

**EVALUATING THE IMPACT OF ENVIRONMENTAL
GOVERNANCE ON BIODIVERSITY MANAGEMENT
IN SOUTH AFRICAN CITIES**

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ABSTRACT

South Africa is recognised as one of the megadiverse nations of the world. In recent years, the South African Government has prioritised human needs, without adequately safeguarding the country's natural resources. Biodiversity is the living fabric of our planet, responsible for human health, well-being and ultimately, the preservation of the environment. It is the Government's responsibility to ensure that processes and policy frameworks recognise the significance of biodiversity and its role in ensuring a sustainable future for the country while at the same time ensuring essential services delivery to its people. The aim of this study was to evaluate the impact of environmental governance on biodiversity management at the local government level in South Africa. The study was conducted in three Metropolitan Municipalities in South Africa. Data were collected by means of a questionnaire from officials of these municipalities. Variables that were assessed include capacity assessment, inter-governmental relations, budget and biodiversity management. Interviews were conducted with the Heads of the environmental departments of the municipalities. A review of the defining national and international environmental law was conducted to evaluate the transformation, challenges and successes of biodiversity management at the local government level in South Africa. The results of this study highlight the challenges faced by local governments in implementing biodiversity management such as capacity constraints, lack of resources and the absence of a biodiversity mandate at the local government sphere. Integrating biodiversity management at the local level will only be possible through more robust policy development, stronger cooperation and communication among the different levels of government, as well as enhanced capacity (skills) and resource provision in the municipalities.

Key words: biodiversity, environmental governance, policy development, municipalities

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Acronyms

| | |
|-------|---|
| CBA | Critical Biodiversity Areas |
| CBD | Convention on Biological Diversity |
| CEPA | Communication, Education and Public Awareness |
| CMS | Convention on the Conservation of Migratory Species of Wild Animals |
| COCT | City of Cape Town |
| COT | City of Tshwane |
| CR | Critically endangered |
| DEA | Department of Environmental Affairs |
| EAP | Environmental Assessment Practitioner |
| EbA | Ecosystem-based Adaptation (to climate change) |
| EIA | Environmental impact assessment |
| EMF | Environmental Management Framework |
| EMP | Environmental Management Programme |
| EN | Endangered |
| ESA | Ecological Support Areas |
| FEPA | Freshwater Ecosystem Priority Areas |
| GBIF | Global Biodiversity Information Facility |
| GDARD | Gauteng Department of Agriculture and Rural Development |
| GHG | Greenhouse gas |
| GIS | Geographic Information System |
| GSP | Green Strategic Programme |
| IAS | Invasive alien species |
| IDP | Integrated Development Plan |
| IUCN | International Union for Conservation of Nature |
| LAB | Local Action for Biodiversity |
| LBSAP | Local Biodiversity Strategy and Action Plan |
| MDG | Millennium Development Goals |
| MEC | Member of the Executive Council |
| MPRDA | Mineral and Petroleum Resources Development Act |
| MTSF | Medium Term Strategic Framework |
| NBA | National Biodiversity Assessment |
| NBF | National Biodiversity Framework |
| NBSAP | National Biodiversity Strategy and Action Plan |
| NDP | National Development Plan |
| NEMA | National Environmental Management Act |
| NFEPA | National Freshwater Ecosystem Priority Areas |
| NFSD | National Framework for Sustainable Development |
| NGO | Non-governmental Organisation |
| NPAES | National Protected Area Expansion Strategy |
| NSBA | National Spatial Biodiversity Assessment |
| SADC | Southern Africa Development Community |
| SALGA | South African Local Government Association |
| SANBI | South African National Biodiversity Institute |
| SDF | Spatial Development Framework |
| SDG | Sustainable Development Goals |
| SEA | Strategic Environmental Assessment |

| | |
|--------|--|
| SPLUMA | Spatial Planning and Land Use Management Act |
| TEEB | The Economics of Ecosystems and Biodiversity |
| UN | United Nations |
| UNDP | United Nations Development Programme |
| UNEP | United Nations Environment Programme |
| UNCCD | Convention to Combat Desertification |
| UNESCO | United Nations Educational, Scientific and Cultural Organisation |
| UNFCCC | Framework Convention on Climate Change |

Glossary

| | |
|-------------------------------|---|
| Biodiversity: | The diversity of genes, species and ecosystems on Earth, and the ecological and evolutionary processes that maintain this diversity |
| Biodiversity Management Plan: | A plan aimed at ensuring the longterm survival in nature of an indigenous species, a migratory species or an ecosystem, published in terms of the Biodiversity Act. Norms and standards to guide the development of Biodiversity Management Plans for Species have been developed. |
| Biodiversity planning: | Spatial planning to identify geographic areas of importance for biodiversity. |
| Biodiversity priority areas: | Features in the landscape or seascape that are important for conserving a representative sample of ecosystems and species, for maintaining ecological processes, or for the provision of ecosystem services |
| Biodiversity stewardship: | A model for expanding the protected area network in which conservation authorities enter into contract agreements with private and communal landowners to place land that is of high biodiversity value under formal protection. The primary responsibility for management remains with the landowner, with technical advice and assistance provided by the conservation authority. |
| Biodiversity target: | The minimum proportion of each ecosystem type that needs to be kept in a natural or near-natural state in the long term in order to maintain viable representative samples of all ecosystem types and the majority of species associated with those ecosystem types. |
| Biome: | An ecological unit of wide extent, characterised by complexes of plant communities and associated animal communities and ecosystems, and determined mainly by climatic factors and soil types. |
| Bioregional plan | A map of Critical Biodiversity Areas and Ecological Support |

| | |
|----------------------------------|---|
| | Areas, published in terms of the Biodiversity Act, for a municipality or group of municipalities, accompanied by contextual information, land- and resource-use guidelines and supporting GIS data. |
| Conservation area: | Areas of land not formally protected by law but informally protected by the current owners and users and managed at least partly for biodiversity conservation |
| Critical Biodiversity Area: | (CBA) Areas required to meet biodiversity targets for ecosystems, species or ecological processes, as identified in a systematic biodiversity plan. May be terrestrial or aquatic |
| Critically endangered ecosystem: | an ecosystem type that has very little of its original extent left in natural or near-natural condition. |
| Ecosystem services: | The benefits that people obtain from ecosystems, including provisioning services (such as food and water), regulating services (such as flood control), cultural services (such as recreational benefits), and supporting services (such as nutrient cycling, carbon storage) that maintain the conditions for life on Earth. |
| Ecological infrastructure: | The stock of ecosystems and species, or natural capital, that provides a flow of essential ecosystem services to human communities |
| Ecological Support Area: | An area that is not essential for meeting biodiversity targets but plays an important role in supporting the ecological functioning of one or more Critical Biodiversity Areas or in delivering ecosystem services. |
| Integrated Development Plan | An integrated approach includes linkages to the process, infrastructure development, marketing and investment plans, skills development, entrepreneurship development and creation of an enabling environment for business development |
| Open Space Framework: | A framework for interconnected Open Space or green areas that accommodates human and natural ecologies, systems and processes developed to spatially manifest the Open Space vision. The conceptualisation is realised through Open Space types as the structuring elements of the network depicted on Metropolitan, Regional and Local Open Space Plans. |
| Polluter pays principle: | The party responsible for producing pollution is responsible for paying for the damage done to the natural environment. |
| Precautionary principle: | When scientific evidence is ambiguous as to when an act causes harm to the environment, the precautionary principle suggest avoiding or changing the action until its effect is known. |
| Protected area: | An area of land or sea that is formally protected by law and managed mainly for biodiversity conservation. |
| Sustainable development: | Development based on the use of resources that can be replaced or renewed and therefore not depleted, and that |

guarantees the welfare and promotes equity of current and future generations.

Threatened ecosystem: An ecosystem that has been classified as critically endangered, endangered or vulnerable, based on an analysis of ecosystem threat status.

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CHAPTER 1

INTRODUCTION

1.1. Introduction and Background to the Study

This chapter presents the introduction and background to this study. It also presents the problem statement of the study, the research aims, objectives and questions that framed this study. Lastly it comprises of the chapter breakdown for the dissertation.

In recent times it has become evident that the concern around environmental matters is no longer an environmental issue on its own, but instead a political and business problem globally (DEA, 2012). Environmental impacts are no longer a peripheral issue, as shown in South Africa's most recent National Development Plan (NDP): Vision 2030 environmental issues are included as a critical part of South Africa's development agenda (NPC, 2012). This stems from an innate recognition of the inter-connectedness and interdependence of the natural environment, human well-being and the economy, as we live in an era where the survival of humankind and their quality of life is directly dependent on their ability to protect and conserve the earth's natural resources (DEA, 2012). These include everything from food security and clean safe drinking water, to regulation of climate and pollution, resilience of communities and environments to natural disaster, and the provision of social, spiritual and recreational opportunities.

Developing countries generally retain more significant remnants of ecosystems than developed countries (ICLEI, 2010). However, a continued demise of ecosystems undermines the ability of these ecosystems to survive (ICLEI, 2010). The combination of current trends in population growth, changing lifestyles, urbanization and economic activity are increasing pressures on the natural environment (NRC, 2002). Signs of intensifying and compounded pressures are evident at global, national and local levels and are reflected in local and regional shortages of vital resources like water, food production, widespread land degradation and the exceeding of critical global thresholds leading to the disruption natural processes, such as climate regulation (NRC, 2002).

South Africa has one of the richest biodiversity counts in the world (DEA, 2012). With its world famous diversity of biomes, ecosystems and species, and its formal protected areas, South Africa depends greatly on its biodiversity, as it plays a major role in the social and economic growth of the country. The country's land surface represents just 1.2% of the earth's total land surface, but contains almost 10% of the world's total known bird, fish and plant species, and more than 6% of reptile and mammal species. However, as reflected in South Africa's most recent National Biodiversity Assessment (NBA, 2011), these rich and diverse landscapes are currently under significant threat as the country grapples with the realities of urbanisation, land transformation for mining and agriculture and the onslaught of water scarcity and climate change (Driver *et al.*, 2011). The NBA found, that approximately 20% of natural habitat has been irreversibly lost (Driver *et al.*, 2011). Forty eight percent of wetland ecosystem types are critically endangered; and 24% of coastal ecosystems are threatened by development pressure (Driver *et al.*, 2011). With the extremely high demand for urbanisation, agriculture and mineral resources, South Africa's biodiversity faces a serious and uncertain future (Driver *et al.*, 2011).

1.2. Problem Statement

Coordinating and supporting the capacity of municipalities to deliver on mandates is pivotal to the successful realization of the New Growth Path. There are several challenges to achieving this. Capacity at the municipal scale is very weak and there is little or no coordination amongst the myriad of institutions that regulate land use (ICLEI, 2010). Less than 9% of land in South Africa is formally protected which leaves critical biodiversity under great threat from degradation and conversion pressure in the absence of effective community based natural resource management (Driver *et al.*, 2011). The potential contribution of biodiversity to the Government jobs agenda is not yet clear and insufficient incentives are in place for municipalities to convince landholders to convert to biodiversity friendly practices. Despite these challenges, South Africa's biodiversity and ecosystem services have outstanding potential to address these threats (ICLEI, 2010).

As a signatory Party to the Convention on Biological Diversity (CBD), South Africa has to ensure it adopts the decisions made by the CBD, Local governments are critical to the conservation of biodiversity as per Decision XI/8 of the CBD, which calls on Parties "to

continue to involve local and subnational authorities in the series of workshops to review and update national biodiversity strategies and action plans, including regional activities. The importance of subnational implementation of the CBD has been further complemented by the Conference of the Parties (COP) in decisions IX/28 and X/22. From these international imperatives, biodiversity and conservation at the local level needs to focus on the ongoing sustainable development problems of local governments in South Africa by addressing the need to protect and enhance biodiversity in cities.

Given that municipalities are the level of government closest to the people, they are directly responsible for the well-being of their residents – including the environment in which they live. The Constitution of South Africa creates the overall framework for cooperative governance with three distinctive, interdependent and interrelated spheres of government. Concurrent function augmented by the Intergovernmental Relations Framework Act, 2005 (Act No. 13 of 2005) allows for decentralised governance (Middleton et al, 2011). The Local government sphere is the implementation arm of the three spheres of government, which include provincial and national government and it is strategically placed to address the needs of its citizens and communities. To secure this implementation, service provision is a key priority along with local economic development (Buccus and Hicks, 2007). However, currently there is no mandate for biodiversity management at the local government level. According to the Constitution, environmental management in South Africa is the responsibility of the National and Provincial government levels (Middleton et al, 2011; Du Plessis 2015a). Because of the lack of mandate at the local level there is very little that local government are allowed to do in terms of legally protecting the biodiversity in their cities (Middleton et al, 2011; Du Plessis 2015a). This study sought to identify legal, procedural and process constraints experienced by local governments in managing biodiversity within their areas of jurisdiction.

1.3. Justification for the Study

The economic growth impacts on environmental quality have been intensely debated in South Africa since before the democratic elections in 1994. In accordance with the country's developing status, economic development, urbanisation and industrialisation are considered as

priorities over the sustainable use of the country's natural resources (Kates and Dasgupta, 2007; Nahman et al., 2008). However, attaining sustainable development in South Africa requires recognition of the interlinkages between the natural environment, economic stability and social well-being. The importance of the natural environment in solving challenges such as poverty, food demand, unemployment and safe drinking water needs to be recognised and addressed effectively. Furthermore, the natural ecosystems such as wetlands and forests are critical for water provision and purification, food security, climate change mitigation and livelihoods in general (Kates and Dasgupta, 2007; Nahman et al., 2008).

Understanding these critical linkages between biodiversity and human wellbeing will enable society to see the importance of conserving biodiversity for the local, national and global good (Nahman *et al.*, 2008). It is for this reason that the outcomes of this study is so critical as it identifies the deficits in the South African legislation, processes and procedures in ensuring biodiversity management as the level of government closest to the people. The outcome of this study necessitates the incorporation of biodiversity management into local government legislation planning, processes and procedures not only to halt environmental degradation in cities but, also to assist with the provision of basic essential services to sustain the livelihoods of local residents such as, clean air, and clean water, health, sanitation, risk and disaster management and recreation.

The justification for this research is based on the premises of the necessity of the incorporation of biodiversity management into local government legislative planning, processes and procedures to not only halt environmental degradation in cities but, to also assist with the provision of basic essential services to sustain the livelihoods of local residents such as, clean air, and clean water, health, sanitation, risk and disaster management and recreation.

By means of primary and secondary data collected through questionnaires, interviews and literature review the study attempted to fill the gaps in the literature with regards to biodiversity management at the local level

1.3.1. Aim of the Study

This study aimed to determine the influence of environmental governance on biodiversity management at the local government level in South Africa by studying three metropolitan municipalities in the country.

1.3.2. Objectives

Based on the overarching aim, the objectives of the study were to:

- determine the major gaps in legislation, processes and procedures affecting biodiversity management at the local level in South Africa.
- assess the influence of environmental governance on biodiversity management at the local level and its implications for a biodiversity sustainable future for South Africa.
- review South Africa's environmental legislative transformation and how it can be used to enhance local government imperatives to improve biodiversity management at the local level.
- review international defining moments in environmental management and how they have impacted on biodiversity management and environmental governance at the local level in South Africa.

1.3.3. Research Questions

- To attain the aim and the objectives of this research, the following were the leading research questions that were utilized during the qualitative data gathering:
- What are the major gaps in legislation, processes and procedures in environmental governance relating to biodiversity management in local governments in South Africa?
- How does environmental governance affect biodiversity management and the sustainable use of natural resources at the local level?
- How can the current legislation be improved to enhance biodiversity management at the local level in South Africa?
- What are the legislative challenges faced by the local governments in fulfilling their environmental mandate?
- What are the defining international events that have shaped biodiversity management and local government in South Africa?

1.3.4. Delimitation of the Study

This study was focused on focused on four Metropolitan Municipalities, namely, eThekweni Municipality in KwaZulu-Natal, the City of Tshwane Municipality in Gauteng, the City of

Cape Town in the Western Cape and the Nelson Mandela Bay Municipality in the Eastern Cape. Metropolitan municipalities are those municipalities that have more than 500 000 voters and co-ordinates the delivery of services to the whole area which it governs. These four Municipalities were selected based on their location and biodiversity significance in achieving the conservation targets for the country.

1.3.5. Limitations of the Study

Several challenges were experienced in the questionnaire response received from the focus groups of this study. While a significant amount of questionnaires were sent out using various methods, a very low response was received from three Municipalities and there was a zero feedback received by the Nelson Mandela Bay Metropolitan Municipality. As a result, this municipality was eliminated from this study. Another major limitation of this research is that the findings cannot be generalized, because of the limitations of the sample taken for the quantitative empirical research, due to the lack of responses and the time lapsed over this study. This was foreseen, therefore qualitative research techniques, in this case, focus group interviews, were also utilized to enrich the quantitative data. These limitations were all due to financial and capacity constraints.

1.4. Structure of Thesis

This dissertation comprises of five chapters:

Chapter 1 presents an introduction to the study. It presents the background to the study, the study aim, objectives and rationale. Chapter 2 reviews the theoretical framework and literature related to the study. Concepts like political ecology and the theory of environmental governance are reviewed along with the country's political and environmental transformation pre-and post-Apartheid eras. A detailed description of each study area is outlined in Chapter 3, which includes the significant biodiversity areas in each city and the activities that impact biodiversity in these areas. Chapter 3 also outlines the methodologies pursued to obtain the data required for the study. Chapter 4 presents the results and discussion of results obtained from the questionnaires, interviews, focus groups and secondary literature. Limitations of the study and recommendations for future work are also discussed in this chapter. Chapter 5 derives conclusions from the results and legislation reviewed.

1.5. Chapter Summary

In this chapter the relationship between Environmental Governance and Biodiversity Management at the local level has been introduced. The importance of this study has been presented and the aims, objectives and research questions underlying the study are detailed. The structure of the dissertation is outlined. Next follows chapter 2. It presents the findings of the literature overview as applicable to this research.

CHAPTER 2

LITERATURE REVIEW

2.1. Introduction

This chapter presents a review on the enigma, which is keeping up with an increasing urban population demand while, simultaneously ensuring the integrity of the natural environment is conserved. The biodiversity conservation challenge presented by the 21st Century urbanisation has resulted in the greatest biodiversity loss and a more lasting impact than any other type of habitat destruction recorded (McKinney, 2002). This chapter comprises of a review of literature that advocates the need for this study.

2.2. The Biodiversity Conundrum

Biodiversity and ecosystem services are the basis upon which humankind depends, first and foremost for survival and for maintaining and enhancing the quality of life. Biodiversity provides food security and clean and safe drinking water, regulation of climate and pollution, resilience of communities and environments to natural disasters, including the provision of social, spiritual and recreational opportunities (Cincotta et al., 2000; Smith et al., 2003; O'Connor and Crowe, 2005). The developing world is home to the fastest-growing component of the world's population. It's also home to the most pristine biological diversity in the world. However, several studies have indicated that, as human population growth and urbanisation continue to increase, the world's biodiversity continues to decrease at unprecedented rates as, a result of habitat fragmentation resulting ecosystem degradation and loss of species (Cincotta et al., 2000; Smith et al., 2003; Driver et al., 2011).

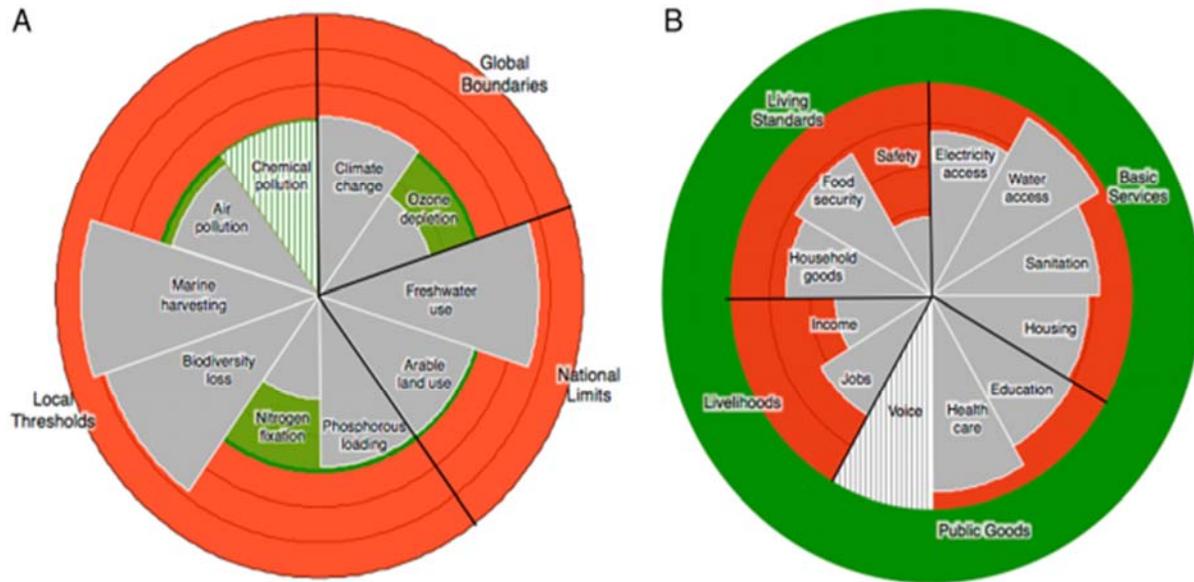


Figure 2.1: A national barometer for inclusive sustainable development in South Africa. (Cole et al., 2014)

Figure 2.1 circle A, displays the environmental boundaries exceeded by South Africa for biodiversity loss, marine harvesting, freshwater use, and climate change. However, trends from circle B show that since 1994 there has been an improvement in nearly all social indicators that has pushed the environmental indicators to detrimental limits (Cole et al., 2014). The above diagram highlights the country's proximity between the country's environmental limits and its ability in achieving an acceptable level of social well-being. The orange circles indicate boundary limits from local to an international scale, the grey pie slices indicate boundary limits that have already been exceeded. Lastly the green indicates those sectors or services still within boundary limits. The diagram focuses first and foremost on the local limits then national and lastly international boundaries. The diagram indicates that in an attempt to achieve social well-being in the country South Africa is close to exceeding almost all of its environmental boundaries, including encroaching on that of its neighbour's natural resources.

Cole et al., (2014) argues that, the rate at which natural resources are exploited in South Africa, is likely to result in international pressure as, it is not only impacting on biodiversity at a country level but at an international level as well (Cole et al., 2014). In order to achieve inclusive sustainable development in South Africa, measures need to be sort on multiple fronts, starting at the local level because, it is that level, that the smallest changes can make the biggest impact on the ground with global implications (Cole et al., 2014). Understanding the interaction

between different environmental domains and development strategies is critical to ensuring that meeting the needs of the population demand does not come at the cost of natural environment as seen already occurring in the above diagram (Cincotta et al., 2000; Smith et al., 2003; Driver et al., 2011; Cole et al., 2014).

At the 7th World Urban Forum in Medellin Columbia in 2014 it was estimated that by year 2030, 75% of the World's population will be living in cities (UN Habitat, 2014). Like other developing countries, South Africa, is faced with the task of promoting economic development that meets the needs of its population, while ensuring that the environmental systems and services which people rely on are not compromised (NPC, 2011). Sustainability, recognizes firstly, that the maintenance of healthy ecosystems and natural resources are essential for human wellbeing, and secondly, that there are limits to the goods and services which they can provide. In other words, ecological sustainability acknowledges that human beings are part of nature and not separate from it (NPC, 2011). Sustainable development implies the selection and implementation of a development option which allows for the achievement of appropriate and justifiable social and economic goals for meeting basic needs without compromising the natural capital (Barnard, 2012). According to Fakier et al., (2005), for this to be possible there has to be corporative governance between the national, provincial and local government spheres. Environmental governance can be best defined as the establishment, confirmation or change of institutions to manage or resolve conflicts over a country's natural resources to ensure the sustainable future of that country (Fakier et al., 2005)

According to the Secretariat of the Convention on Biological Diversity in the 2012 publication of the Cities and Biodiversity Outlook (CBO, 2012) it has been globally document that cities contribute significantly to biodiversity loss due to rapid urbanisation in trying to keep up with population demand. However, cities are being perceived as the drivers for sustainable development in the 21st Century (McKinney, 2008; SACN, 2016). Cities in particular are home to more than half of the world's population, and are responsible for a disproportionately large ecological footprint accelerating loss of biodiversity with serious consequences for climate change, availability of water, food, and many other ecosystem services, threatening livelihoods and ultimately lives (Driver et al., 2011). It is therefore becoming increasingly clear, worldwide, that the structures of local or municipal government are better placed than any other sphere of government to manage biodiversity and, in so doing, to raise awareness amongst citizens about the importance of protecting the environment. Local action support at the global

level, have taken great strides to raise the importance of local government in the battle for sustainability. This can be seen in a new strategic plan of the Convention on Biological Diversity (CBD) for period 2011-2020, which was adopted at the CBD COP 2010 (Annexure IX/28, CBD 2010). This Strategic plan included a Plan of Action for subnational governments, cities and other local authorities for biodiversity which was endorsed by the Conference of the Parties to the Convention on Biological Diversity (Annexure IX/28, CBD 2010).

Local governments present a crucial opportunity to take a leading role in biodiversity conservation as the level of government closest to the people and most directly responsible for taking action. Over 50% of the South African population now lives in cities. Cities consume over 75% of the resources consumed worldwide (UN-Habitat, 2013). Municipalities are important centres of economic growth and service delivery, and are therefore seen as key to the implementation of the New Growth Path (NPC, 2011).

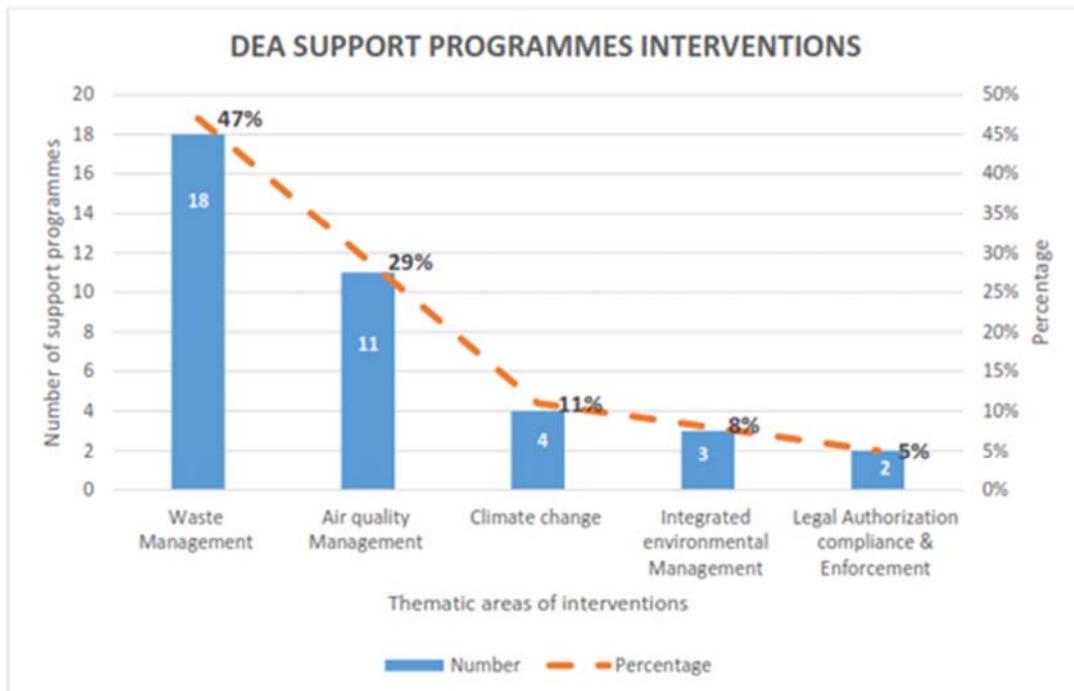


Figure 2.2: A display of the Local Government Support Programmes in the Department of Environmental Affairs as of 2015 (DEA, 2015)

Figure 2.2 exhibits the local government support programmes provided by the National Department of Environmental Affairs to various municipalities in the country. This diagram shows that the Local Government Support Programmes, with regard to the environment, allocate the most resources, namely 47%, to waste management, followed by resources to

secure air quality, namely 29%. Climate change receives 11%, integrated environmental management 8% and legal authorization and compliance and enforcement, only 5% of the resources. What can be extrapolated from the above diagram is that there is no support provided to municipalities specifically for biodiversity management.

Since the addition of environmental imperatives into the Constitution in 1996, waste management and air quality were considered to be the main environmental focus at the local level as those were two aspects that most affected human wellbeing locally and nationally (DPME, 2015). What can also be seen from the diagram is that the focus and support for all other environmental concerns were much lower than that of waste and air quality. Given that this report was completed in 2015, it is very clear that the attitude towards environmental concerns since 1996 has not changed. Several studies have attributed the absence of biodiversity conservation at the local level to the lack of effective environmental governance aligned structures, policies, procedures and processes between the different spheres of government (Glazewski, 2001; Kotze, 2003; Fakier et al., 2005; Duplessis, 2015a).

2.3. Environmental Governance and the Importance of Biodiversity Conservation in South Africa

Environmental Governance is one of the defining features of modern environmental policy-making and management. It can be best defined as the establishment, confirmation or change of institutions to manage or resolve conflicts over a country's natural resources to ensure the sustainable future of that country (Fakier et al., 2005). Feris (2010) explains the connection between good environmental governance and sustainable developments as a management process that is implemented by institutions and individuals in both the public and private sector to fully regulate human activities and its effects on the natural environment. Fakier et al., (2005) argues that, good environmental governance identifies processes and mechanisms set in legislation that flow from national down to provincial and local levels through formal and informal institutions, to ensure environmental sustainability for current and future generations (Fakier et al., 2005).

Pertaining to these issues, environmental governance in South Africa faces serious challenges in terms of improving service-delivery at the cost of the county's natural capital (Nahman, et al, 2008). Fuo, (2011), contends that, despite the progressive domestic environmental law

framework, fragmentation of the environmental governance effort is a reality in South Africa. This can be seen in the lack of corporative governance between the various spheres of government and the various line functionaries in each sphere (Fuo, 2011). The nature of local government was described as the lowest tier of government in a strict hierarchical structure that derived its powers from national and provincial governments and served to a large extent as the administrative arm of the province (Fuo, 2011). The overall effect of the previous system of local government is that, it inherited a legacy of massive poverty, gross inequalities in municipal services, and disrupted the spatial, social and economic environments in the country (Powell, 2010; Steyn 2014).

Agenda 21, of the Rio Earth Summit that convened in 1992, identifies the importance of local governments in achieving the sustainable development objectives (Roberts and Diederichs, 2002). It recognizes local government as the level of governance closest to the people and its responsibility to develop and maintain the economic, social and environmental infrastructure, to oversee all planning processes and to establish effective local environmental policies and regulations to ensure protection of the country's natural resources and to promote sustainable development (Roberts and Diederichs, 2002). Therefore, municipalities are important centres of economic growth and service delivery, and are also perceived as key to the implementation of the New Growth Path. This path is founded on the restructuring of the South African economy to improve its performance in terms of job creation as well as the composition and rate of growth for the country (NPC, 2011).

To attain this, coordinating and supporting the capacity of municipalities to deliver is pivotal to the successful realization of the New Growth Path. However, there are several challenges to achieving this realisation. As discussed in the LAB, 2010 Guidebook, capacity at the municipal scale is very weak and there is little or no coordination amongst the myriad of institutions that regulate land use (ICLEI, 2010). Less than 9% of land in South Africa is formally protected which leaves critical biodiversity under threat from degradation and conversion pressure in the absence of effective community based natural resource management (Driver et al., 2011), but still, the potential contribution of biodiversity to the Government jobs agenda is not yet clear and insufficient incentives are in place for municipalities to convince landholders to convert to biodiversity friendly practices (NPC, 2011). Despite these challenges, South Africa's biodiversity and ecosystem services have outstanding potential to address these threats (ICLEI, 2010).

Various literatures have indicated that environmental governance in South Africa faces serious challenges in terms of improving service-delivery at the cost of the natural assets (Kotze, 2006; Fuo, 2011; Middleton et al., 2011). Despite the progressive domestic environmental law framework, fragmentation of the environmental governance effort is a reality in South Africa. This can be seen in the lack of corporative governance between the various spheres of government and the various line functionaries in each sphere (Fuo, 2011).

Before the current constitutional alignment, local government in South Africa was constituted by over 1000 fragmented municipalities, organized along racial lines and strongly controlled by the central government (Ministry of Constitutional Development and Provincial Affairs, 1998). Local government has a duty to protect the ‘environmental rights’ of its citizens (Kotze, 2006). The Municipal Systems Act states” The Constitution of South Africa envisages a robust local government system, which can provide democratic and accountable government for local communities; ensure the provision of services to communities in a sustainable manner; promote social and economic development; promote a safe and healthy living environment (Middleton et al., 2011). The assurance of environmental protection is a citizen right (Middleton et al., 2011).

2.4. South Africa’s History of Environmental Protection

International debates on tackling the mounting global environmental issues have raged since the 1970s. During the apartheid regime in South Africa, strategies that focused on the protection and conservation of the natural environment operated in total isolation that neglected both economic and social compasses. During this time the concept of environmentalism dominated the field, which, was mainly concerned with the conservation of threatened plants, animals and wilderness areas (Cock, 2012). During the 1990’s, an important shift away from this narrow focus, to include urban, health, labour and development issues, gave way for the notion of Environmental Justice. It provided South Africa with the opportunity to view environmental conservation in a different light. It was no longer just focused on threatened species or the emphasis on the then newly developed term of Sustainable Development, but rather promoted a very inclusive understanding of the term environment (Cock, 2012). This new understanding identified the linkages the critical relationship and the importance of environmental conservation in the socio-economic system of the country and the World.

The emergence of the concept of sustainable development in the 1980s integrated the

environment with development, and the international community increasingly recognizes the interdependence of the environment, society, and the economy (DEAT, 2006). These debates have strongly influenced South Africa's development agenda, and the country has since increased its efforts in participating in international and regional initiatives. Distinguished milestones for South Africa since its notion of Environmental Justice include, the ratification of the Convention on Biological Diversity on the 2nd November 1995 as a formal recognition by the Government of South Africa of the new and many opportunities offered by the Convention for integrated planning and development, the hosting of the World Summit on Sustainable Development in Johannesburg in 2002 and the central role played by the country in the formulation of the New Partnership for Africa's Development (DEAT, 2006). Despite this visibility in the international and regional arena, the environment is still at the edge of socioeconomic development. It is viewed and dealt with in the context of an overriding economic and social development agenda.

Due to the increasing depletion and extinction of the world's biodiversity, it has become a vital process among the global community to protect the environment and safeguard natural habitats and thousands of species (Burgess, 2012). In developing countries like South Africa, factors like the growth and development of urban and rural spaces, industrialisation, high population growth and agriculture activities have added extra pressures to the countries' biodiversity and natural environment. For this reason, there has been an increase in the number of protected areas established, especially national parks, that are firstly established to protect biodiversity and secondly, established for education and recreation (Burgess, 2012). Now more than ever a transition of environmental power must occur to ensure a holistic approach to biodiversity conservation in South Africa.

2.5. Transition of the Local Government in South Africa

The local government in South Africa has undergone a process of significant transformation (Powell, 2012). The local government was seen as the lowest tier of government before the democratic government of 1994. In 1996 the local government was transformed from a statutory institution to a full sphere of government with a broad developmental mandate. After the first democratic elections in 1994, the new ANC government took office with a strong directive from its people to rebuild and develop the country (Powell, 2012). The Local government was to play a leading role in this plan with a focus on reducing poverty and providing essential services to meet basic needs of people. To improve the economy,

government adopted a macro-economic framework in 1996 which introduced strict financial measures. Powell (2012) and Fuo (2011) emphasize that it this was the turning point that led to local government transformation that, would be strictly controlled by economic reform goals and tighter treasury measures. This gave way for the White Paper's vision for local government conceived in a context defined by competing policy objectives, larger political and economic forces, separations and problems that began shaping South African society (Powell, 2012).

The White Paper on Local Government was developed early in 1998. It is unique in that it does not deal with a sectoral policy, but with the entire sphere of Local Government. It can almost be regarded as a "mini-Constitution" for local government, as it affects all South Africans. It recognizes the Local Government as the sphere closest to the ground and therefore responsible for efficient essential service delivery (Ministry of Constitutional Development and Provincial Affairs, 1998). It also recognizes that even though each municipality is different from the next the one common goal to achieving sustainable living at the local level is the protection of the natural environment. It is clear that Municipalities need to work closely with other government spheres, as this is critical to ensuring that the natural environment is protected to its greatest potential (Powell, 2012).

Due to swift changes world-wide, the South African local government and communities need to rethink the way they are controlled and governed to ensure a more sustainable future. Corporative environmental governance is critical in ensuring municipalities become more strategic, creative and ultimately more influential in the way they operate in South Africa. Municipalities can enhance environmental sustainability by including environmental issues in their planning processes. Many municipalities, such as eThekweni, and CoCT, are participating in Local Agenda 21, which requires them to develop long-term strategic action plans that address sustainable development concerns. Planning for environmental sustainability should not be a separate planning process, but should be an essential part of the process of developing Integrated Development Plans (IDPs) that ensure municipalities reach their sustainable development goals (White Paper, 1998).

The Green Paper for Local Government was a product of the second phase development of the White Paper and consisted of extensive research and consultative processes (White Paper, 1998). The paper consisted of the history of Local Government and its vision for a developmental local government system. It was established as a transition measure to bridge the gap old apartheid councils and the new local government system. It recognized that local

government has a crucial role to play as policymakers, as thinkers and innovators, and as institutions of local democracy. A developmental municipality should be innovative and creative in their methods to seek of resource mobilization for meeting the basic needs of the communities and achieve developmental goals (White Paper, 1998).

In addition to municipal functions relating to basic service provision which includes, water and sanitation, housing, electricity, health care, and infrastructure, municipalities are also responsible for sustainable development (Chauke, 2014). This requires maintenance of essential services to the growing population whilst still ensuring that the environment is protected. South Africa is faced with a number of environmental issues at a national level, which present several challenges for implementation at the local level. Even though the Constitution lists environmental management as a concurrent function of provincial and national government, it requires the full support of local government as they are the government arm responsible for implementation on the ground (Freedman, 2013). Their primary objective is to provide a safe and healthy environment to all its inhabitants and in terms of Schedules 4 and 5 of the Constitution municipalities have functions that are considered to be essentially environmental functions (Fredman, 2013).

Environmental governance is embedded in the South African environmental legislation. It contains various pieces of legislation that places the responsibility of environmental management on all three spheres of government. Duplessis (2015a) emphasizes, that if municipalities are to ensure their objective of promoting a safe and healthy environment, the implementation of the environmental governance principles of fairness, accountability, responsibility and transparency are critical to not only ensuring environmental protection at the local level but also for ensuring that local government are on the path to sustainable development.

2.6.Conclusion

To summarise, this chapter reviewed literature relating to the significance of biodiversity to human well-being. The chapter has also highlighted the importance of effective environmental governance at the local government level and the crucial roles they have in achieving sustainable development in South Africa. This chapter highlighted gaps in local policies, process and procedures of local government in finding the balance between meeting

governments social priorities, without compromising the integrity of the country's natural environment. Next follows a complete description of the research methodologies implemented during this research.

CHAPTER 3

METHODOLOGY

3.1. Introduction

This chapter presents a discussion of the design and methodology of this study. It includes a brief background of the three study areas as well as a map of each area. Data collection and analysis for this study will also be discussed. The chapter concludes with a description of how the individual investigations were conducted.

3.2 Research Design

There are three main types of research designs: qualitative, quantitative and mixed method.

Qualitative design is the use of narratives of the subjects to represent the findings of a study. A qualitative design is also any type of research that the results are not obtained by statistical means, but is more descriptive (Strauss and Corbin, 1990). Quantitative design is different from qualitative design in that it is the use of numbers to represent the findings of a study statistically and is expressed as “explaining phenomena by collecting numerical data that are analysed using mathematically based methods” (Almalki, 2016). Mixed method design on the other hand is a combination of both qualitative and quantitative methods (Creswell, 2009).

The selection of a research design for a study depends on the nature of the study and what needs to be achieved. Given that environmental governance has been a longstanding topic both nationally and globally, there is no shortage of literature, data, a living experience on the subject, which makes a mixed method design appropriate for this study (Fakier *et al.*, 2005).

This approach enabled perspectives from various local government officials working at different levels within their departments. This approach was taken because according to Johnson *et al.*, (2007), qualitative and quantitative designs are combined in a study for the purpose of obtaining a deeper understanding of the phenomenon under investigation. Creswell and Clark (2011) adds to Johnson *et al* by stating that the use of both qualitative and quantitative approaches enhances the outcome of the study further together, than if they were

used individually as the sole research method. Next, the areas where the research was conducted in South Africa will be described in more detail.

3.3 Description of the Study Areas



Figure 3.1: Locations of the three study areas in South Africa.

Figures 3.2, 3.3 and 3.4 below display the land covers for eThekweni, CoT and CoCT Municipalities respectively. In each map the areas shaded in light green display the critically endangered ecosystems located within Critical Biodiversity Areas (CBA's) remaining in each municipality. As can be seen from the diagram there are very few CBAs remaining in each municipality. The CBAs are the areas in light purple in each map and are characterized as areas containing biodiversity that is of high strategic importance such as wetlands (Driver et al, 2011). The dark green areas in the maps represent those areas that have already been transformed into various land uses such as urbanization, agriculture and industries.

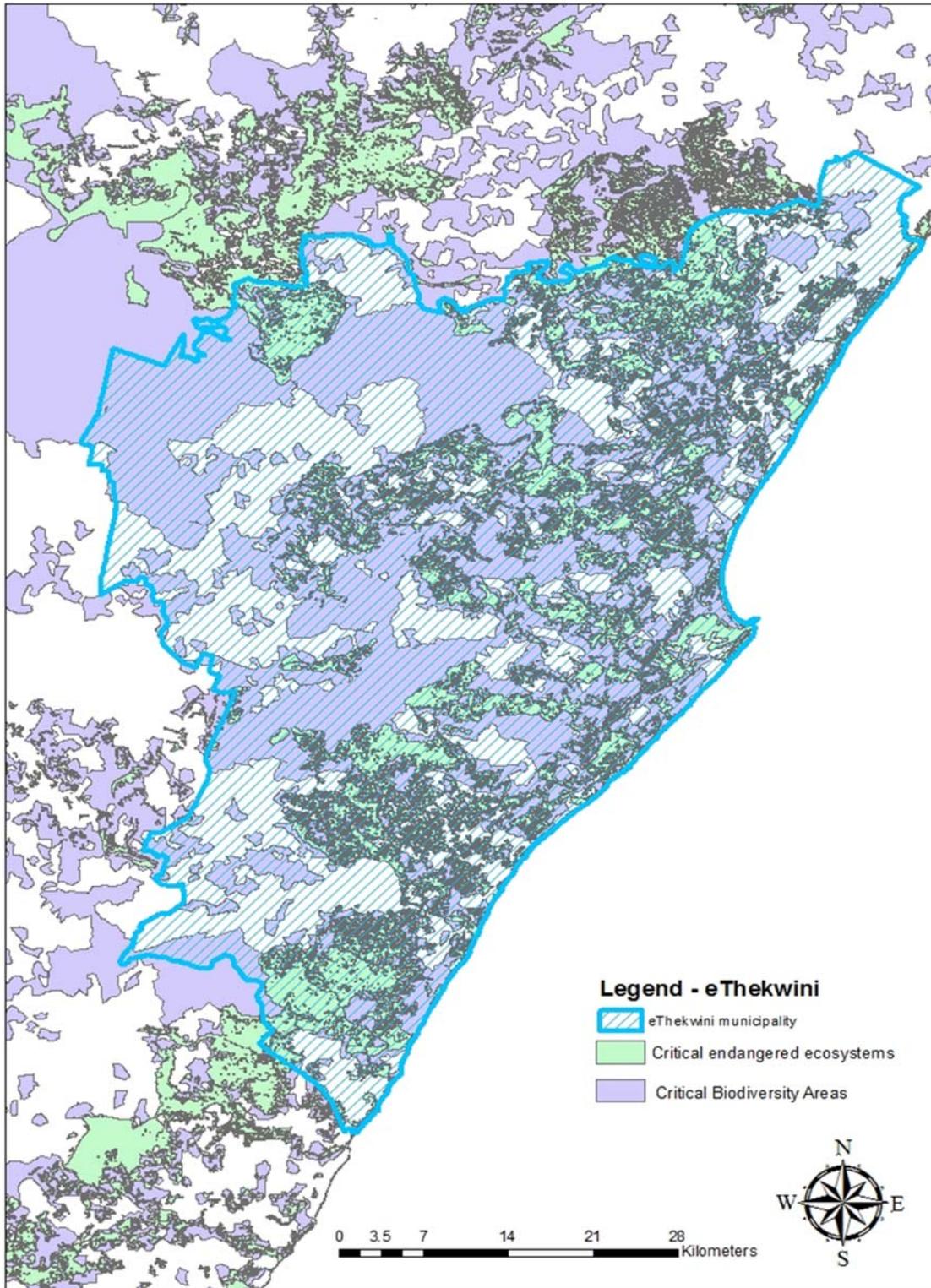


Figure 3.2 Land cover map showing critically endangered ecosystems within CBAs of eThekweni Metropolitan Municipality

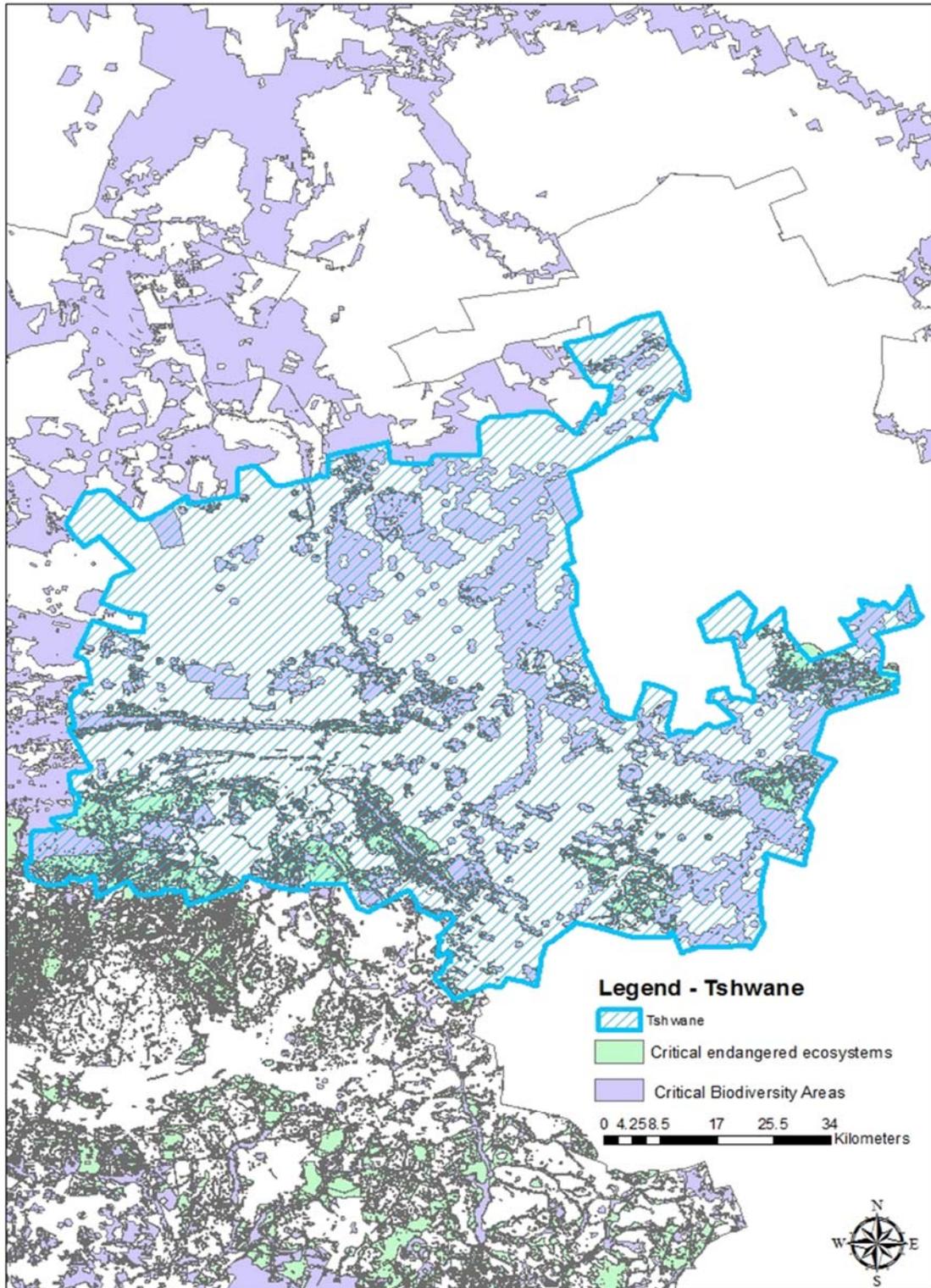


Figure 3.3 Land cover map showing critically endangered ecosystems within CBAs of City of Tshwane Metropolitan Municipality

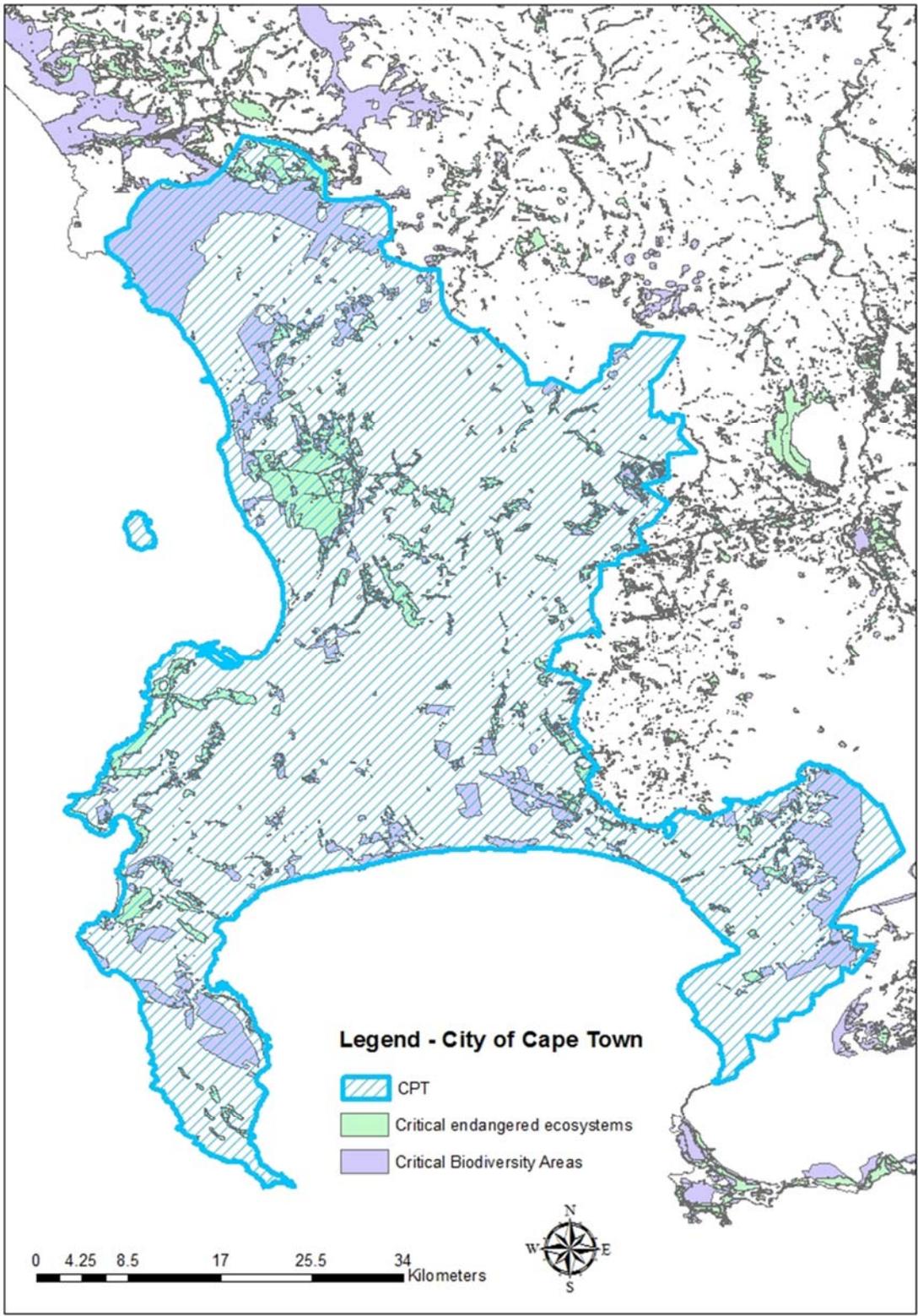


Figure 3.4 Land cover map showing critically endangered ecosystems within CBAs of City of Cape Town Metropolitan Municipality

3.3.1 eThekweni Metropolitan Municipality

The eThekweni (Durban) Metropolitan Municipality lies in the KwaZulu-Natal (KZN) province along the east coast of South Africa. According to the 2011 national census, the eThekweni Municipality is home to 3.5 million people, representing 33% of the province's population and 7% of South Africa's total population. Durban is the largest city in KwaZulu-Natal and hosts the busiest port in Africa (eThekweni, 2013). It is a manufacturing hub and premier tourist destination. The eThekweni Municipality is characterised by diverse topography, from steep escarpments in the west to a relatively flat coastal plain in the east. The majority of the municipality has been modified residential and economic land uses covering 122 641 ha or 53.5% of the land area (eThekweni, 2013). Natural land cover occurs mostly to the south and outer west, comprising 106 017 ha or 46.3% of the total area. An open space system of approximately 74 500 ha (approved 2010/2011), representing almost 1/3 of Durban's total municipal area (eThekweni, 2013). Figure 3.2 below, displays the study area for the eThekweni Municipality.

3.3.2 City of Tshwane (CoT)

The second study area, the City of Tshwane falls within the Province of Gauteng and is home to a total population of 3 million (Ganief and Thorpe, 2013).

This municipality makes the second largest contribution to the provincial GDP at 27%. It houses most of the national government departments and foreign embassies (Ganief and Thorpe, 2013). The City of Tshwane falls within the Grasslands biome, and is home to a disproportionately high percentage of rare and threatened species and threatened ecosystems (GDARD, 2015). A high proportion of South Africa's mining activity, heavy industry, commercial enterprise and urban population occur in the region, and consequently, the pressures placed on the remaining natural environment are very high, and opportunities for conservation of biodiversity are limited (GDARD, 2015). Just under two thirds of the City of Tshwane is in a natural or near natural state (65%), with urban areas (14%), intensive agriculture (19%) and mining (2%) together covering 35% of the City (GDARD, 2015).

3.3.3 Cape Town Metropolitan Municipality (CoCT)

The City of Cape Town, (CoCT), the third study area, is the economic hub of the Western Cape Province and is home to the fastest growing population in South Africa currently sitting at 3.7 million people (Holmes et al., 2008).

Urban development, agriculture, and natural remnants cover 26%, 35%, and 39%, respectively, of the 2,460 km² city area (Holmes et al., 2008). Bounded by ocean and mountains and situated in the smallest of the Worlds Six Floral Kingdoms, Cape Town is one of the most environmentally rich cities in the world (EADP2/2013). It falls within the Cape Floristic Region (CFR) which is the smallest and richest of the six floral kingdoms in the world, and it is the only one to be found entirely within one country (EADP2/2013). Its rich biodiversity is under serious threat for a variety of reasons including conversion of natural habitat to permanent agriculture, inappropriate fire management, rapid and insensitive development, overexploitation of water resources, marine resources, and infestation by alien species (EADP2/2013). The region has been identified as one of the worlds "hottest" hotspots of biodiversity (EADP2/2013). Recent data has shown that due to increasing population in the city this biodiversity is in grave danger of degradation. The next section discusses the data collection methods used in the study.

3.4 Data Generation Methods and Sampling

Data generation is fundamental to all research and the data generating methods used for this study were questionnaires, interviews and document analysis. Document analysis according to Bowen, (2009), is a systematic procedure for reviewing or evaluating documents, in order to produce meaning and develop first-hand knowledge. The document analysis focused on the national and international environmental legislative transformation in relation to environmental governance and how it influenced local government policy, procedures and regulations. Interviews, on the other hand, are a specific form of conversation where knowledge is produced through an interaction between the one gathering data also known as the interviewer and the one responding to the enquiry also known as the interviewee (Kvale, 2007).

Interviews are research instruments for collecting the more qualitative data. Interviews can be face-to-face communication between a researcher and a participant. Depending on the scope of the study, an interview could either be a structured interview or a semi structured interview

(Rubin and Rubin, 2005). Structured interviews relate to cases in which there is a set of self-completing questions which are created in advance and have a limited set of responses. Such interviews are often aimed at gathering data from large samples (Kvale, 2007). Semi-structured interview on the other hand relate to cases in which data are collected through face-to face interviews with an interview guide assisting the interrogation of the topic under investigation (Rubin and Rubin, 2005). The semi-structured interviews that were conducted for this study sought narratives on environmental challenges in the different metropolitans.

The interview schedule comprised open-ended questions in order to obtain maximum information from head of the environmental departments of three municipalities. These questions included; a brief description of the state of biodiversity at the local level; the greatest threats facing Biodiversity in the municipality; what is being done to conserve biodiversity from the local level; are funding or special initiatives geared specifically towards biodiversity conservation in the municipality; Biodiversity considerations in SDF's and IDP's and other relevant local legislations; international policy or convention influence on Biodiversity Management in the municipality; vision for Biodiversity Conservation in the municipality and lastly how biodiversity can be used to achieve sustainable development in the municipality.

A questionnaire is a list of questions designed to gather information from individuals regarding their views on a particular issue of interest (Wilkinson and Birmingham, 2003). As it is impossible to study every member of a population, there arose the need for sampling participants (Kitchin and Tate, 2001). Depending on the nature of the study a choice of two sampling techniques can be employed. The choice of technique is dependent on the research question, nature of the sample population and access to said population (Kitchin and Tate, 2001; Flowerdew and Martin, 2005)

Given the limited target population for this study, purposeful sampling was the method used in this study (Patton, 2002). Cresswell & Plano Clark, (2011), identified purposeful sampling as one of the most effective methods for identifying and selecting individuals or groups of individuals that are especially informed about or experienced within a specific area of interest. In this study the structured questionnaire and semi-structured interview methods were used and targeted specifically at environmental officials in the four municipalities.

3.5 Data Collection

3.5.1. Sampling Methods

3.5.1.1. The Questionnaire

In this study, questionnaires were designed to elicit information on biodiversity management and environmental governance from environmental municipal officials from three metropolitan municipalities across South Africa. The questionnaire covered various themes such as; municipal capacity, budget, intergovernmental relationships, biodiversity legislation and biodiversity threats at the municipal level.

A formal questionnaire with a combination of closed- and open-ended questions was distributed to municipal officials in the environmental departments. Closed-ended questions provide opportunity to compare responses between officials and conduct quantitative analyses of the responses. Open-ended questions proved important as they allowed individual stories and perspectives to emerge and potentially reveal factors that had not been expected by the researcher.

The questionnaire was constructed based on gaps identified in various literature findings and real life experiences in working with biodiversity issues at a local level. This questionnaire focused on municipal contribution to biodiversity management in terms of human capacity, budget allocation, intergovernmental relations and biodiversity specific legislation as well as biodiversity challenges and threats experienced at the local level.

This study began in four Metropolitan Municipalities across South Africa, but due to lack of response to the questionnaires from one of the four municipalities, only three municipalities remain in this study. They were the eThekweni Municipality in the KwaZulu-Natal; the City of Cape Town Municipality in the Western Cape and the City of Tshwane Municipality in Gauteng.

For the purpose of obtaining a robust data set for analysis, 100 questionnaires were distributed to various municipal environmental officials at local government support workshops that were organised by the National Department of Environmental Affairs as part of the Local Government Support Programme. The questionnaires were distributed at 8 workshops over 18 months. Other methods used to distribute the questionnaire were through emails and phone calls. The sampling time period for the questionnaires was a year and 6 months. From the 100

questionnaires, only 33 were returned with viable responses suitable for analysis. From the CoCT, 12 completed questionnaires were received, 7 from CoT and 14 from the eThekweni Municipality. No response was received from Nelson Mandela Bay Metropolitan Municipality; as a result they were removed from the study.

There are several limitations to this methodological approach. Many officials refused to take part in this exercise. Most of the emails were ignored and many did not have the time for telephonic or face-to-face questionnaire interviews. The distribution of questionnaires at workshops proved to be most effective.

3.5.1.2. The Telephonic Interview

A separate semi-structured interview was conducted with the heads of departments of each municipality. Three interviews were conducted, one in each Municipality. This enabled a more in-depth view into biodiversity management issues at the local government level. The questions were open ended and allowed much flexibility for discussion on the study. The interview was conducted telephonically on the HODs of eThekweni, City of Tshwane and City of Cape Town Municipalities. Each interview was scheduled in advance and took approximately one hour to complete. The participants were made aware that they would remain unnamed in the study and would be referred to as the interviewee for the purpose of this study. The interviews were transcribed and analysed by means of the well-known qualitative data-analysis techniques, including organizing the answers, read thoroughly and making notes. Themes, attitudes and behaviours, were identified and then amalgamated and analysed with the results of the questionnaires. The outcomes of these interviews were included in Section 4 of this study supplementing the discussion of the questionnaires.

3.6. Data Analysis

Following the completion of the questionnaires, the questionnaires were analysed and coded according to responses per Municipality. Once coded, the data were analysed using Microsoft Excel 2010.

3.7 Legislative Review

A Legislative review was conducted to determine the efficacy and evolution of legislation governing Environmental Management and Local Government processes in South Africa and on an international scale. The national review included legislation included a list of main documents that were reviewed, and tabulated for ease or reference, which was also discussed in detail in section 4 of this study. These included; the White and Green Papers on Environmental Management in South Africa and the National Environmental Management Act (107 of 1998), the White Paper on the Conservation and Sustainable Use of South Africa's Biological Diversity, The Municipal Systems Act along with various journal articles that supported and challenged the development of Environmental legislation in South Africa. The review provided a more thorough understanding on the transformation of environmental developments in South Africa and how it has unfolded through time.

An international review was also conducted to demonstrate the international influences that shaped biodiversity conservation in South Africa and the linkages to the local government sphere. A list of the defining international conventions and documents were reviewed, and tabulated for ease or reference and discussed in further detail in section .It focused on the introduction of the concept of sustainable development and how critical the integration of biodiversity into local government policies and strategies can be to achieving sustainable development from the bottom-up. The review included all the major summits, declarations, decisions, agendas and conventions that has galvanised the biodiversity and sustainable development agenda on an international scale. This included the 1992 Rio Summit, the 2002 Johannesburg Summit, the Rio + 20 in 2012, the Sustainable development Goals and the New Urban Agenda.

3.8. Ethical Considerations

This study adhered to research ethical principles. Ethical clearance for this study was obtained during the proposal phase of the study, before commencing data collection. All participants and respondents were informed prior to completing the questionnaire that; their responses would be treated as confidential, that participation in the study was voluntary and that they could pull out at any time without any consequences. Participants were informed that feedback on the results of this study would be sent to them via email upon the completion of this study.

3.9 Chapter Summary

An assessment of the impacts of environmental governance on biodiversity management at the local level requires an interdisciplinary approach that engages both natural and social science methods. This chapter has discussed the data collection and data analysis methods used and the theories that inform them. This study was conducted in four Metropolitan Municipalities across South Africa. Primary data were collected using structured questionnaires for environmental officials. A desktop study was conducted to collect background information of study areas and an analysis of the legislation governing local governments and legislation that affect the environmental management in South Africa was also conducted. The results from the above methods along with the discussion on the outcomes will be contained in the next chapter.

CHAPTER 4

RESULTS AND DISCUSSION

This chapter presents and discusses the results of this study obtained from the municipal questionnaires and the interviews with the Heads of the environmental departments of the three municipalities. It also presents the a discussion on the document review conducted on various documents pertaining to national and international environment law that has impacted on biodiversity management at the local government level.

4.1. Environmental Governance impacts on Biodiversity Management in Local Government

4.1.1. Municipal Capacity Assessment

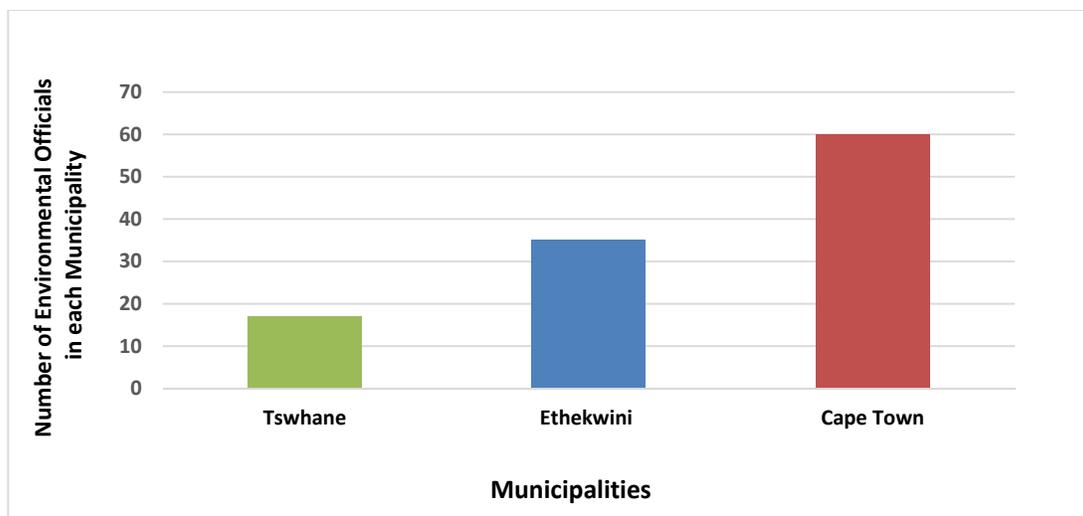


Figure 4.1 Number of officials working on biodiversity management in the three municipalities.

Figure 4.1 highlights the capacity assessment for biodiversity management in the three selected municipalities. It can be seen from the graph that of the three municipalities, the City of Tshwane had the least number of officials working on biodiversity management (30 officials). The eThekweni Municipality had the second highest number of officials with around 35 officials and the City of Cape Town had the largest number of officials in this regard, with up to 60 officials.

The results displayed in figure 4.1 indicate a clear lack of capacity in the three municipalities

dedicated to biodiversity management. On analysing the questionnaire responses for capacity assessment it was found that, while all three municipalities had officials dedicated specifically to biodiversity management majority of their duties focused on administration and not on biodiversity management itself.

This proved true for the City of Cape Town especially given that the Western Cape Province completely houses the Fynbos floral kingdom, one of only six floral kingdoms globally, most of which fall within the CoCT boundaries. CoCT has a large number of officials dedicated to biodiversity management in the municipality, with numbers varying from 30 to 60 officials at the main office and from 120 to 200 officials in parks and reserves of the Municipality. However, when closely scrutinised it was found that only a handful (10 out of the 30 to 60 officials) specifically focused on biodiversity management excluding those in parks and reserves of the Municipality.

eThekweni Municipality employs 30 to 60 officials in the main office and 90-120 in parks and reserves within the municipal boundaries. When asked how many officials focus specifically on biodiversity management in eThekweni Municipality they indicated 32 officials. The City of Tshwane has between 15 and 30 officials, with 19 officials specifically focused on the various aspects of biodiversity management, such as conservation management, protected area planning and management and ecological functions.

The findings from the capacity assessment indicated that these three municipalities are severely under capacitated for completing the required biodiversity management duties at the local level. While the officials are doing the best that they can the number of officials required to do what is necessary for effective biodiversity at the local government level is just not enough.

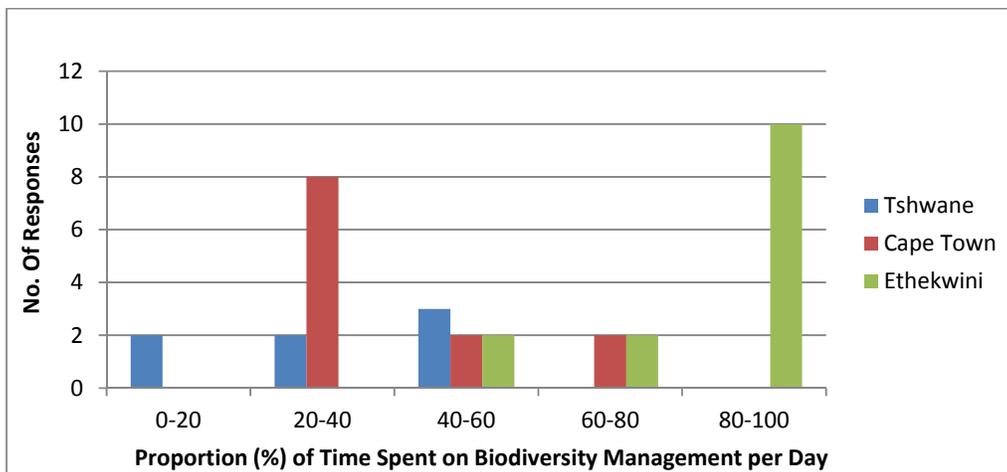


Figure 4.2 Percentage of time spent on biodiversity management by officials in the three municipalities per day.

Figure 4.2 indicates the proportion of time environmental officials spent on biodiversity in their daily duties. The actual time spent on activities specific to biodiversity differed in all three municipalities, as can be seen in figure 4.2. Most of the respondents (10 out of 14 respondents) from the eThekweni Municipality indicated that they allocated a higher percentage of time spent on biodiversity management in the municipality when compared to the other two municipalities. Ten officials in EThekwini indicated that they spent 80-100% of their time focusing on biodiversity management, while (7 in COT and 12 in CoCT) indicated that they only spent 20% to 60 % of their work day on Biodiversity Management duties and on administrative duties thereafter. These findings correspond with the results of figure 4.1, in which many of the officials indicated that they spend the majority of their work day on administrative duties and not on biodiversity management specifically.

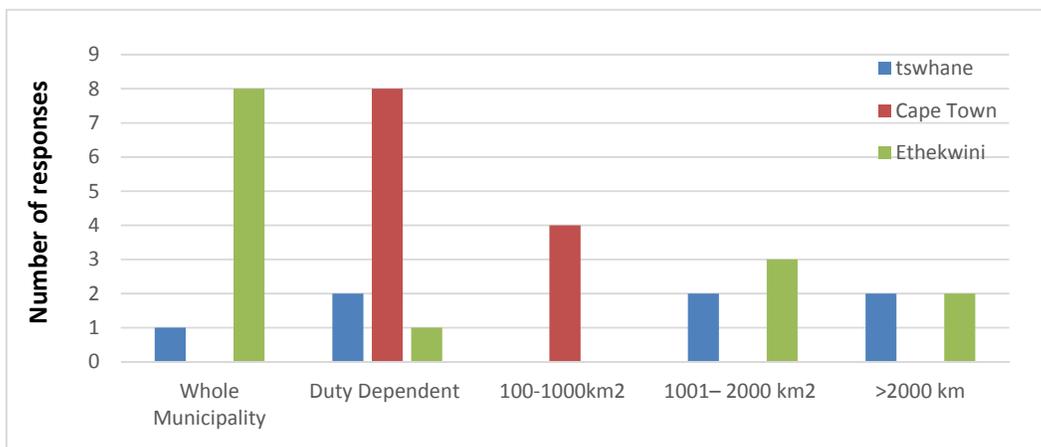


Figure 4.3. Area covered by officials for biodiversity management per municipality.

Figure 4.3 highlights the municipal area covered by officials for biodiversity management in the three municipalities. As opposed to officials from the CoT and CoCT, most of the officials from eThekwini Municipality indicated that their work on biodiversity management covers the municipality in its entirety and not just specific landscapes or areas per km². From figure 4.3 it can be extrapolated that while the CoCT have the highest numbers of environmental officials, only a handful really focus on biodiversity specific duties.



Figure 4.4 Competency areas most lacking as identified in all three municipalities

This study also investigated the official's capability to carry out their everyday duties by identifying the three most common competency areas preventing the officials from executing their duties efficiently and effectively. The results shown in figure 4.4, identifies communication, administrative and legal skills as the largest skill capacity gap among officials in the three municipalities with 58% of officials found to be lacking in these areas. Compliance and enforcement capabilities were the next skill set identified as lacking by officials with 24 % and lastly Management functions with 18%. These results indicate that even though the officials are adequately qualified from a scientific perspective they lack the necessary skill sets that will enable them to execute their duties beyond their scientific requirements.

An inquiry into the competency areas of the officials in the three municipalities produced several areas that officials were found to be lacking the capacity for. Skill sets such as communication, administration and management functions are critical for improved decision making, policy development and implementation, and maintaining vital relationships in the public and private sectors alike, according to Newig and Fritsch (2009). In order to ensure that officials were fully equipped to carry out their duties, capacity building in the form of the necessary skills training had to be conducted and this put pressure on what was already a tight budget for biodiversity management.

Findings on the budget from the questionnaire indicated that the overall budget for biodiversity was insufficient as, it was allocated for more than just biodiversity management. A great amount was identified for staff provisions such as salaries and skills training. However, at least 80% of the CoCT respondents indicated that the majority of their biodiversity budget was allocated towards the safety and security of their officials in charge of managing biodiversity

in the city and very little on the cities biodiversity. This was later confirmed during the interview with CoCT HOD, who indicated that due to the rise in crime within the city's boundaries, protecting their employees and scientific equipment claimed a large portion of their annual biodiversity budget.

Other findings on the annual budget from the questionnaires included the municipality contribution to community education and awareness on biodiversity conservation at the local level. These included environmental education and awareness programmes, friends groups and biodiversity forums, as well as their interactions with their government counterparts

Similarly to the responses received from the questionnaires, the interviews also suggested that the human capacity for biodiversity management is far too low at the local level. In all three interviews there were indications that in order for biodiversity management to run efficiently in these cities the human capacity would need to double if not triple in numbers. They stressed the fact that their manpower for biodiversity management was stretched beyond capacity in the local government sphere. Even though these municipalities are doing the best with what resources they have been allocated, they are in no way close to reaching their annual biodiversity targets. The skills shortage is another major capacity constraint that local government have been contending with. Due to the lack of financial resources, being able to employ officials with the desired skills or even train current employees has put significant strain on their municipal budgets.

To summarise, the study revealed major gaps in environmental governance and how it impacts on biodiversity management in the local government sphere. Poor environmental governance was attributed largely to a lack of capacity, scarcity of resources and specialized skills. While this study identified that the number of officials for biodiversity management at the local level are indeed insufficient in all three municipalities, this capacity assessment focused on more than just the official capacity numbers needed for biodiversity management at local government level. Due to several constraints in budget, capacity and resources, the local government has limited ability to be flexible and improvise as required, especially in the context of environmental management (Chauke, 2014). This was seen in the zero response rates of questionnaires received from the Nelson Mandela Bay Metropolitan Municipality. Due to severe capacity and budget constraints the environmental officials of the municipality were spread so thin across the municipality, that they did not have time to answer one questionnaire or even an interview and as a result were excluded from this study.

4.1.2 Intergovernmental Relationships

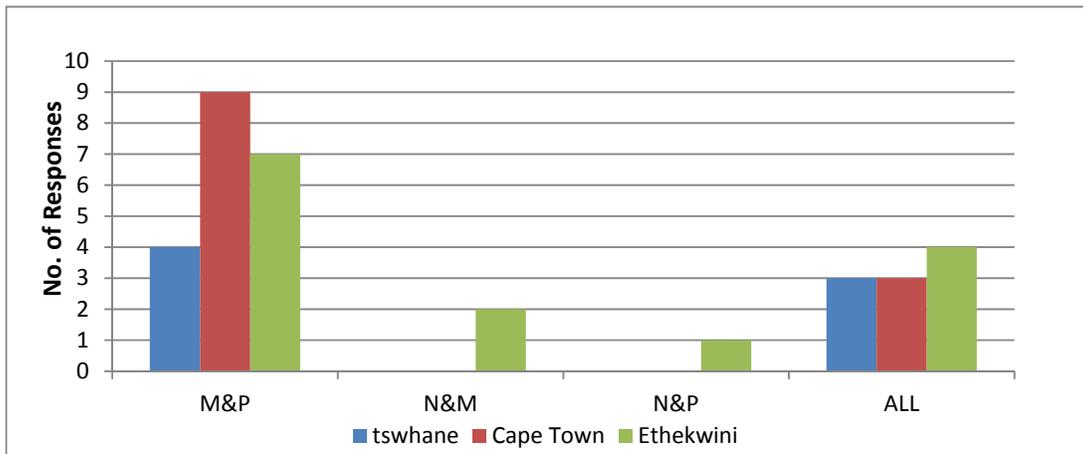


Figure 4.5 relationships between the National (N), Provincial (P) and Local (M) Government spheres according to responses from the questionnaires.

To determine the intergovernmental relationships with regards to biodiversity management between the three spheres of government, the local government officials were asked to describe their level of interaction with the national, provincial government spheres. These results are displayed in figure 4.5. The results indicate a lack of interaction between the three spheres of government in the management of their natural environment.

An inquiry into partnerships between governmental tiers on issues relating to biodiversity provided insight into the absence of collaboration from the national down to the local levels. The questionnaire responses indicated that the relationships between the Municipal and Provincial structures were strong. However, the interaction between the national government and the other two tiers was minimal

These results concur with the responses relating to the types or nature of biodiversity programmes within the municipalities. In response to the question on the agreements or programmes between the three spheres of government for biodiversity management, programmes such as Biodiversity Stewardship, Bioregional Plans, Management of Nature Reserves and Conservation Planning were the most common responses received from the officials. This response was significant, due to the fact that these programmes are all managed by either provincial or local government or both. The results clearly showed the lack of support and guidance for the local government from the national level.

This lack of national government support for the lower tiers was confirmed in interviews conducted. While each interviewer provided vital insight into how biodiversity management

was conducted in each city and the various constraints they each experience, they all had one main comment in common, that is, there was no mandate for biodiversity management at the local government. According to According to Fakier et al (2005) the Constitution assigned responsibility as a concurrent function of the national and provincial governments. However, it also required that the three spheres of government in the country function as a single coordinated system.

Over the years the expectation on local government, to take responsibility of their natural environments, has increased significantly (SALGA, 2015). From the responses of both the questionnaire and the interviews indicate that, there are measures that have been taken to instil that responsibility down at the local government level. However, until that change is made biodiversity management will continue to take a back seat to local issues such as service delivery and job creation.

Rogerson (2009) notes that, the lack of direction from higher spheres of government that has resulted in the local government being unsure of what functions to prioritise. Because of this lack of support, biodiversity management has suffered the consequences of this lack of leadership. These results are also in line with an international study conducted by the Swedish Environmental Protection Agency that identifies the critical role of environmental governance in ensuring improved environmental outcomes (Wingqvist et al., 2012).

In this study local government participation, transparency and accountability are the three main contributing factors towards ensuring environmental protection at the local level. This also concurs with the capacity findings of the questionnaires and interviews, which have recognised the importance of sufficient resource availability. This includes financial resources for training and equipment, at the local level to enable officials to effectively carry out their environmental functions. According to Rebelo et al., (2011) adequate funds for securing biodiversity at the local level far exceed what is currently available to local government. This includes budget for staff provisions, management of declared areas, and restoration of degraded areas, mitigation of climate change impacts, public participation and intergovernmental relations. Issues such as capacity in local government, budget constraints, lack of communication and skills all stem from poor environmental governance at the local level.

To summarise, majority of the study participants agreed that the ineffectiveness of environmental governance preventing effective biodiversity management in the three selected

municipalities are attributed to the lack of, adequate human capacity, insufficient financial resources for biodiversity specific activities. It was further determined that staff capacity and skills must be enhanced if biodiversity management is to be improved at the local level. Lastly the absence of interaction and lack of leadership from national government to local government cannot be allowed to continue as these relationships are critical to ensuring the integration of biodiversity imperatives at all levels of the government.

4.2 Impacts of Environmental Governance on Sustainable Development at the Local Government Sphere

In considering the relationship between sustainable development and environmental governance one needs to consider how decision-making would in practice incorporate the principle. This concept is unpacked further in 4.2.1 and 4.2.2. below.

4.2.1. Biodiversity Management Integration into Local Planning and Policies

Figure 4.6 looks at biodiversity management inclusion into the Integrated Development Plans of the three municipalities. The graph shows that eThekweni Municipality had the largest number of responses saying that biodiversity was already incorporated in the IDP. CoCT recorded the highest number of respondents demonstrating the absence of biodiversity management in their current IDP. The CoT on the other hand had fairly varied responses to this question with some officials indicating that biodiversity was incorporated in the current IDP; 60% provided a negative response and 20% indicating its consideration of biodiversity in the next IDP review.

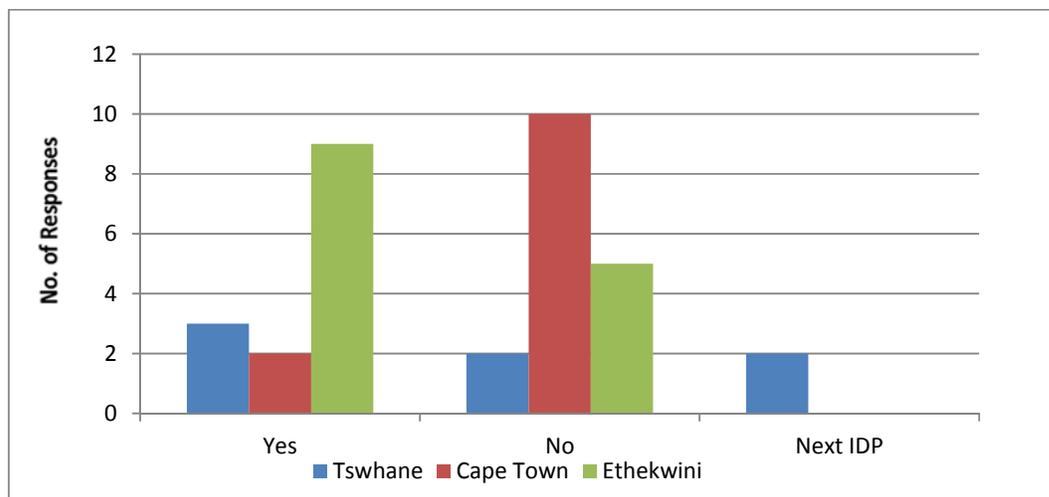


Figure 4.6 municipalities that have included biodiversity management into their IDP's, those that have not included it and those that have identified the need to include it in the next IDP review.

According to the Municipal Systems Act (Act 32 of 2000), which is the Act that provides the framework for local government functioning, including integrated development planning, community participation and service delivery, all municipalities are required to develop an Integrated Development Plan (IDP). This is the principal planning instrument that guides and informs all planning and developments in a municipality. Environmental sustainability is an integral part of the process of developing municipal IDPs, which must include all relevant biodiversity plans, as well as invasive species monitoring, evaluation and control plans. Each municipal IDP is supported by a Spatial Development Framework (SDF), which maps the spatial representations of desired patterns of land-use, directions of growth, urban edges, special development areas and conservation worthy areas.

Local governments are often highly dependent on the services provided by biodiversity and ecosystem services (ICLEI, 2010). They are directly responsible for the provision of essential services, such as, a safe and healthy living environment, as well as social and economic development as many communities depend directly on biodiversity for their livelihoods (ICLEI, 2010). The importance of biodiversity's role in ensuring successful essential service delivery at local government level cannot be stressed enough. Food security, clean water provision, healthy natural environments are all essential services that are provided for, by the municipalities and are all dependent on the state of biodiversity in that municipality. It is for this reason; protective measures for biodiversity should have a place in every IDP not only in these three municipalities but every municipality to ensure a sustainable future for its people and environment. The integration of biodiversity, sustainable development and human

communities is most relevant at the scale of local government as according to Patel, (2005), local government are champions in our country's fight for sustainable development and being the sphere closest to the people, this burden falls heavily upon their poorly resourced shoulders.

According to Meyer, (2013), environmental and spatial planning legislation gives guidance on the supporting environmental layers that must be incorporated into the SDF, thus providing an excellent opportunity for biodiversity to be incorporated into development planning. Integrating the projects of civil society organisations directly into municipal IDPs can help to ensure that they contribute to essential service delivery, whilst achieving common objectives of biodiversity conservation, maintaining ecosystem integrity and improved human wellbeing (Meyer, 2013). However, the results of this study revealed that biodiversity management had not been incorporated in the IDP's of two of the three selected Metropolitan Municipalities.

4.2.2. Policy Instrument contributing to biodiversity management at the local government level

Figure 4.7 displays the three most frequently used biodiversity management tools revealed by the questionnaire survey. The Open Space framework, most commonly used by eThekweni Municipality (Figure 4.7), identifies the importance of green spaces in the strategic planning of cities (eThekweni, 2013). The Bioregional plans identify Critical Biodiversity Areas (CBAs) in the region they are mapping for conservation purposes (CoT Bioregional Plan, 2016) The Biodiversity Management Plan (BMP) makes a number of key recommendations as to how the city or implementing agency intends to protect identified critical biodiversity (DEA, 2008). Based on the responses from the questionnaires the BMPs were most commonly used by the CoT and CoCT.

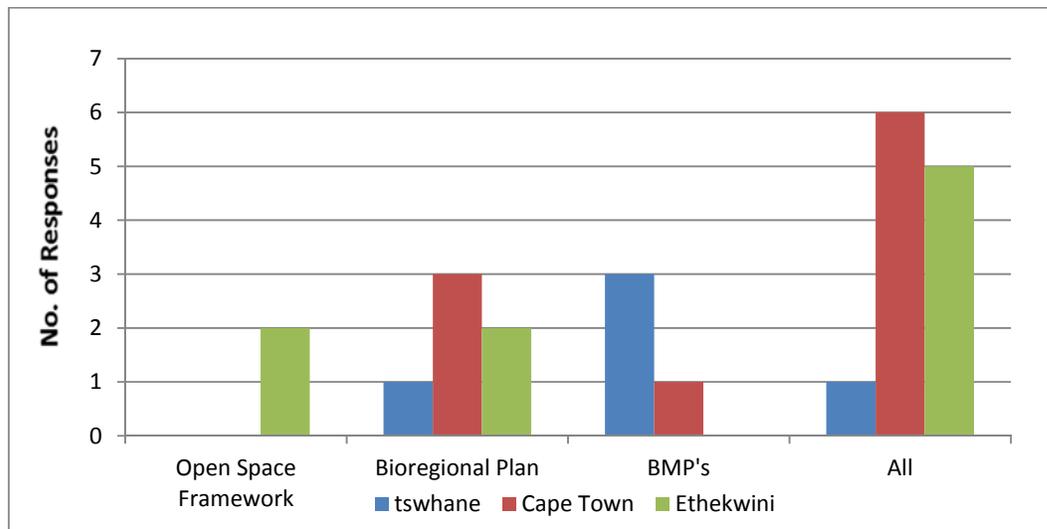


Figure 4.7: Biodiversity Management tools used most commonly by the Municipalities.

Based on the responses from the questionnaires, a further investigation was carried out on past and existing IDPs of the three metropolitan municipalities. This investigation has brought to light the fact that eThekweni Municipality has included environmental concerns into their IDP since the democratic elections of 1994. This includes Open Space frameworks (identifies green open spaces or areas of biodiversity importance within municipal boundaries), Environmental Management Plans for the City and a Climate Change Mitigation Plan. While the focus on biodiversity specifically was not explicit, ecosystems and species of concern were being identified and protected by the city’s Environmental Management Department.

Further research into past IDPs and from the information received from interviews and questionnaires of the three municipalities have indicated that, in contrast to eThekweni Municipality’s IDP history, is that of the City of Cape Town and the City of Tshwane. While the CoCT is now known to be one the largest global biodiversity hotspots, it didn’t always consider its natural environment, more specifically its biodiversity, as essential for protection (EADP2/2013). Past IDP’s for the CoCT have indicated that city officials considered water protection, waste management and climate change strategies as appropriate environmental management for the city (CoCt IDP, 2012). As a result the CoCT’s incredible biodiversity landscapes are in desperate need of protection in today’s world. On the other hand the CoT only mention biodiversity in reference to the NDP’s outlook on the importance of biodiversity to the health and wellbeing of the country and the in the city’s resilience programme (CoT, 2016). Both of these municipalities have in no way legally protected their biodiversity in their five year Integrated Development Plans, which is according the Local Government Green

Paper, the mini-constitution for local government process and strategy.

According to Wessels, (2003), the key to effective and efficient environmental governance is the harmonisation of good governance tools along with the coordination between the different spheres of government. If there is coordination between these governance tools which may include the formulisation of policies, strategies, guidelines, procedures, legislation, regulations and by-laws, only then may good environmental governance and co-operative governance be achieved amongst the different spheres of governance.

In summary, the absence of biodiversity management was made revealed in both the CoT and CoCT, with only the CoT indicating its inclusion in the city’s next IDP review. Out of the three municipalities’ only eThekweni Municipality had indicated the consideration of biodiversity imperatives into the IDP. While all three municipalities did indicate the frequent use of biodiversity management tools such as the Open Space Frameworks and Biodiversity Management Plans both the CoT and the CoCT had justified the exclusion of biodiversity in their IDPs by the significant use of these biodiversity management tools. Including environmental protection into the IDPs not only ensure legal protection for the city’s environment but it also guarantees clean and safe provision of essential services to communities in a sustainable manner, and to promote a safe and healthy environment for all that reside in that city, that is also binding on that municipality in terms of legislation.

4.3 National Document Review

4.3.1 South African Environmental Legislative Reform

Legislative documents and published literature relating to biodiversity management in South Africa were reviewed to determine legislative transformation of the environmental agenda in South Africa. Table 4.1 summarises the review findings.

| Name | Description | Impact to Biodiversity Management |
|--|---|---|
| Environmental Conservation Act 73 of 1989 (ECA) | ECA was developed in 1989 in response to the lack of environmental in South Africa | This act displayed several short comings in the way it facilitated environmental protection in the Country. This will be discussed further in section 4.3.1 of this study. |
| The Constitution of the Republic of South Africa, (Act No.108 of | The Constitution of the Republic of South Africa, 1996, best described as the supreme law of the land was approved by the | Disseminates powers and functions to the government spheres of South Africa. Introduced Chapter 24 on the importance of the natural environment to human wellbeing and sustainable development of the country |

| | | |
|--|---|---|
| 1996) | Constitutional Court (CC) on 4 December 1996 and took effect on 4 February 1997. | Local Government Chapter 7 Section 156 focuses on Powers and functions of municipalities. |
| Green Paper on Environmental Management (1996) | This paper had a major part to play in meeting the development needs of people in the new democratic South Africa. At the time of its development the country was undergoing a major process of socio-economic transformation as it attempts to correct the negative impacts caused by previous political regimes | This paper identified the many areas which the government needed to address shortfall in its environmental policy. These include, amongst others: improved pollution and waste control, focusing on people and their participation in environmental decision making, developing an improved system of governance, and ensuring that environmental decision making employs an integrated and macroeconomic perspective. However it lacked the mention of biodiversity imperatives and its integration at the local level |
| White Paper on Environmental Management Policy (1998) | This paper was developed in response to the Rio Convention of 1992. | This paper recognized that that development and environmental issues and goals are one and; that sustainable development depends on good environmental management just as good environmental management depends on sustainable development It set out the powers and responsibilities of the different spheres and agencies of government and the regulatory approach to environmental management. It was the prelude to the National Environmental Management Act (Act No.107 of 1998). |
| National Environmental Management Act (Act No.107 of 1998). (NEMA) | NEMA is the overarching environmental framework legislation which provides for environmental management in South Africa. | The Environmental Management Act provides for the protection of the environment through: principles for decision-making on matters affecting the environment Promoting the conservation and sustainable use of biodiversity Integrated environmental Management procedures for coordinating environmental functions exercised by organs of state provide for co-operative environmental governance by establishing Institutions that will promote co-operative governance |
| Municipal Systems Act (Act 32 of 2000) | It focus is to provide for the core principles, mechanisms and processes that are necessary to enable municipalities to move progressively towards the social and economic upliftment of local communities, and ensure universal access to essential services that are affordable to all | The Municipal Systems Act (Act 32 of 2000) enables integrated development at the local level. However the local government lacks the mandate biodiversity for biodiversity management in municipalities. |

| | | |
|--|---|--|
| National Environmental Management: Biodiversity Act (Act 10 of 2004) (NEMBA) | It is the primary act developed for biodiversity conservation in South Africa | NEMBA operates at a national scale, However it contains several provisions for biodiversity at the provincial level but NOT the local level. There is a need to purge this legislation of the lack of integration of biodiversity management in the local government sphere. |
|--|---|--|

After reviewing the documents displayed in tale 4.1 on the transformation of environmental legislation development in South Africa, several insights into why environmental management has taken the shape and form it has today. The first insight included the absences of legal environmental policy and procedures in South Africa, post 1989, which were attributed to the lack of political will and awareness of the need to consider environmental issues (Glazewski, 1991; Sowman et al., 1995; Sowman, 2002). This was seen as a direct result of an authoritarian system of government, a lack of accountability by decision-makers, inadequate public participation, inefficient administrative structures, legislative inadequacies, as well as a lack of environmental expertise and financial resources (Cock 1991). This led to the development of the Environmental Conservation Act 73 of 1989 (ECA).

Prior to this Act, South Africa had been very slow to develop the correct procedures appropriate to its environmental circumstances (Sowman et al., 1995). This development was partly triggered by the enactment of the National Environmental Policy Act of 1970 (NEPA) in the United States, which was recognized worldwide as the formal inception of environmental impact assessment (EIA), a procedure for identifying and investigating the environmental consequences of development, as an aid to decision-making (Sowman et al., 1995). Environmental protection gained traction with its inclusion into the Constitution of South Africa, in section 24 stating that *“everyone has the right—to an environment that is not harmful to their health or well-being; and to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that— prevent pollution and ecological degradation; promote conservation; and secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.”* (Middleton et al., 2011:6)

However, there was still a widespread notion that environmental issues in South Africa continued to be a low priority and being narrowly defined as relating mainly to nature conservation (Patel, 2005). It was identified that this Act only provided comprehensive protection to the immediate environment. It suggested nothing to that of the people or

government, and its protection was only afforded to a select environment (Snowman et al., 1995). The Act did not provide the holistic effect of Section 24 of the Constitution as previously envisioned (Sowman et al., 1995; Sowman, 2002). This was reflected by its failure to integrate environmental concerns into economic planning and decision making at all levels in society. Sustainable development, effective integrated environmental planning and management were seriously obstructed and environmental processes such as the EIAs were being blamed for holding up development (Patel, 2005; Field, 2006).

After these legislative developments, there was a lack of support for environmental issues due to it being very low on the political agenda and seen as an obstacle to development of the country (Patel, 2005). It was only during the 90's that a more integrated, participatory approach to environmental concerns began slowly making their way toward the central political arena (DEAT, 1997a). In 1995, South Africa became signed and ratified the United Nations Convention on Biological Diversity (CBD) (Wynberg, 2002). During this time, the then Deputy Minister for Environmental Affairs and Tourism, Major General Bantu Holomisa, identified the urgent need for a new and more robust national environmental policy in South Africa. Together with the Committee of Ministers and Members of the Executive Councils: Environment and Nature Conservation (MINMEC) he convened a National Consultative Conference to launch the new policy development process (DEAT, 1998a).

Research for the new policy identified major gaps in current South African legislation (DEAT, 1997a). The research process identified a wide range of environmental concerns affecting both people and procedures. These gaps include public exclusion, environmental governance, lack of capacity and access to information. South Africa faced enormous challenges in addressing these issues (DEAT, 1998a). Not only does the policy have to solve many problems created by Apartheid era, but it also had to meet the future needs of all the people in the country through a system that will be economically and environmentally sustainable for future generations as set out in section 24 of the Constitution (DEAT, 1998a).

In early 1996 the discussion document went out for public comment in an effort to bridge the gap of public exclusion and access to information and to allow input from those interested or affected by issues concerning the conservation and sustainable use of biodiversity in South Africa (DEAT, 1997b). Later in 1996, the Green Paper on Environmental Management was published and in February 1997 the White Paper on Environmental Management Policy was officially published. An immediate step that followed this policy was the development of a

detailed implementation strategy and action plan, which included a full costing for implementation. This was known as the National Environmental Strategic Action Plan (NESAP) (DEAT, 1997b).

Out of this long and extensive consultative national environmental policy process, grew the new National Environmental Management Act 107 of 1998 which, officially came into effect on the 29th January 1999 (Kotze, 2003). According to its long title NEMA had essentially promised that it would, " *provide for co-operative environmental governance by establishing principles for decision-making on matters that effect the environment, institutions that will promote co-operative governance and procedures for co-ordinating environmental functions exercised by organs of the state, to provide for certain aspects of the administration and enforcement of other environmental management laws; and to provide for matters connected therewith.*" (DEAT, 1998a:2). According to Kotze (2003), the new national environmental policy was to play a crucial role in setting the scene for the broad changes in direction and approach that government needs to take to ensure that South Africa's future development is ecologically sustainable and equitable.

Until recently, South Africa has developed an impressive network of national parks, game reserves, botanical gardens and environmental legislation and policies that are unequalled in Africa and globally (Burgess, 2012). South Africa has cultivated its image as a leading state in its work on biodiversity conservation and management with policies and tools that are mirrored on every continent (Burgess, 2012). Since the advent of the NEMA, there has been a fundamental shift of environmental sustainability within the country and strengthening its environmental position globally (Sowman, 2002; Wynberg, 2002). The new mandate developed from being focused on nature conservation, to promoting a broad, integrated environmental management approach. It takes into account the need to balance social, economic and environmental issues in the country so as to advance sustainable development (Kotze, 2003). Since its enactment the NEMA has undergone several amendments to keep up with a constantly changing natural and socio-economic environment (Kotze, 2003).

Chapter 3 of the NEMA 107 of 1998 primarily focuses procedures for Corporate Governance. Section 16(4) (a) and (b) of Chapter 3 encourages municipalities to support their relevant provincial Environmental Implementation Plans (EIPs) (Paschke and Glazewski, 2006). However the general environmental management function of municipalities entails the provision healthy environment conducive to a high quality of life with access to recreational

facilities, clean air and water, as well as ample functional open space. There is no mandate specifically for biodiversity management at the local level within NEMA (Du Plessis, 2015b). However, when the Constitution is read with section 2(1)(c) and (e) of NEMA, when exercising any of its constitutional functions, a municipality must take into account the principles set out in section 2 of NEMA (Du Plessis, 2015b). This implies that even though there is no legal biodiversity mandate for local government, they are required in terms of NEMA Chapter 2 and the Constitution of South Africa, to ensure the country's biodiversity legislations is adhered to (Du Plessis, 2015b).

The role of municipalities in respect of environmental management is further enhanced in section 152 of the Constitution, specifically Section 152(d) of the Constitution which requires municipalities to, amongst other things “*to ensure the provision of services to communities in a sustainable manner and to promote a safe and healthy environment*” (Paddock et al., 2011:384). According to SALGA, (2015) Chapter 5 of the Local Government: Municipal Systems Act 32 of 2000, focuses on integrated development planning, gives further effect to these constitutional imperatives, by stating that municipalities have the duty to strive to ensure that municipal services are provided in an environmentally sustainable manner. and recognises in section 23(1) (c) that there is an obligation on the municipality, “together with other organs of state to contribute to the progressive realisation of the fundamental rights contained in section 24 of the Constitution”, (SALGA, 2015:3) which also places a positive obligation on municipalities with regard to the environmental rights which are the subject of section 24 of the Constitution (SALGA, 2015).

To summarise, South Africa's environmental legislative transformation has been a long and arduous journey that will continue to change so long as the threats to its natural environment are present and increasing. To date the South African Legislative Framework remains among the best globally, however it is not without its shortfalls. From the Constitution, to the ECA, the NEMA and the EIAs there is much to be learnt from these legislative processes and much room for improvement.

4.3.2 Environmental Management Legislative Challenges at the Local Level

South Africa's legislative and institutional framework for the management and protection of the natural environment is a complicated and fragmented set of responsibilities that is unequally

shared across national government departments and the three spheres of government. The findings of this study supplements the findings of Middleton et al., (2011) by identifying further complexities in the institutional arrangements that differ across provincial level, which eventually fizzles down to the local level, such as appointed officials, elected politicians and civil society.

The mandates of the three spheres of government in South Africa are set out in the Constitution. In accordance with the Constitution, all organs of state, including municipalities, are required to take legislative and other measures to give effect to Section 24 (Middleton et al., 2011; Du Plessis, 2015a). However, the development of these legislative instruments, together with the mandates given to the spheres of government in the Constitution, has also resulted in some confusion as to the roles and responsibilities of local government in relation to environmental management. This is due to fact that according to NEMA and the Constitution, the environment is seen as a concurrent function of national and provincial government with local government playing a minor supporting function (Middleton et al., 2011; Du Plessis, 2015a).

Given the inclusion of environmental rights into the Constitution, specifically the Section 24, the role of local government in biodiversity management remains restricted due to the lack of a biodiversity mandate at the local level (Du Plessis, 2015a). According to the Constitution, the only biodiversity management responsibilities imposed on local government is narrowed to the administration of municipal parks and beaches (South Africa, 1996). These findings concur with several similar statements made during both the interview and questionnaire processes, as; it is because of this legal restriction, that local government officials are unable to fulfil their duties in biodiversity management appropriately.

Since the democratic elections there has been a significant improvement in environmental laws in South Africa, with the introduction of NEMA and the EIA regulations. However, post 1994 also brought with it, a suite of new challenges for environmental management at the local level. Political interference saw the environmental agenda change pre and post democratic elections. According to an article by P Steyn published in the political science book by Oosthoek and Gills, 2008, prior to the 1994 elections a Reconstruction and Development Policy was developed that identified the natural environment as the key to solving poverty reduction issues, improvement of living conditions and access to essential services such as water and food. However, once the ANC had won the elections the party had left their environmental ambitions behind them and even omitted the environmental section from the final RDP report

(Oosthoek and Gills, 2008).

According to Oosthoek and Gills, 2008, Environmental Management in South Africa was left to take its own path. However, the new environmental legislation was soon viewed as an obstruction to the developmental agenda shaping the country. It was because of this new environmental agenda, that the local government was handed the weakest mandates and granted the least power in government (Steyn, 2005). It had to make way for what was seen a political priorities such as job creation, the economy, poverty alleviation, health and infrastructure development. This conflict of interest that has resonated from this double role, has had an impact on industries such as Trade, Mining and infrastructure which, to this day have not been resolved (Steyn, 2005). Because municipalities are the closest point of contact between the people and government, it became their responsibility to ensure that these priority mandates were successfully implemented, even if it was at the cost of the natural environment (Duplessis, 2015b). The environment went from being part of the solution pre-elections to part of the problem post-elections.

In summary, emerging from this review are the challenges that has shaped the development of environmental legislative framework from national down to the local level. Despite the development of a robust national legislative framework, due to concurrent competencies of the environment still being limited to national and provincial governments by the Constitution, limits the true potential of what the South African environmental framework can achieve if it was successfully implemented by all spheres of government. The fragmented implementation of environmental legislation in South Africa has seen biodiversity management almost absent in local government, which is the government sphere that is known to make the most difference on the ground.

4.4. International law relating to biodiversity management at local level

The following section presents a review of defining international environmental law that has impacted on biodiversity management at the local government level in South Africa. It also discusses the importance of the integration of biodiversity management at the local government level and the significance this has to achieving sustainable development in South Africa.

4.4.1 Defining moments in international law: where it started?

Table 4.2: International law relating to biodiversity management at local level

| Name | Description | Outcomes of conference related to study |
|---|--|--|
| <p>United Nations Conference on Environment and Development (UNCED) 1992. Also known as the Rio Earth Summit.</p> | <p>The focus of this conference was the state of the global environment and the relationship between economics, science and the environment in a political context. The conference concluded with the Earth Summit. It introduced the concept of Sustainable Development to world.</p> | <p>The two main documents to come out of this conference were Agenda 21 and the Declaration on Environment and Development (also Referred to as the Rio Declaration). The Rio Declaration gave rise to several conventions such as the: UN Framework Convention on Climate Change – UNFCCC and the UN Convention on Biological Diversity – UNCBD. These two conventions gave rise to the National Environmental Framework that governs South Africa today.</p> <p>Agenda 21- Agenda 21 is a comprehensive plan of action to be taken globally, nationally and locally by organizations of the United Nations System, Governments, and Major Groups in every area in which humans impact on the environment. Chapter 15 focused on bring out the goals of the conservation of biological diversity. It highlighted the importance of conserving biodiversity for sustainable development. Chapter 28 – focused on the role of local government in sustainable development initiatives. The inclusion of this chapter gave rise to single largest movement of local government towards one common goal. This chapter also gave rise to the Local Agenda 21 document- which is a formal commitment by municipalities to undertake a formal commitment for a broadly based participatory policy and planning processes that aims to achieve sustainable development in their countries. These documents were milestones for international environmental law and detailed many principles, such as public participation, prior assessment of environmental impacts and precaution, which have since been included in many binding and non-binding international Instruments. The environmental policy and law reform in South Africa since 1994 were an effort to build upon this international trend of growth, equity and biodiversity conservation. The Rio Conference documents were responsible for the introduction of environmental imperatives at the local level, which is discussed further in section 4.4.1 of this study.</p> |
| <p>World Summit on Sustainable Development</p> | <p>This summit focused on reaffirming the commitment to the</p> | <p>The outcome of this summit was critical to the study, because of the next phase of Local Agenda that was introduced. This was the shift from planning to</p> |

| | | |
|---|---|--|
| <p>(WSSD) 2002 and Local Action 21.</p> | <p>principles of the Rio Declaration and to ensure the continued implementation of Agenda 21. Commitment to accelerated Implementation of LA21.</p> | <p>implementation of LA21. South Africa was one the countries that had pledged their commitment to LA21 and as a result had to implement plans of action in municipalities across the country, with the main focus on reducing the loss of biodiversity by 2010.</p> |
| <p>Rio+20 Conference, the United Nations Conference on Sustainable Development (UNCSD) took place in Rio de Janeiro between the 20-22 June 2012, twenty years after the UNCED (United Nations Conference on Environment and Development),</p> | <p>The 2012 UN Conference on Sustainable Development, known as “Rio+20”, highlighted the international community’s commitment to foster sustainable development</p> | <p>This conference identified the inclusion of municipalities as critical in achieving sustainable development. It included Municipalities as one of the seven critical issues that need to be globally addressed in order for to achieve sustainable development to be successful. The Rio+20 also reinforced the significance of biodiversity conservation and management in achieving sustainable development. This was the first time at the global level that biodiversity imperatives were requested to be included into local planning initiatives, with the introduction of the document on the Green Economy There was also a strong call for effective environmental governance in the form of funding, partnerships, and capacity development that came of this summit.</p> |
| <p>Sustainable Development Agenda 2030</p> | <p>The Sustainable Development Agenda 2030 was endorsed by the UN General Assembly in 2015. It addresses key systemic barriers to sustainable development such as inequality, unsustainable consumption patterns, weak institutional capacity, and environmental degradation.</p> | <p>The The Sustainable Development Agenda 2030 forms an integral part of this this study as it included a goal that specifically focused on cities and how critical they are to the new sustainable agenda. The Agenda identifies cities as the arm of government that make the most recognisable impact on sustainable development. The Agenda also included two goals 14 and 15 respectively that focus specifically on enhancing biodiversity on sea and land for sustainable development. Other goals indirectly related to this study include Climate Change (G13), Poverty Eradication (G1), Water (G6) and forming partnerships to take forward the agenda (G17)</p> |
| <p>The Habitat III – New Urban Agenda 2016</p> | <p>Focused on challenges that an increasing population in cities will pose to sustainable development. It included social and economic exclusion, inequalities and environmental degradation as a result of unsustainable urbanization.</p> | <p>Habitat III is significant to this study because it was the first time in the history of the conference that natural environment concerns were put on the agenda. It focused on the increasing conflict between human development and environmental in urban areas.</p> |

Table 4.2 lists defining moments in international law that has shaped the development of biodiversity management and local government involvement globally and nationally. The Rio Earth Summit was the first defining international event that laid the path for Local Authorities in South Africa and Globally (Du Plessis, 2015a; Middleton et al, 2011; Wynberg, 2002). It focused on developing a global framework for promoting environmentally sound development at a time when the world was desperate for good environmental government and healthy living conditions that would no longer be at the cost of their natural environment. The Rio Earth Summit was held June 3 – 14, 1992 in Rio de Janeiro, Brazil (Hens, 2005). It was at this summit the concept of Sustainable Development was officially born into the world, through the acceptance of the Rio Declaration on Environment and Development and Agenda 21 (Ling, 2012). This Summit also saw the outcome of two major International Conventions namely, the United Nations Framework Convention on Climate Change (UNFCCC), and the United Nations Convention on Biological Diversity (CBD), both which were ratified by South Africa in the years after the Rio Summit. It was arguably the most successful Earth Summit marking it a milestone in Environmental Law on a global scale (LAB, 2010).

4.4.1.1. The Rio Declaration

The Rio Declaration resulted in a set of 27 non-binding principles, committing governments to ensure environmental protection, as well as economic growth that is respectful to the environment, human rights, and development needs of poor (UN, 1992). These principles include, (Principle 1); the importance of the environment for current and future generations and its equal footing with development (Principle 7), Environmental issues are best handled with participation of all concerned citizens, at the relevant levels (Principle 10), which is where Local Government participation in the sustainable development agenda was included. It also included the two critical economic principles of polluter pays (Principle 16) and precautionary approach (Principle 15).

The Declaration requested Member states to strengthen or develop adequate legislative instruments to address environmental issues, according to these 27 principles (UN, 2011:68). However it was Principle 10” *Environmental issues are best handled with the participation of all concerned citizens, at the relevant level.....*” that was considered to have laid the foundation of a healthy governance system that ensure a that the concept of sustainable development and environmental protection was accepted not just by government but by civil society, communities and NGO’s alike (Collins, 2014).

Principle 10 was the first globally established commitment that recognised human rights, by ensuring that all individuals, communities and government are able to access information on environmental issues at the local, national and international scale, they are involved in the decision-making process at all levels and they have a right to a free and fair justice system that will enable them to hold government responsible for impacts their natural environment (Collins, 2014). Since the Rio Summit, over 80 Countries including South Africa have improved their people's access to information in matters concerning the environment (UN, 2011). This principle ties up with several of the principles set out in section 2 of the NEMA 107 of 1998, Such as the "*Polluter Pays, Duty of Care, and Public Participation.*" This Principle recognises that it is only by protecting the natural environment, can long-term socio-economic progress be seen and it is further enhanced through the establishment of equitable global partnerships between governments and key actors of civil society and the business sector (Glazweski and Posnik, 2001).

Another principle of the Rio declaration that directly affects local environmental policies is the Principle 15 that states "*Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation*" (UN, 2011:93). This principle gave rise to the NEMAs Precautionary principle which is the key component of environmental decision-making practice at all levels in South Africa (Barnard, 2012). It places the burden of proof on decision makers to the extent that responsibility falls on the decision-maker to show that a decision will not result in harm to the environment (Barnard, 2012). The precautionary principle, proposed as a new standard in environmental decision making, that has four central components: taking preventive action in the face of uncertainty; shifting the burden of proof to the proponents of an activity; exploring a wide range of alternatives to possibly harmful actions; and increasing public participation in decision making (Kriebel *et al.*, 2001).

4.4.1.2 Agenda 21

Table 4.2 has identified Agenda 21 as a non-binding set of 40 principles and was the second of the two documents to come out of the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro in 1992 (UN, 2012). It remains till today, the most comprehensive document on sustainable development consisting of 40 chapters and just over

200 pages (UN, 2012). It became known as the international blueprint for sustainable development for the 21st century. It depicted the important role that countries play in the implementation of the plan to achieve sustainable development in the 21st Century, with the involvement of national and local governments (du Plessis 2002). Agenda 21 was a plan of action devised to deal with some of the fundamental problems of environmental degradation and to provide support to the developing world in its attempt to address global sustainability issues. It made it clear that in order for global sustainability to be achieved, we can no longer think of environment and economic and social development as isolated fields (Keating, 1992).

Chapters one to eight of Agenda 21 reflect on the sustainable development challenges facing the global population and how they would need to adapt in order to deal with prevailing social and economic structures and institutions (du Plessis, 2002). Some of these challenges include; combating poverty; changing consumption patterns; protecting and promoting basic human health and developing sustainable human settlements (Keating, 1992). Consequently, chapters one to eight essentially, call on governments, to create sustainable development strategies to integrate social and environmental policies at all levels of the government, including economic measures and the budget. Chapter 15 which gave rise to the Convention on Biological Diversity (CBD) by recognizing the need to conserve and maintain genes, species, and ecosystems, in the face of development (du Plessis, 2002).

Chapters 23 to 32 focus on how people are to be mobilized and empowered for their various roles in sustainable development (du Plessis, 2002). This includes; chapters 24 and 25 that focus on women and children for sustainable development, chapter 26 focusing on strengthening the role of indigenous people for sustainable and chapter 28 that focuses on Local Authorities role in achieving sustainable development *“Calls on local authorities, by 1996, to promote a harmony in their local populations on a local Agenda 21;” This agreement would help them reshape local programs, policies, laws, and regulations to achieve desired objectives. The process of consultation would increase people's awareness of sustainable development issues.*” (Rio Declaration, 1992- Pg 15)

Given that so many of the problems and solutions being addressed by Agenda 21 have their roots in local activities, the participation and cooperation of local authorities will be a

determining factor in fulfilling its objectives (du Plessis, 2002). As part of the implementation plan for Agenda 21 Local authorities must construct, operate and maintain economic, social and environmental infrastructure, oversee planning processes, establish local environmental policies and regulations, and assist in implementing national and local environmental policies, in their efforts to achieve sustainable development at the local level (Roberts and Diederichs, 2002). As the level of governance closest to the people, the local government plays a vital role in educating, mobilizing and responding to the public to promote environmental protection and ultimately sustainable development (Roberts and Diederichs, 2002).

Between 1997 and 2000 the International Council for Local Environmental Initiatives (ICLEI) developed the Charters project which was aimed at establishing partnerships between local governments in developed and developing countries to assist each other in the implementation of their LA21 action plans (UN, 2002). Six African countries participated in the project and South Africa was one of them. Support was provided in the form of regional training and technical assistance programs and the creation of a global monitoring and reporting system (UN, 2002). Between local governments the assistance programs were linked through sustainable development agreements or Local Agenda 21 charters. A participatory, multi-stakeholder process to achieve the goals of Agenda 21 at the local level through the preparation and implementation of a long-term, strategic plan that addresses priority local sustainable development concerns. (UN, 2002)

Local Agenda 21 was the introduction of environmental concerns and sustainable development into the local government sphere in South Africa (du Plessis, 2015^a). South Africa's institutional response to the international LA21 mandate was a new and integrated approach to planning which responds to the needs of local communities. This was seen as a key to accomplishing reconstruction, overcoming the skewed spatial policies of the apartheid government, and addressing poverty (UNDP, 2002). By 2001 almost 80 percent of municipalities completed first round IDPs in South Africa. These IDPs addressed key development priorities and are an indication of how environmental and land development issues in need of attention. It is however important to note that while many municipalities did not formally adopt a Local Agenda 21, they did adopt the IDP that contained an integrated environmental programme, integrated local economic development programme, and integrated spatial development framework for each municipality in the country.

Since 1994, Durban (eThekweni Municipality) has been at the forefront of the Local Agenda 21 Programme as they became the first city in South Africa to accept the Local Agenda 21 mandate as a corporate responsibility (Roberts and Diederichs, 2002). Their programme of work has since helped keep sustainable development at the forefront of the city's agenda and has provided a mechanism through which local stakeholders can interact with local government around environmental management issues in the city (Roberts and Diederichs, 2002). However, Both the COT and COCT have failed to integrate the imperatives of LA21 into their policies and planning at the municipal level.

However, while the IDP's represent a significant move towards sustainability there were various challenges that need to be addressed in the implementation and review process. These challenges included capacity constraints, budget, and the lack of substantial political support and administrative power struggles that was critical to the successful implementation of IDPs. According to an OECD (2001) report, the Rio Summit failed to acquire financial assurances to support the implementation of Agenda 21. Many of the initiatives were to be funded by the countries themselves without any external support and over 90 % of issues mentioned in Agenda 21 remain without financial means for implementation (OECD, 2001). The only funding that was made available was for incremental costs of projects, only related to three conventions (UNFCCC, UNCBD and UNCCD). The main reason why Rio failed to implement financial instruments for the implementation of Agenda 21 was the fact that the conference was seen as one for the environment, which even at that time seemed insignificant to many ministries (Roberts and Diederichs, 2002).

In the UN, (2012) review of the implementation of Agenda 21 since its 1992 inception there was an acknowledgement of failure in the methods used to implement this plan of action globally. LA21 recognised that in order to move forward successfully with Agenda 21 it required an institutional framework for sustainable development based on multi-level governance that needs to be vertically interconnected and supported from the top-down. It identified the need for local governments to be given a more prominent role in country and global processes. Lastly the review also stated that given the responsibility of the local government to its people, it should have the same legalities as its national government, only then will real positive change be seen and felt at the local level.

4.4.1.3. Johannesburg Summit on Sustainable Development

On a larger scale, the shift of emphasis from human development to sustainable development seen in the Rio Declaration continued 10 years later at the 2002 UN World Summit on Sustainable Development held in Johannesburg, South Africa (WSSD, 2002). The Johannesburg Declaration on Sustainable Development made slight reference to ‘human dignity’, while its main focus remained on sustainable development. Despite the positive effects in the results of UNCED, governments have not been implementing the action plans that were produced in the past conferences (Pisiano *et al.*, 2012). As a result, the World Summit on Sustainable Development (WSSD) in Johannesburg in 2002 was convened in order to strengthen the global commitment to sustainable development. According to Thornton and Beckwith, 2004 both Principles 10 and 15 of the Rio Declaration, were said to be of particular importance at Johannesburg Summit with the development of several high ranking reports focusing on Human Rights and Environmental Development. This Conference saw the remnants of several Rio Declaration outcomes rear their heads again.

The hypothetical bubble surrounding The Johannesburg Summit filled with the expectations of next generation environmental agreements and declarations soon burst into failure and disappointment of paramount proportions (Galizzi, 2005). A summit that was originally convened to address issues on the environment and sustainable development soon turned its focus to social and economic development and focused on these issues mainly in the developing countries (Galizzi, 2005). The Summit failed to achieve its target of reigniting the flame towards environmental sustainability, and rather it produced weak outcomes and declarations that mirrored those of the Rio and Stockholm Declarations. However, Pisiano *et al.*, (2012) did identify one positive outcome from the summit, which was the inclusion of poverty alleviation and eradication as an important step towards integrating social, economic and environmental aspects to achieve sustainable development (Pisiano *et al.*, 2012).

4.4.1.4. Rio+20

Commonly known as the Rio+20 Conference, the United Nations Conference on Sustainable Development (UNCSD) took place in Rio de Janeiro between the 20-22 June 2012, twenty years after the UNCED (United Nations Conference on Environment and Development), which was also hosted in Rio in 1992 (Pisiano *et al.*, 2012). The conference began on the notion and findings that the objectives of the 1992 Rio conference were not achieved. This after the U.N.’s

fifth Global Environmental Outlook, published in June 2012, found significant progress toward only four of 90 internationally-agreed goals associated with sustainable development (Leggett and Carter, 2012). The Rio+20 proved to be an epic failure of note, more so even than the Johannesburg Summit. The lack of commitment of time and financing by several countries including the major states, made outcomes from this conference weak and poorly supported (Pisano *et al.*, 2012).

Nevertheless, despite this conference being branded a failure by numerous states, NGO's and media, it did produce two critical documents. A Green Economy document that focused on sustainable development and poverty eradication with the aid of biodiversity and ecosystem services and a framework for sustainable development that built on decisions that were taken at the Johannesburg 2002 Summit. In addition to the two documents, seven critical issues were recognised and given attention during the conference. These were jobs, energy, cities, food, water, oceans, and disasters.

The Conference acknowledged "At their best, cities have enabled people to advance socially and economically. The challenges cities face should be overcome in ways that allow them to continue to thrive and grow, while improving the natural resource use and reducing pollution and poverty." (Pisano *et al.*, 2012:20). The Rio+20 finally recognised the unsung hero of sustainable development in the 21st century. In the outcome document of the Rio+20 cities are recognised for being hubs of innovation and accelerating sustainable growth. There is a growing understanding that local government have an important role in sustainable development and the recognition of this role needs to be acknowledged at national and international level. (Roehrl, 2012)

More than fifty per cent of the world's populations now live in cities and up to seventy five percent of the Global GDP is produced in cities. Cities are cooperating internationally without borders, without customs, without military forces (Roehrl, 2012). They can address the issues of the future without the global power play that is currently taking place at an intergovernmental level. The negative impacts of this unsustainable relationship between cities and the general state of the environment culminates in a significant deterioration in the quality of life of urban dwellers and the natural environment alike.

4.4.2 Where is it going?

4.4.2.1 The 2030 Sustainable Development Agenda

The basic challenge of sustainable environmental management is to take actions which does not exceed the threshold for harm to a local environment and which does not limit the use of environmental resources in the future (Kelly, 2010). According to Sood (2009) humans and their needs are at the centre of the sustainability and conservation discourse with less emphasis on nonhuman species. The proposal of ecological sustainability as a new paradigm shift to maintain a stable pattern of various forces acting from within or outside the ecosystem so as to maintain a healthy environment was seen as the best resolution to achieving sustainable development, according to Sood (2009). After The Millennium Development Goals fell significantly short of reaching its targets in the given time frame of 15 years, goals such as, Goal 7, which states that: *Environmental sustainability means using the natural resources wisely and protecting the complex ecosystems on which our survival depends*, required a make-over, such that the outcome was them some but with a new fresh and innovative approach (MDG, 2005:52; SACN, 2016).

In September 2015 the World's Leaders convened once again, to decide on the new global sustainable development agenda. The proposed Sustainable Development Goals (SDG) offer seeks improvements on the Millennium Development Goals (MDGs) (SACN, 2016). The SDG framework addresses key systemic barriers to sustainable development such as inequality, unsustainable consumption patterns, weak institutional capacity, and environmental degradation. The SDG framework consists of 17 goals with 169 targets and a time-frame of 15 years, which officially began in January 2016. The 17 goals offer a balance between the three dimensions of sustainable development social, economic and environmental sectors including a special focus on the institutional and governance aspects (UN, 2016a).

Since the 1992 Rio Declaration outcome on the Convention of Biological Diversity (CBD), the significance of biodiversity in contributing to success of the sustainable development was indisputable. Biodiversity importance was further embedded into the sustainable agenda by the addition of Goals 14 and 15 focusing specifically on Biodiversity in water and on land respectively. Pavan Sukdhev, the author of *The Economics of Ecosystems and Biodiversity* has said it time and time again that Biodiversity is the living fabric of life; we simply cannot survive without it (TEEB, 2008).

Goal 14: *Conserve and sustainably use the oceans, seas and marine resources for sustainable development*- SDG 14 is nothing short of ambitious, timely and is also backed by a substantial load of natural and social science (UN, 2016a:38). According a (2015) ICSU study oceans and coasts support about 75% of the global population and given that the ocean and seas cover 70% of the Earth's surface area, which is also the largest connected ecosystem, there is a growing dependency on the significant ecosystem services provided by these system. This includes the central role it plays in climate stability, oxygen generation, nutrient cycling, food production and coastal protection and it heavy human reliance for the transportation of goods; food through fisheries and aquaculture; and new uses such as the generation of renewable energy, mining of materials and tourism (ICSU, 2015).

Goal 15: *Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss* (UN, 2016a:40). Countless studies, publications, scientists and media have over the years stressed the importance of biodiversity to human wellbeing. But, biodiversity does more for the world than just making it look attractive (Wynberg, 2002,; LAB., 2010; Driver et al.,2011 Weitz et al., 2014; Boas et al, 2016,). By preserving biodiversity and ecological processes we enable the earth to shield itself and its inhabitants and by responding to disturbances and environmental change, such as land degradation, desertification, habitat loss and fragmentation, pollution, biological invasions, climate change or overexploitation (Reyers and McGeoch, 2007; Driver et al, 2011). Biodiversity conservation entails preserving and creating more resilient ecosystems, ensuring the current and future provision of ecosystem services, contributing to poverty alleviation and conserving these opportunities for current and future generations ((Reyers and McGeoch, 2007; LAB, 2010).

The implementation plan of the new Sustainable Agenda identified several gaps that resulted in the shortfalls of its predecessor, the MDG's (ICSU, 2015). It recognised that in order for these goals to be successful as whole they cannot be reached in isolation. An integrated implementation plan was the first step towards understanding the intelinkages between the goals (Boas et al, 2016; UN, 2016a). They understood that achieving sustainable development cannot happen if each goal is attended to in silos. The new SDGs reinvigorate the need and ability to bridge the gap between domestic foreign policies across the various sectors to create a system of goals that provide a great opportunity to cross-sectoral solutions, to identify trade-offs and synergies, and knock-on effects (Boas et al, 2016; UN, 2016a). Creating these linkages

in search of new and innovative solutions to earth's biggest paradoxes has become key step for governance of the sustainable development and the 2030 Agenda for Sustainable Development, as it recognises a more comprehensive, holistic and systemic approach to achieving a sustainable future for all (Boas et al, 2016; UN,2016a)

The most obvious linkages according to Weitz et al., (2014) and Boas et al, (2016) would be that of the climate-water-energy-and-food. These create potential for synergies and risks of trade-offs between policies aiming to address poverty reduction (SDG 1), food security (SDG 2), climate action (SDG 13), access to energy (SDG 7) and sustainable use of biodiversity and ecosystem services (SDG 14 and 15). But it also creates opportunity for innovation (SDG 9), reduced inequalities (SDG 10) and (SDG 17) the forming of partnerships (Weitz et al., 2014; Boas et al, 2016). These linkages recognise that by conserving the earth's natural resources and using them in a sustainable manner, would ultimately result in poverty alleviation, food security and action against the impacts felt by climate change, and in order for this to be achieved it would require innovative creations such as green industries and infrastructure, and this is made possible through the right partnerships and only then can we begin to reduce inequality on a global scale (Weitz et al., 2014; Boas et al, 2016).

However, the 21st century has seeing an incredible power shift with the rise of cities as, ultimate hub where, social, natural, economic pressures and most importantly opportunities for sustainable development merge (Cities Alliance,2015). Cities are becoming globally recognised as socio-economic and political power houses on national and world stages. It is for this reason the former UN Secretary General Mr Kofi Annan stated that "the battle for sustainable development will be won or lost in cities" (Loewe and Rippin, 2015). Cities are being recognized as the key to achieving major aspects of the 2030 Agenda, which is why cities were given SDG 11 –"Make cities and human settlements inclusive, safe, resilient and sustainable" (McGranahan et al., 2016:13). According to the UN (2016a) report on the SDGs implementation, today, more than half the world's population live in cities and by 2030, almost 70% of the world's population will be living in cities. This is due to the increased opportunities cities offer, in more efficient economies on many levels, including the provision of goods, jobs, services and transportation. It is why the role of local government has become so crucial in recent times. There is a dire need for comprehensive well informed planning and management and with that, cities can become hubs for innovation and growth and the ultimate drivers of sustainable development (SACN, 2016).

However the threats of modern urbanisation to the natural environment cannot be ignored (McGranahan and Satterthwaite 2014). McKinney 2008, found that urbanisation endangers more species and destroys more natural ecosystems than any other human activity globally (McKinney, 2008). This finding is consistent with the majority of the questionnaires and all of the interviews conducted for this study where it was identified that urbanisation in the form of land transformation was the major cause of biodiversity loss in the three cities. Which is why including Cities in the new sustainable development agenda is so crucial to improving biodiversity conservation at the local level on a global stage.

With the increase in populations in urban areas globally, the threats that urbanization pose to biodiversity and sustainable development are likely to increase 10 fold by 2030 (Satterthwaite, 2016). Impacts such as unsustainable infrastructure development, climate change adversity and unsustainable food consumption that increases the burden on natural systems for production, are all issues that are likely to continue unless the path of sustainable urbanisation is followed (McGranahan and Satterthwaite 2014). It is imperative that the problems posed by rapid urbanization are tackled, and the opportunities they present are harnessed for increased sustainable growth (McDonald et al., 2008). In order to achieve the goal of sustainable growth cities need to be repositioned as drivers of sustainable urbanisation by developing innovative and inclusive policies and strategies for sustainably maximizing social, economic and natural resources starting at the local level (McDonald et al., 2008)

4.4.2.2 The New Urban Agenda.



Figure 4.8: Timeline of defining international events that has shaped biodiversity conservation, sustainable development and local government relationships. (UN HABITAT III, 2016)

The United Nations Human Settlements Programme (UN-Habitat) started in 1976 with the UN Conference on Human Settlements in Vancouver, Canada, at a time when the governments first began seriously to perceive their cities as “emerging futures” in their own right (WCR, 2016). There were two major outcomes of this defining event. The first was the Vancouver Declaration, which urged both countries and the global community to commit to human settlements policies which would combine spatial planning with economic, social and scientific thinking in order to relieve the world of the impacts of uncontrolled urbanization within a framework of social justice (UN HABITAT, 2014). The second outcome, announced in a UN General Assembly document of December 1977, was the establishment of the United Nations Centre for Human Settlements UN Habitat (UN HABITAT, 2014).

The Second UN Conference on Human Settlements (Habitat II) was held twenty years later in June 1996 in Istanbul. It contributed to raising global awareness about urban and human settlements issues (UN, 1996; Sivaramakrishnan, 1999; WCR, 2016). Habitat II was the last in

the series of UN global conferences that took place in the 1990s, and marked for the first time in a UN conference the invitation of NGOs and civil society organizations to speak and participate in drafting the recommendations (Sivaramakrishnan,1999). Behind all the organization and planning that went into Habitat II were trends and changes that were demanding the world's attention. Habitat II was the institutional turning point in the Habitat agenda (Sivaramakrishnan, 1999; WCR, 2016).

The outcomes of this conference identified that, there is much that national Governments can do to enable local communities to find solutions on the ground. It identified local governments as the lead agencies that will determine success or failure in improving the human settlements condition and placed them on the front line in achieving the goals of Habitat II (UN, 1996; Turok, 2016; WCR, 2016). These goals included important issues of people-centred sustainable development, including sustained economic growth and equity, for which successful implementation requires action at all levels, particularly the local level. This included Strategies on social, economic, environmental, disaster reduction, population, disability and gender issues will have to be implemented in urban and rural areas (UN, 1996; Turok, 2016; WCR, 2016).

The Habitat III conference took place in Quito Ecuador in October 2016. It was the first Habitat conference to take place in the 21st Century where majority of the world's population, an estimated that 54.5%, are now living in urban areas (Turok, 2016). This made the decisions and outcomes of Habitat III even more critical from the global to local scale. Its mission was to determine and adopt the much anticipated “New Urban Agenda”, which was an action-oriented document that set global standards focused on sustainable urban development (WCR, 2016; UN, 2016^c). The plan was centered around three themes focused on the challenges that an increasing population in cities will pose to sustainable development. These themes included social and economic exclusion, inequalities and environmental degradation as a result of unsustainable urbanization. It was the first time in the history of the conference that the natural environment was put on the agenda (WCR, 2016; UN, 2016^b).

An 18 point plan outlining a global commitment to environmentally sustainable and resilient urban development was adopted. Topics of concern in this plan include; the social and ecological function of land, climate change, unsustainable consumption, slum upgrading,

energy efficiency and disaster risk management (UN, 2016^b). The New Urban Agenda identifies local governments as key players in this plan of action. By embedding sustainable urban development in local frameworks, and making it the responsibility of all levels of government, sustainable urban development can be reached (UN, 2016^c). It sets out a long-term, integrated and people- focused vision that has committed to empowering local governments in leading sustainable urban development and advocating for participatory approaches, with the introduction of the Role of Participatory and Bottom-Up Practices Participation Plan to all level of governments and community, in local decision-making, implementation and monitoring(UN, 2016^c; Satterthwaite, 2016)

Still fairly new in its time, The New Urban Agenda has been applauded for its focus on a strengthened role for local governments, its progressive view of equity, and its emphasis on robust sustainable urban planning principles (UN, 2016^c). However, there are also concerns that the Agenda has not sufficiently integrated the SDGs and the Paris Agreement into its plan, as it does not include actions for the implementation of these agreements in cities (Lucci, 2016). The fate of the world's cities will depend on how successfully implemented Habitat III's New Urban Agenda will be. It will require a shift towards proactive and innovative approaches to increase resilience and embraces modern concepts such as resource efficiency, inclusive economy and ecosystems-based approaches (Lucci, 2016). It therefore represents a great opportunity for local government to showcase its ability to lead from the front in achieving inclusive and sustainable urbanisation in building the cities now for the future (Cities Alliance, 2015).

In conclusion, the misunderstanding of the full extent and nature of the linkages between the environmental challenges and meeting global population demand stems from the misguided notion that ecological processes are infinite and that they respect national boundaries (Boas *et al*, 2016). Issues like climate change, water scarcity and food security are globally and environmentally linked. These critical links need to be recognized and understood to be able to capitalize on the opportunities presented by the natural environment and its role in ensuring a sustainable future for the world and our country (Boas *et al*, 2016). The ability of the human population to think globally scale and act locally also brings with it a new dimension of responsibility and challenges, not only to global resources but also to local fairness. South Africa, like many developing countries face great challenges in its pursuit of sustainable

development agenda (Cities Alliance, 2015). The country's need for economic prosperity comes at great risk to natural resources, despite its advanced biodiversity legislation and policies (SACN, 2016). This conflict stems from lack of integration between biodiversity and development that undermines the biodiversity sector's work within the broader socio-economic activities and priorities (SACN, 2016). South African cities are entering a critical phase at which the growth momentum presents an opportunity for accelerating national development and for creating the foundation of a sustainable urban future (SACN, 2016).

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

This chapter presents the summary of findings of the study, the conclusions derived from the findings of the investigations and recommendations for legislation and policy development as well as recommendations for future research.

5.1. Summary of Findings

The objective of this study was to investigate the influence of environmental governance on biodiversity management at the local government level in South Africa. The study investigated the difficulties experienced by officials at the local level in an effort to protect the biodiversity resources within their municipalities. The study revealed a lack of policy, processes and procedures for biodiversity management at the local level which could mean that the municipalities continue to lose biodiversity. Major findings from the study included; the lack of a biodiversity mandate, resources, capacity and skills for biodiversity management at the local level. On a global scale, the critical role that the local government spheres have in driving the environmental agenda is becoming increasingly clear. There is a global drive pushing for biodiversity conservation approaches to be integrated in all three government spheres especially given the influence local municipalities have in policy implementation. However, the results of this study have shown that this global realisation has not reached the South African Government as there is still no mandate for biodiversity management at the local level in the country. This has negative implications on biodiversity management and sustainable development at the local level.

5.2. Conclusions

The following conclusions were derived from this study:

- a. This study has identified that environmental governance plays a critical role in the implementation of policy, procedures and processes that impact on biodiversity management at the local level. It highlighted the challenges and constraints to the implementation of biodiversity imperatives at the local level. Institutional and governance challenges such as legislation, lack of capacity, skills and budgetary constraints tend to prevent effective implementation of policy. Despite a shift in

environmental governance in South Africa in recent years, the practical efforts to address the biodiversity conservation and management challenge are lagging behind.

- b. Biodiversity management policies and processes are yet to be included in the leading municipal strategic tool, which is the Integrated Development Plan (IDP). The IDP essentially represents the business plan for the city over a five year cycle, however, both the CoT and CoCT have not included biodiversity imperatives into their respective IDPs. The integration of tools such as, Biodiversity Management Plans (BMPs) for species and ecosystems, Biodiversity stewardship and bioregional plans that promote the sustainable use of natural resources is critical for ensuring effective biodiversity management at the local level. The evidence of this conclusion can be seen in the eThekweni Municipality, where biodiversity imperatives are included into the IDP and as a result biodiversity imperatives are taken into account in every development activity that occurs in the municipality. The eThekweni municipality is also the only municipality to include an international layer of protection through the implementation of Local Agenda 21 and Rio Conventions.

- c. Findings from this study identified discrepancies in the South African Constitution and National Environmental Legislation that has severely impacted on biodiversity management at the local level. The local government lacks the mandate for implementing biodiversity management functions, according to the South African Constitution and the National Environmental Management Act 107 of 1998 (NEMA). Although the NEMA has given rise to several specific environmental management acts and policies for all levels of government it excludes municipalities from biodiversity specific functions. According to the Constitution of South Africa, all spheres of government are required to take measures to give effect to Section 24 on Environmental Management. However, when read together with the environmental mandate given to the spheres of government along with what has been included in NEMA, there is a great deal of confusion that has resulted as local government seems to have been left without an environmental specific mandate.

- d. The local government has received international recognition as the level of government that is going to make the achievement of the 2030 Sustainable Development Agenda

possible. The very same conventions that identified biodiversity conservation as the key to achieving sustainable development have identified the local government as the level of government that will be the main driver on the road sustainability. Given that the 21st century has been identified as the “urban era” due to more than 50% of the global population living in urban areas its seems fitting that road to sustainable development begin at the local level (Cities Alliance,2015).

5.3. Recommendations

The following recommendations can be made from this study:

- Biodiversity loss is a shared responsibility thus, interdisciplinary approaches are necessary to address the underlying processes that influence the inadequate resource, capacity and skill distribution in the sector, which negatively impacts on biodiversity at the local government sphere. Effective biodiversity management at the local level requires the development and implementation of long-term, dynamic and adaptive biodiversity strategies and policies that address all elements of local level planning, infrastructure development, service provision, procurement and management. It has long been known that cities with high biodiversity richness have been magnets for increased human inhabitants. This is clearly seen in case of the City of Cape Town, which is a major global biodiversity hotspot. Given this fact, the planning of these major cities need to be more innovative and inclusive of not only its people but it natural surroundings. Investment in ecological infrastructure to aid built infrastructure in making the city more green are small steps towards effectively integrating biodiversity management in cities. These include more open spaces, green roofs and planting more trees within the city boundaries
- Biodiversity requires an alignment of existing and new legislation to which effective environmental governance plays an integral role. Similarly, a clear, aligned, integrated and effective environmental governance and management system must be created, as well as encouraging intergovernmental relationships for improved co-corporative governance. Municipalities must include biodiversity management priorities, targeting areas of high biodiversity importance and giving them the protective status they so require, by including them into all levels of planning and policy at the local level. Biodiversity features such as wetlands are critical for water purification, flood attenuation and disaster risk reduction.

Having these natural features within cities provide major benefits to those living in those cities and as a result should be included into all levels of planning and policy at the local level.

- Biodiversity management requires greater political will if it is to be successfully integrated at the local government level. More effort needs to be made by municipalities in showcasing the value of biodiversity in everyday living and human wellbeing to their political leaders. Local environmental officials must put extra effort when addressing their political leaders to emphasize, the significance of biodiversity and how it can be used for poverty eradication, food security, job creation, water purification, climate change mitigation and just life improvement in general. Political leaders also need to be made aware of the international benefits and recognition of biodiversity integration in cities such, as the Cities Resilience Programmes (CRP), Sustainable Cities Programme (SCP) and the Local Action for Biodiversity (LAB) all focus on helping cities become more climate resilient, green and sustainable through innovative finance mechanisms, skills development and partnership. When the motivation for biodiversity protection outweighs the motivation for its destruction, only then will attempts be made towards biodiversity conservation.
- Municipalities need to mainstream biodiversity into governance legislation, processes and procedures and the most effective way to achieve this at the local level is through the IDP. Using effective biodiversity management to address larger issues such as climate change, food security and clean water provisions should all be seen as major incentives for including biodiversity into the IDP. The small benefits of biodiversity that contribute significantly to mitigating the impacts of climate change at the city level include shade, breeze, precipitation and the low carbon benefits from planting extra trees and creating green corridors within the city boundaries. Biodiversity management provides city planners with new and more innovative ideas of creating cities of the future. Only when biodiversity conservation has its own mandate at the local level and is included into the IDP, will it have a voice that has never before been heard at the local level and only then will sustainable development be seen from the bottom-up.
- This study identified the need for further research on effectively integrating biodiversity imperatives into the IDP, generating creative methods for political buy in for biodiversity

management at the local level and lastly bridging the institutional gap between the three spheres of government to enable effective all round support for biodiversity conservation and sustainable development in South Africa. The scope for further research includes awareness of the importance of biodiversity in an urban context and the value of ecosystem services, and how these are threatened by various factors within the city limits. Identify the different areas where local governments can actively engage in biodiversity protection, based on current situation and capabilities

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7. APPENDICES

7.1 The Questionnaire used to obtain quantitative data in this study.

Questionnaire

BIODIVERSITY MANAGEMENT ASSESSMENT

| | |
|--|-----------------------------------|
| Name | Santhuri Naidoo |
| Telephone number | 012 399 9580 |
| E-mail address: | snaidoo@environment.gov.za |
| Background: this questionnaire is part of my Masters project which entails analyzing factors that influence Biodiversity conservation and management at municipal level. It will quantitatively measure the biodiversity awareness, knowledge and activity levels of the Municipality and also determine to what extent Environmental Governance affects the role of municipalities in having a positive or negative impact on its biodiversity. The information provided will be used solely for academic purposes and will be treated as strictly confidential . This questionnaire will take approximately 15 minutes. Thank you in advance for your cooperation. | |

Instructions: Please tick or fill in where appropriate

1. Capacity Assessment

Does your Municipality have a dedicated sector or department to ensure Biodiversity Conservation and Management terms of the National Environmental Management Act: (No. 107 of 1998).

| | |
|-----|--|
| Yes | |
| No | |

If yes:

a. How many Officials are there in this section?

.....
.....
.....

b. Are they appropriately qualified for their duties?

.....
.....
.....

c. How large an area does each official cover in the municipality?

.....
.....
.....

d. Do they have sufficient resources to execute their duties successfully?

.....

.....
.....

- e. Indicate the percentage time the official is allocating to Biodiversity Management:
0-20 20-40 40-60 60-80 80 + Full time

.....
.....
.....

- f. Please indicate the competence areas where staff lack the required competence or capacity to fulfill the Biodiversity management function

.....
.....
.....

2. Inter-Governmental Relationships

- a. Are there any agreements or mandates in place between the Municipality, Province and National Government to render the Biodiversity management functions within your area?

| | |
|----------|--|
| Yes | |
| No | |
| Not Sure | |

If yes, indicate the nature of the agreement or policies you follow for Biodiversity management.

.....
.....
.....
.....
.....
.....
.....

- a) Are regular meetings held to discuss Biodiversity management issues between:

Municipal and provincial staff:

National and Municipal staff:

National and Provincial staff:

All 3 Government spheres:

| | |
|----------|--|
| Yes | |
| No | |
| Not Sure | |

Can you please explain if these interactions have any impact on Biodiversity Management in your municipality?

.....

.....

.....

.....

b) Is there any established government or non-governmental Biodiversity management forums in the Municipality, or the local communities?

| | |
|----------|--|
| Yes | |
| No | |
| Not Sure | |

If yes: Can you briefly describe what is discussed in these forums

.....

.....

.....

.....

If no: Are there any plans to develop such forums in your Municipality, or local communities

.....

.....

.....

.....

c) Does the community contribute in any way towards biodiversity conservation in the municipal area?

| | |
|----------|--|
| Yes | |
| No | |
| Not Sure | |

Explain:

.....

.....

.....

.....

3. Budget Allocations

a. Indicate your Department’s budget per annum allocated to Biodiversity Management:

Less than R 500 000

R 500 000 – R 1 Million

R 1 Million to R 5 Million

Greater than R 5 Million

b. Does this budget include staff provisions such as resources and skills development?

| | |
|-----|--|
| Yes | |
| No | |

Explain further

.....

.....

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.....

.....

c. Does your department contribute to community awareness on Biodiversity conservation?

| | |
|-----|--|
| Yes | |
|-----|--|

| | |
|----------|--|
| No | |
| Not Sure | |

If yes, please explain how

.....

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4. Biodiversity Management

- a. Is there a Biodiversity Management Plan (BMP) in place, as required in terms of NEMA or NEMBA, within your municipality:

| | |
|----------|--|
| Yes | |
| No | |
| Not Sure | |

Please explain further:

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.....

- b. Is the BMP incorporated into the municipality's Integrated Development Plan?
 Yes Not included in next revision of IDP

Please explain:

.....

.....

.....

.....

.....

.....

- c. Are you aware of any international best practices for Biodiversity Management that you could apply to improve Biodiversity management in your city?

| | |
|----------|--|
| Yes | |
| No | |
| Not Sure | |

Please explain further:

.....

.....

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.....

.....

- d. Are there any activities being carried out in your municipality to promote the protection of the Biodiversity in your City.

Please tick relevant activities in the table below. Additional descriptive information will add value to the issues raised.

| ACTIVITY | Y / N | DESCRIPTION |
|-----------------------------------|--------------|--------------------|
| Biodiversity Awareness Programmes | | |
| Greening Programmes | | |

| | | |
|-----------------------------------|--|--|
| | | |
| Green School Initiatives | | |
| Pollution Awareness | | |
| Parks and Green area Developments | | |
| Botanical Gardens | | |
| Nature Reserves | | |
| Protection of species | | |
| Fines for non-compliance | | |
| Other | | |

Please make any further comments:

.....

.....

.....

.....

.....

BIODIVERSITY MANAGEMENT ISSUES IN THE MUNICIPALITY

4. Biodiversity Management Issues

a. What Biodiversity impacts are experienced in the municipality?

Please tick relevant issues and indicate their priority. Additional descriptive information will add value to the issues raised.

| IMPACT | Y/N | PRIORITY (HIGH, LOW, MEDIUM) | DESCRIPTION |
|-----------------------|------------|---|--------------------|
| Industries | | | |
| Motor vehicles | | | |
| Residential | | | |
| Mining/ quarries | | | |
| Other Developments | | | |
| Agricultural | | | |
| Forestry | | | |
| Marine Issues | | | |
| New Developments | | | |
| Other | | | |

Please make any further comments:

.....

.....

.....

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.....

7.2 The semi-structured Interview

Interview Questions

Student: Santhuri Naidoo

Topic: Evaluating the impact of Environmental Governance on Biodiversity Management of South African cities

Background: this questionnaire is part of my Masters project which entails analyzing factors

that influence Biodiversity conservation and management at municipal level. It will quantitatively measure the biodiversity awareness, knowledge and activity levels of the Municipality and also determine to what extent Environmental Governance affects the role of municipalities in having a positive or negative impact on its biodiversity. The information provided will be used solely for academic purposes and will be treated as **strictly confidential**. This questionnaire will take approximately 15 minutes. Thank you in advance for your corporation.

1. Can you briefly describe the state of biodiversity at the local level?
2. What are the greatest threats facing Biodiversity in your city?
3. What is the government doing to conserve biodiversity from the local level upwards? Do you think they are doing enough?
4. Is there funding or special initiatives geared specifically towards biodiversity conservation in your city?
5. Is there sufficient capacity dedicated to biodiversity conservation in your Municipality?
6. To what extent are National environmental legislations incorporated into the Local SDF's and IDP's and other relevant local legislations?
7. Is there any international policy or convention influence on Biodiversity Management in your city? Can you please explain further?
8. In what way is the public involved in any biodiversity management in your municipality?
9. Has there been any awareness raising to highlight the importance of Biodiversity in your municipality?
10. What is your department's vision for Biodiversity Conservation in your city, taking into account socio and economic growth rates
11. What do you think will be the best way to achieve sustainable development in your city?

7.3 Approval to conduct research by eThekweni Municipality

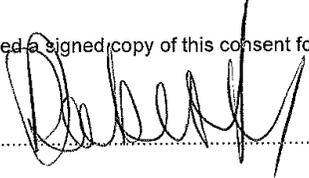
CONSENT

I, the undersigned, **Dr Deborah Roberts, Deputy Head of Environmental Planning and Climate Protection Department, Ethekewini Municipality**, have read the above information relating to the project, and declare that I understand it. I have been afforded the opportunity to discuss relevant aspects of the project with the project leader, and hereby declare that I agree voluntarily to participate in the project.

I indemnify the university and any employee or student of the university against any liability that I may incur during the course of the project.

I further undertake to make no claim against the university in respect of damages to my person or reputation that may be incurred as a result of the project/trial or through the fault of other participants, unless resulting from negligence on the part of the university, its employees or students.

I have received a signed copy of this consent form.

Signature: 

Signed at Durban on 16/12/14

WITNESSES

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7.4 Approval to conduct research by the City of Cape Town Municipality

CONSENT

I, the undersigned, JULIA WOOD (full name) have read the above information relating to the project and have also heard the verbal version, and declare that I understand it. I have been afforded the opportunity to discuss relevant aspects of the project with the project leader, and hereby declare that I agree voluntarily to participate in the project.

I indemnify the university and any employee or student of the university against any liability that I may incur during the course of the project.

I further undertake to make no claim against the university in respect of damages to my person or reputation that may be incurred as a result of the project/trial or through the fault of other participants, unless resulting from negligence on the part of the university, its employees or students.

I have received a signed copy of this consent form.

Signature of participant: [Handwritten Signature]

Signed at Maitland on 24/3/2015

WITNESSES

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7.5 Approval to conduct research by the City of Tshwane Municipality

REQUEST TO CONDUCT A RESEARCH FOR MS SS NAIDOO

Tshwane Leadership and Management Academy supports the application to enable him to complete his studies, provided that it is conducted within the prescripts of applicable policies.

RECOMMENDATIONS

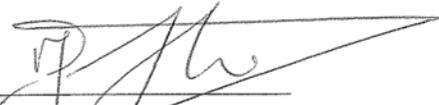
- That Ms SS Naidoo be allowed to conduct her research within CoT.
- That the Agriculture and Environmental Management Department: Section-Environmental Management give full support to the student in her research.
- That her research starts from 5th of January 2015 to 30th June 2015.
- That the KAS's as far as possible assist (offer support) to the student.



NV MOSWEU
SENIOR COMPETENCY DEVELOPMENT STRATEGIC OFFICER

17-12-2014
DATE

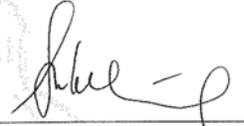
RECOMMENDED/~~NOT RECOMMENDED~~/RECOMMENDED-AS-AMENDED



DR TJD VAN STADEN
DIRECTOR: STRATEGIC COMPETENCY DEVELOPMENT MANAGEMENT

19-12-14
DATE

RECOMMENDED/~~NOT RECOMMENDED~~/RECOMMENDED AS AMENDED



DR MS MOTEKANG
EXECUTIVE DIRECTOR: TSHWANE LEADERSHIP AND MANAGEMENT ACADEMY

19.12.2014
DATE

APPROVED/~~NOT APPROVED~~/APPROVED AS AMENDED



Kgoro ya Ditirelo tša Tšhwano le tša Mohlakarekwa • Departement Korporatiewe en Gedeelde Dienste
Lefapha la Tshwaraganelo ya Ditirelo tsa Setheo • Ndzawulo ya Vukorhokeri bya Nhlanguano wa Bindzu
UMnyango Wezemisebenzi Yokwabelana Nokopeletsheni
Corporate and Shared Services Department

