses (%)
21 to 25 years old	0%	Certificate	4%	1 to 5 years	4%	Director	4%
26 to 30 years old	0%	National Diploma	13%			Deputy Director	26%
31 to 35 years old	23%	B-Tech/ Degree	57%	6 to 10 years	17%	Project Manager	22%
36 to 40 years old	41%	Honours	9%			Engineer	4%
41 to 45 years old	23%	Masters	17%	11 to 15 years	48%	Civil Engineering Technologist	17%
46 to 50 years old	5%					Civil Engineering Technician	13%
51 to 55 years old	9%	PhD	0%	16 to 20 years	22%	Environmental Practitioner	0%
56 to 60 years old	0%					SCM Officer/ Procurement Officer	4%
61 to 65 years old	0%	Other (Specify)	0%	Over 21 years	9%	Other (Specify)	9%
Total	**100%**	**Total**	**100%**	**Total**	**100%***	**Total**	**100%**

4.6 The presentation of results based on the objectives of the study

In pursuit of answers to the research questions, the researcher arranged the questions on the questionnaire so that they followed the sequence of the objectives of the study. The collected data is presented and analysed in the following sections.

4.6.1 The practice of green procurement at the level of metropolitan municipality

4.6.1.1 Awareness, education and training of employees on green procurement

There were conflicting views on the existence of green procurement policy in the municipality. While 39% of respondents agreed that a green procurement policy existed in the municipality, another 52% disagreed and were not sure about its existence. The mean has been determined as 2.65 as illustrated in Table 3.4 under Q7. In addition, 61% of participants were not sure when the policy had been implemented. Forty-eight percent of participants agreed and strongly agreed that the municipality provided awareness, education and training of employees on green procurement. The results are illustrated in Tables 4.3 to 4.5.

In contrast, 48% of respondents disagreed and were not sure whether the municipality provided awareness, education and training of employees on sustainable procurement. It is

noteworthy that green procurement is not a standalone policy but is embedded in the environmental policy of the organisation. The uncertainty on the existence of policy would be low if employees were adequately trained, educated and made aware of green procurement.

Table 4.3: Existence of green procurement policy in the municipality

The existence of green procurement policy	Responses (No.)	%
Agree	9	39%
Strongly agree	2	9%
Strongly disagree	0	0%
Disagree	3	13%
Not sure	9	39%
Total	**23**	**100%**

Table 4.4: Number of years since green procurement policy had been introduced in the municipality

Number of years since green procurement policy was introduced	Responses (No.)	%
1 to 3 years ago	5	22%
4 to 6 years ago	2	9%
7 to 10 years ago	0	0%
Over 10 years ago	2	9%
Not sure	14	61%
Total	**23**	**100%**

Table 4.5: Awareness levels, education and training of employees on green procurement

Awareness, education and training of employees on green procurement	Responses (No.)	%
Agree	8	35%
Strongly agree	3	13%
Strongly disagree	1	4%
Disagree	6	26%
Not sure	5	22%
Total	**23**	**100%**

4.6.1.2 The commitment of senior management to green procurement

Fifty-six percent of participants agreed and strongly agreed that senior management was committed to promoting green procurement, as presented in Table 4.6.

Table 4.6: Commitment of senior management to green procurement

Commitment of senior management	Responses (No.)	%
Agree	9	39%
Strongly agree	4	17%
Strongly disagree	0	0%
Disagree	7	30%
Not sure	3	13%
Total	**23**	**100%**

The municipality had implemented a number of strategies, policies and plans, as discussed in Chapter 2, subsection 2.2.4. Despite these efforts, only 48% of respondents agreed and strongly agreed that the municipality had developed strategies to achieve KPIs on green procurement, as illustrated in Table 4.7. Forty-one percent of participants agreed and strongly agreed that the municipality had achieved its green procurement targets during the 2017/2018 fiscal year, as presented in Table 4.8. One participant did not answer the question.

In addition, 61% of respondents were not sure, strongly disagreed and did not agree that the municipality would achieve its KPIs on green procurement in the 2018/2019 fiscal year, as presented in Table 4.8. The study was conducted during the second quarter of the 2018/2019 financial year. The majority of respondents (61%) did not know in quarter two whether or not the municipality was on track to achieve its KPIs on green procurement.

Table 4.7: Strategies to achieve green procurement KPIs

Strategies to achieve KPIs on green procurement	Responses (No.)	%
Agree	9	39%
Strongly agree	2	9%
Strongly disagree	1	4%
Disagree	2	9%
Not sure	9	39%
Total	**23**	**100%**

Table 4.8: Achievement of green procurement KPIs by the municipality

	2017/2018		2018/2019	
Achievement of green procurement KPIs	Responses (No.)	%	Responses (No.)	%
Agree	8	36%	7	30%
Strongly agree	1	5%	2	9%
Strongly disagree	1	5%	1	4%
Disagree	6	27%	5	22%
Not sure	6	27%	8	35%
Total	**22**	**100%**	**23**	**100%**

4.6.1.3 The benefits of practising green procurement in metropolitan municipalities

The responses to various green procurement benefits were translated into the matrix and ranked, as presented in Table 4.9. 'The reduced impact on the environment' and 'recycling initiatives' were considered top benefits of practicing green procurement by the respondents with a mean score of 4.17. 'ISO 14001 certification' was ranked second by the participants with a mean score of 4.04. 'Improved efficiency' and 'the promotion of change in the behaviour of private businesses when initiated by the municipality' were graded third and fourth respectively. The 'cost-effectiveness' was the lowest-graded benefit with a mean rating of 3.77.

Table 4.9: Ranking of green procurement benefits as scored by respondents

Benefits of green procurement	Mean score	Ranking #
Reduced impact	4.17	1
Recycling initiative promote green procurement	4.17	1
ISO 14001 certification enhances green procurement	4.04	2
Improved efficiency	4.00	4
Promotes change in behaviour of private businesses when initiated by the municipality	3.91	3
Cost effective	3.77	5

The participants were presented with an open-ended question to afford them the opportunity to express their views and provide additional positive impacts of executing sustainable procurement in the municipality. ‘The reduction in resource wastage’, ‘improved efficiency’, ‘mainstreaming sustainability into the city’s procurement processes’ and reduction on ‘climate change’ are some of the benefits of implementing green procurementwhich have been listed by the respondents. Only five out of twenty-three respondents listed benefits, as illustrated in Table 4.10. These were respondents R2, R3, R7 and R19. Some respondents indicated that the researcher had covered all benefits while others did not provide a response.

Table 4.10: Additional benefits of executing green procurement

Respondent #	Additional benefits of implementing green procurement
R2	Undertake a thorough value chain analysis of products and services as a way of mainstreaming sustainability into city procurement processes.
R3	Reduction in resource waste and also helping manage resources and improve efficiency.
R7	- Social Aspects - Economic Aspects - Cost Life cycle - Maintenance Plan - Human Health - Climate Change - Eco- System Quality
R19	It enhances efficiency and better quality product delivery
R22	Use of non metal and reduction on theft and vandalism

4.6.1.4 Summary of results for the first objective

The first objective of the study was to determine the practice of green procurement at the level of a metropolitan municipality. The SWOT analysis presented below was derived from document analysis and Tables 4.1 to 4.10. The internal factors are classified as strengths and weaknesses while external factors are outside of the organisation. The internal factors may support or hinder the municipality in achieving its goals in the medium to long term.

The following six practices of green procurement, also known as strengths for this objective, were identified from document analysis and respondents (i) a variety of strategies, policies, plans and other initiatives have been undertaken at the municipal level of governance to promote green procurement (ii) the presence of competent and skilled personnel promotes the practice of green procurement in the organization (iii) procurement of CNG bus fleet to reduce carbon footprint (iv) reduction of water and energy losses promotes green procurement (v) reduction and recycling of waste to landfill sites and (vi) respondents participate in the purchasing of supplies and services through the preparation of specifications, quotations and tender documents. The strengths are considered strong elements where the municipality is performing well on green procurement.

In addition, nine weaknesses were derived from responses of participants. The top six weaknesses are (i) absence of responce from departments (ii) inadequate exposure to the practice of green procurement (iii) inadequate knowledge of green procurement (iv) absence of awareness of green procurement by employees (v) limited education and training of employees on green procurement and (iv) absence of communication of green procurement to employees. Three opportunities were identified by participants as (i) green procurement reduces negative impacts on the environment (ii) it promotes changes in the behaviour of private businesses, when initiated by the municipality and (iii) the practice raises awareness of green procurement policy to external stakeholders. The following two threats were derived from responses of participants (i) lack of awareness of green

procurement policy by external stakeholders and (ii) lack of communication to external stakeholders on green procurement. The results of the SWOT analysis for objective 1 are shown below.

Table 4.11: SWOT analysis of the practice of green procurement at the level of metropolitan municipality

Internal Strengths	**Internal Weaknesses**
1. A variety of strategies, policies, plans and initiatives have been implemented at the municipal level of governance to promote green procurement. 2. The presence of competent and skilled personnel promotes the practice of green procurement in the organization. 3. The procurement of CNG bus fleet reduces carbon footprint. 4. The reduction of water and energy losses promotes green procurement. 5. Green procurement enhances the reduction and recycling of waste. 6. Respondents participate in the procurement of goods and services through the preparation of specifications, quotations and tender documents.	1. Lack of responses from departments. 2. Lack of exposure to the practice of green procurement. 3. Limited knowledge on green procurement. 4. Lack of awareness of green procurement by employees. 5. Lack of education and training of employees on green procurement. 6. Lack of communication of green procurement to employees. 7. Lack of knowledge of green procurement KPIs by employees. 8. No certification of ISO 14001 for the municipality is cited in the literature. 9. Green procurement policy is not a standalone policy but embedded in the environmental policy of the municipality.

External Opportunities 1. Green procurement reduces negative impacts on the environment. 2. It promotes changes in the behaviour of private businesses when initiated by the municipality. 3. The practice raises awareness of green procurement policy to external stakeholders.	**External Threats** 1. Lack of awareness of green procurement policy by external stakeholders. 2. Lack of communication to external stakeholders on green procurement.

4.6.2 The challenges that prevent metropolitan municipalities from practising green procurement

4.6.2.1 The challenges of green procurement

The respondents were asked to rate challenges that prevent metropolitan municipalities from practising green procurement. The rating was on a scale of 1 to 5, where 1 was not at all significant and 5 was very significant. However, an error occurred during the rating, with some participants rating some challenges at 6 points. In such cases, the scoring was adjusted to the maximum rating of 5 points.

These challenges, which may be considered internal weaknesses and external threats, were translated into a ranking matrix. Respondents R20, R21 and R22 did not rate the challenge ‘lack of commitment from management’. The mean score for all the challenges ranged from 3.74 to 3.22 as

illustrated in Table 4.12. 'Lack of awareness, education and training' was ranked the top challenge that prevents municipalities from executing sustainable procurement with a mean score of 3.74, followed by 'inadequate tender specifications on sustainable procurement' with a mean rating of 3.70.

The low response rate from some departments and divisions in the municipality, as highlighted in Table 4.1, may be attributed to 'lack of awareness, education and training'. The 'absence of enforcement' and 'limited comprehension of the positive impacts of green procurement' were ranked third with a mean score of 3.61. The 'restricted supply of green goods and services' was ranked fourth, followed by 'lack of legislation and policy directive on green procurement' at fifth place.

Table 4.12: Ranking of the challenges of implementing green procurement in metropolitan municipalities

Challenges of implementing green procurement	Mean score	Ranking #
Lack of awareness, education and training on green procurement	3.74	1
Inadequate tender specifications on green procurement	3.70	2
Lack of enforcement	3.61	3
Inadequate knowledge on the benefits of green procurement	3.61	3
Limited supply of green products and services	3.57	4
Lack of legislation and policy directive on green procurement	3.52	5

Challenges of implementing green procurement	Mean score	Ranking #
Lack of commitment from management	3.50	6
Lack of desire to implement green procurement	3.48	7
The implementation of green procurement is costly	3.22	8

The additional challenges identified by participants are illustrated in Table 4.13. Four respondents, namely R2, R3, R16 and R18, identified additional challenges of executing sustainable procurement in metropolitan municipalities. Most of the listed challenges were incorporated in question 17 of the survey. “Political will”, which is considered internal weakness, emerged as the only additional challenge, listed by respondent R16. Others responded ‘none’ or did not provide a response.

Table 4.13: Additional challenges identified by participants

Respondent #	Additional challenges which have been identified by participants on the practice of green procurement in metropolitan municipalities
2	List of green procurement checklists for all goods and services must be included
3	- To analyze the organizational structure on implementation of green procurement - To explore the effects of cost of green procurement on implementation of green procurement
16	Political will
18	Lack of training or education to employees

4.6.2.2 Summary of results for the second objective

The second objective was to determine the challenges that prevent metropolitan municipalities from practising green procurement. The challenges may be considered internal weaknesses and external threats. The SWOT model was applied to analyse the data presented in Tables 4.12 and 4.13. The results yielded ten internal weaknesses and no external threats, as presented in Table 4.14. The top six weaknesses were identified by participants as (i) lack of awareness, education and training of employees on green procurement (ii) inadequate tender specifications on green procurement (iii) lack of enforcement (iv) inadequate knowledge on benefits of green procurement (v) restricted supply of green goods and services and (vi) absence of legislation and policy directives on green procurement. The SWOT analysis for objective 2 is illustrated below.

Table 4.14: SWOT analysis of challenges that prevent metropolitan municipalities from practising green procurement

Internal Strengths	**Internal Weaknesses**
	1. Lack of awareness, education and training of employees on green procurement. 2. Inadequate tender specifications on green procurement. 3. Lack of enforcement. 4. Inadequate knowledge on benefits of green procurement.

	5. A limited supply of green products and services. 6. Lack of legislation and policy directives on green procurement. 7. Lack of commitment from management. 8. Lack of desire to execute sustainable procurement. 9. The execution of sustainable procurement is costly. 10. Lack of political will to implement green procurement.
External Opportunities	**External Threats**

4.6.3 Approaches to address challenges and improve on the execution of sustainable procurement in metropolitan municipalities

4.6.3.1 The identification of approaches to address sustainable procurement challenges

The participants were requested to identify and list approaches to address the challenges of implementing green procurement in metropolitan municipalities. There was a strong response to this open-ended question. With the exception of respondents R6, R20 and R21, all respondents provided an approach. Some responses contained spelling or grammatical errors and have been edited by the researcher. The approaches are presented in Table 4.15.

Table 4.15: List of approaches to address the challenges of implementing green procurement

Respondent #	Approaches to address the challenges on the execution of sustainable procurement in metropolitan municipalities
1	Different departments must have their own budget for the execution of sustainable procurement.
2	Audit verifications of declarations and ensure that management reports on the use of the green procurement in their respective departments.
3	Management needs to be knowledgeable about the execution of sustainable procurement so that they are able to teach employees about that.
4	I believe once a study of this nature is done, a policy at government level has to be implemented and deadlines for such implementation need to be set. Penalties for failure to implement must be defined.
5	Introduce policies on green procurement Training on green procurement Awareness Enforcement
7	- Review of MFMA & its regulations - Review of NEMA & its regulations - Review of National Water Act & its regulations - Review of Municipal Standards & Specifications
8	KPI measures for green procurement must be in place and monitored.
9	Experts need to have workshops at the municipalities highlighting the advantages and also the available alternative products. Department of Environmental Affairs needs to regulate the policy on going green to enforce implementation.
10	Training and workshops for employees of the municipalities.
11	To have more committed top management leaders with a vision for them to see growth within the municipality in order to be able to train junior staff accordingly.

Respondent #	Approaches to address the challenges on the execution of sustainable procurement in metropolitan municipalities
12	Organise a workshop to explain the importance of preserving the environment and applying knowledge from an early age.
13	Policies should be set apart to make sure that green procurement is implemented.
14	A dedicated unit/structure needs to put in place that will only focus on green procurement. The unit's primary principle should be monitoring the implementation of green procurement across all units/structures/departments and assist where there are gaps. Should make sure policies are updated and that all employees are aware of those policies around green procurement. The unit should roll out training not only among employees but to all role players including stakeholders. The unit must be capacitated with funding and also with highly skilled people.
15	Training should be scheduled for all the departments in the municipality.
16	Workshops Short courses Appointment of practitioners
17	1. The green procurement must be incorporated into the City's strategy. 2. Executive leadership must be committed to it and articulate it. 3. The importance must be known by all the employees
18	The practicality of green procurement, based on tried and tested methods, should be presented frequently to employees by training or courses.
19	The management must prioritise green procurement and it must be incorporated in their scorecard.
22	Compile the policy, implement and make it form part of the scorecard of executives and management.
23	To have a department that will make sure municipalities do have or follow the green procurement as one of their priorities.

The approaches were grouped into themes, translated into the matrix and rated, as illustrated in Table 4.16 below. The approaches may be considered internal strengths and external opportunities since they address green procurement challenges. The top five approaches on the matrix are discussed:

Training of employees to raise awareness and knowledge on green procurement was rated by 11 of 23 participants as the top approach to overcome the challenges of implementing green procurement. Policy regulation and enforcement of green procurement was ranked second on the matrix. The provision of performance scorecards, KPIs and targets on green procurement was rated third by respondents. A dedicated department with experts and practitioners dealing primarily with green procurement was ranked fourth by participants. The commitment of top management was ranked fifth on the matrix. A review of policy and legislation, a dedicated budget for green procurement and increasing the availability of green products were rated lowest on the matrix.

Table 4.16: Frequency and ranking of approaches to address green procurement challenges

Approaches to addressing the challenges of implementing green procurement	Respondent #																							Total	Ranking #
	R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8	R 9	R 10	R 11	R 12	R 13	R 14	R 15	R 16	R 17	R 18	R 19	R 20	R 21	R 22	R 23		
Training of employees to raise awareness and knowledge on green procurement			✓		✓				✓	✓	✓	✓		✓	✓	✓	✓	✓						11	1
Policy regulation and enforcement				✓	✓				✓				✓	✓								✓		6	2
Performance scorecards, KPIs and targets on green procurement		✓						✓									✓		✓			✓		5	3

Approaches to addressing the challenges of implementing green procurement	Respondent #																						Total	Ranking #
	R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8	R 9	R 10	R 11	R 12	R 13	R 14	R 15	R 16	R 17	R 18	R 19	R 20	R 21	R 22	R 23		
Dedicated department with experts and practitioners dealing with green procurement									✓					✓		✓							✓	4	4
The commitment of top management											✓						✓		✓					3	5
Review of policy and legislation				✓			✓																	2	6
A dedicated budget for green procurement	✓																							1	7

Approaches to addressing the challenges of implementing green procurement	Respondent #																							Total	Ranking #
	R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8	R 9	R 10	R 11	R 12	R 13	R 14	R 15	R 16	R 17	R 18	R 19	R 20	R 21	R 22	R 23		
Availability of alternative products									✓															1	7

4.6.3.2 Suggestions to strengthen the execution of green procurement in metropolitan municipalities

The participants were asked to list suggestions to strengthen the execution of sustainable procurement in metropolitan municipalities. Respondents R4, R13, R17, R20 and R21 did not respond to the open-ended question. Respondent R5 indicated that green procurement was already being enforced in metropolitan municipalities, so no suggestion was provided. Responses are presented in Table 4.17, with spelling and typing errors corrected by the researcher,

Table 4.17: List of suggestions to strengthen the implementation of sustainable procurement in metropolitan municipalities

Respondent #	Please state suggestions on how the execution of sustainable procurement can be improved in metropolitan municipalities?
1	Enough budget to implement green procurement.
2	1) Green procurement policy must be used as a reference timeously for the procurements of good and services. 2) Top management from all the departments to report on GP. 3) Provide courses on the implementation and importance of GP.
3	Top management and Supply Chain Management need to have an understanding and practise the principles of green procurement.
5	Introduce it as a policy and make it mandatory. Also, have a measuring system.
6	The green procurement is currently enforced in the Metropolitan Municipalities.

Respondent #	Please state suggestions on how the execution of sustainable procurement can be improved in metropolitan municipalities?
7	- Training and awareness - Review of Bid Specifications - Elimination of carbon emissions standards
8	Policies for green procurement must be in place and monitored.
9	All specifications must go through a rigorous process to include, where possible, green procurement before recommendations for advertising. The specification committee must be clued up with the latest developments regarding green procurement. KPIs to be extended to most departments and not just the environmental department. Economic development to include development and training of SMMEs on producing green products which can possibly reduce the unemployment levels in SA as well as contribute to a cleaner environment so that people are healthier and reduce the burden on state medical facilities.
10	Policies need to be put in place from the strategic management level.
11	By involving more knowledgeable members.
12	Awareness campaign by relevant stakeholders and advertising on social media.
14	The execution of sustainable procurement can be improved by establishing a dedicated unit. Its focus will be to manage green procurement. Source of funding is crucial to effectively manage green procurement. Appointments of highly skilled personnel will provide benefits for the execution of sustainable procurement.
15	Each department should be given a platform to give inputs on the idea of sustainable procurement.
16	Appointment of professionals in the green procurement industry.
18	It can be improved by limiting the current resources that are not relevant in addressing green procurement, and training staff.

Respondent #	Please state suggestions on how the execution of sustainable procurement can be improved in metropolitan municipalities?
	Awareness is very key and monitoring of the application of the information presented.
19	The procurement policy must be revised to incorporate green procurement.
22	Create awareness, provide training and workshops on the policy.
23	Have people that check the municipalities every quarter as an auditor.

The suggestions listed above were translated into a matrix and ranked, as illustrated in Table 4.18, with some textual, spelling and grammar errors corrected by the researcher. The suggestions for improving the implementation of green procurement may be considered internal strengths and external opportunities. The top three suggestions on the matrix are discussed:

The existence of green procurement policy and its enforcement was listed by 7 of 23 respondents as mandatory to strengthen the execution of sustainable procurement in the metropolitan municipality. Education and skilling of employees and stakeholders on sustainable procurement was ranked second by participants. A dedicated department for green procurement and the appointment of skilled personnel, as well as performance scorecards, KPIs and targets on green procurement, was ranked third on the matrix. The provision of a budget and a review of bid specifications was ranked fourth. The lowest-ranked suggestions, at fifth on the matrix were (i) budget to implement green procurement (ii) review of SCM

policy to incorporate green procurement (iii) elimination of carbon emissions (iv) development, training and support of local SMMEs to produce green products and (v) departments to provide inputs on sustainable procurement.

Table 4.18: Frequency and ranking of suggestions to strengthen the execution of sustainable procurement in metropolitan municipalities

Suggestions to strengthen the execution of sustainable procurement in metropolitan municipalities	Respondent #																							Total	Ranking #
	R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8	R 9	R 10	R 11	R 12	R 13	R 14	R 15	R 16	R 17	R 18	R 19	R 20	R 21	R 22	R 23		
Have a green procurement policy and enforce it.		✓			✓			✓		✓								✓				✓	✓	7	1
Provide education and training of employees and stakeholders.		✓					✓		✓			✓						✓				✓		6	2
Dedicated department on											✓			✓		✓								3	3

Suggestions to strengthen the execution of sustainable procurement in metropolitan municipalities	Respondent #																							Total	Ranking #
	R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8	R 9	R 10	R 11	R 12	R 13	R 14	R 15	R 16	R 17	R 18	R 19	R 20	R 21	R 22	R 23		
green procurement and appointment of skilled personnel.																									
Performance scorecards, KPIs and targets on green procurement		✓			✓				✓															3	3
Budget to implement green procurement	✓													✓										2	4
Review of bid specifications							✓		✓															2	4

Suggestions to strengthen the execution of sustainable procurement in metropolitan municipalities	Respondent #																						Total	Ranking #
	R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8	R 9	R 10	R 11	R 12	R 13	R 14	R 15	R 16	R 17	R 18	R 19	R 20	R 21	R 22	R 23		
Review of SCM policy to incorporate green procurement																			✓					1	5
Elimination of carbon emissions							✓																	1	5
Development, training, and support of local SMMEs to produce green products									✓															1	5

Suggestions to strengthen the execution of sustainable procurement in metropolitan municipalities	Respondent #																						Total	Ranking #
	R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8	R 9	R 10	R 11	R 12	R 13	R 14	R 15	R 16	R 17	R 18	R 19	R 20	R 21	R 22	R 23		
Departments to provide inputs on green procurement															✓									1	5

4.6.3.3 The views of participants on whether green procurement offered benefits to the organisation

The participants were asked to articulate their views regarding whether green procurement offered benefits to the organisation. Respondents R20 and R21 did not respond to the question. Seventy-one percent of participants agreed and strongly agreed that sustainable procurement was beneficial, as illustrated in Table 4.19. The participants were mindful of the positive impacts of practising sustainable procurement.

Table 4.19: The views of participants on whether green procurement offered benefits to the organisation

From your experience, does green procurement offer benefits to your organisation?	Responses (No.)	%
Agree	9	43%
Strongly agree	6	29%
Strongly disagree	1	5%
Disagree	3	14%
Not sure	2	10%
Total	**21**	**100%**

The reasons provided by participants were grouped, as indicated in Table 4.20. Respondents R5, R6, R11, R15 and R23 did not state reasons. Three participants, R4, R17 and R22, disagreed that green procurement offered benefits to the municipality. Respondent R4 emphasised that the notion of sustainable procurement was not being implemented in the CoT

while respondent R22 cited specifications that were non-compliant with green procurement requirements.

Table 4.20: List of reasons provided by respondents on whether the practice of green procurement offered benefits to the municipality

Respondent #	From your experience, does green procurement offer benefits to your organisation?	Please provide reasons for your response.
2	Agree	1) It will be aligned with the city's service charter. 2) The city will get value for money. 3) The public deserves the service they need. 4) Cost-effective measures will be in place. 5) Efficient outcomes will be achieved.
6		
7		- Sustainable environment - Less maintenance costs - Promotes health quality
8		Corruption of awarding tenders will be eliminated.
9		Less pollution to the rivers requires less maintenance to river streams - these funds can be allocated to other high priorities such as housing to reduce the backlogs. Avoid the depletion of natural resources such as gravel which is used to re-gravel roads. Cleaner atmosphere results in healthier citizens which

Respondent #	From your experience, does green procurement offer benefits to your organisation?	Please provide reasons for your response.
		reduces the requirements at clinics, such as high medical stock.
12		Newly established recycling for young people.
15		
16		The green procurement is costly as the industry is not yet well developed but there are many benefits in the long run.
19		Products procured have better implications for service delivery.
1	Strongly agree	It integrates human health and environmental concerns into the quest for high-quality goods and services at competitive costs.
3		It increases its image in the eye of the public - Client satisfaction - Lower risk - Reduced costs - Maximising shareholder value
11		
13		Saves the environment and the quality and standard of our living, as well as improving people's economic living standard through saving.

Respondent #	From your experience, does green procurement offer benefits to your organisation?	Please provide reasons for your response.
14		Green procurement is the future and it's innovative. The world is going green procurement so it should be in the priority list of municipalities. For municipalities to compete in a global world they should also consider green procurement.
18		It is very key as we could save on a lot of disposal of materials, and recycle to reuse the material.
5	Strongly disagree	N/A
4	Disagree	It is currently not being fully practised. It is my view that such a benefit identification must be research-based.
17		Most material and equipment purchased are not recyclable.
22		Our standard designs are still based on the old specifications which do not support green procurement.
10	Not sure	Green procurement is technically not practised in our organisation.
23		I'm not sure about the benefit.
20		
21		

The reasons listed above were translated into a matrix and ranked in Table 4.21. The positive reasons are considered internal strengths and external opportunities, while the negative reasons are considered internal weaknesses and

external threats to green procurement. The top three reasons on the matrix are discussed:

Cost-effectiveness and the promotion of sustainable environments were listed by 5 of 23 participants as top benefits of practising green procurement. Four of twenty-three respondents indicated that green procurement improves the standard and quality of living and thus promotes healthier citizens. It was ranked second on the matrix. Three participants emphasised that the municipality would get value for money when implementing green procurement. It was ranked third on the matrix.

The following reasons listed by respondents were ranked fourth on the matrix (i) green procurement improves the image of the municipality (ii) it provides efficient outcomes (iii) it improves the economic standards of people through savings and (iv) it promotes recycling. The long-term benefit of green procurement was cited by only one of twenty-three participants. It is therefore ranked fifth and last on the matrix.

Table 4.21: Frequency of reasons provided by respondents on reasons why the practice of green procurement offers benefits to the municipality

Reasons provided by respondents on why green procurement offer benefits to the municipality	Respondent #																						Total	Ranking #
	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15	R16	R17	R18	R19	R20	R21	R22	R23		
Cost effective	✓	✓	✓				✓		✓														5	1
It promotes sustainable environment			✓				✓		✓				✓					✓						5	1
It improves the standard and quality of living	✓						✓		✓				✓											4	2
The municipality will get value for money	✓	✓												✓										3	3
It improves the image of the municipality			✓											✓										2	4
It provides efficient outcomes		✓																	✓					2	4

Reasons provided by respondents on why green procurement offer benefits to the municipality	Respondent #																						Total	Ranking #
	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15	R16	R17	R18	R19	R20	R21	R22	R23		
It improves economic standards of people through savings			✓										✓											2	4
It promotes recycling												✓						✓						2	4
It offers long-term benefits																✓								1	5

4.6.3.4 The adoption of green procurement in other municipalities

The participants were asked to articulate whether green procurement should be adopted by other municipalities. Eighty-six percent of respondents agreed and strongly agreed that green procurement should be expanded to other municipalities, as illustrated in Table 4.22. The finding is an indication of the need to expand green procurement to other local and district municipalities in South Africa.

Table 4.22: Adoption of green procurement in other municipalities

Should green procurement be adopted in other municipalities?	Responses (No.)	%
Agree	8	38%
Strongly agree	10	48%
Strongly disagree	2	10%
Disagree	0	0%
Not sure	1	5%
Total	**21**	**100%**

Respondents R20 and R21 did not respond to the question while R23 was not sure whether green procurement should be adopted or not. Respondents R5, R6 and R11 did not state their reasons. Although respondents R14 and R19 strongly disagreed that green procurement should be adopted in other municipalities, their reasons contradict their answers. Respondent R14 clearly articulated that 'green procurement should be considered in other municipalities' which is

contradictory to the disagreement. Respondent R19 indicated 'to have standardisation in all municipalities' which appears to assume that green procurement is not being practised in other municipalities, but ought to be. Responses are shown in Table 4.23, with spelling and grammar errors corrected.

Table 4.23: List of reasons why green procurement should be adopted in other municipalities

Respondent #	Should green procurement be adopted in other municipalities?	Please provide reasons for your response.
2	Agree	1) For openness and transparency 2) To avoid wasteful and fruitless expenditures 3) To improve on meeting targets of national developments plans
3		- It saves money - Efficient procurement often supports local SMME's - Green procurement reduces resource usage - To strengthen safe and healthy environment - To strengthen social and economic development
4		It will be paperless; hence reduced storage of documents and information resulting in improved efficiency.
6		
10		I believe it should be adopted in as many municipalities as possible to keep the negative impact on the natural environment minimal.

Respondent #	Should green procurement be adopted in other municipalities?	Please provide reasons for your response.
15		It integrates human health and environmental concerns into the quest for high-quality goods and services at competitive costs.
16		Provides long-term awareness.
22		To strengthen the quality of life and preserve the environment.
5	Strongly agree	N/A
1		Environmental and climate protection. Conserve water and protect natural resources.
7		- Sustainable procurement process - Improvement on life cycle & impact assessments
8		There will be fairness in procuring services or goods.
9		Take for example a river which runs through multiple municipalities - if one municipality fails to abide by the policy and regulations then the contaminated water enters the sea which affects the sea life and adversely affects the health of people who consume, for example, fish.
11		
12		It promotes no littering.
13		Improves humankind.
17		- The greener operations enhance conservation of natural resources. - The water streams shall be protected from oil contamination. - The ozone layer shall be protected from the smoke.

Respondent #	Should green procurement be adopted in other municipalities?	Please provide reasons for your response.
18		I have observed the City of Cape Town, the way they do things there is at another level and if all municipalities could adopt their strategies, then the lack of service delivery will be history.
14	Strongly disagree	Green procurement should be considered in other municipalities. We can't afford to have certain municipalities providing certain initiatives and others not. Municipalities should not operate in isolation but with an integrated approach.
19		To have standardisation in all municipalities.
23	Not sure	I'm not sure about that.
20		
21		

The reasons why green procurement should be adopted in other municipalities were translated into a matrix and ranked as illustrated in Table 4.24. The top three findings are discussed:

Participants articulated that the expansion of green procurement to other municipalities would enhance a safe and healthy environment. This reason was given by 8 of 23 respondents and was the top-ranked reason. The idea that the adoption of green procurement would promote openness and fairness during the procurement of goods and services when expanded to other municipalities was ranked second on the

matrix. Respondents rated the following reasons third on the matrix (i) green procurement reduces resource usage (ii) it promotes social and economic development and (iii) it improves the quality of life. The lowest-ranked reasons were (i) green procurement saves money (ii) it supports local SMMs; (iii) it promotes the production of high-quality goods and services at competitive costs (iv) it promotes awareness and (v) it promotes service delivery.

Table 4.24: Frequency of reasons provided by participants on why green procurement should be adopted in other municipalities

Reasons provided by respondents on why green procurement should be adopted in other municipalities	Respondent #																						Total	Ranking #
	R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8	R 9	R 10	R 11	R 12	R 13	R 14	R 15	R 16	R 17	R 18	R 19	R 20	R 21	R 22	R 23		
Promotes safe and healthy environment	✓		✓				✓			✓		✓			✓		✓					✓		8	1
Promotes openness and fairness when procuring goods and services		✓					✓	✓																3	2

Reasons provided by respondents on why green procurement should be adopted in other municipalities	Respondent #																						Total	Ranking #
	R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8	R 9	R 10	R 11	R 12	R 13	R 14	R 15	R 16	R 17	R 18	R 19	R 20	R 21	R 22	R 23		
Reduces resource usage			✓	✓																				2	3
Promotes social and economic development			✓						✓															2	3
It improves the quality of life													✓									✓		2	3
It saves money			✓																					1	4
It supports local SMMEs			✓																					1	4

Reasons provided by respondents on why green procurement should be adopted in other municipalities	Respondent #																						Total	Ranking #
	R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8	R 9	R 10	R 11	R 12	R 13	R 14	R 15	R 16	R 17	R 18	R 19	R 20	R 21	R 22	R 23		
Promotes the production of high-quality goods and services at competitive costs															✓									1	4
Promotes awareness																✓								1	4
Promotes service delivery																		✓						1	4

4.6.3.5 Summary of results for the third objective

The third objective of the study was to identify approaches to address the challenges and improve on the implementation of green procurement in metropolitan municipalities. The SWOT analysis presented in Table 4.25 was derived from Tables 4.15 to 4.24. The respondents identified the following top five internal strengths of the municipality to address the challenges (i) the use of performance scorecards, KPIs and targets on green procurement (ii) budget provisions for green procurement (iii) the commitment of top management (iv) the majority of participants, 71%, were aware of benefits of green procurement and (v) green procurement is cost effective.

In addition, participants identified the following top five external opportunities (i) green procurement should be expanded to other local and district municipalities (ii) it promotes a healthy and sustainable environment (iii) it improves the standard and quality of living (iv) it enhances development, training and support of local SMMEs to produce green products and (v) it improves the image of the municipality. The following internal weaknesses were identified, rated top on both Tables 4.16 and 4.18 by respondents (i) lack of training and education of employees to raise awareness (ii) lack of policy regulation and enforcement (iii) lack of a dedicated department with experts and practitioners dealing primarily with green procurement (iv) lack of clear policy and legislation on green procurement and (v) need for a review of bid specifications to incorporate green products.

The lack of availability of alternative products was identified by participants as the only external threat faced by the municipality. The SWOT analysis of the approaches to address and improve on the implementation of green procurement in metropolitan municipalities is illustrated in the table below.

Table 4.25: SWOT analysis of the approaches to address and improve on green procurement in metropolitan municipalities

Internal Strengths	**Internal Weaknesses**
1. Performance scorecards, KPIs and targets on green procurement. 2. Budget provisions for green procurement. 3. The commitment of top management. 4. The majority of participants, 71%, were aware of the benefits of green procurement. 5. Green procurement is cost effective. 6. It enhances value for money. 7. It offers long-term benefits. 8. It promotes openness and fairness when procuring goods and services. 9. It reduces resource usage.	1. Lack of training and education of employees to raise awareness of green procurement. 2. Lack of policy regulation and enforcement. 3. No dedicated department with experts and practitioners dealing primarily with green procurement. 4. Lack of policy and legislation on green procurement. 5. Need for a review of bid specifications to incorporate green products. 6. Need to incorporate other departments to provide inputs on green procurement.
External Opportunities	**External Threats**
1. Green procurement should be expanded to other local and district municipalities.	1. Lack of availability of alternative products.

2. It promotes a healthy and sustainable environment. 3. It improves the standard and quality of living. 4. It enhances development, training and support of local SMMEs to produce green products. 5. It improves the image of the municipality. 6. It promotes recycling. 7. It enhances the elimination of carbon emissions. 8. It enhances social and economic development. 9. It enhances service delivery.	

4.7 Chapter summary

The consolidated strengths, weaknesses, opportunities and threats on the practice of green procurement in metropolitan municipalities were derived from the SWOT analyses and findings listed in Tables 4.11, 4.14 and 4.25. 'Green procurement enhances the reduction and recycling of waste' was cited by respondents as an internal strength in Table 4.11 and external threat in Table 4.25. Following thorough examination, the researcher is of the view 'green procurement enhances the reduction and recycling of waste' should instead be an external opportunity.

Similarly, ‘limited supply of green products’ was cited by respondents as an internal weakness in Table 4.14 and external threat in Table 4.25. Following thorough examination, the researcher is of the view ‘limited supply of green products’ should be an external threat. The SWOT analysis illustrated in Table 4.26 below arranges items according to the internal and external factors which appear in the previous SWOT analysis tables. The internal strengths and weaknesses of the practice of green procurement in metropolitan municipalities are 12 and 16 in numbers respectively. In contrast, external factors which affect the implementation of green procurement comprise nine opportunities and three threats.

Table 4.26: The consolidated SWOT analysis based on the objectives of the study

Internal Strengths	**Internal Weaknesses**
1. A variety of strategies, policies, plans and initiatives have been implemented at the municipal level of governance to promote green procurement. 2. The presence of competent and skilled personnel promotes the practice of green procurement in the organization. 3. The procurement of CNG bus fleet by the municipality reduces carbon footprint.	1. Lack of awareness, education and training of employees on green procurement. 2. Lack of legislation and policy directive on green procurement. 3. Lack of enforcement. 4. There is a need for a review of bid specifications to incorporate green products. 5. Inadequate knowledge on benefits of green procurement. 6. Lack of exposure to the practice of green procurement.

4. The reduction of water and energy losses promotes green procurement. 5. Respondents participate in the procurement of goods and services through the preparation of specifications, quotations and tender documents. 6. Performance scorecards, KPIs and targets for green procurement. 7. Budget provisions for green procurement. 8. Senior management is committed to promote green procurement. 9. Geen procurement is cost-effective. 10. It offers long-term benefits. 11. It promotes openness and fairness when procuring goods and services. 12. It reduces resource usage.	7. Lack of responses from departments. 8. Lack of desire to implement green procurement. 9. Lack of communication of green procurement to employees. 10. No dedicated department with experts and practitioners dealing primarily with green procurement. 11. Lack of knowledge of green procurement KPIs by employees. 12. Lack of ISO 14001 certification. 13. Green procurement policy is not a standalone policy but embedded in environmental policy. 14. Perception that implementation of green procurement is costly. 15. Lack of commitment from management. 16. Lack of political will to implement green procurement.
External Opportunities 1. Green procurement enhances the reduction and recycling of waste. 2. It promotes a healthy and sustainable environment. 3. It improves the standard and quality of living. 4. It enhances development, training and the support of local SMMEs to produce green products.	**External Threats** 1. Limited supply of green products and services. 2. Lack of awareness of green procurement policy by external stakeholders. 3. Lack of communication to external stakeholders.

5. Provides awareness of green procurement policy to external stakeholders. 6. The majority of participants, 86%, emphasised that green procurement should be expanded to other local and district municipalities. 7. It improves the image of the municipality. 8. It enhances social and economic development. 9. It enhances service delivery.	

5 CHAPTER FIVE – DISCUSSION OF RESULTS

5.1 Introduction

Following the presentation of data in the previous chapter, the findings of the study are discussed and linked with the literature review. This is preceded by addressing of comments from the professional editor. The status quo of the practice of green procurement at the local level of governance is presented in subsequent sections based on answers revealed by the respondents.

5.2 Discussion of results

The discussion of results is preceded by addressing of comments raised by the professional editor. The editor has corrected grammatical errors and raised the following comments addressed below:

- Page 5: “Are you referring here to your own study or the one by Agyebong and Nhamo? This needs to be clarified.” The comment was addressed by replacing the word “study” with “scholars” to clarify that the researcher was referring to Agyebong and Nhamo (2016).

- Page 8: “Are you referring here to their study or your own? If your own, change to ‘this’”. The words “their study” have been replaced with “the scholars” to clarify that the researcher was referring to Agyebong and Nhamo (2016).

- Page 38: The researcher wrote “As part of its commitment on sustainable procurement, the municipality has set the target that 40% of its bus fleet will be green by 2020 and that 10% of its procurement will be sustainable by 2021 (GLCN, nd). The latter corroborates the earlier observation that environmental criteria do not form part of its procurement process. The editor made these comments “This does not seem logical. How does the setting of targets for bus fleets corroborate that environmental criteria do not form part of its procurement process? The two ideas are not adequately linked. Do you mean ‘form part of its procurement process’”.

  The two statements are interrelated since they form part of the practice of green procurement by the CoT. The researcher highlighted that environmental criteria do not, at this stage, form part procurement process of the municipality as discussed under subsection 2.2.4.3. Therefore, the researcher is of the view the sentences are correct.

- Page 87: “I hope I have interpreted the order of your actions correctly. This sentence originally said the data analysis was ‘preceded’ by the SWOT analysis, which imply that you did a SWOT analysis first – but how would you do that without the data? I therefore inserted it here”. The editor has correctly edited the sentence to read “An analysis of the strengths, weaknesses, opportunities and strengths of the organisation was then conducted using the data, based on insights gained through the literature review, as discussed in Chapter 2.”

- Page 102: “It does not seem quite accurate to say these are the top internal strengths. As I understand it, these were only the top-ranked benefits of green procurement, as perceived by participants. The results say nothing about whether these categories are strengths of the municipality. I may be mistaken. But that is what the data suggests to me. I would say ‘The results indicate the benefits of green procurement, according to participants, and in order of perceived significance, were…’ However, I do not see how ranking the benefits answers objective 1, which was ‘to determine the practice of green procurement’ (which in itself is obscurely worded. It might have been better to state the objective as ‘to determine whether green procurement is practised at the CoT). This area needs some thought and re-wording.”

  The objective 1 has been reviewed by the researcher based on the comments from the editor. The SWOT analysis presented in Table 4.11 was derived from document analysis and includes responses from participants. The objective 1 has been re-worded to read “To determine the practice of green procurement at the level of a metropolitan municipality”. The researcher is of the view the revised SWOT analysis shown in Table 4.11 now answers objective 1.

- Page 104: “Again I fail to see how ‘perceived benefits’ can be considered a strength. Unless this question was not about perceived benefits and has been incorrectly worded in the text.” The perceived benefits have now been omitted from the internal strengths described in Table 4.11.

- Page 127: “Note that this does not seem quite the same idea as the title. Respondents may be aware of the benefits but this does not necessarily translate into positive prospects for implementing green procurement in the CoT.” The heading of Subsection 4.6.3.3 has been amended to read “The views of participants on whether green procurement offered benefits to the organisation”.

- Page 152: “Is this altogether true? It seems from some responses that they are not committed at all. I added ‘in theory’ to explain this discrepancy.” 56% of respondents agree and strongly agree that senior management is committed to green procurement as illustrated in Table 4.6. The researcher is of the view that the initial comments are correct and therefore agree with “in theory” comment from the editor.

- Page 154: “Note that the third result was lack of enforcement, and your comment for the fourth result, inadequate knowledge, seemed mere appropriate to this third result than to inadequate knowledge. I therefore swopped these two comments around.” The editor has correctly swopped the results around.

- Page 157: “This seems more relevant to the third finding, ‘standard and quality of living’”. The researcher is of the view the findings, ‘promoting a sustainable environment’ and ‘improves the standard and quality of living’ are corroborated by Cocca and Ganz (2015) and Peprah et al. (2018) as described in the same paragraph.

5.2.1 The practice of green procurement at the level of a metropolitan municipality

The SWOT analysis technique was applied to analyse data. The following practices of green procurement were determined from document analysis and responses from participants (i) a variety of strategies, policies, plans and other initiatives have been undertaken at the municipal level of governance to promote green procurement (ii) the presence of competent and skilled personnel promotes the practice of green procurement in the organization (iii) procurement of CNG bus fleet to reduce carbon footprint (iv) reduction of water and energy losses and (v) reduction and recycling of waste to landfill sites and (vi) respondents participate in the procurement of goods and services through the preparation of specifications, quotations and tender documents.

The first finding is in line with Geng et al. (2017) advocating that legislation and policy are the cornerstone of green procurement. The latter is not a standalone policy but embedded in the environmental policy of the organisation. This fact tended to create confusion among participants on whether a policy existed or not and is an indication that the policy is not being communicated to employees. Although enforceable legislation is mandatory to the success of green procurement, MFMA does not incorporate elements of green procurement in its current form. The development of strategies, plans and other initiatives to promote green procurement are corroborated by Young et al. (2016) and Lundberg and Marklund (2017).

The second finding, the presence of competent and skilled personnel promotes the practice of green procurement in the organization, is corroborated by Testa et al. (2016) who emphasise that empowering employees with relevant training and knowledge increases their competency and probability of practising green procurement in the organisation. The third finding, procurement of CNG bus fleet to reduce carbon footprint, is supported by Aldenius and Khan (2017) who advocate that a public authority can directly contribute to emission reductions when it accounts for a large market share. The fourth finding, reduction of water and energy losses, is not supported by the literature review.

The fifth finding, the reduction and recycling of waste, is corroborated by Geng et al. (2017), who identified recycling as an enabler of green procurement. The last finding, respondents participate in the procurement of goods and services, is supported by Akenroye et al. (2013) who reiterate that environmental and procurement professionals are enablers of the practice of green procurement in the organisation. The findings are in line with themes generated from literature review presented in Table 2.3.

5.2.2 The challenges that prevent metropolitan municipalities from practising green procurement

The respondents indicated the top six challenges of implementing green procurement at the local sphere of governance as (i) lack of awareness, education and training (ii) lack of legislation and policy directives on green procurement

(iii) lack of enforcement (iv) inadequate tender specifications on green procurement (v) inadequate knowledge of the benefits of green procurement and (vi) lack of exposure to the practice of green procurement.

The first result has been identified by a few scholars as a barrier to the practice of green procurement (Ikediashi et al., 2012; Akenroye et al., 2013; Testa et al., 2016; Agyepong and Nhamo, 2016; Aragao and Jabbour, 2017; Peprah et al., 2018; Rais et al., 2018). The finding on lack of education and training on green procurement is strongly corroborated by Testa et al. (2016) who identified it as more critical than other factors. The second result, lack of legislation and policy directives, is corroborated by Geng et al. (2017).

The third finding, lack of enforcement, is supported by Young et al. (2016) who state that lack of enforcement hinders the adoption of green procurement. The fourth result is corroborated by Das (2017), who emphasises that environmental requirements should be integrated into supply chain management tender requirements to leverage the benefits of green procurement. The fifth finding, inadequate knowledge of the benefits, is identified by Ikediashi et al. (2012) as attributed to the uncertainty of green procurement outcomes. The last result is supported by a few scholars in the literature (Akenroye et al., 2013; Cocca and Ganz, 2015; Young et al., 2016; Peprah et al., 2018).

5.2.3 Approaches to address challenges and improve on the implementation of green procurement in metropolitan municipalities

The participants listed the top approaches to addressing the challenges and improving on the implementation of green procurement at the local levels of governance as (i) training of employees to raise awareness and knowledge (ii) policy regulation and enforcement (iii) the provision of performance scorecards, KPIs and targets on green procurement (iv) a dedicated department with experts and practitioners dealing primarily with green procurement and (v) the commitment of top management. The first approach is corroborated in the literature, with many scholars concurring that the provision of training and capacitating employees with knowledge on green procurement improves its practice in the organisation (Testa et al., 2016).

The second finding, policy regulation and enforcement, is in line with Pepra et al. (2018) and Okereke et al. (2019) who determined that the success of green procurement should be supported by policies, legal frameworks and enforcement. The literature is silent on the third finding. However, the municipality reports quarterly on the achievement of KPIs through the quarterly performance reports. The fourth result, a dedicated department, is in line with conclusions drawn by Akenroye et al. (2013) who identified the availability of procurement and environmental professionals in the organisation as enablers of green procurement. The last finding, commitment of top management, was identified by Blome et al. (2014) as the driver of green procurement.

The respondents listed the following suggestions to improve on the implementation of green procurement at the local sphere of governance (i) have a green procurement policy and enforce it (ii) provide education and training for employees and stakeholders on green procurement (iii) have a dedicated department on green procurement and appoint skilled personnel and (iv) use performance scorecards, KPIs and targets for green procurement. The first suggestion is corroborated in the literature by Pepra et al. (2018), who state that the success of green procurement should be supported by policies, a legal framework and enforcement.

In support of the second suggestion, the need for education and training, it is clear that the municipality has conducted workshops with stakeholders to get buy-in on the implementation of the environmental plan (TIEPIP, 2007). The provision of training for employees was found by Testa et al. (2016) to be a significant factor in raising the level of knowledge on green procurement. It is, in fact, obvious that education and training on a particular subject improve knowledge. On the third suggestion - have a dedicated department and skilled personnel - the municipality has an SCM Division and an Environmental Division dealing primarily with procurement and environmental matters respectively. However, the integration of environmental criteria into SCM policy was clearly lacking. On the matter of performance scorecards, KPIs and targets for green procurement, the literature was silent. The municipality does, however, provides quarterly reports on the achievement of KPIs.

The majority of participants were aware of the benefits of the practice of green procurement at the local level of governance. They listed the following benefits of green procurement (i) it is cost-effective (ii) it promotes a sustainable environment (iii) it improves the standard and quality of living and (iv) it promotes value for money. On the first benefit, cost-effectiveness, the literature concurs, highlighting the fact that green procurement aids organisations to improve their efficiency, reduce operational liabilities and gain global recognition (Peprah et al., 2018).

The second finding, promoting a sustainable environment, is corroborated by Cocca and Ganz (2015), who determined that businesses offering sustainable goods and services contribute directly towards social justice and quality of life. The third finding is corroborated by Cocca and Ganz (2015) and Peprah et al. (2018). The last finding, value for money, is supported by Akenroye et al. (2013), citing Erdmenger (2003), who determined that green procurement promotes competitive practices by permitting for the procurement of green products and services of high quality at minimum costs.

The majority of participants, 86%, said that green procurement should be expanded to other municipalities. The finding is an indication of the need to expand green procurement to other local and district municipalities in South Africa. They listed the following reasons for its widespread adoption (i) it enhances a safe and healthy environment (ii) it promotes openness and fairness during the procurement of goods and services (iii) it

reduces resource usage (iv) it promotes social and economic development and (v) it improves the quality of life.

The first reason, a safe and healthy environment, is mentioned in the literature, which highlights that public authorities play an influential role in getting private businesses to develop and procure environmentally friendly goods and services (Brammer and Walker, 2011). In addition, Aldenius and Khan (2017) emphasise that public authorities account for a large market share when it comes to the reduction of carbon emissions. The finding is therefore supported by the literature. On the second finding, openness and fairness during the procurement process, the literature is silent. Peprah et al. (2018) highlight that green procurement enables organisations to improve their efficiency, reduce operational liabilities and gain global recognition. The finding is therefore not supported by the literature.

The third approach, reducing resource usage, is corroborated by Geng et al. (2017) who state that green procurement encourages recycling which saves resources. The fourth finding, the promotion of social and economic development, is supported in the literature by Brammer and Walker (2011), who state that green procurement encourages authorities to purchase from SMMEs, and businesses operated and owned by minorities and women. The literature is not explicit on the last finding, improving the quality of life. However, it is a well-known fact that the reduction of carbon emissions in the atmosphere improves the quality of life for all.

6 CHAPTER SIX – CONCLUSIONS AND RECOMMENDATIONS

6.1 Introduction to chapter

Following the discussions of results in the previous chapter, the study concludes by providing an overview, review of the research design, limitations and mitigations, summary of the key findings and their implications. Recommendations, suggestions for future studies and conclusion are presented in subsequent sections below.

6.2 An overview of the study

The study investigated the practice of green procurement at the local levels of governance particularly in the City of Tshwane. The literature review was conducted to gather empirical knowledge published by other academic scholars on green procurement. The literature was used as a tool to aid in structuring of the questionnaire in preparation for fieldwork to collect primary data. The Infrastructure Departments, SCM and Environmental Divisions with a combined budget of approximately 66.1% of the total budget of the municipality were identified as the sampling frame to answer the research question. 42 participants were invited to participate in the study. 23 respondents responded to the online survey. The SWOT analysis technique was applied to analyse data. The overview is briefly described in subsequent sections below.

6.2.1 Addressing the research objectives

The study pursued three objectives (i) to determine the practice of green procurement at the level of a metropolitan municipality (ii) to determine the challenges that prevent metropolitan municipalities from practising green procurement and (iii) to identify approaches to addressing the challenges and improving the implementation of green procurement in metropolitan municipalities. A variety of strategies, policies, plans and other initiatives have been formulated at the municipal level of governance to promote green procurement. The reduction of water, energy losses and waste are some of green procurement practices being implemented at the local levels of governance. The lack of awareness, education and training on green procurement was identified by the participants as the challenge that prevent metropolitan municipalities from practising green procurement. Training of employees to raise awareness levels and knowledge of green procurement has been identified as the top approach to address the challenges and improve its implementation at the municipal level of governance.

6.2.2 Addressing the research aim

The study was aimed at investigating the practice of green procurement at the level of metropolitan municipalities, with a view to understand the status, determine attendant challenges and identify ways to address such challenges. To achieve the aim, the study focused on three objectives as described in the previous section. The practices of green procurement are described under subsection 4.6.1.4.

6.2.3 Addressing the research question

The research question was “what is the status of the practice of green procurement at the local levels of governance?” To answer this question, the research focused on studies published by scholars in other countries to empirically explore green procurement from the South African perspective. The status quo of green procurement practices at the levels of metropolitan municipalities have been investigated and described under subsection 2.2.3.

6.2.4 Addressing the research problem

The inadequate practice of green procurement which prevailed at the municipal levels of governance, motivated undertaking of the study. The research problem was addressed by exploring green procurement trends and practices undertaken by other countries as described under subsection 2.2.2.

6.3 A review of the research design/methodology

The research design was thoroughly described and corroborated by literature review. The study adopted the epistemological paradigm to determine how the local levels of governance attain knowledge on green procurement and communicate this to the stakeholders. Consequently, the positivist philosophy was espoused to leverage on its flexibility

to build theory generated in other countries on green procurement. The philosophy has an added advantage of being objective when collecting secondary data. The deductive approach was applied through the reading of literature generated globally by a variety of scholars. The survey strategy was adopted to collect primary data.

The design of questions was linked with the findings of previous studies as elucidated in the literature review. The SWOT analysis technique was applied to analyse data due to its flexibility to determine internal and external factors affecting the municipality on the practice of green procurement. The internal factors assessed the status of the organisation, available skills and competencies required for the municipality to become competitive in the area of sustainable procurement. The external factors assessed the available market opportunities for the organisation and the prevailing threats to green procurement. The technique was found to be suitable when used in environmental management as applied in the study.

6.4 Limitations to the research and mitigations

The study was limited to the five biggest departments in the City of Tshwane with a combined budget of approximately 66.1% of the total budget allocation. The sample was restricted to 42 participants in the departments. However, only 23 participants responded to the survey despite permission which was granted by the municipality to allow the researcher to conduct the study. Although confidentiality and anonymity of

participants were indicated in the informed consent and general information sheet, participants cited possible recording of their personal details on the online survey which may result in potential victimisation at work. In mitigating the prevailing challenges, the researcher has made personal contacts with some participants to assure them of their confidentiality and the right to remain anonymous when participating in the study. The findings cannot be generalised to all metropolitan municipalities in the country.

6.5 Findings from the research

The local levels of governance has implemented the following green procurement practices (i) a variety of strategies, policies, plans and other initiatives have been undertaken to promote green procurement (ii) the presence of competent and skilled personnel promotes the practice of green procurement in the organization (iii) procurement of CNG bus fleet to reduce carbon footprint (iv) reduction of water and energy losses and (v) reduction and recycling of waste to landfill sites and (vi) respondents participate in the procurement of goods and services through the preparation of specifications, quotations and tender documents.

The top six challenges of implementing green procurement are (i) lack of awareness, education and training (ii) lack of legislation and policy directives on green procurement (iii) lack of enforcement (iv) inadequate tender specifications on green procurement (v) inadequate knowledge of the benefits of green procurement and (vi) lack of exposure to the practice of green

procurement. The establishment of legislation and sound policies emerged from the literature review as the foundation of the practice of green procurement. The study found that the applicable legislation, MFMA, which governs municipalities on corporate governance and financial management, does not make it mandatory for the local sphere of governance to incorporate green procurement into their SCM policies.

This is a clear barrier to the successful implementation of green procurement. In addition, elements of green procurement have been incorporated into the environmental policy and other strategies, instead of creating a standalone green procurement policy. These facts have been identified as weakness which helps explain the prevailing confusion as to whether a green procurement policy exists or not. The local sphere of governance was found to be lacking in the area of training and educating employees on green procurement. The appropriate education and training of employees and stakeholders are critical to its successful implementation. Although it was found in the literature that all eight metropolitan municipalities in South Africa have green procurement policies in place, its enforcement was found to be fragmented or completely lacking.

The SCM policy at the local sphere of governance makes no mention of environmental criteria forming part of tender awarding criteria and was silent on green procurement. The roles and functions of Supply Chain Management, the Environmental Division and other departments need to be integrated to leverage the benefits of green procurement. The municipality has committed to gradually integrating

environmental criteria into SCM policy in accordance with applicable legislation.

The provision of performance scorecards, KPIs and targets on green procurement at the local level of governance was established among the top five approaches for improving green procurement. The respondents also suggested that the adoption of green procurement would promote openness and fairness during the procurement of goods and services when expanded to other municipalities. The latter was ranked second by the participants as an approach to enhance green procurement. The literature was found to be silent on these findings, indicating an opportunity for further research.

The majority of participants recommended that the implementation of green procurement be adopted in other local and district municipalities in the country. There was political willingness and commitment from top management to allocate adequate resources at the local sphere of governance to promote the practice of green procurement through the signing of a pledge, as part of the TIEP, as discussed in section 2.2.4.4. However, it appears that at this stage much of the commitment remains theoretical and is not communicated to all staff, nor translated into the tender evaluation process.

6.6 Implications of findings

The status quo of the challenges that impede the practice of green procurement at the local levels of governance will remain

unchanged if the national government does not consider amending MFMA to mandate municipalities to incorporate green procurement and its enforcement in their SCM policies. The competency of employees can be improved by providing comprehensive training. The adoption of green procurement by other municipalities, as suggested by 86% of respondents, can significantly contribute to the global reduction of negative impacts posed by climate change.

6.7 Recommendations based on the implications of findings

The local levels of governance should consider green procurement policy as a standalone policy to minimise confusion about its existence. The municipalities should conduct training of employees and external stakeholders to educate and raise awareness levels of the policy. The national government should consider amending the MFMA to mandate municipalities to incorporate environmental requirements into tender awarding criteria in their procuring goods and services. The amendments should incorporate annual targets, reporting, monitoring and auditing.

As a result of such a step, all local, districts and metropolitan municipalities would be required to amend their SCM policies to comply with the amended MFMA. These municipalities should consider amending and standardising tender documents to incorporate environmentally friendly specifications for the procurement of goods and services from external service providers. Efforts should also be made by municipalities to conduct extensive workshops to educate and train external

service providers on compliance with the new specifications on green products and services.

6.8 Suggestions for future studies

The following studies are suggested:

- To determine the efficiency of green procurement policy frameworks and the status of enforcement in the public sector.
- To determine the role of the AU on the promotion of the practice of green procurement amongst member states.
- To determine the magnitude of the influence of performance scorecards, KPIs and targets on the practice of green procurement in the public sector.
- Does the adoption of green procurement in municipalities contribute to openness and fairness during the procurement of goods and services?

6.9 Conclusion

There are elements of green procurement practices at the local levels of governance. Although efforts have been made by the municipality to improve on the practice, the absence of green procurement legislation at national level compounded by lack of standalone policy and enforcement at the municipal level negatively affect these efforts. The latter has been found to be a major deterrent to the practice of green procurement. The prevailing challenges affecting the implementation of green procurement can be mitigated by developing a standalone

policy, improving its enforcement and educating and training of employees. In addition, the development of performance scorecards, KPIs and targets on green procurement were identified among top approaches for improving green procurement.

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8. APPENDICES

Appendix A: Ethics Clearance Certificate

School of Construction Economics & Management

University of the Witwatersrand, Johannesburg -PO Box 20, Wits 2050, South Africa • Tel: +27 (0)11 717 7652/77669 · Fax: +27 (0)11 717 9729 Email:CEM@wits.ac.za

SCHOOL OF CONSTRUCTION ECONOMICS AND MANAGEMENT RESEARCH ETHICS COMMITTEE

CLEARANCE CERTIFICATE	**PROTOCOL NUMBER CEM/15/08/PR2**
PROJECT TITLE	The Practice of Green Procurement in the City of Tshwane Metropolitan Municipality in Gauteng Province
INVESTIGATORS	Tseke Remed Namanyane 1636755
SCHOOL/DEPARTMENT	**SCHOOL OF CONSTRUCTION ECONOMICS AND MANAGEMENT**
DATE CONSIDERED	18/09/2018
DECISION OF THE COMMITTEE	Approved conditionally with respect to the declaration
EXPIRY DATE	30th September 2019
DATE 31/Jan/2018	**CHAIRPERSON** Dr. Kola Ijasan

cc: Supervisor: Dr. Obi Ozumba

DECLARATION OF INVESTIGATOR (S)

To be completed in duplicate and **ONE COPY** returned to the Secretary Mrs. M. Sithole at the CEM reception desk.

I/We fully understand the conditions under which I am/we are authorized to carry out the abovementioned research and I/we guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to resubmit the protocol to the Committee. **I agree to completion of a yearly progress report.**

Signature **Date** 20/09/2018

Appendix B: Consent

INFORMED CONSENT

The informed consent will be built into Qualtrics as the first page of the questionnaire as follows:

Welcome to the research study

You are welcome to participate in the research study on the practice of green procurement in the City of Tshwane Metropolitan Municipality in Gauteng Province. The purpose of undertaking the study is to attain knowledge on the concept of green procurement and how the City of Tshwane practices this phenomenon.

Consent

By clicking on the button below, you acknowledge that you:

- agree to participate in the study voluntarily;
- are 21 years of age or older;
- have read and understood the information provided by the researcher for the study; and
- agree to answer the questionnaire provided by the researcher.

I consent to participate in the study

By clicking on the button below, you decline to participate in the study:

I do not consent

Important information for the Participant

1. The participant has the right to remain anonymous.
2. No money or form of payment will be offered for participating in the study.
3. The participant is free to withdraw at any time without giving a reason.
4. The participant has the right to contact the researcher regarding their participation in the research.
5. The participants are informed of the following ethical principles which will be applied to this study:
    - The researcher will be objective when conducting data analysis and reporting of the findings of the study.
    - The researcher will avoid deception and dishonesty.
    - No harm, discomfort or embarrassment will be caused by the researcher on the participants.
    - Confidentiality of the participants will be maintained.

The conduct of the researcher will be of high ethical standard.

Appendix C: General Information Sheet

General Information

Institution

University of the Witwatersrand

Research topic

The practice of green procurement in the City of Tshwane Metropolitan Municipality in Gauteng Province

Introduction

I, Namanyane Tseke Remed, student number 1636755, have registered for the Master of Science degree in Building (Construction Project Management) at the University of the Witwatersrand. As part of the fulfilment of the degree, I am undertaking a research on the practice of green procurement in the City of Tshwane Metropolitan Municipality in Gauteng Province under the supervision of Associate Prof. O. Ozumba.

Invitation to participate in the study

I hereby invite you to participate in the described survey through the questionnaire developed on the system called

Qualtrics. It is a simple online questionnaire service which you can access through the link provided in this email. By clicking on the link provided, you agree to participate in the research survey.

Following your agreement to participate in the survey, I hereby request permission to utilise your responses for the stated study.

Duration of the study

The research participants are expected to take approximately 30minutes to answer all the questions in the study.

Confidentiality

The researcher will endeavour to keep personal information of the participant confidential unless required by law to disclose the information. The participant has the right to remain anonymous in the study.

Contact details of the researcher

The participant can contact the researcher on the following contact details regarding the study:

- Cell : 082 678 4610
- Email : 1636755@students.wits.ac.za

Contact details of the REC Administrator

Should the participant experience any problem or complaint on the manner in which the researcher is conducting the study, please report them to the Research Ethics Committee (REC) Administrator, Dr Kola Ijasan as follows:

- Tel : 011 717 7681
- Email : kola.ijasan@wits.ac.za

Appendix D: Questionnaire

Questionnaire

Green procurement is defined as the acquisition of goods and services that minimise the negative impact on the environment with special emphasis on the desire to deal with climate change (Agyepong & Nhamo, 2016). The principle of green procurement is primarily concerned with acquiring products, goods or services that do not yield negative effects on the environment during their life cycle. Life cycle is the period from manufacturing to decommissioning of such products, goods or services at the end of their life span.

1 Please select the name of your department in the City of Tshwane Metropolitan Municipality.

- Roads and Transport
- Water and Sanitation
- Procurement/Supply Chain Management (SCM)
- Environmental
- Others (Specify)

2 What is your occupation?

- Director
- Deputy Director
- Project Manager
- Engineer
- Civil Engineering Technologist
- Civil Engineering Technician
- Environmental Practitioner
- SCM Officer/Purchasing/Procurement Officer
- Others (Specify)

3 What is your role at work?

4 What is your highest academic qualifications?

- Certificate
- National Diploma
- B-Tech/Degree
- Honours
- Masters
- PhD
- Others (Specify)

5 Please provide details on years of experience.

- 1 to 5 years
- 6 to 10 years
- 11 to 15 years
- 16 to 20 years
- Over 21 years

6 What is your age?

- 21 to 25 years old
- 26 to 30 years old
- 31 to 35 years old
- 36 to 40 years old
- 41 to 45 years old
- 46 to 50 years old
- 51 to 55 years old
- 56 to 60 years old
- 61 to 65 years old

7 The organisation has a policy on green procurement.

- Strongly disagree
- Disagree
- Not sure
- Agree
- Strongly agree

8 How long was green procurement introduced in the organisation?

- 1 to 3 years ago
- 4 to 6 years ago
- 7 to 10 years ago
- Over 10 years ago
- Not sure

9 The organisation provides awareness, education and training of employees on green procurement.

- Strongly disagree
- Disagree
- Not sure
- Agree
- Strongly agree

10 In your opinion, Senior Management is committed to promote the practice of green procurement in the organisation.

- Strongly disagree
- Disagree
- Not sure

- Agree
- Strongly agree

11 The organisation has developed KPI's (key performance indicators) on green procurement.

- Strongly disagree
- Disagree
- Not sure
- Agree
- Strongly agree

12 The organisation has developed strategies to achieve KPI's on green procurement.

- Strongly disagree
- Disagree
- Not sure
- Agree
- Strongly agree

13 The organisation has achieved KPI's on green procurement in the previous financial year.

- Strongly disagree
- Disagree
- Not sure
- Agree
- Strongly agree

14 The organisation is expected to achieve KPI's on green procurement in the current financial year.

- Strongly disagree
- Disagree
- Not sure
- Agree
- Strongly agree

15 On a scale of 1 to 5, rate the following benefits on the practice of green procurement in metropolitan municipalities where 1 is not at all significant and 5 is very significant.

	1	2	3	4	5
Cost effective					
Reduced impact on the environment					
Improved efficiency					
Promotes change in behaviour of private businesses when initiated by the municipality					
Recycling initiatives promote green procurement					
ISO 14001 certification enhances green procurement					

16 If there are any benefits of green procurement which you feel I have not incorporated in this study, please list them below.

17 On a scale of 1 to 5, rate the following challenges on the practice of green procurement in metropolitan municipalities where 1 is not at all significant and 5 is very significant.

	1	2	3	4	5
Lack of legislation and policy directive on green procurement					
Lack of enforcement					
Inadequate knowledge on the benefits of green procurement					
Lack of awareness, education and training on green procurement					
Lack of commitment from management					
The implementation of green procurement is costly					
Lack of desire to implement green procurement					
Inadequate tender specifications on green procurement					
Limited supply of green products and services					

18 If there are any challenges on the practice of green procurement in metropolitan municipalities which you feel I have not incorporated in this study, please list them below.

19 In your opinion, what could be done to address the challenges on the implementation of green procurement in metropolitan municipalities?

20 Please state suggestions on how the implementation of green procurement can be improved in metropolitan municipalities?

21 From your experience, does green procurement offer benefits in your organisation.

- Strongly disagree
- Disagree
- Not sure
- Agree
- Strongly agree

22 Please provide reasons for your response above.

23 In your opinion, should green procurement be adopted in other municipalities?

- Strongly disagree
- Disagree
- Not sure

- Agree
- Strongly agree

24 Please provide reasons for your response above.

Appendix E: The Kolmogorov-Smirnov Table

Critical values, d_{alpha};$(n)^a$, of the maximum absolute difference between sample $F_n(x)$ and population $F(x)$ cumulative distribution.

Number of trials, n	Level of significance, α			
	0.10	0.05	0.02	0.01
1	0.95000	0.97500	0.99000	0.99500
2	0.77639	0.84189	0.90000	0.92929
3	0.63604	0.70760	0.78456	0.82900
4	0.56522	0.62394	0.68887	0.73424
5	0.50945	0.56328	0.62718	0.66853
6	0.46799	0.51926	0.57741	0.61661
7	0.43607	0.48342	0.53844	0.57581
8	0.40962	0.45427	0.50654	0.54179
9	0.38746	0.43001	0.47960	0.51332
10	0.36866	0.40925	0.45662	0.48893
11	0.35242	0.39122	0.43670	0.46770
12	0.33815	0.37543	0.41918	0.44905
13	0.32549	0.36143	0.40362	0.43247
14	0.31417	0.34890	0.38970	0.41762
15	0.30397	0.33760	0.37713	0.40420
16	0.29472	0.32733	0.36571	0.39201
17	0.28627	0.31796	0.35528	0.38086
18	0.27851	0.30936	0.34569	0.37062
19	0.27136	0.30143	0.33685	0.36117
20	0.26473	0.29408	0.32866	0.35241
21	0.25858	0.28724	0.32104	0.34427
22	0.25283	0.28087	0.31394	0.33666
23	0.24746	0.27490	0.30728	0.32954
24	0.24242	0.26931	0.30104	0.32286
25	0.23768	0.26404	0.29516	0.31657
26	0.23320	0.25907	0.28962	0.31064
27	0.22898	0.25438	0.28438	0.30502
28	0.22497	0.24993	0.27942	0.29971
29	0.22117	0.24571	0.27471	0.29466
30	0.21756	0.24170	0.27023	0.28987
31	0.21412	0.23788	0.26596	0.28530
32	0.21085	0.23424	0.26189	0.28094
33	0.20771	0.23076	0.25801	0.27677
34	0.20472	0.22743	0.25429	0.27279
35	0.20185	0.22425	0.26073	0.26897
36	0.19910	0.22119	0.24732	0.26532
37	0.19646	0.21826	0.24404	0.26180
38	0.19392	0.21544	0.24089	0.25843
39	0.19148	0.21273	0.23786	0.25518
40^b	0.18913	0.21012	0.23494	0.25205

[a] Values of $d_{\alpha}(n)$ such that $p(\max)|F^n(x) - F(x)|d^{\alpha}(n) = \alpha$.

[b] $N > 40 \approx \frac{1.22}{N^{1/2}}, \frac{1.36}{N^{1/2}}, \frac{1.51}{N^{1/2}}$ and $\frac{1.63}{N^{1/2}}$ for the four levels of significance.

Source: O'Connor and Kleyner (2012)

Appendix F: Summary of collected data

Respondent #	Q1 Please select the name of your department/ division in the City of Tshwane Metropolitan Municipality.	Q1_1 Other (Specify)	Q2 What is your occupation?	Q2_1 Other (Specify)	Q3 What is your role at work?	Q4 What is your highest academic qualifications?	Q4_1 Other (Specify)
1	Roads and Transport		Project Manager		Am managing the Capex Projects for Roads and Stormwater.	B-Tech/ Degree	
2	Roads and Transport		Deputy Director		My Role is on the operations management for the regional maintenance of roads, storm water and traffic markings and signs activities as well as the resources (Human & Logistical) used to provide the reactive maintenance on the municipal road infrastructure and furniture.	B-Tech/ Degree	
3	Roads and Transport		Project Manager		Managing Roads and Stormwater Capital Projects around City of Tshwane	National Diploma	
4	Roads and Transport		Deputy Director		Planning, managing the roll-out of Tshwane Bus Rapid Transit. Preparing reports to various stake holders.	Honors	
5	Roads and Transport		Civil Engineering Technologist		Construction Management and Tendering	Masters	

Respondent #	Q1 Please select the name of your department/ division in the City of Tshwane Metropolitan Municipality.	Q1_1 Other (Specify)	Q2 What is your occupation?	Q2_1 Other (Specify)	Q3 What is your role at work?	Q4 What is your highest academic qualifications?	Q4_1 Other (Specify)
6	Roads and Transport		Project Manager		Manage roads and stormwater projects	B-Tech/ Degree	
7	Roads and Transport		Deputy Director		Management	B-Tech/ Degree	
8	Roads and Transport		Civil Engineering Technologist		To maintain road infrastructure assets	B-Tech/ Degree	
9	Other (Specify)	Regional Operations and Coordination	Deputy Director		Manage the maintenance of traffic signs, road markings, guardrails, bollards and security fences using external service providers.	Masters	
10	Roads and Transport		Civil Engineering Technician		Construction contract management. This entails: Design of roads and storm water, Tender documentation and construction supervision.	National Diploma	

Respondent #	Q1 Please select the name of your department/ division in the City of Tshwane Metropolitan Municipality.	Q1_1 Other (Specify)	Q2 What is your occupation?	Q2_1 Other (Specify)	Q3 What is your role at work?	Q4 What is your highest academic qualifications?	Q4_1 Other (Specify)
11	Supply Chain Management (SCM)/Procurement		Other (Specify)	Demand section	Inviting the bidders to quote from specific panel, conduct compulsory briefing session, taking minutes at BSC, assisting with evaluation of panel, Designing tender documents, attending to quiries etc.	B-Tech/ Degree	
12	Roads and Transport		Civil Engineering Technician		Contracts Manger on roads and stormwater projects.	B-Tech/ Degree	
13	Roads and Transport		Project Manager		Managing the cities roads projects based on the allocated budget for the year and do planning of forthcoming years and new projets .	B-Tech/ Degree	
14	Roads and Transport		Deputy Director		Management of Transport Infrastructure which include roads and stomwater related function, public transport infrastructure and information management system.	B-Tech/ Degree	
15	Roads and Transport		Project Manager		To manage Roads and Stormwater Capital Projects.	B-Tech/ Degree	
16	Other (Specify)	Utilities Services	Engineer		Management of the Credit control function	Masters	
17	Electricity		Other (Specify)	Functional head/ Acting Chief Engineer	Overseeing the maintenance and construction of electrical network in region1 of the City of Tshwane.	Masters	

Respondent #	Q1 Please select the name of your department/ division in the City of Tshwane Metropolitan Municipality.	Q1_1 Other (Specify)	Q2 What is your occupation?	Q2_1 Other (Specify)	Q3 What is your role at work?	Q4 What is your highest academic qualifications?	Q4_1 Other (Specify)
18	Roads and Transport		Civil Engineering Technologist		Ensuring that the Road Infrastructure is kept in a serviceable, safe and maintainable condition in a cost effective way	Honors	
19	Roads and Transport		Deputy Director		Programme management on the roads and stormwater programmmes	B-Tech/ Degree	
20	Roads and Transport		Civil Engineering Technologist		Assisting the Deputy Director in managing the Infrastructure Asset Management Sub-section and to ensure that roads infrastructure is kept in a serviceable, safe and maintainable condition in a cost effective way. I also assist in development, implementation, maintenance and operation of Pavement Management System	B-Tech/ Degree	
21	Roads and Transport		Civil Engineering Technician		I'm the contract manager responsible for managing capital project.	National Diploma	
22	Other (Specify)	Regional Operations and Coordination	Director		Managing operations in the regions to ensure the effective execution of maintenance tasks and work for other organizations on the road, storm water and traffic sign/markings infrastructure by contractors and internal construction teams supported by hired local labour, contractors and suppliers.	B-Tech/ Degree	
23	Supply Chain Management (SCM)/ Procurement		SCM Officer/ Purchasing/ Procurement Officer		Quotation Bid evaluation. I work the quotation and we are doing the evaluation of the quotation.	Certificate	

Respondent #	Q5 Please provide details on years of experience.	Q6 What is your age?	Q7 Does the organization have a policy on green procurement?	Q8 How long was green procurement introduced in the organization?	Q9 Does the organization provide awareness, education and training of employees on green procurement?	Q10 In your opinion, Senior Management is committed to promote the practice of green procurement in the organization?	Q11 Does the organization have KPI's (key performance indicators) on green procurement?	Q12 The organization has developed strategies to achieve KPI's on green procurement?	Q13 The organization has achieved KPI's on green procurement in the previous financial year?	Q14 Please indicate if the organization is expected to achieve KPI's on green procurement in the current financial year?
1	11 to 15 years	36 to 40 years old	Agree	1 to 3 years ago	Agree	Not sure	Agree	Agree	Agree	Agree
2	16 to 20 years	36 to 40 years old	Agree	Not sure	Agree	Strongly agree	Strongly agree	Agree	Agree	Agree
3	11 to 15 years	46 to 50 years old	Agree	Not sure	Agree	Strongly agree	Not sure	Agree	Agree	Agree
4	11 to 15 years	41 to 45 years old	Not sure	Not sure	Agree	Agree	Not sure	Not sure	Not sure	Not sure
5	11 to 15 years	31 to 35 years old	Not sure	Not sure	Disagree	Disagree	Strongly disagree	Strongly disagree	Strongly disagree	Strongly disagree

Respondent #	Q5 Please provide details on years of experience.	Q6 What is your age?	Q7 Does the organization have a policy on green procurement?	Q8 How long was green procurement introduced in the organization?	Q9 Does the organization provide awareness, education and training of employees on green procurement?	Q10 In your opinion, Senior Management is committed to promote the practice of green procurement in the organization?	Q11 Does the organization have KPI's (key performance indicators) on green procurement?	Q12 The organization has developed strategies to achieve KPI's on green procurement?	Q13 The organization has achieved KPI's on green procurement in the previous financial year?	Q14 Please indicate if the organization is expected to achieve KPI's on green procurement in the current financial year?
6	16 to 20 years	41 to 45 years old	Strongly agree	Over 10 years ago	Strongly agree	Strongly agree	Strongly agree	Strongly agree	Strongly agree	Strongly agree
7	11 to 15 years		Agree	1 to 3 years ago	Agree	Not sure	Agree	Not sure	Not sure	Not sure
8	11 to 15 years	41 to 45 years old	Agree	Not sure	Disagree	Disagree	Disagree	Not sure	Disagree	Disagree
9	Over 21 years	41 to 45 years old	Agree	Not sure	Not sure	Disagree	Not sure	Not sure		Not sure
10	6 to 10 years	31 to 35 years old	Not sure	Not sure	Disagree	Disagree	Disagree	Not sure	Disagree	Not sure

Respondent #	Q5 Please provide details on years of experience.	Q6 What is your age?	Q7 Does the organization have a policy on green procurement?	Q8 How long was green procurement introduced in the organization?	Q9 Does the organization provide awareness, education and training of employees on green procurement?	Q10 In your opinion, Senior Management is committed to promote the practice of green procurement in the organization?	Q11 Does the organization have KPI's (key performance indicators) on green procurement?	Q12 The organization has developed strategies to achieve KPI's on green procurement?	Q13 The organization has achieved KPI's on green procurement in the previous financial year?	Q14 Please indicate if the organization is expected to achieve KPI's on green procurement in the current financial year?
11	1 to 5 years	31 to 35 years old	Not sure	Not sure	Not sure	Agree	Agree	Agree	Agree	Agree
12	6 to 10 years	31 to 35 years old	Not sure	1 to 3 years ago	Agree	Agree	Agree	Agree	Agree	Strongly agree
13	6 to 10 years	51 to 55 years old	Not sure	1 to 3 years ago	Not sure	Agree	Not sure	Not sure	Not sure	Not sure
14	Over 21 years	51 to 55 years old	Agree	4 to 6 years ago	Not sure	Agree	Agree	Agree	Not sure	Not sure
15	11 to 15 years	36 to 40 years old	Not sure	4 to 6 years ago	Agree	Agree	Agree	Agree	Agree	Agree
16	11 to 15 years	41 to 45 years old	Not sure	Not sure	Disagree	Agree	Not sure	Not sure	Disagree	Disagree
17	11 to 15 years	36 to 40 years old	Disagree	Not sure	Strongly disagree	Disagree	Not sure	Disagree	Disagree	Disagree

Respondent #	Q5 Please provide details on years of experience.	Q6 What is your age?	Q7 Does the organization have a policy on green procurement?	Q8 How long was green procurement introduced in the organization?	Q9 Does the organization provide awareness, education and training of employees on green procurement?	Q10 In your opinion, Senior Management is committed to promote the practice of green procurement in the organization?	Q11 Does the organization have KPI's (key performance indicators) on green procurement?	Q12 The organization has developed strategies to achieve KPI's on green procurement?	Q13 The organization has achieved KPI's on green procurement in the previous financial year?	Q14 Please indicate if the organization is expected to achieve KPI's on green procurement in the current financial year?
18	6 to 10 years	31 to 35 years old	Not sure	Not sure	Agree	Agree	Agree	Agree	Not sure	Not sure
19	16 to 20 years	36 to 40 years old	Agree	1 to 3 years ago	Strongly agree	Strongly agree	Strongly agree	Strongly agree	Agree	Agree
20	16 to 20 years	36 to 40 years old	Agree	Not sure	Not sure	Not sure	Not sure	Not sure	Not sure	Not sure
21	11 to 15 years	36 to 40 years old	Strongly agree	Over 10 years ago	Strongly agree	Agree	Agree	Agree	Agree	Agree
22	16 to 20 years	36 to 40 years old	Disagree	Not sure	Disagree	Disagree	Disagree	Disagree	Disagree	Disagree
23	11 to 15 years	36 to 40 years old	Disagree	Not sure	Disagree	Disagree	Not sure	Not sure	Disagree	Disagree

	Q15_1 On a scale of 1 to 5, rate the following benefits on the practice of green procurement in metropolitan municipalities where 1 is not at all significant and 5 is very significant. - Cost effective	Q15_2 On a scale of 1 to 5, rate the following benefits on the practice of green procurement in metropolitan municipalities where 1 is not at all significant and 5 is very significant. - Reduced impact on the environment	Q15_3 On a scale of 1 to 5, rate the following benefits on the practice of green procurement in metropolitan municipalities where 1 is not at all significant and 5 is very significant. - Improved efficiency	Q15_4 On a scale of 1 to 5, rate the following benefits on the practice of green procurement in metropolitan municipalities where 1 is not at all significant and 5 is very significant. - Promotes change in behavior of private businesses when initiated by the municipality	Q15_5 On a scale of 1 to 5, rate the following benefits on the practice of green procurement in metropolitan municipalities where 1 is not at all significant and 5 is very significant. - Recycling initiatives promote green procurement
Respondent #					
1	Very significant Scale point 5	Very significant Scale point 5	Very significant Scale point 5	Often significant Scale point 4	Very significant Scale point 5
2	Very significant Scale point 5	Often significant Scale point 4	Often significant Scale point 4	Very significant Scale point 5	Often significant Scale point 4
3	Significant Scale point 3	Very significant Scale point 5	Very significant Scale point 5	Very significant Scale point 5	Significant Scale point 3
4	Seldom significant Scale point 2	Seldom significant Scale point 2	Significant Scale point 3	Often significant Scale point 4	Significant Scale point 3
5	Often significant Scale point 4	Often significant Scale point 4	Very significant Scale point 5	Very significant Scale point 5	Very significant Scale point 5

Respondent #	Q15_1 On a scale of 1 to 5, rate the following benefits on the practice of green procurement in metropolitan municipalities where 1 is not at all significant and 5 is very significant. - Cost effective	Q15_2 On a scale of 1 to 5, rate the following benefits on the practice of green procurement in metropolitan municipalities where 1 is not at all significant and 5 is very significant. - Reduced impact on the environment	Q15_3 On a scale of 1 to 5, rate the following benefits on the practice of green procurement in metropolitan municipalities where 1 is not at all significant and 5 is very significant. - Improved efficiency	Q15_4 On a scale of 1 to 5, rate the following benefits on the practice of green procurement in metropolitan municipalities where 1 is not at all significant and 5 is very significant. - Promotes change in behavior of private businesses when initiated by the municipality	Q15_5 On a scale of 1 to 5, rate the following benefits on the practice of green procurement in metropolitan municipalities where 1 is not at all significant and 5 is very significant. - Recycling initiatives promote green procurement
6	Often significant Scale point 4	Very significant Scale point 5	Often significant Scale point 4	Seldom significant Scale point 2	Often significant Scale point 4
7	Significant Scale point 3	Very significant Scale point 5	Very significant Scale point 5	Very significant Scale point 5	Very significant Scale point 5
8	Very significant Scale point 5	Very significant Scale point 5	Significant Scale point 3	Significant Scale point 3	Very significant Scale point 5
9	Significant Scale point 3	Often significant Scale point 4	Significant Scale point 3	Often significant Scale point 4	Often significant Scale point 4
10	Significant Scale point 3	Very significant Scale point 5	Often significant Scale point 4	Often significant Scale point 4	Very significant Scale point 5

Respondent #	Q15_1 On a scale of 1 to 5, rate the following benefits on the practice of green procurement in metropolitan municipalities where 1 is not at all significant and 5 is very significant. - Cost effective	Q15_2 On a scale of 1 to 5, rate the following benefits on the practice of green procurement in metropolitan municipalities where 1 is not at all significant and 5 is very significant. - Reduced impact on the environment	Q15_3 On a scale of 1 to 5, rate the following benefits on the practice of green procurement in metropolitan municipalities where 1 is not at all significant and 5 is very significant. - Improved efficiency	Q15_4 On a scale of 1 to 5, rate the following benefits on the practice of green procurement in metropolitan municipalities where 1 is not at all significant and 5 is very significant. - Promotes change in behavior of private businesses when initiated by the municipality	Q15_5 On a scale of 1 to 5, rate the following benefits on the practice of green procurement in metropolitan municipalities where 1 is not at all significant and 5 is very significant. - Recycling initiatives promote green procurement
11	Significant Scale point 3	Significant Scale point 3	Significant Scale point 3	Significant Scale point 3	Significant Scale point 3
12	Very significant Scale point 5	Very significant Scale point 5	Often significant Scale point 4	Significant Scale point 3	Very significant Scale point 5
13	Very significant Scale point 5	Very significant Scale point 5	Very significant Scale point 5	Significant Scale point 3	Very significant Scale point 5
14	Very significant Scale point 5	Very significant Scale point 5	Very significant Scale point 5	Very significant Scale point 5	Very significant Scale point 5
15	Often significant Scale point 4	Significant Scale point 3	Often significant Scale point 4	Often significant Scale point 4	Often significant Scale point 4
16	Seldom significant Scale point 2	Very significant Scale point 5	Often significant Scale point 4	Often significant Scale point 4	Often significant Scale point 4
17	Not at all significant Scale point 1	Seldom significant Scale point 2	Seldom significant Scale point 2	Seldom significant Scale point 2	Seldom significant Scale point 2

	Q15_1 On a scale of 1 to 5, rate the following benefits on the practice of green procurement in metropolitan municipalities where 1 is not at all significant and 5 is very significant. - Cost effective	Q15_2 On a scale of 1 to 5, rate the following benefits on the practice of green procurement in metropolitan municipalities where 1 is not at all significant and 5 is very significant. - Reduced impact on the environment	Q15_3 On a scale of 1 to 5, rate the following benefits on the practice of green procurement in metropolitan municipalities where 1 is not at all significant and 5 is very significant. - Improved efficiency	Q15_4 On a scale of 1 to 5, rate the following benefits on the practice of green procurement in metropolitan municipalities where 1 is not at all significant and 5 is very significant. - Promotes change in behavior of private businesses when initiated by the municipality	Q15_5 On a scale of 1 to 5, rate the following benefits on the practice of green procurement in metropolitan municipalities where 1 is not at all significant and 5 is very significant. - Recycling initiatives promote green procurement
Respondent #					
18	Very significant Scale point 5	Very significant Scale point 5	Very significant Scale point 5	Very significant Scale point 5	Very significant Scale point 5
19	Often significant Scale point 4	Significant Scale point 3	Often significant Scale point 4	Often significant Scale point 4	Often significant Scale point 4
20	Often significant Scale point 4	Often significant Scale point 4		Significant Scale point 3	Significant Scale point 3
21	Often significant Scale point 4	Very significant Scale point 5	Very significant Scale point 5	Very significant Scale point 5	Very significant Scale point 5
22		Significant Scale point 3	Seldom significant Scale point 2	Often significant Scale point 4	Significant Scale point 3
23	Often significant Scale point 4	Often significant Scale point 4	Often significant Scale point 4	Often significant Scale point 4	Very significant Scale point 5

	Q15_6 On a scale of 1 to 5, rate the following benefits on the practice of green procurement in metropolitan municipalities where 1 is not at all significant and 5 is very significant. - ISO 14001 certification enhances green procurement	Q16 If there are any benefits of green procurement which you feel I have not incorporated in this study, please list them below.	Q17_1 On a scale of 1 to 5, rate the following challenges on the practice of green procurement in metropolitan municipalities where 1 is not at all significant and 5 is very significant. - Lack of legislation and policy directive on green procurement	Q17_2 On a scale of 1 to 5, rate the following challenges on the practice of green procurement in metropolitan municipalities where 1 is not at all significant and 5 is very significant. - Lack of enforcement	Q17_3 On a scale of 1 to 5, rate the following challenges on the practice of green procurement in metropolitan municipalities where 1 is not at all significant and 5 is very significant. - Inadequate knowledge on the benefits of green procurement	Q17_4 On a scale of 1 to 5, rate the following challenges on the practice of green procurement in metropolitan municipalities where 1 is not at all significant and 5 is very significant. - Lack of awareness, education and training on green procurement
Respondent #						
1	Often significant Scale point 4	N/A	Significant Scale point 3	Significant Scale point 3	Often significant Scale point 4	Significant Scale point 3
2	Very significant Scale point 5	Undertake a thorough value chain analysis of products and services as a way of mainstreaming sustainability into city procurement processes.	Significant Scale point 3	Often significant Scale point 4	Significant Scale point 3	Seldom significant Scale point 2
3	Significant Scale point 3	Reduction in resource waste and also helping manage resources and improve efficiency	Significant Scale point 3	Seldom significant Scale point 2	Significant Scale point 3	Very significant Scale point 5
4	Seldom significant Scale point 2		Seldom significant Scale point 2	Seldom significant Scale point 2	Seldom significant Scale point 2	Significant Scale point 3
5	Very significant Scale point 5	None	Very significant Scale point 5	Very significant Scale point 5	Very significant Scale point 5	Very significant Scale point 5

Respondent #	Q15_6 On a scale of 1 to 5, rate the following benefits on the practice of green procurement in metropolitan municipalities where 1 is not at all significant and 5 is very significant. - ISO 14001 certification enhances green procurement	Q16 If there are any benefits of green procurement which you feel I have not incorporated in this study, please list them below.	Q17_1 On a scale of 1 to 5, rate the following challenges on the practice of green procurement in metropolitan municipalities where 1 is not at all significant and 5 is very significant. - Lack of legislation and policy directive on green procurement	Q17_2 On a scale of 1 to 5, rate the following challenges on the practice of green procurement in metropolitan municipalities where 1 is not at all significant and 5 is very significant. - Lack of enforcement	Q17_3 On a scale of 1 to 5, rate the following challenges on the practice of green procurement in metropolitan municipalities where 1 is not at all significant and 5 is very significant. - Inadequate knowledge on the benefits of green procurement	Q17_4 On a scale of 1 to 5, rate the following challenges on the practice of green procurement in metropolitan municipalities where 1 is not at all significant and 5 is very significant. - Lack of awareness, education and training on green procurement
6	Often significant Scale point 4	Would say the reseacher has covered almost aspect concerning green environment.	Very significant Scale point 5	Very significant Scale point 5	Very significant Scale point 5	Very significant Scale point 5
7	Very significant Scale point 5	- Social Aspects - Economic Aspects - Cost Life cycle - Maintenance Plan - Huma Health - Climate Change - Eco- System Quality	Very significant Scale point 5	Very significant Scale point 5	Very significant Scale point 5	Very significant Scale point 5
8	Very significant Scale point 5		Significant Scale point 3	Often significant Scale point 4	Often significant Scale point 4	Often significant Scale point 4
9	Often significant Scale point 4		Very significant Scale point 5	Often significant Scale point 4	Very significant Scale point 5	Very significant Scale point 5
10	Often significant Scale point 4		Often significant Scale point 4	Very significant Scale point 5	Very significant Scale point 5	Very significant Scale point 5

Respondent #	Q15_6 On a scale of 1 to 5, rate the following benefits on the practice of green procurement in metropolitan municipalities where 1 is not at all significant and 5 is very significant. - ISO 14001 certification enhances green procurement	Q16 If there are any benefits of green procurement which you feel I have not incorporated in this study, please list them below.	Q17_1 On a scale of 1 to 5, rate the following challenges on the practice of green procurement in metropolitan municipalities where 1 is not at all significant and 5 is very significant. - Lack of legislation and policy directive on green procurement	Q17_2 On a scale of 1 to 5, rate the following challenges on the practice of green procurement in metropolitan municipalities where 1 is not at all significant and 5 is very significant. - Lack of enforcement	Q17_3 On a scale of 1 to 5, rate the following challenges on the practice of green procurement in metropolitan municipalities where 1 is not at all significant and 5 is very significant. - Inadequate knowledge on the benefits of green procurement	Q17_4 On a scale of 1 to 5, rate the following challenges on the practice of green procurement in metropolitan municipalities where 1 is not at all significant and 5 is very significant. - Lack of awareness, education and training on green procurement
11	Significant Scale point 3	None	Often significant Scale point 4	Often significant Scale point 4	Significant Scale point 3	Often significant Scale point 4
12	Often significant Scale point 4	None	Significant Scale point 3	Often significant Scale point 4	Seldom significant Scale point 2	Significant Scale point 3
13	Very significant Scale point 5		Significant Scale point 3	Significant Scale point 3	Significant Scale point 3	Significant Scale point 3
14	Very significant Scale point 5	None	Often significant Scale point 4	Very significant Scale point 5	Often significant Scale point 4	Often significant Scale point 4
15	Often significant Scale point 4		Significant Scale point 3	Seldom significant Scale point 2	Seldom significant Scale point 2	Seldom significant Scale point 2
16	Often significant Scale point 4	n/a	Often significant Scale point 4	Significant Scale point 3	Often significant Scale point 4	Often significant Scale point 4
17	Seldom significant Scale point 2		Not at all significant Scale point 1	Not at all significant Scale point 1	Click to write Scale point 6	Not at all significant Scale point 1

Respondent #	Q15_6 On a scale of 1 to 5, rate the following benefits on the practice of green procurement in metropolitan municipalities where 1 is not at all significant and 5 is very significant. - ISO 14001 certification enhances green procurement	Q16 If there are any benefits of green procurement which you feel I have not incorporated in this study, please list them below.	Q17_1 On a scale of 1 to 5, rate the following challenges on the practice of green procurement in metropolitan municipalities where 1 is not at all significant and 5 is very significant. - Lack of legislation and policy directive on green procurement	Q17_2 On a scale of 1 to 5, rate the following challenges on the practice of green procurement in metropolitan municipalities where 1 is not at all significant and 5 is very significant. - Lack of enforcement	Q17_3 On a scale of 1 to 5, rate the following challenges on the practice of green procurement in metropolitan municipalities where 1 is not at all significant and 5 is very significant. - Inadequate knowledge on the benefits of green procurement	Q17_4 On a scale of 1 to 5, rate the following challenges on the practice of green procurement in metropolitan municipalities where 1 is not at all significant and 5 is very significant. - Lack of awareness, education and training on green procurement
18	Very significant Scale point 5	You have incorporated all the benefits	Very significant Scale point 5	Very significant Scale point 5	Very significant Scale point 5	Very significant Scale point 5
19	Very significant Scale point 5	It enhances efficiency and better quality product	Significant Scale point 3	Very significant Scale point 5	Significant Scale point 3	Click to write Scale point 6
20	Often significant Scale point 4		Click to write Scale point 6	Seldom significant Scale point 2	Significant Scale point 3	Often significant Scale point 4
21	Often significant Scale point 4	None	Often significant Scale point 4	Often significant Scale point 4	Often significant Scale point 4	Often significant Scale point 4
22	Significant Scale point 3	Use of non metal and Reduction on theft and vandalism	Significant Scale point 3	Very significant Scale point 5	Significant Scale point 3	Often significant Scale point 4
23	Often significant Scale point 4	None	Not at all significant Scale point 1	Not at all significant Scale point 1	Not at all significant Scale point 1	Not at all significant Scale point 1

	Q17_5 On a scale of 1 to 5, rate the following challenges on the practice of green procurement in metropolitan municipalities where 1 is not at all significant and 5 is very significant. - Lack of commitment from management	Q17_6 On a scale of 1 to 5, rate the following challenges on the practice of green procurement in metropolitan municipalities where 1 is not at all significant and 5 is very significant. - The implementation of green procurement is costly	Q17_7 On a scale of 1 to 5, rate the following challenges on the practice of green procurement in metropolitan municipalities where 1 is not at all significant and 5 is very significant. - Lack of desire to implement green procurement	Q17_8 On a scale of 1 to 5, rate the following challenges on the practice of green procurement in metropolitan municipalities where 1 is not at all significant and 5 is very significant. - Inadequate tender specifications on green procurement	Q17_9 On a scale of 1 to 5, rate the following challenges on the practice of green procurement in metropolitan municipalities where 1 is not at all significant and 5 is very significant. - Limited supply of green products and services	Q18 If there are any challenges on the practice of green procurement in metropolitan municipalities which you feel I have not incorporated in this study, please list them below.
Respondent #						
1	Very significant Scale point 5	Significant Scale point 3	Significant Scale point 3	Often significant Scale point 4	Often significant Scale point 4	None
2	Not at all significant Scale point 1	Significant Scale point 3	Click to write Scale point 6	Click to write Scale point 6	Seldom significant Scale point 2	List of green procurement checklists for all goods and services must be included
3	Very significant Scale point 5	Significant Scale point 3	Significant Scale point 3	Often significant Scale point 4	Significant Scale point 3	To analyze the organizational structure on implementation of green procurement To explore the effects of cost of green procurement on implementation of green procurement
4	Seldom significant Scale point 2	Seldom significant Scale point 2	Seldom significant Scale point 2	Not at all significant Scale point 1	Seldom significant Scale point 2	
5	Very significant Scale point 5	Often significant Scale point 4	Often significant Scale point 4	Very significant Scale point 5	Very significant Scale point 5	None

Respondent #	Q17_5 On a scale of 1 to 5, rate the following challenges on the practice of green procurement in metropolitan municipalities where 1 is not at all significant and 5 is very significant. - Lack of commitment from management	Q17_6 On a scale of 1 to 5, rate the following challenges on the practice of green procurement in metropolitan municipalities where 1 is not at all significant and 5 is very significant. - The implementation of green procurement is costly	Q17_7 On a scale of 1 to 5, rate the following challenges on the practice of green procurement in metropolitan municipalities where 1 is not at all significant and 5 is very significant. - Lack of desire to implement green procurement	Q17_8 On a scale of 1 to 5, rate the following challenges on the practice of green procurement in metropolitan municipalities where 1 is not at all significant and 5 is very significant. - Inadequate tender specifications on green procurement	Q17_9 On a scale of 1 to 5, rate the following challenges on the practice of green procurement in metropolitan municipalities where 1 is not at all significant and 5 is very significant. - Limited supply of green products and services	Q18 If there are any challenges on the practice of green procurement in metropolitan municipalities which you feel I have not incorporated in this study, please list them below.
6	Very significant Scale point 5	Very significant Scale point 5	Very significant Scale point 5	Very significant Scale point 5	Very significant Scale point 5	Nothing at all
7	Very significant Scale point 5	Significant Scale point 3	Often significant Scale point 4	Very significant Scale point 5	Very significant Scale point 5	N/A
8	Often significant Scale point 4	Often significant Scale point 4	Very significant Scale point 5	Often significant Scale point 4	Often significant Scale point 4	
9	Very significant Scale point 5	Seldom significant Scale point 2	Often significant Scale point 4	Often significant Scale point 4	Often significant Scale point 4	
10	Significant Scale point 3	Significant Scale point 3	Click to write Scale point 6	Very significant Scale point 5	Very significant Scale point 5	

Respondent #	Q17_5 On a scale of 1 to 5, rate the following challenges on the practice of green procurement in metropolitan municipalities where 1 is not at all significant and 5 is very significant. - Lack of commitment from management	Q17_6 On a scale of 1 to 5, rate the following challenges on the practice of green procurement in metropolitan municipalities where 1 is not at all significant and 5 is very significant. - The implementation of green procurement is costly	Q17_7 On a scale of 1 to 5, rate the following challenges on the practice of green procurement in metropolitan municipalities where 1 is not at all significant and 5 is very significant. - Lack of desire to implement green procurement	Q17_8 On a scale of 1 to 5, rate the following challenges on the practice of green procurement in metropolitan municipalities where 1 is not at all significant and 5 is very significant. - Inadequate tender specifications on green procurement	Q17_9 On a scale of 1 to 5, rate the following challenges on the practice of green procurement in metropolitan municipalities where 1 is not at all significant and 5 is very significant. - Limited supply of green products and services	Q18 If there are any challenges on the practice of green procurement in metropolitan municipalities which you feel I have not incorporated in this study, please list them below.
11	Significant Scale point 3	Significant Scale point 3	Significant Scale point 3	Significant Scale point 3	Significant Scale point 3	No
12	Significant Scale point 3	Seldom significant Scale point 2	Seldom significant Scale point 2	Significant Scale point 3	Often significant Scale point 4	None
13	Significant Scale point 3	Click to write Scale point 6	Significant Scale point 3	Significant Scale point 3	Significant Scale point 3	
14	Seldom significant Scale point 2	Significant Scale point 3	Seldom significant Scale point 2	Not at all significant Scale point 1	Not at all significant Scale point 1	None
15	Seldom significant Scale point 2	Click to write Scale point 6	Significant Scale point 3	Often significant Scale point 4	Often significant Scale point 4	
16	Significant Scale point 3	Often significant Scale point 4	Often significant Scale point 4	Significant Scale point 3	Often significant Scale point 4	Political will
17	Click to write Scale point 6	Seldom significant Scale point 2	Seldom significant Scale point 2	Click to write Scale point 6	Click to write Scale point 6	

Respondent #	Q17_5 On a scale of 1 to 5, rate the following challenges on the practice of green procurement in metropolitan municipalities where 1 is not at all significant and 5 is very significant. - Lack of commitment from management	Q17_6 On a scale of 1 to 5, rate the following challenges on the practice of green procurement in metropolitan municipalities where 1 is not at all significant and 5 is very significant. - The implementation of green procurement is costly	Q17_7 On a scale of 1 to 5, rate the following challenges on the practice of green procurement in metropolitan municipalities where 1 is not at all significant and 5 is very significant. - Lack of desire to implement green procurement	Q17_8 On a scale of 1 to 5, rate the following challenges on the practice of green procurement in metropolitan municipalities where 1 is not at all significant and 5 is very significant. - Inadequate tender specifications on green procurement	Q17_9 On a scale of 1 to 5, rate the following challenges on the practice of green procurement in metropolitan municipalities where 1 is not at all significant and 5 is very significant. - Limited supply of green products and services	Q18 If there are any challenges on the practice of green procurement in metropolitan municipalities which you feel I have not incorporated in this study, please list them below.
18	Very significant Scale point 5	Often significant Scale point 4	Very significant Scale point 5	Very significant Scale point 5	Very significant Scale point 5	Lack of training or education to employees
19	Significant Scale point 3	Significant Scale point 3	Significant Scale point 3	Significant Scale point 3	Significant Scale point 3	Not at all
20		Significant Scale point 3	Often significant Scale point 4	Seldom significant Scale point 2	Seldom significant Scale point 2	
21		Very significant Scale point 5	Often significant Scale point 4	Often significant Scale point 4	Often significant Scale point 4	
22		Not at all significant Scale point 1	Significant Scale point 3	Very significant Scale point 5	Significant Scale point 3	None
23	Not at all significant Scale point 1	Seldom significant Scale point 2	Seldom significant Scale point 2	Seldom significant Scale point 2	Seldom significant Scale point 2	None

Respondent #	Q19 In your opinion, what could be done to address the challenges on the implementation of green procurement in metropolitan municipalities?	Q20 Please state suggestions on how the implementation of green procurement can be improved in metropolitan municipalities?	Q21 From your experience, does green procurement offer benefits in your organization?
1	Different Departments must have its own budget to Implementation of Green Procurement	Enough budget to implement the Green procurement .	Strongly agree
2	audit verifications of declarations and ensure that management reports on the use of the green procurement in their respective departments	1) Green Procurement Policy must be used as reference timeously for procurements of good and services. 2) Top Management from all the departments to report on GP 3) Provide courses on the implementation and importance of GP	Agree
3	Management need to knowledgeable about implementation of green procurement so that they can be able to teach employees about that.	Top management and Supply Chain Management need to have an understanding and practicing the principles of green procurement.	Strongly agree
4	I believe once a study of this nature is done, a policy at government level has to be implemented and deadlines of such implentation be set. Penulties for failure to implement be defined.		Disagree
5	Introduce policies on green procurement Training on green procurement Awareness	Introduce it as a policy and make it mandatory. Also have a measuring system.	Strongly disagree

Respondent #	Q19 In your opinion, what could be done to address the challenges on the implementation of green procurement in metropolitan municipalities?	Q20 Please state suggestions on how the implementation of green procurement can be improved in metropolitan municipalities?	Q21 From your experience, does green procurement offer benefits in your organization?
6	At this stage there's nothing to be done because everything is covered	The green procurement is currently enforced in the Metropolitan Municipalities	Agree
7	- Review of MFMA, & its regulations - Review of NEMA & its regulations - Review of National Water Act & its regulations - Review of Municipal Standards & Specifications	'- Training and Awareness - Review of Bid Specifications - Elimination of Carbon emissions standards	Agree
8	KPI measures for green procurement must be in place and monitored	Policies for green procurement must be in place and Monitored.	Agree
9	Experts need to have workshops at the municipalities highlighting the advantages and also the available alternative products. Department of Environmental Affairs need to regulate the policy on going green to enforce implementation.	All specifications must go through a rigorous process to include where possible green procurement before recommendation for advertising. The specification committee must be clued up with the latest developments regarding green procurement. KPI's to be extended to most departments and not just the environmental department. Economic development to include development and training of SMMEs on producing green products which can possibly reduce the unemployment levels in SA as well as contribute to a cleaner environment so that people are healthier and reduce the burden on state medical facilities.	Agree
10	Training and workshops for employees of the municipalities	Policies need to be put in place from the strategic management level	Not sure

Respondent #	Q19 In your opinion, what could be done to address the challenges on the implementation of green procurement in metropolitan municipalities?	Q20 Please state suggestions on how the implementation of green procurement can be improved in metropolitan municipalities?	Q21 From your experience, does green procurement offer benefits in your organization?
11	To have more committed top management leaders with a vision for them to be see growth within the municipal in order to be able to train the junior staff accordingly	By involving more knowledgeable members	Strongly agree
12	organize workshop to envisage the importance of preserving the environment and apply knowledge from an early age.	Awareness campaign by relevant stakeholders and on advertising on social media.	Agree
13	policies should be set apart to make sure that green procurement is implemented.		Strongly agree
14	A dedicated Unit/Structure need to put in place that will only focus on green procurement. The unit primary principle should be monitor the implementation of green procurement across all units/structure/departments and assist where there is gaps. Should make sure policies are updated and that all employees are aware of those policies around green procurement. The unit should role out trainings not only among employees but to all role players including stake holders. The unit must be capacitated with funding and also with highly skilled people.	The implementation of green procurement can be improve by establishing a dedicated unit which its focus will be to manage green procurement. Source of funding is crucial to effectively manage green procurement. appointments of highly skilled will provide benefit to the implementation of green procurement.	Strongly agree
15	Training should be scheduled for all the departments in the municipality.	Each department should be given a platform to give inputs on the concept of green procurement.	Agree
16	Workshops Short courses Appointment of practitioners	Appointment of professionals in the green procurement industry	Agree
17	1. The green procurement must be incorporated into the City's strategy. 2. Executive leadership must be committed to and articulate it. 3. The importance must be known by all the employees		Disagree

Respondent #	Q19 In your opinion, what could be done to address the challenges on the implementation of green procurement in metropolitan municipalities?	Q20 Please state suggestions on how the implementation of green procurement can be improved in metropolitan municipalities?	Q21 From your experience, does green procurement offer benefits in your organization?
18	The practicality of green procurement on the trial and tested methods should be presented frequently to employees by training or courses.	It can be improved by limiting the current recourses that are not relevant in addressing the green procurement and training staff, awareness is very key and monitoring of the application of the information presented.	Strongly agree
19	The management must priotise is and green procurement must be incorporated in their scorecard	There procurement policy must be revised to incorporate green procurement	Agree
20			
21			
22	Compile the policy, implement and make it part of the score card for the executives, and management	Create awareness, Provide training and workshops on the policy	Disagree
23	To have a department that will make sure municipalities do have or follow the green procurement as one of their priorities.	Have people that check the municipalities every quarter as an auditors.	Not sure

Respondent #	Q22 Please provide reasons for your response above.	Q23 In your opinion, should green procurement be adopted in other municipalities?	Q24 Please provide reasons for your response above.
1	It incorporates human health and environmental concerns into the search for high quality products and services at competitive prices.	Strongly agree	Environmental and climate Protection. Conserve water and Protect natural resources
2	1) It will be aligned to the city's service charter 2) The city will get value for money 3) The public will deserve the service they need 4) cost effective measures will be in place 5) Efficient outcomes will be achieved	Agree	1) For openness and transparency 2) To avoid wasteful and fruitless expenditures 3) To improve on meeting targets of National developments plans
3	It increases its image in the eye of the public Customer Satisfaction Reduced Risk Cost Reduction Increased Shareholder Value	Agree	It saves money Efficient procurement often supports local and smaller suppliers Green Procurement reduce resource usage To promote a safe and healthy environment To promote social and economic Development
4	It is currently not being fully practiced. It is my view that such benefits identification measure must be research based.	Agree	It woll be paperless; hence reduced storage of documents and information resulting in improved efficiency.
5	N/A	Strongly agree	N/A

Respondent #	Q22 Please provide reasons for your response above.	Q23 In your opinion, should green procurement be adopted in other municipalities?	Q24 Please provide reasons for your response above.
6		Agree	
7	'- Sustainable Environment - Less Maintenance Cost - Promotes Health Quality	Strongly agree	'- Sustainable Procurement process - Improvement on Life Cycle & Impact Assessments
8	Corruption of awarding tenders will be eliminated	Strongly agree	They will be fairness of procuring services or goods
9	Less pollution to the rivers requires less maintenance to river streams - these funds can to allocated to other high priorities such as housing to reduce the backlogs. Avoid the depletion of natural resources such as gravel which is used to re-gravel roads. Cleaner atmosphere results in healthier citizens which reduces the requirements at clinics such as high medical stock.	Strongly agree	Take for example a river which runs through multiple municipalities - if one municipality fails to abide by the policy and regulations then the contaminated water enters the sea which affects the sea life and adversely affects the health of people who consume for example fish.
10	Green procurement is technically not practiced in our organization.	Agree	I believe it should be adopted in as many municipalities as possible to keep the negative impact on the natural environment minimal.

Respondent #	Q22 Please provide reasons for your response above.	Q23 In your opinion, should green procurement be adopted in other municipalities?	Q24 Please provide reasons for your response above.
11		Strongly agree	
12	Newly established recycling young people	Strongly agree	It promotes no littering
13	Saves environment and the quality and standard of our living, as well as improving people's economic living standard through saving.	Strongly agree	Improves human kind.
14	Green procurement is the future and its innovative. The world is going green procurement so it should be in the priority list of municipalities. For municipalities to compete in a global world should also consider green procurement.	Strongly disagree	Green procurement should be considered in other municipalities. We cant afford having certain municipalities providing certain initiative and other not. Municipalities should not operate in isolation but in an intergraded approach.
15		Agree	It incorporates human health and environmental concerns for high quality products and services at competitive prices
16	The green procurement is costly as the industry is not yet well developed but there are many benefits in the long run	Agree	This will go a long way in creating awareness
17	1. most material and equipment purchased are not recyclable.	Strongly agree	The greener operations enhances conservation of the natural resources. The water streams shall be protected from oil contamination.

Respondent #	Q22 Please provide reasons for your response above.	Q23 In your opinion, should green procurement be adopted in other municipalities?	Q24 Please provide reasons for your response above.
18	it is very key as we could safe a lot of dispose material and recycle to reuse the material	Strongly agree	I have observed the City of Cape Town, the way they do things there is at another level and if all Municipality could adopt their strategies then the lack of service delivery will be history.
19	product procure have better implication for service delivery	Strongly disagree	To have standardization in all municipalities
20			
21			
22	Our standard designs still based on the old specifications which doesn't support green procurement.	Agree	To improve the quality of life and preserve the invironment
23	I'm not sure about the benefit	Not sure	I'm not sure about that