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Incorporating sustainability into development plans in selected African cities

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A research report submitted to the Faculty of Commerce, Law and Management, University of the Witwatersrand, in partial fulfilment of the requirements for the degree of Master of Management in Energy Leadership

Johannesburg, 2024

ABSTRACT

Cities have the task of delivering critical services to residents with limited financial resources while challenged by the effects of climate change. African cities are vulnerable to floods, and water and energy insecurity due to insufficient capacity and poor infrastructure for stormwater drainage. Furthermore, environmental sustainability projects cannot be successfully implemented by cities unless they are systematically integrated into their operations and management. According to recent reports, two-thirds of the cities in sub-Saharan Africa are categorized as "at extreme risk" of experiencing the impacts of climate change. This poses a serious threat to crucial local infrastructure and systems required for development. Mitigation and adaptation to climate change cannot be addressed through a single economic sector as it has impacts across the board on all aspects of social and economic development. In addition, development without consideration of environmental sustainability can sometimes increase climate change vulnerability. Hence there is a need to mainstream environmental sustainability into all development policies, programmes, and plans.

This research study evaluated the way in which selected African cities had incorporated environmental sustainability into their development plans and evaluated their success and challenges. The research study employed a qualitative approach that entailed thematic content analysis and used the OECD mainstreaming framework to assess the extent of integration of environmental sustainability considerations into development plans. To assess the level of integration of environmental sustainability into the development plans for the selected cities, five categories were used. These five categories were based on the literature review and the OECD mainstreaming framework. The categories were: 1) address environmental concerns through projects and programmes in the development plan; 2) allocate resources to environmental sustainability projects, either through the municipal budget or external funding; 3) implement environmental sustainability projects and programmes; 4) inform and influence decision- makers through awareness-raising, stakeholder engagement, and meetings; and 5) monitor and evaluate the impact of implemented projects and programmes.

The research findings show that a number of the selected African cities have been more successful than others in incorporating some dimensions required for mainstreaming

environmental sustainability into their development plans. Additionally, the findings suggest that there are impediments to incorporating environmental sustainability into development plans, but when the identified enablers are present, this incorporation can be more effective and successful. Overall, the research findings indicate that some dimensions required for environmental sustainability mainstreaming are weakly included while others are effectively incorporated into development plans by the selected cities.

Keywords

Sustainability, climate-resilient, development plans, mainstreaming, sustainable cities, resilient cities, sustainable development

DECLARATION

I, Lesego Gaegane, declare that this research report is my work except as indicated in the references and acknowledgements. It is submitted in partial fulfilment of the requirements for the degree of Master of Management in Energy Leadership at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in this or any other university.

Name: Lesego Gaegane Signature: 

Signed at ……Pretoria……

On the 9th day of July 2024.

ACKNOWLEDGEMENTS

I would like to express my sincere gratitude to all those who have contributed to the completion of this Master's research. Completing this academic journey would not have been possible without their support, encouragement, and guidance.

I extend my deepest appreciation to my supervisor, Professor Anthony Stacey, for his support, guidance, and valuable insights throughout the research process. His expertise, constructive feedback, and commitment to academic excellence have been instrumental in shaping the quality of this research.

I would like to express my gratitude to my family and friends for their love, encouragement, and understanding during this demanding period of academic pursuit. Their support provided me with the strength and motivation to overcome challenges and persevere in my studies.

TABLE OF CONTENTS

ABSTRACT ii
DECLARATION iv
ACKNOWLEDGEMENTS v
LIST OF ACRONYMS viii
CHAPTER 1: INTRODUCTION 1
1.1 PURPOSE OF THE STUDY 1
1.2 CONTEXT OF THE STUDY 1
1.3 RESEARCH PROBLEM 3
1.4 RESEARCH OBJECTIVES 4
1.5 DELIMITATIONS OF THE STUDY 6
1.6 DEFINITION OF TERMS 7
1.7 ASSUMPTIONS 8
CHAPTER 2: LITERATURE REVIEW 10
2.1 INTRODUCTION 10
2.2 THE CONTEXTUALISATION OF SUSTAINABILITY AND CLIMATE RESILIENT CITIES 10
2.3 THEORETICAL FRAMEWORK 15
2.4 DEVELOPMENT PLANS AND THEIR DEVELOPMENT PROCESSES IN AFRICA 19
2.4.1 LOCAL GOVERNMENT IN SOUTH AFRICA 19
2.4.1.1 DEFINITION OF INTEGRATED DEVELOPMENT PLANS IN SOUTH AFRICA 19
2.4.1.2 THE DEVELOPMENT OF INTEGRATED DEVELOPMENT PLANS IN SOUTH AFRICA 21
2.4.2 LOCAL GOVERNMENT IN NAMIBIA 25
2.4.2.1 DEFINITION OF STRATEGIC PLANS IN NAMIBIA 26
2.4.2.2 DEVELOPMENT OF STRATEGIC PLANS IN NAMIBIA 26
2.4.3 LOCAL GOVERNMENT IN GHANA 27
2.4.3.1 DEFINITION OF MEDIUM-TERM DEVELOPMENT PLANS IN GHANA 28
2.4.3.2 DEVELOPMENT OF MEDIUM-TERM DEVELOPMENT PLANS IN GHANA 29
2.4.4 LOCAL GOVERNMENT IN ZAMBIA 30
2.4.4.1 DEFINITION OF INTEGRATED DEVELOPMENT PLANS IN ZAMBIA 31
2.4.4.2 DEVELOPMENT OF INTEGRATED DEVELOPMENT PLANS IN ZAMBIA 32
2.5 THE EXTENT TO WHICH SUSTAINABILITY DIMENSIONS ARE INCORPORATED INTO DEVELOPMENT PLANS 33
2.6 CONCLUSION OF LITERATURE REVIEW 36
CHAPTER 3: RESEARCH METHODOLOGY 40
3.1 INTRODUCTION 40
3.2 RESEARCH APPROACH 40
3.3 RESEARCH DESIGN 41
3.4 DATA COLLECTION METHODS 42
3.4.1 CONTENT ANALYSIS OF INTEGRATED DEVELOPMENT PLANS AND ANNUAL PLANS 42
3.5 DATA ANALYSIS AND INTERPRETATION 43
3.6 TRUSTWORTHINESS 45
3.7 LIMITATIONS OF THE STUDY 46
3.7 ETHICAL CONSIDERATIONS 47
3.8 CONCLUSION 47
CHAPTER 4: RESEARCH FINDINGS 48
4.1 INTRODUCTION 48
4.2 RESULTS OF CONTENT ANALYSIS 49

4.2.1 OVERVIEW OF DOCUMENTS REVIEWED 49
4.2 THEMATIC CONTENT ANALYSIS 52
4.3 ANALYSIS THROUGH THE MAINSTREAMING FRAMEWORK 57
4.3.1 INTENTIONALLY TAKING ACCOUNT OF ENVIRONMENTAL CONCERNS AND ADDRESSING THEM THROUGH SPECIFIC PROJECTS AND PROGRAMMES IN THE DEVELOPMENT PLAN 57
4.3.2 ALLOCATING RESOURCES TO ENVIRONMENTAL SUSTAINABILITY PROJECTS, EITHER THROUGH MUNICIPAL BUDGET OR SOURCING EXTERNAL FUNDING FROM DONORS AND PARTNERS 59
4.3.3 IMPLEMENTATION OF THE ENVIRONMENTAL SUSTAINABILITY PROJECTS AND PROGRAMMES 60
4.3.4 INFORMING AND INFLUENCING DECISION-MAKERS THROUGH AWARENESS-RAISING, STAKEHOLDER ENGAGEMENTS AND REGULAR MEETINGS 62
4.3.5 MONITORING AND EVALUATION OF THE IMPLEMENTED PROJECTS AND PROGRAMMES 63
4.4 SUMMARY OF RESEARCH FINDINGS 64
CHAPTER 5: DISCUSSION OF RESEARCH FINDINGS 66
5.1 INTRODUCTION 66
5.2 THEMATIC ANALYSIS 66
5.3 ASSESSMENT OF SELECTED FRAMEWORK FOR MAINSTREAMING ENVIRONMENTAL SUSTAINABILITY INTO DEVELOPMENT PLANNING 67
5.3 IMPEDIMENTS TO INCORPORATING ENVIRONMENTAL SUSTAINABILITY INTO THE DEVELOPMENT PLANS OF SELECTED AFRICAN CITIES 71
5.4 ENABLERS OF INCORPORATING ENVIRONMENTAL SUSTAINABILITY INTO THE DEVELOPMENT PLANS OF SELECTED AFRICAN CITIES 73
5.5 FACTORS IDENTIFIED FOR THE SUCCESSFUL INCORPORATION OF ENVIRONMENTAL SUSTAINABILITY INTO DEVELOPMENT PLANS 80
5.6 CONCLUSION 81
CHAPTER 6: CONCLUSIONS AND RECOMMENDATIONS 82
6.1 INTRODUCTION 82
6.2 KEY CONCLUSIONS OF THE RESEARCH STUDY 82
6.2.1 KEY ELEMENTS OF FAILURE TO INCORPORATE SUSTAINABILITY INTO DEVELOPMENT PLANS 84
6.2.2 KEY ELEMENTS OF SUCCESS IN INCORPORATING SUSTAINABILITY INTO DEVELOPMENT PLANS 86
6.3 RECOMMENDATIONS 90
6.4 RECOMMENDATIONS FOR FURTHER RESEARCH 91
REFERENCES 93
APPENDICES 106
APPENDIX A: PROCESS OF INTEGRATING CLIMATE CHANGE CONSIDERATIONS 106
APPENDIX B: ACCRA METROPOLITAN ASSEMBLY (AMA) MONITORING AND EVALUATION WORK PLAN 111
APPENDIX C: AMA MTDP COMMUNICATION STRATEGY 112
APPENDIX D: APOLITICAL METHODOLOGY TO SELECT INFLUENTIAL PEOPLE IN CLIMATE LIST 114
APPENDIX E: CITY OF TSHWANE PROGRESS OF IMPLEMENTED PROJECTS 115
APPENDIX F: CITY OF TSHWANE (COT) BIODIVERSITY PLAN 117

LIST OF ACRONYMS

AMA	Accra Metropolitan Assembly
AU	African Union
CO_2	carbon dioxide
COGTA	Cooperative Governance and Traditional Affairs
CoJ	City of Johannesburg
CoT	City of Tshwane
CoW	City of Windhoek
DMRE	Department of Mineral Resources and Energy
ESG	environmental, social and governance
GNI	gross national income
IDP	integrated development plan
IPCC	Intergovernmental Panel on Climate Change
LCC	Lusaka City Council
MEC	Member of the Executive Council
M & E	monitoring and evaluation
MMDAs	metropolitan, municipal, and district assemblies
MTDPs	medium-term development plans
MTREF	medium term revenue and expenditure framework
NDC	Nationally Determined Contribution
OECD	Organisation for Economic Co-operation and Development
PPP	policies, plans and programmes
SDBIP	service delivery and budget implementation plan

SEA	strategic environmental assessment
SDGs	Sustainable Development Goals
UN	United Nations
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
WWTP	wastewater treatment plant

CHAPTER 1: INTRODUCTION

1.1 Purpose of the study

The aim of this research was to consider whether there are impediments to incorporating environmental sustainability into the development plans of selected African cities. Development plans have different names in the selected countries. In South Africa they are called integrated development plans, in Namibia they are called strategic plans, in Ghana they are called medium-term development plans and in Zambia they are called integrated development plans.

1.2 Context of the study

South Africa has been experiencing the impacts of climate change since the 1970s, with these effects intensifying each year (Bates et al., 2008). Trisos et al. (2022) assert that the worst impact will be felt in Africa. Due to Africa's socio-economic development circumstances and geographical location, it is more susceptible to the effects of climate change. Fourteen years later, the visible effects of climate change, from the frequent floods and droughts to the severe heat waves, are already being experienced by African countries (Trisos et al., 2022). Given that most African countries are arid to semi-arid according to the Köppen climate classification, and experience warming at double the global average rate, the continent faces unique climate challenges. However, African country's financial institutions are overburdened while governments are addressing historic transformation, social injustice, economic growth, and poverty eradication. Thus, climate change has not been prioritised nor are there sufficient resources available to address it (Scholes & Engelbrecht, 2021).

Bates et al. (2008) stated that by the 21st century, South Africa would experience diminished water resources, floods due to extreme rainfall events, prolonged droughts, high CO_2 emissions, and altered energy generation potential and demands, and this turned out to be an accurate projection. The rest of Africa has suffered the same plight. Unfortunately, sufficient mitigation actions were not put in place to circumvent these effects; had these warnings been taken seriously and acted upon, Africa would not be experiencing these harsh effects. This is why climate information and early warning systems, and their effective utilisation are critical.

Moriconi-Ebrard et al. (2020) state that Africa's urbanisation is far exceeding that of the rest of the world, with twice as many people anticipated to be urbanised between 2020 and 2050. This offers various economic opportunities but puts pressure on the ecosystem and its services (Moriconi-Ebrard et al., 2020). Due to urbanisation, most cities are becoming densely populated, with an estimated increase in the global city population from a current 55% to 70% in 2050 (YouMatter, 2022) This increases the strain on already frail infrastructure and a lack of sufficient energy and water capacity. Baker (2012) urged cities to take a proactive approach to climate change and to manage natural disasters. Ajibade (2017) states that urban planning should include land-use practices, environmental preservation, and policies enabling socio-economic development. These measures would have assisted KwaZulu-Natal in South Africa, which experienced severe flooding with catastrophic impacts in 2022. Proper use of early warning systems, adequate drainage infrastructure, healthy ecosystems and evolving urban planning could have prevented the devastation. The United Nations (UN) has emphasised the importance of building climate-resilient cities, which is reflected in its 2030 Agenda for Sustainable Development, where cities are seen as crucial enablers in meeting the Sustainable Development Goals (SDGs) (Moriconi-Ebrard et al., 2020). In order to meet these SDGs, it is imperative that cities are managed through a systematic, sustainable approach, climate early warning systems are enhanced, and that there is effective dissemination of this knowledge to prevent further harm to the planet. Whereas sustainable development is vital to preserving ecosystem services, research has shown that it is challenging to find pragmatic all-inclusive approaches to improving sustainability (Little et al., 2016). There is thus an urgent need for the world to determine the most suitable way of integrating environmental sustainability into everyday life. Development plans may be the most ideal instrument as they are the blueprint for managing cities.

South African municipalities manage their local governance through an Integrated Development Plan (IDP) (City of Johannesburg, 2022). Through this development framework, the municipalities manage the work required to enhance their residents' quality of life. All cities must produce an approved four- or five-year development plan, depending on the cities' electoral term, which must be approved at an entire sitting of the council after the municipality has undertaken broad consultation, which includes public participation.

The approach of integrating environmental sustainability into South African municipal development began at the dawn of South Africa's democracy (Hardy & Lloyd, 1994), and further attempts have continued through the decades that followed (Roberts & Colwell, 2001). However, it has not been institutionalised, demonstrating that implementation has not been successful. According to Todes (2006) municipalities have not regarded environmental issues as important enough to be part of development plans. Legislation and guidelines argue that development plans ought to enable sustainable development (Todes, 2006). However, Coetzee (2002) argues that they are merely an upgraded Local Agenda 21 programme in South Africa (Coenen, 2009). This reflects the limitation in the actual implementation of environmental sustainability through development plans, and Sowman (2002) adds that environmental sustainability principles are not prioritised in development plans due to them being poorly developed.

Determining the barriers to development plans being a tool for advancing environmental sustainability within municipalities could be the start of solving some of Africa's climate issues in the long term. Establishing these limitations and finding appropriate mechanisms for incorporating sustainability into development plans in a realistic manner can assist in turning development plans into practical robust strategic plans. The outcomes and lessons learnt from this research has paved the way towards a new approach to sustainable city development and contributed to enabling African cities to become climate resilient. The research outcomes have contributed to the knowledge around development plans and their implementation in Africa as enablers of sustainable development. The results of this research has will been valuable in detailing the barriers to the successful implementation of environmental sustainability within cities, how these impediments can be overcome, and recommended the most effective approaches to improve the incorporation of environmental sustainability into development plans.

1.3 Research problem

Currently, municipal development plans are developed every four or five years; if there is a new administration, most of the projects are discontinued, as the new administration may choose to replace existing plans with their own objectives and vision (Practice Group, 2017; United Cities and Local Governments, 2019). For sustainable cities, there should be a continuity of sustainable practices, which will stem from certain aspects of development plans being fixed. Todes (2006) argues that although development plans are crucial to enabling cities to develop sustainably, they are not in a state that can provide

a planning system in which environmental sustainability can be enhanced. Thus, should environmental sustainability metrics be embedded in development plans, and these being fixed in the daily operations of the municipality, there is an opportunity for cities to enhance climate resilience (Feldmeyer et al., 2019; Kumar et al., 2023; Liu & Jensen, 2017; Xu et al., 2021). An example of this is seen in Copenhagen. The HOFOR (Greater Copenhagen Utility) adopted the Copenhagen Climate Plan in 2012 to prioritise climate resilience and sustainable development (Srivastava, 2022). Skanderborg Municipality has effectively incorporated environmental sustainability metrics into its operations. It has also implemented a comprehensive set of sustainability indicators and resilience metrics to monitor and adapt to climate change (Romero-Lankao et al., 2016).

Thirty-five years after the publication of the Brundtland Report (Keeble, 1988), the three pillars of sustainability are still significant, and sustainability in cities is still vital to achieving sustainable development. However, the question of why it has been so challenging for development plans to accomplish this, is still unanswered. In 1983, the United Nations formed the Brundtland Commission, which aimed at guiding the world to sustainable development, and the Brundtland Report titled "*Our Common Future*" was published in 1987. The report details how the world was moving towards a sustainable pathway by integrating development and environmental issues (Kono, 2014).

Incorporating environmental sustainability into the Accra Metropolitan Assembly's (AMA's) Medium Term Development Plan (MTDP) has been challenging due to the similar issues faced by South African cities. Accra is plagued by poor spacial planning which is exacerbated by the city's rapid and often unplanned urban expansion. According to (Cobbinah et al., 2019), Accra's growth has surpassed infrastructure development, resulting in inadequate provision of services and significant pressure on housing, thus worsening the existing housing deficit (Teye & Owusu, 2015). Accra's vulnerability to flooding is worsened by poor land-use planning and climate change due to its topography, characterised by low-lying areas prone to flooding, requiring robust planning and management strategies to mitigate flood risks (Asumadu-Sarkodie et al., 2015), and ensure integrated planning has environmental sustainability in mind. (Karley, 2009) states that Accra's issues are due to the lack of effective implementation and enforcement of urban planning regulations (Mensah & Ahadzie, 2020). Additionally, the lack of collaboration and coordination between different stakeholders, local authorities and national agencies hinders the incorporation of environmental sustainability measures into the MTDP (Jha et al., 2012). According to (Korah et al., 2017) political and

administrative changes can lead to discontinuities in policy and project implementation, as the new administrations may prioritise different objectives, further complicating long-term sustainability efforts, which is another barrier to successful implementation. These issues emphasise the need for a more integrated and sustained approach to urban planning and development, ensuring that environmental sustainability is a core component of Accra's growth strategy. This is key to addressing these challenges to build Accra's resilience against climate change impacts and ensure that the city develops sustainably (Cobbinah et al., 2019; Teye & Owusu, 2015).

The city of Windhoek, much like Accra, faces challenges in integrating environmental sustainability into its strategic plan. There are significant financial constraints, a lack of resources and expertise to implement and sustain environmental sustainability measures (Brandt, 2019). This includes limited funding for green infrastructure and ecosystem-based adaptation (EbA) projects, which are crucial for building climate resilience (SEI, 2019). The city's governance structures are often ill-equipped to handle the integration of environmental sustainability into urban planning. Issues include a lack of effective channels for information dissemination, inadequate environmental impact assessment processes, and the absence of clear mandates for environmental management in informal settlements (Wijesinghe & Thorn, 2021). Climate change exacerbates existing challenges, such as prolonged droughts and increased frequency of flash floods. The urban heat island effect further strains the city's resources and infrastructure, making it harder to maintain sustainability (SEI, 2019). There is a low level of awareness among residents about the benefits of environmental sustainability and the importance of managing biodiversity. Effective community engagement is necessary to ensure that residents are involved in identifying, planning, and implementing sustainability projects (Wijesinghe & Thorn, 2021). Therefore, it is crucial to have a multi-faceted approach that includes improving governance frameworks, securing financial resources, enhancing community involvement, and integrating environmental sustainable practices into all levels of urban planning and development, which is provided for through the strategic plan.

The Lusaka City Council (LCC) faces challenges in implementing and enforcing environmental policies due to weak governance structures and institutional capacity (Climate Champions, 2022). The LCC has acknowledged that effective planning and regulation requires better coordination among different sectors and stakeholders, which they currently struggle with. This would involve the need for improved land use

regulation, investment direction, and enforcement of compliance with environmental standards (Lusaka City Council, 2008; Taylor et al., 2021). The city recognizes the importance of urban planning that integrates environmental sustainability, strengthens governance and institutional capacities, and involves local communities to enhance resilience and improve service delivery. To effectively plan for environmental sustainability, it's crucial to involve the community, however (Climate Champions, 2022), states that within the city of Lusaka, there is a lack of public awareness and engagement in environmental issues. Initiatives such as waste separation and recycling require the community's involvement, but it's challenging to secure without widespread education and engagement efforts (Climate Champions, 2022; Lusaka City Council, 2008). Lusaka's is plagued by prehistoric spacial planning like Windhoek, Accra, and South African cities. Lusaka’s planning frameworks still reflect colonial-era modernist approaches, emphasizing physical zoning and segregation (Lusaka City Council, 2008).

Africa’s implementation of development plans lacks the integration of economic and ecological dimensions in city development (Grobbelaar, 2012; Pasquini et al., 2013). Even though the concept of development planning is regarded as a reliable tool for sustainable development, Todes (2006) cautions that it is not that easy to create an effective development plan, in view of the concern around the nature of politics and institutional dynamics in Africa, as these are support mechanisms for development plans evolving and being instruments of transformational sustainable development.

All four selected cities have outdated frameworks that are not well-suited to modern needs for integrated, inclusive, and sustainable urban development. The persistence of such approaches hampers efforts to adopt more flexible and adaptive planning strategies that address current environmental challenges (Taylor et al., 2021). Addressing the challenges faced by these African cities, heightened by climate change, requires integrating climate resilience into planning and promoting sustainable resource use and conservation.

The development plans present an opportunity to integrate environmental sustainability into development planning. This can be facilitated by collaborating with local and international stakeholders, as well as investing in sustainable development education and policies (Thorn et al., 2021). Therefore, it would be beneficial to evaluate how these cities have incorporated environmental sustainability into their development plans and draw lessons from the implementation.

Research questions

To address the research problem, this study seeks to answer the following research questions:

1. What are the key elements of failure and success in incorporating environmental sustainability into development plans.
2. How could the successful incorporation of environmental sustainability into development plans be achieved.

1.4 Research objectives

The aim of this research is to determine the impediments to incorporating environmental sustainability into selected African city's development plans.

This aim will be achieved through the following objectives:

1. To evaluate development plans and their development process within selected African cities.

2. To evaluate the extent to which environmental sustainability dimensions are incorporated into development plans, and determine the critical elements required to successfully incorporate environmental sustainability into development plans.

Significance of the study

Cities play a vital role in the economic performance and prosperity of a country. Determining the limitations to successfully embedding environmental sustainability in the development plans of cities can assist Africa in moving towards becoming more climate resilient. The significance of this research is relevant not only to South Africa but to the greater African continent and could result in great strides being made in Africa towards developing more robust development plans that will enable sustainable development. Africa is trailing behind the Global North with climate adaptation and mitigation and does not have the luxury of time due to its vulnerability; this notion is supported by Shackleton et al. (2015) in their research on sub-Saharan Africa's challenges to climate adaptation. Biesbroek et al. (2013) identified weak institutional capacity, limited prioritisation of sustainability, intricate socio-ecological transition, and poor governance as some of Africa's challenges to responding promptly to climate change. Like many African cities

that are plagued by great legislation with lackluster implementation, Accra's policies are ideally suited to support its sustainability initiatives; however, poor governance and fragile institutions are barriers (World Health Organization, 2022). Thus, the outcomes of this research would help unlock barriers to the successful incorporation of environmental sustainability into municipal development plans and highlight enabling principles for environmental sustainability. This could be the paradigm shift that Africa needs to support the successful implementation of the African Union Climate Change and Resilient Development Strategy and Action Plan.

While South Africa has recognised the need to transition to a low-carbon economy and has made ambitious commitments in the country's NDCs, pragmatic, sustainable practices are required to meet these goals. The AU is committed to such pragmatic, sustainable practices; the African Union (2022) outlines how they will pursue transformative and equitable climate-resilient development pathways. These actions are highly needed in these times.

The outcomes of this research study will enhance and contribute to the empirical work and knowledge of climate resilient cities. The research will provide insight into the various challenges to developing climate-proof cities in Africa and how these challenges can be overcome. The research will also provide enlightenment on how governance structures within cities in the African continent can incorporate sustainable development practices.

The approach of embedding environmental sustainability metrics in municipal development plans is not customary practice within the African continent (Ajibade, 2017), nor is it an easy exercise that has been implemented successfully. The outcomes of this research could provide new methodologies for managing and operating African cities based on environmental sustainability dimensions. The research outcomes will provide a better understanding of the way in which African countries can mainstream environmental sustainability more effectively in local municipal planning to enhance sustainable development.

Determining the barriers to development plans being a tool for advancing sustainability within municipalities could be the start of solving some of Africa's climate issues in the long term. Establishing these limitations and finding appropriate mechanisms for incorporating sustainability into development plans in a realistic manner can assist in turning development plans into practical robust strategic plans. The outcomes and lessons learnt from this research can pave the way towards a new approach to

sustainable city development and contributing to enabling African cities to become climate resilient. The research outcomes will contribute to the knowledge around development plans and their implementation in Africa as enablers of sustainable development. The results of this research were valuable in detailing the barriers to the successful implementation of sustainability within cities, how these impediments can be overcome, and recommended the most effective approaches to improve the incorporation of sustainability into development plans.

1.5 Delimitations of the study

The research did not focus on national government development plans; rather, the study focused on the importance of local municipal development plans, the South African IDP, the Namibian strategic plan, the Ghanaian MTDP and the Zambian IDP, being linked to and contributing towards the national goals of countries. The four cities were chosen due to their similar challenges related to rapid urbanisation, climate change impacts, infrastructure deficits, financial constraints, environmental sustainability, and governance issues. The local government structures of the Accra Metropolitan Assembly (Ghana), City of Tshwane (South Africa), City of Windhoek (Namibia), and Lusaka City Council (Zambia) share several similarities, reflecting common principles of local governance in urban areas. These similarities include their organisational frameworks, functions, and challenges. All four cities operate under a decentralised system of governance where local authorities have a degree of autonomy to manage their own affairs. This decentralisation aims to bring government closer to the people and enhance service delivery. Each city has a council composed of elected representatives, typically headed by a mayor. The councils are responsible for making policy decisions and overseeing the executive arm of the local government, which is responsible for implementing these policies. They all have common environmental challenges and face financial constraints that limit their capacity to deliver services and maintain infrastructure. This research did not attempt to embed environmental sustainability into the development plans of African cities but considered the impediments to and enablers of successfully incorporating sustainability into development plans, and how mainstreaming of environmental sustainability can be improved within African municipalities. This research focused on environmental sustainability, which is one of the three pillars of sustainability, along with social and economic sustainability. The research examined how development planning prioritises environmental sustainability and how the relevant governance and institutional practices promote the integration of environmental issues. The political party structures

and their administrations were not the focus of this research. The research scope included only metropolitan cities and did not focus on rural towns. The research sought to produce impartial data on the impediments to incorporating environmental sustainability into municipalities development plans.

1.6 Definition of terms

Adaptation (to climate variability and change) – policies, actions, and other initiatives designed to limit the potential adverse impacts arising from climate variability and change (including extreme events), and exploit any positive consequences (Hay et al., 2005).

Climate change – the long-term altering in temperatures and weather patterns through anthropogenic and natural causes (United Nations, 2023).

Climate proofing – Identify and mitigate risks posed by climate change to a development project or any other natural or human asset. This can be achieved by implementing long-lasting and environmentally sustainable changes at various stages of the project cycle, such as planning, design, construction, operation, and decommissioning. These changes should be economically viable and socially acceptable, ensuring that the risks are reduced to acceptable levels. (Hay et al., 2005).

Climate resilience – the ability to mitigate and adapt to the impacts of climate change (Clarke, 2022)

Ecological infrastructure – naturally functioning ecosystems that are the nature-based equivalent of built infrastructure; they provide critical services for people that include but are not limited to water, wetlands, healthy catchment areas, climate regulation, soil formation and disaster risk reduction (Colvin et al., 2015)

Ecosystem – a community of plants, animals and various organisms that interact together with its environment to give life.

Ecosystem services – the benefits that humans receive from the environment and the ecosystems to make life possible (Brauman et al., 2007).

Local Agenda 21 – a policy initiative from the Rio Earth Summit in 1992 which aims to encourage local authorities to promote more environmentally, socially, and economically sustainable communities. Communities implementing the agenda improve institutional capacity and capability, both public and private, to evaluate and address the crucial

questions related to policy choices and modes of implementation among

development options, based on an understanding of environmental potentials and limits and of needs as perceived by the people of the country concerned (United Nations Desertlinks, 2023).

Mainstreaming (of adaptation) – the effective and equitable integration of adaptation activities into the preparation and implementation of policies, plans, and other instruments associated with economic development, social progress, and/or environmental protection (Lebel et al., 2012).

Metropolitan city – an area which is a Category A municipality which is governed by local government in performing the services of the area. The city is a conduit for commercial activities where integrated development planning is required (Sedibeng District Municipality, 2014).

Net metering – a billing mechanism that credits grid-connected solar energy system customers to offset some or all their electricity consumption and get paid for the excess energy they feed into the grid (Dufo-López & Bernal-Agustín, 2015).

Sustainable development – development that is cognisant of preserving ecosystems and providing social and economic services to current generations without compromising the former and latter for future generations (Coetzee, 2002).

Urbanisation – the increase in the proportion of people living in towns and cities. Urbanisation occurs because people move from rural areas (countryside) to urban areas (towns and cities). This usually occurs when a country is still developing (EEA, 2022).

1.7 Assumptions

In conducting this research study, the following assumptions were made:

1. For all African countries, the development plan was the primary planning tool that provides a strategic outline for local government to develop their respective

municipalities through integration of environmental, social, economic, and spatial dimensions.

2. The development plan was seen as a tool to enhance sustainable development within the African countries, and thus environmental sustainability dimensions are assumed to be reflected in the development plan.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

The objective of this chapter is to provide a critical analysis of the existing literature on development plans and the integration of environmental sustainability into development plans. The literature review starts by synthesising both local and international literature on sustainable urban development within cities. The chapter examines the theoretical and conceptual background of the central aspects of development plans as tools for sustainable development. The literature review provides an analysis of integrated development planning in Africa and the extent to which sustainability has been mainstreamed in local government. A framework for integrating climate change adaptation and environmental sustainability into development planning is reviewed. South Africa, Namibia, Ghana, and Zambia were selected to obtain an understanding of their municipal integrated development planning processes, structures, and implementation. Development plans have different names in the various African cities. In South Africa they are called integrated development plans, in Namibia they are called strategic plans, in Ghana they are called medium-term development plans and in Zambia they are called integrated development plans. The review will further analyse the available literature on the integration of environmental sustainability concepts into IDPs, strategic plans and medium-term development plans of these countries and the success thereof.

2.2 The contextualisation of sustainability and climate resilient cities

Climate change has left cities unable to manage natural disasters adeptly and deliver services efficiently (Khare et al., 2011)(Kenny, 2020). There is a need for cities to implement pragmatic plans to ensure that they are resilient and provide reliable access to energy and water for their residents.

Combating climate change should be a multipronged approach from industry, civil society, government departments and municipalities to ensure that the efforts have a greater impact (Mohtar, 2017). Thus, partnerships and collaborations are crucial and are the pinnacle of integrated development planning processes.

In the early development of the concept of sustainability, environmental conservation, economic development, and social equity were identified as the pillars of sustainability by the Brundtland report (Little et al., 2016). Over the years it has become apparent that these three dimensions are interconnected and need to be equally achieved for sustainability to be successful. This has also been interpreted as environmental, social and governance (ESG), a holistic framework. In 2006, the environmental, social and governance (ESG) framework came into prominence when it was mentioned in the United Nations-supported Principles for Responsible Investment (PRI) initiative (United Nations, 2006); the PRI, launched by the UNEP Finance Initiative and the UN Global Compact, provide a voluntary framework which encouraged organisations to adopt ESG principles, and also emphasised the importance of governance in sustainability. Matos (2020) states that the governance aspect in ESG encompasses the responsibility that management must administer effective guidance with the interest of its shareholders and stakeholders in mind, ensuring that the board implements sound policies that will enhance the social and economic dimensions of an organisation. In the case of cities, shareholders are the residents, the board (city council) is made up of the council members, and governance is pivotal for cities to perform well and for the implementation of development plans.

Sustainability in organisations is becoming more prominent both in profile and in practice. Organisations have started to entrench environmental sustainability in their organisational strategies, to maximise impact and provide them with a competitive advantage. When organisations are strategically proactive instead of being reactive, their ability to generate profits and face challenges with resilience is increased. Organisations that have environmental sustainability principles and prioritise environmental sustainability in their operations are better able to forecast targets, and to manage their key energy, water, environmental, economic and social risks (Rosen & Kishawy, 2012)(Ikram et al., 2020). These organisations are also resilient to natural disasters, the impacts of climate change, recessions, pandemics, and disruptions. Development plans are a cities' version of a strategy to deliver services to residents and develop a particular municipality to elevate the residents' quality of life. Thus, cities also need to include environmental sustainability principles in their operations and management.

The 2021 State of South African Cities Report stated that more than 60% of South Africans live in cities, which creates a bigger demand on service delivery (SACN, 2022)

Cities need to be sustainable, well governed, resilient, and agile to be able to deliver services with growing resident populations and the impacts of climate change.

Cities are already beleaguered by the impacts of climate change and urbanisation (Goodarzi et al., 2020), and these are exacerbated by natural disasters. The IPCC has warned global policymakers and industry that the 2030 target of limiting global warming to 2 °C appears to be unachievable and should it not be met, climate change extreme events will be intensified and become more frequent (YouMatter, 2022). The Co-chair of the IPCC Working Group II, Hans-Otto Pörtner states that “every extra bit of warming matters, especially since warming of 1.5 °C or higher increases the risk associated with long-lasting or irreversible changes, such as the loss of some ecosystems” (Allen et al., 2018). Therefore, reducing global warming will give humans and the ecosystem the ability to adapt and avoid reaching risky temperatures. It is expensive for cities to repair the damage caused by natural disasters and adapt to climate change, thus mitigating the impacts is ideal and necessary. According to the World Bank, should cities not become more resilient by 2030, the global cost because of natural disasters could be $300 billion (YouMatter, 2022).

Copenhagen is one of the most sustainable and energy efficient cities in the world, in 2012, Copenhagen adopted the CPH 2025 Climate Plan with the goal of a 20% CO_2 reduction by 2015 from 2005 levels, with a longer-term goal to become the world’s first carbon neutral city by 2025 (Copenhagen, 2014). Copenhagen has been successful in its sustainable development journey due to supporting policies and its government’s support and commitment. In 2011, Copenhagen started with awareness-raising among its residents on climate-proofing and capacitating them with knowledge to prepare for natural disasters. The city’s Combined Heat and Power (CHP) system captures and reuses heat energy, which is partially fueled by biomass (Copenhagen, 2011); the city is retrofitting old buildings into energy efficient buildings and there is a policy that mandates all new developments to install sustainable urban drainage systems (SUDS) for improved water systems (Kaye, 2015). Copenhagen is equipping itself for the future weather, which is what most cities should start doing. Copenhagen’s sustainability initiatives are incorporated into the management of the city. This is an example of institutionalising environmental sustainability into city operations and management. The mayor of Copenhagen states that “a sustainable world starts with sustainable cities. In Copenhagen, we keep this in mind as we strive to combine sustainable solutions with a

focus on growth and the quality of life to make Copenhagen an even more livable city" (Copenhagen, 2014).

Although Africa is not as advanced as Europe with regards to environmental sustainability, some African cities are making progress in becoming sustainable. Arcadis conducted a sustainability survey in 2022 which ranked the top one hundred sustainable cities in the world, and six African cities were included in the list. The survey assessed the urban sustainability of cities by focusing on how these cities preserve their ecological infrastructure, the quality of life of the residents, and not merely the economic development. Focusing on economic development of a city only gives a fragmented outlook on sustainability. According to John Batten, the Global Cities Director at Arcadis, " A city that does not have a flourishing urban landscape that is able to give its citizens inclusive opportunities while prioritizing the planet cannot succeed in the long-term, and thus, will not have sustained prosperity" (Arcadis, 2022). The six African cities that were in the top 100 based on their ecological transition amongst other indexes are Cairo in Egypt (86th), Cape Town in South Africa (89th), Nairobi in Kenya (96th), Johannesburg in South Africa (97th), Lagos in Nigeria (99th) and Kinshasa in the Democratic Republic of Congo (100th) (Arcadis, 2022). Africa may not be in the top ten; however, it is certainly striving, and with intentional sustainable development practices, more cities in Africa can be part of the top one hundred sustainable cities in the world going forward.

Accra in Ghana is a member of the C40 Cities Climate Leadership Group and is part of the Global Green New Deal Pilot Implementation Initiative (C40 Cities, 2022), which aims to assist cities in implementing strategic projects that will enable environmental sustainability and effective governance. Accra is committed to ensuring that urban decision-making prioritises comprehensive climate change activities and that strong partnerships are built to develop the city's climate resilience (C40 Cities, 2022). The Ugu District Municipality in KwaZulu-Natal made headway in incorporating ecological sustainability into their 2002 development plan, through commissioning a strategic environmental analysis which ensured that environmental projects were included in the development plan (Todes, 2006)(Howes et al., 2017). However, as is common in most municipalities, the lack of commitment and resources limited the success of this implementation, and Todes (2006) states that only 2% of the municipality's R900 million budget was allocated to environmental sustainability programmes. Irrespective of a monitoring and evaluation plan being suggested, which would have supported the implementation, it did not materialise and showed that the manner in which South Africa

addresses sustainability is vague and lopsided (Todes, 2006).

Cities contribute more than half of the worlds energy related greenhouse gas (GHG) emissions (Axel Baeumler et al., 2012)(Harris et al., 2020) due to cities being so densely populated. Cities are ecosystems for countries, and well-functioning cities that are energy- and water- efficient contribute to the climate goals of a country. Figure 1 illustrates how Africa's carbon emissions are miniscule as compared to other parts of the world; however, due to the continent's vulnerability to climate change and variability (CDP, 2020), Africa needs to be more aggressive in its response.

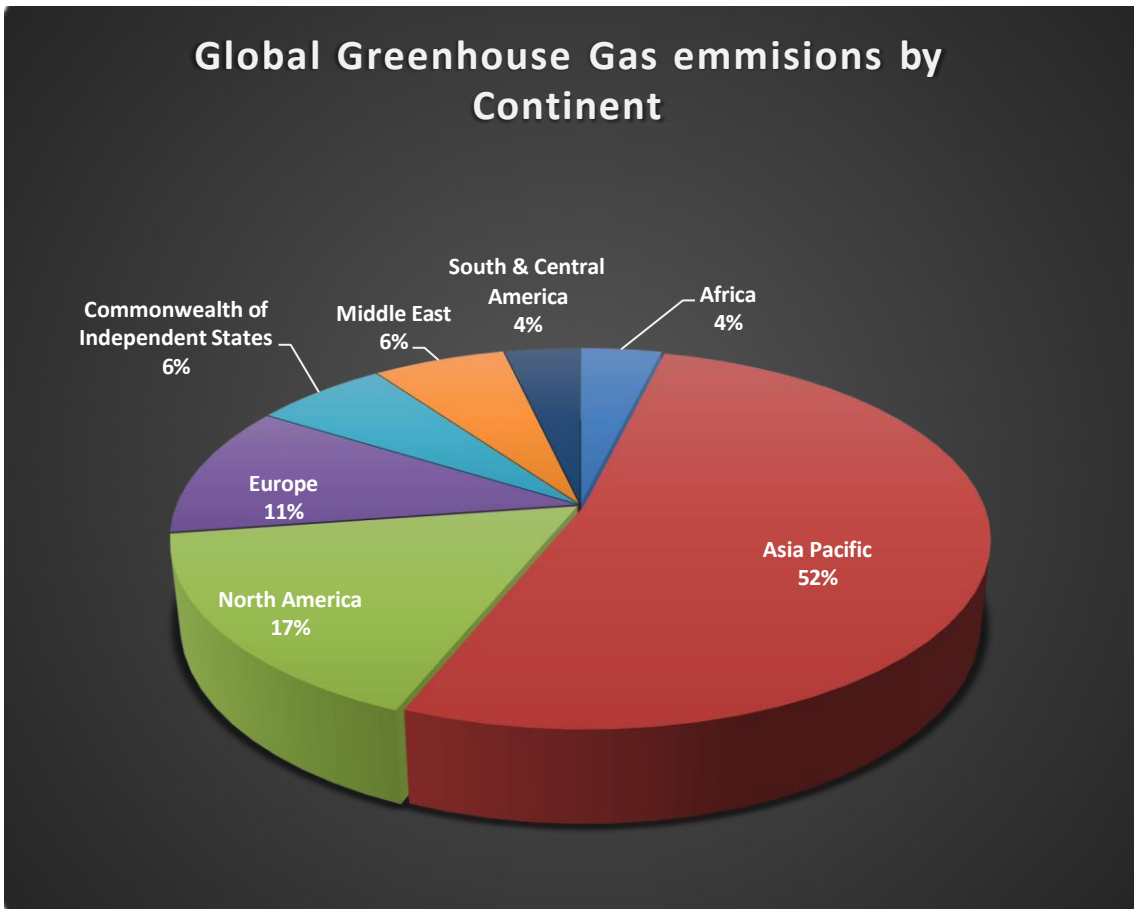


Figure 1: Global greenhouse gas emissions by continent (Statista, 2022)

The importance of the African continent to increase its water and energy security, and to climate-proof its cities, is amplified due to its socio-economic status, its natural resource-based sectors, and heavy reliance on rain-fed agriculture (African Union, 2022). In its ten-year strategic planning document, the Climate Change and Resilient Development

Strategy and Action Plan (2022-2032), the African Union is focused on intentionally making Africa more sustainable, through robust mitigation and adaptation strategies for climate change. The purpose of the action plan is to aid Africa's adaptive capabilities and establish resilient economies, cities, and ecological communities (African Union, 2022). In its urban health initiative programme implementation, Accra incorporated key policy recommendations to its local strategies which will advance sustainability (World Health Organization, 2022). Other African countries can learn from Accra's successes, and hopefully the African Union Climate Change and Resilient Development Strategy and Action Plan includes mechanisms for cross-border learning and sharing. Ruwanza and Shackleton (2016) indicated that minimal budget allocations were provided to programmes that supported ecological aspects within municipal development plans. This might be one of the reasons why development plans lack enablement of environmental sustainability, as inadequate resources are provided to implement this.

Through the work on climate adaptation, Copenhagen has been building up knowledge and expertise in climate adaptation, innovation, and growth. This is the case partly because climate adaptation creates a need for interdisciplinary knowledge and collaboration with research and industry on specific initiatives and selected demonstration projects (Copenhagen, 2014)(Boogaard et al., 2020). Through these collaborative approaches, Copenhagen has made progress in building the climate resilience of the city, and Africa can learn from the work done in Copenhagen to develop the enabling governance principles to climate-proof their cities. This can be achieved through partnerships that some African cities have with organisations like C40 Cities Climate Leadership Group and the Resilient Cities Network. Key lessons can be learned and implemented by customising them to fit the African context.

2.3 Theoretical framework

Sustainable development limits the impact and risk of climate change and builds the resilience of countries (Levina & Adams, 2006). Development should be conducted in conjunction with environmental sustainability considerations, as it allows planning to be incorporated into decision making. Huq and Ayers (2008) suggest that the ideal manner to integrate sustainability into development is through mainstreaming, as it allows policy integration and mechanisms to address climate change into development planning. The advantage of mainstreaming is that it limits the risk of the impacts of climate change while safeguarding the long-term sustainability of investments (Klein et al., 2007). According

to the United Nations Development Programme (UNDP), mainstreaming is defined as integrating climate change adaptation objectives, policies, strategies and processes into a country or cities development policies, processes and budgets at all levels and stages (OECD & Tirpak, 2006). This ensures that environmental considerations are entrenched into cities' operations and planning, and environmental issues also become institutionalised. Mainstreaming environmental sustainability is not a once-off activity that is implemented; rather, it is an iterative process which involves monitoring and evaluation. Mainstreaming entails correcting and improving processes as environmental sustainability is integrated into development policymaking, planning, budgeting, implementation, and monitoring processes at national and municipal levels (UNDP, 2012). In its *Guidance Note on Mainstreaming Environment into National Development Planning (UNDP, 2012)*, the UNDP states that mainstreaming requires collaborations of multiple stakeholders over periods of time, effective governance structures and institutional arrangements in order to stimulate socio-economic growth, enhance the adaptive capabilities of communities and to achieve sustainable development (UNDP, 2012; UNEP, 2009). This requires working with various facets of government, social and economic partners, and all sectors of the economy.

Mainstreaming has been used for decades in other spectrums to elevate the urgency of certain issues. Mainstreaming has been used to address gender disparities and addressing pandemics. In 1995, mainstreaming was adopted as a global policy to enhance gender equality which stemmed from the World Conference on Women (Moser & Moser, 2005). This approach has been phenomenal in elevating gender issues and ensuring equality in all levels of society for women. The UNDP and United Nations Environment Programme (UNEP) have implemented numerous programmes to mainstream environmental and poverty issues into development plans of developing countries (Olhoff & Schaer, 2010), this has enabled many countries to value ecological conservation and recognise that healthy ecosystems are important for human development and economic development. The UNDP and UNEP have endorsed mainstreaming as an efficient approach to sustainable development and addressing climate change. The Poverty-Environment Initiative (PEI) of the United Nations Development Programme (UNDP) and the United Nations Environment Programme (UNEP) is a global programme that supports country-led efforts to mainstream poverty-environment objectives into national development and sub-national development planning, from policymaking to budgeting, implementation, and monitoring. In a report of the Organisation for Economic Co-operation and Development (OECD) it is stated that

through mainstreaming, it becomes easier to integrate sustainability into existing policies and operations rather than developing new policies to address sustainability (OECD, 2009)(Swart & Raes, 2015).

The approach to mainstreaming climate change adaptation into development planning is summarised in the flow chart in Figure 2. The mainstreaming components are awareness-raising, pre-screening of climate risks and vulnerabilities, detailed climate risk assessment, identification of adaptation option, prioritisation and selection, implementation of adaptation option including budget allocation, and monitoring and evaluation (M & E) (Lebel et al., 2012). This iterative approach allows for monitoring and evaluation of the mainstreaming process, which is critical in identifying areas of improvement, tracking performance of the implementation and rectifying where gaps are identified. This approach is suitable for integrating environmental sustainability into development plans as the awareness-raising will ensure capacity is developed to lay the foundation for institutionalisation. The framework highlights the importance of allocating resources to adaptation activities, as a lack of finances has been cited as one of the limitations to successfully integrating environmental aspects into development planning. Research has shown that municipalities in developing countries have limited human and financial resources to effectively integrate environmental sustainability into their development planning, and awareness-raising has been helpful to conscientize them on the impacts of climate change before mainstreaming can be implemented, as experienced in India (Sharma & Tomar, 2010). Lebel et al. (2012) emphasises the importance of roles and responsibilities in planning for mainstreaming to be successful, as it ensures accountability. For mainstreaming to be successful, local government needs to be prepared to work outside traditional 'comfort zones' and be open minded (Sowman & Brown, 2006).

In conceptualising the integration of environmental sustainability into development plans, this research study draws from the literature on mainstreaming. Research has highlighted the challenges and limitations of successfully integrating environmental sustainability dimensions into development plans and the successes thereof have been highlighted.

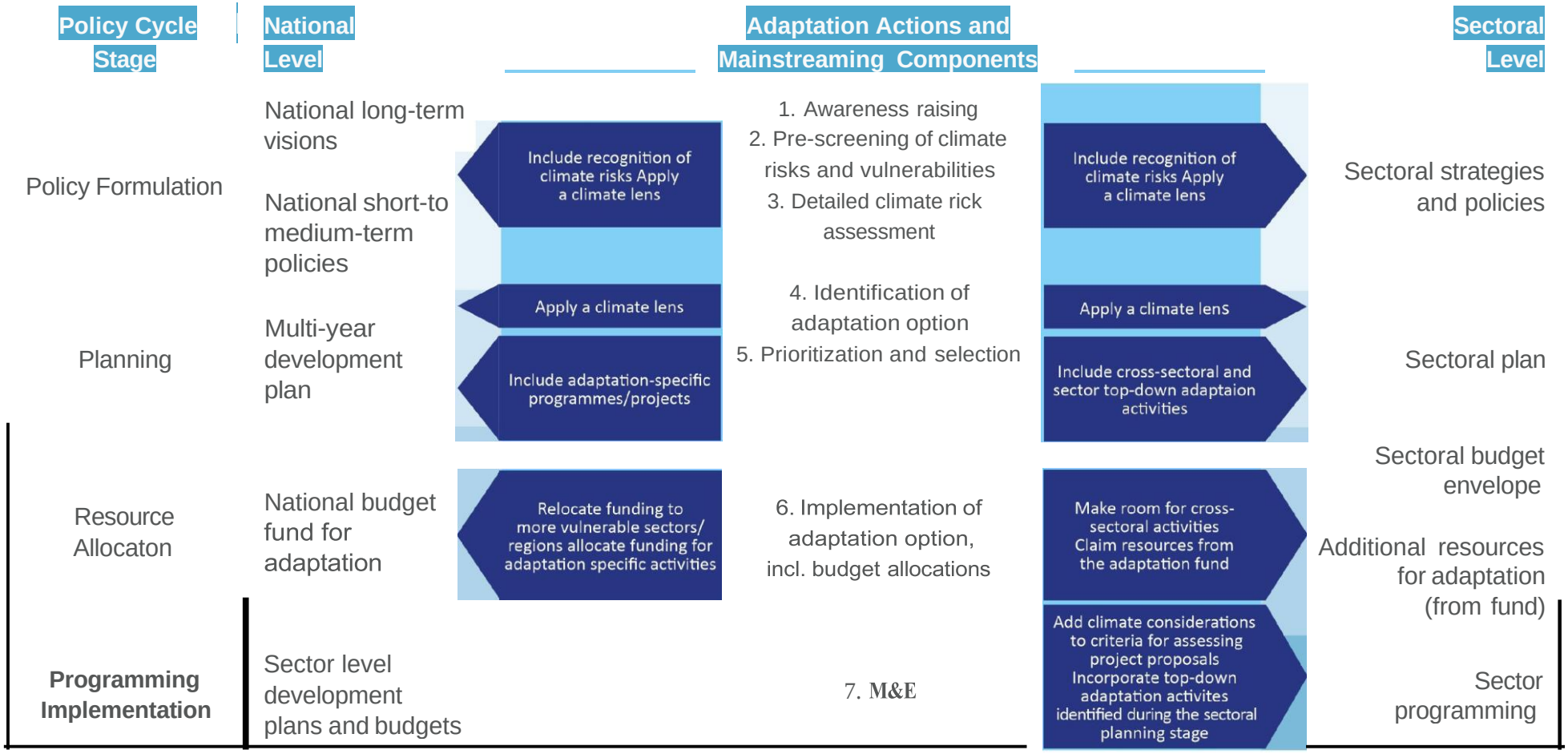


Figure 2: Flow chart illustrating OECD mainstreaming framework (OECD, 2009)

2.4 Development plans and their development processes in Africa

2.4.1 Local government in South Africa

The government system in South Africa consists of three tiers of government which are national, provincial, and local government. Local government receives its mandate from the Municipal Systems Act No. 32 of 2000; its role varies between regulatory functions and the delivery of services to the residents in the particular municipality (Pasquini et al., 2013). Local government is responsible for the provision of an array of services which include water, electricity, stormwater systems, human settlement, health services, road infrastructure, wastewater and sanitation, infrastructure development, firefighting services, local tourism, decisions around land use, street lights and recreation, amongst others (Education Training Unit for Democracy and Development, 2023).

There are instances where national or provincial government delegates some responsibilities to local government; this overburdens local government if resources are not provided as it compromises key projects within local government (Basdeo, 2012). These are called unfunded mandates and plague many municipalities, which results in municipalities not performing efficiently.

The South African Constitution provides for three categories of municipalities, namely metropolitan, local and district municipalities; this research study scope will focus only on metropolitan municipalities. Metropolitan areas, with their high population density and significant economic activities, present both challenges and opportunities for sustainable urban development (Danquah et al., 2022; Mwaniki & Ndugwa, 2021). These areas have the potential to significantly impact the overall environmental footprint of a country and can inform policies and practices in smaller urban and rural areas. Metropolitan municipalities face distinct environmental challenges due to rapid urbanisation, making them critical for implementing effective sustainability practices that can be adapted to other regions (UN-Habitat, 2020). Focusing on metropolitan areas can provide insights into governance models that work well for sustainability and offer valuable case studies for broader application. Each municipality is governed by a council of members that are elected and these members approve policies and bylaws for their area. The council is responsible for development plans according to a yearly budget and reports to the mayor who is assisted by a mayoral committee. The council together with the mayor supervise the municipal manager and department heads (Education Training Unit for Democracy

and Development, 2023). The municipal manager employs and oversees staff members who are responsible for implementing all programmes of the council for the community (Pasquini et al., 2013).

2.4.1.1 Definition of integrated development plans in South Africa

Section 25 of the South African Local Government Municipal Systems Act, 2000 (Act 32 of 2000) requires each municipal council to develop a strategic plan in which it will govern the municipality, at the beginning of an election term (City of Tshwane, 2022). This plan, which is the IDP, should include resource needs, development plans and outlines how the municipal council will stimulate that municipality's socio-economic state.

According to City of Tshwane (2022) an IDP is a strategy used by South African municipalities that details development plans of a particular area, to elevate the communities standard of living and provide them with additional resources. The objective is to leverage all facets of government to deliver effective services to the communities.

Stellenbosch Municipality (2020) defines an IDP as a municipality's five-year strategy detailing how it will develop its municipal area and it encompasses crucial governance aspects of the municipal council. Table 1 lists the characteristics of an integrated development plan.

According to Dlamini and Reddy (2018) the IDP is a management tool used to integrate development goals of local government through its local community participation, by stretching and augmenting resources and current infrastructure. It aims to stimulate the local community socio-economically through seeking accountable governance and sustainable delivery of services (Dlamini & Reddy, 2018).

From the literature above, it can be summarised that an IDP is a strategic five-year plan that is utilised to govern municipalities; it contains economic, social, infrastructure and environment development goals.

Table 1: Characteristics of an IDP (Stellenbosch Municipality, 2020)

	Characteristics
1	Adopted by the council within 24 months of the new administration being elected and is effective for the five years of the administration's term.
2	It is reviewed every year in consultation with the local community, NGOs, other spheres of government, stakeholders, and partners.
3	Gives direction and informs all aspects of planning, management, and development for the community.
4	Provides an outline on the municipalities medium term financial forecasts and performance management system.
5	Endeavors to promote economic, environmental, and social sustainability within the implementation of its mandate of service delivery and development. It pursues promotion of institutional capability and leveraging on actions across sectors and spheres of government.

2.4.1.2 The development of integrated development plans in South Africa

Prior to 1995, local government only focused on basic infrastructure maintenance and upgrading certain social facilities (Atkinson, 2002), which left minimal opportunity for integrated urban planning. Local government only prioritised development around new houses and certain tourism initiatives, until the dawn of democracy which saw new legislation being adopted that required a more progressive approach to urban planning and the IDP was the key tool to achieve this (Ruwanza & Shackleton, 2016).

The advent of democracy in South Africa in 1994 brought about the prioritisation of social and economic development by municipalities, where IDPs were used to facilitate sustainable development growth while serving as an instrument to deliver services (Ruwanza & Shackleton, 2016). While this was the intention when IDPs were introduced in South Africa, this aspiration has not been achieved yet. South Africa is still ridden with poor service delivery and a considerable proportion of the citizens are not economically independent and their quality of life is poor. This new dawn required municipalities to evolve in their development planning goals and with IDPs requiring regular updating and

consultation; this necessitated municipalities to develop strategic projects as part of IDPs (Atkinson 2002). This brought about the hope that urban planning and service delivery would take a new visionary direction to address the disparities of the past. The Municipal Systems Act, 32 of 2000, compels all municipalities to undertake an IDP process to produce IDPs; this Act encouraged decentralisation and a new governance structure that would deliver strategic projects that intersected across all three pillars of sustainability (Todes, 2004).

With the IDP being conceptualised as a participatory approach between municipalities and its residents for long-term development of the community (Sowman & Brown, 2006), and a tool for achieving sustainable development, Coetzee (2002) argues that IDPs are a policy initiative that has been poorly implemented. This might have been an ambitious task for the IDP, as post-apartheid South Africa was confronted with many challenges, while redressing the effects of inequality.

The Local Agenda 21 was an outcome of the 1992 United Nations Conference on Environment and Development (UNCED) or 'Earth Summit' held in Rio de Janeiro, Brazil to enhance sustainable development in local government (Coenen, 2009). The objective was that each country would tailor-make the Local Agenda 21 based on its own local environment. According to Pozo-Llorente et al. (2019), the Local Agenda 21 has encouraged local municipalities to strive for global urban sustainability. The Local Agenda 21 had great aspirations, but it, being a non-binding action plan limited its full implementation and success. It is clear that the world has always aspired to sustainable development, thus the development of the Kyoto Protocol. Although adopted in 1997 at COP3 in Kyoto, Japan, the Kyoto Protocol only became legally binding in February 2005 due to the United Nations Framework Convention on Climate Change (UNFCCC) recognising its limitations and ratifying it (UNFCCC, 2023).The Kyoto Protocol was pioneering in its time, and although it was the only legally binding treaty to reduce GHG emissions, only a few countries were part of the treaty which diminished its impact (UNFCCC, 2023). The Paris Agreement, adopted by 196 parties on 12 December 2015 at the UN Climate Change Conference (COP21) in Paris (UNFCCC, 2015), has superseded the 1997 Kyoto Protocol, even though the latter remains technically in force. The Paris Agreement establishes both temperature and emissions goals that supplement the ultimate objective of the UNFCCC. The SDGs reaffirmed aspects of the Local Agenda 21 programme and are attempting to achieve governance through setting goals that cut across a spectrum of dimensions that integrate basic human needs (Biermann et al., 2017). With the limited success of the implementation of the Local Agenda 21, it could

be that something else was needed to drive and be the instrument of sustainable development. Jörby (2002) asserts that IDPs are more transformative than the Local Agenda 21 as municipal budgets are encompassed within IDPs which was not the case with the Local Agenda 21. Despite this improvement in IDPs, Todes (2006) states that little effort is attached to sustainability within IDPs due to the assumption that they will automatically enhance sustainability. One of the reasons for the limited success in implementing the Local Agenda 21 programme in South Africa was that the country was in transition (Roberts & Diederichs, 2002), thus indicating that the political landscape could be an enabler of sustainable development. Lessons learnt from Durban's implementation of the Local Agenda 21 programme indicated that the shift from business as usual to a more sustainable approach takes time and changing mindsets needs more effort to ensure that the evolution transcends all levels within a municipality. Capacity development is also essential to ensure that municipal staff and all stakeholders are knowledgeable on sustainability and that institutional capacity is reinforced (Roberts & Diederichs, 2002).

Local government in collaboration with sector partners develop IDPs for particular municipalities according to their development needs, and at times external consultants are contracted to assist municipalities due to insufficient IDP development skills within local government (Todes, 2004). Although a strategic approach is needed for IDPs, there is no specific methodology on developing these, as they are guided by principles from the Department of Provincial and Local Government, which resides at the national level (Coetzee et al., 2001), and contextualised according to the communities' priorities in order to provide solutions. The municipality develops the IDP with specific projects and programmes, which are workshopped with community members for their input and consideration. The municipality then refines the IDP and consults the community further before it is adopted by the council for implementation (Ruwanza & Shackleton, 2016).

National and provincial policy requirements are considered in the IDP review, but this is done with a prioritisation of local community needs. Figure 2 shows the relationship of the City of Tshwane (CoT) IDP to national and provincial policy needs.

The City of Tshwane is a Category A Grade 6 urban municipality founded on December 5, 2000. It was formed by amalgamating several municipalities and councils that had previously served the Pretoria area and neighboring areas. On May 28, 2008, the city's boundaries were further adjusted through a proclamation in the Government Gazette, bringing the city's land area to 6 345 km^2. This means that the city spans over 121 km

from east to west and 108 km from north to south. It also accounts for more than 30% of the land area of Gauteng Province (19 055 km^2) (City of Tshwane, 2016).

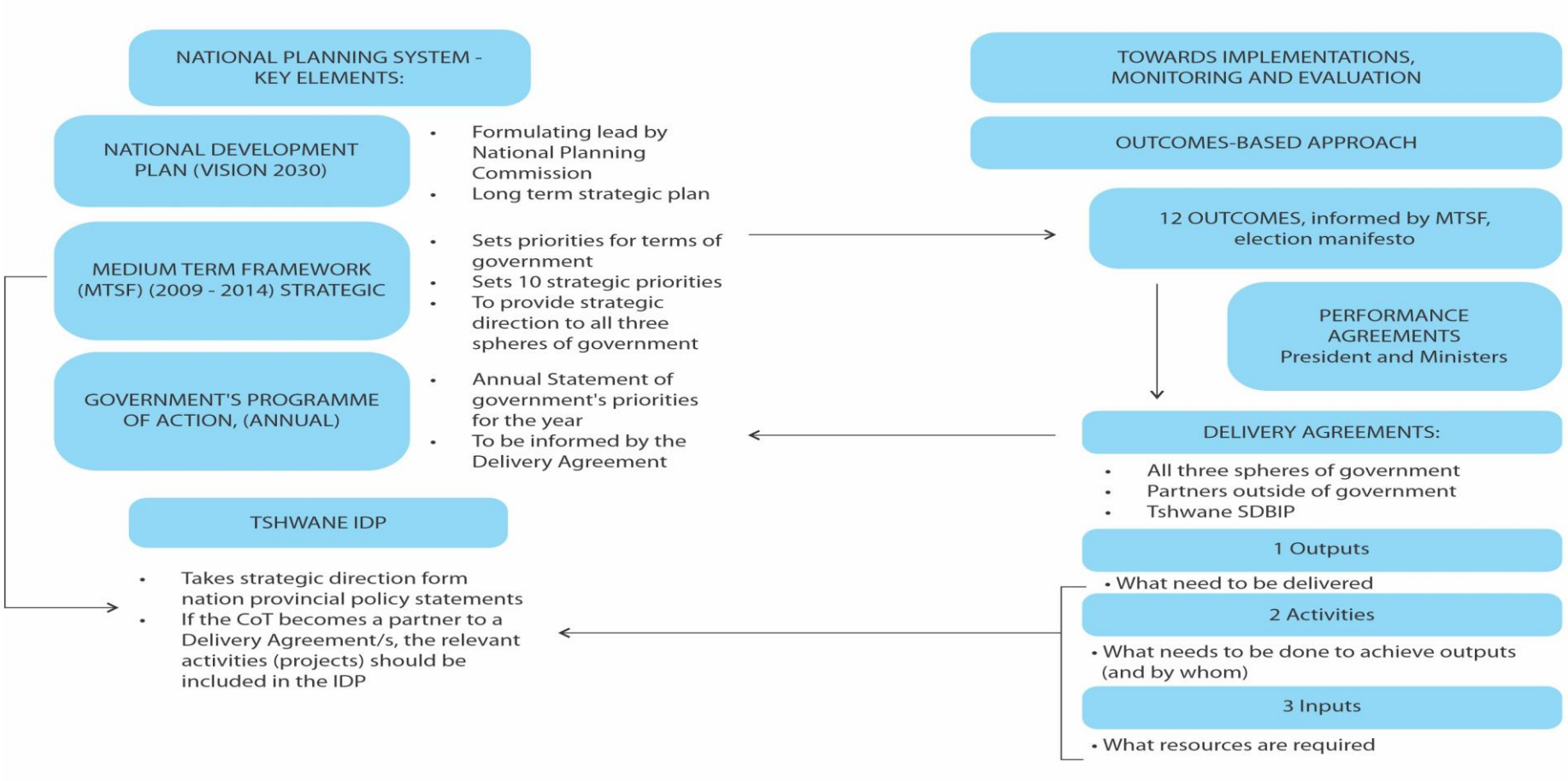


Figure 3: Flow chart indicating the relationship of the City of Tshwane (CoT) IDP to national and provincial policy needs (City of Tshwane, 2011)

The City of Tshwane operates under a Mayoral Executive System along with a ward participation system, as per Section 8 (g) of the Municipal Structures Act, Act 117 of 1998. The city has 107 physically delimited wards and 214 elected councilors, consisting of 107 ward councilors and 107 proportional representation councilors. The total population of the city was slightly over 3.1 million people in 2016 (City of Tshwane, 2016). The city is divided into seven regions for administrative purposes, which helps to improve service delivery. The city is the administrative seat of the government, and it hosts several embassies. It has become a leader on the African continent in terms of providing affordable industrial sites, varied industries, office space, education, and research facilities (City of Tshwane, 2016).

The 2017-2021 IDP was adopted by the city council on 25 May 2017. The IDP has strategically laid out pillars and deliverables that will guide the city towards a new and transformative development trajectory. The goal was to create a city of unparalleled opportunities, sustainability, inclusivity, safety, cleanliness, transparency, and accountability. These pillars were based on priority areas that required immediate and urgent attention during the 2017–2021 term of office. The five strategic pillars of the city's IDP were advancing economic growth and job creation, creating a caring environment and promoting inclusivity, delivering excellent services and protecting the environment, keeping the residents safe, and being open, honest and responsive (City of Tshwane, 2017b).

As per the Municipal Systems Act, the IDP should connect, merge, and synchronise the CoT development plans. It should ensure that the resources and capabilities of the municipality are in line with the plan's execution. It also establishes the policy framework and fundamental groundwork on which yearly budgets should be formulated (City of Tshwane, 2016). The CoT has transformational strategic focus areas that it aspires to achieve by 2030. The 2017-2021 IDP presented a situational analysis of where the city was in 2016 when the IDP was developed and how the municipality planned to transform by 2030. In 2016, the CoT faced economic inefficiencies due to administrative shortcomings that restricted residents from accessing job and investment opportunities. The city aimed to transform its economy into a highly productive one that fostered entrepreneurship, innovation, and accessibility for all actors to meet its 2030 goals. In terms of governance, the CoT was not collaborative and had a clear divide between the city and its external stakeholders. By 2030, the city aspires to become a highly integrated and delivery-focused institution that collaborates with stakeholders and prioritises

innovation. In addition, the CoT was heavily reliant on carbon-intensive sources of energy and had unsustainable management practices for its natural environment. The city sought to diversify its energy sources and preserve its ecological heritage through the 2017-2021 IDP.

The IDP should encompass strategic projects and programmes that should enable the municipality to achieve its strategic goals of Vision 2023. Given where the city aspired to be, the projects and programmes in the 2017-2021 IDP should be such that enabled the city to move towards being a “sustainable city” as stated in the IDP. According to the municipality, a sustainable city is “a city that provides infrastructure services that promote economic and livelihood activities while minimizing environmental impact. This requires an unwavering focus on systematic project planning and funding for service infrastructure planning and maintenance. Responsible management of natural resources is also essential to achieve a sustainable city. Hence, waste management and energy sources must align with the green agenda for environmental sustainability.” (City of Tshwane, 2016).

2.4.2 Local government in Namibia

Namibia is a democratic republic with three tiers of government, namely national, regional and local authorities, where the local authorities deliver waste management, water supply, sanitation and electricity supply services to the community, as well as promoting economic growth (Commonwealth Governance Namibia, 2023). The local authorities generate their own income and receive income from the national government as well (CLGF-Namibia, 2018). The local authorities comprise of municipalities which are classified as Part I and II municipalities; Part I municipalities are the cities and Part II municipalities are the small towns and villages (CLGF-Namibia, 2018). Part I municipalities are generally financially stable and relatively self-sufficient, while Part II municipalities are financially dependent on the national government (Siddle, 2019a).

Local elections must be held every five years; the municipalities are governed by a mayor alongside council members and an executive committee (Siddle, 2019a). Councilors are responsible for various portfolios in accordance with the respective services to be delivered to the community; these portfolios are economic development, infrastructure, public health, administration, finance and social welfare (Mweti, 2013). Through these

portfolios the councilors are accountable to the communities in provision of services in a sustainable manner (Craythorne, 2006).

2.4.2.1 Definition of strategic plans in Namibia

In the Outjo Municipality Strategic Plan 2016 – 2022 (Outjo Municipality (2016), it is stated that strategic plans provide municipalities with a framework to deliver services to communities.

DiNapoli (2003) defines strategic plans as a strategy to aid municipalities to project their development plans for cities in a systematic step-by-step approach.

A strategic plan is the primary strategic framework that guides decision-making within municipalities on its delivery of services and budget priorities, which articulates the objectives, annual plans and targets of a city over a period of five years (City of Windhoek, 2017).

The Ministry of Local and Regional Government and Housing state that the strategic plan is an instrument for improving good governance in municipalities and generate positive, transparent and sustainable results for development (AllAfrica, 2007).

Through the implementation of strategic plans, councilors can account to their residents on their performance as per the established indicators (Mweti, 2013).

2.4.2.2 Development of strategic plans in Namibia

In 1990, when the apartheid system came to an end, Namibia saw the need to contribute towards overcoming the social divisions and spatial marginalisation produced and naturalised by the apartheid urban planning policies (Müeller-Friedman, 2006). Strategic plans were a tool the government used to integrate spatial and development planning, as well as be a framework for service delivery. In late 2000, as part of the transformative transition, the Namibia National Planning Commission was tasked with coordinating activities and developing a shared national vision for Namibia, and in June 2004, President Sam Nujoma launched Vision 2030 to be a vehicle to address inequalities, facilitate sustainable development and access to land and capital (Namibia National Planning Commission, 2004).

With the objective of achieving sustainable development, Namibia developed Vision 2030 as a framework for long-term development, which articulates the country's pathway to industrialisation by 2030 (Namibia National Planning Commission, 2004). The strategic plans are guided by the Vision 2030 framework and detail strategic themes of social and economic development of the municipality. The strategic plans enable alignment between municipal resources and activities; they serve as a communication of the direction and focus of the municipality and establish value-added connections across departmental staff (Oshakati, 2015).

Council members, in consultation with the community members and various stakeholders, identify strategic development issues of the municipality and develop the strategic plans (Oshakati, 2015). The strategic plans incorporate both service delivery as well as developmental aspects. The consultation with the public empowers the citizens with the ability to hold the council accountable for the programmes or objectives planned for implementation.

2.4.3 Local government in Ghana

Ghana has a democratic government system with two tiers of government at the national and local level. The local government is decentralised and receives its mandate from the Local Government Act 2016 (Act 936) (CLGF, 2023). Local government in Ghana is classified under metropolitan, municipal and district assemblies, where each assembly has council members and committees which govern and deliver services to the residents (CLGF, 2023). Every four years a new administration is elected which is responsible for environmental conservation, health, sanitation and education services through the Metropolitan, Municipal, and District Assemblies (MMDA's) developing medium term development plans (MTDPs) (Commonwealth Governance Ghana, 2023). There are three types of assemblies at the higher levels of local government: metropolitan, municipal and district (CLGF, 2023). Metropolitan assemblies are areas with a population of over 250 000 which are cities, municipal assemblies are areas with a population of over 95 000 which are small towns, and district assemblies are a group of settlements with a population between 75 000 and 95 000 (Friedrich Ebert Stiftung Foundation, 2010).

The Accra Metropolitan Assembly is one of the 261 Metropolitan, Municipal, and District Assemblies (MMDAs) in Ghana, and one of the 29 MMDAs in the Greater Accra Region. It was established in 1898, and has since undergone multiple changes in name, size,

and number of sub-metros. In 1993, after Ghana returned to constitutional rule, the Assembly's legal basis became the Local Government Act of 1993 (Act 462), which was updated in 2016 as the Local Governance Act (ACT 936) (Accra Metropolitan Assembly, 2023). The Assembly consists of 16 departments and various units, all of which report directly to the Metro Coordinating Director (MCD), who in turn reports to the Metro Chief Executive (Mayor). The General Assembly meetings are chaired by the Presiding Member (Accra Metropolitan Assembly, 2023).

The General Assembly has 34 members, including 20 elected members, 10 government appointees, 3 members of parliament, and the Metro Chief Executive, who also chairs the executive committee. The Accra Metropolitan Assembly performs its duties through 14 sub-committees, each with specific responsibilities. These sub-committees perform deliberative functions and make recommendations to the Executive Committee for further consideration, followed by the General Assembly for final decisions and execution. The sub-committees include Social Services, Finance & Administration, Development Planning, Revenue Mobilization, Justice & Security, Education, Works, Environment, Youth & Sports, Culture & Trade Tourism and Industry, Disaster Management, Food & Agriculture, Health, Women & Children (Accra Metropolitan Assembly, 2023).

2.4.3.1 Definition of medium-term development plans in Ghana

Medium-term development plans (MTDPs) are a tool to decentralise local government activities for the implementation of programmes with the aim of stimulating economic growth, alleviating poverty and improving citizens' quality of life (Local Government Service Secretariat, 2014). The purpose of MTDPs is to streamline local government services with the incorporation of various stakeholders' needs.

The Municipal Planning Co-ordinating Unit (2021) of the New Juaben South Municipal Assembly, Ghana states that MTDPs provide a situational assessment of priority developmental needs of district assemblies, together with stakeholder participation they outline strategies to meet these needs and detail the budget, and the monitoring and evaluation framework. The MTDPs are strategic documents that detail integrated development activities of district assemblies, which include annual action plans to direct accounting and finance management systems for a period of four years (Gomoa West District Planning Coordinating Unit, 2021).

The MTDPs include a mission and vision statement of the municipality and articulates the implementation of the MTDP as well as indicators for monitoring and evaluation (Kwahu-West municipality, 2018).

2.4.3.2 Development of medium-term development plans in Ghana

Prior to attaining democracy, the local government was centralised, and decision-making resided with national government only. The 1992 constitution brought about decentralised local government systems that empowered citizens to participate in decision-making and local governance (Friedrich Ebert Stiftung Foundation, 2010). The transfer of power established district assemblies as the highest political, legislating, budgeting and planning authorities at the local level (Friedrich Ebert Stiftung Foundation, 2010).

The MTDPs outline local governments' implementation plans for various infrastructure and social services which include energy, health, education, transport, water, and sanitation (Akrofi & Akanbang, 2021). The district assemblies follow the process outlined in Figure 4. In the preparation and review stage, district assemblies consult with the public and stakeholders to ascertain critical development issues in the planning and development of MTDPs (Kwahu-West municipality, 2018) According to the Constitution of Ghana (1992, section 240e), citizen participation creates awareness amongst citizens, which has shown to foster greater understanding, appreciation, acceptance and ownership of the MTDP and ensures the accountability of local government authorities (West Akim Municipal Assembly, 2018). The district assemblies conduct a needs assessment in consultation, which is then translated into MTDPs. The process involves a variety of stakeholders including ordinary citizens, heads of institutions, traditional authorities (kings and queen mothers), religious leaders, civil society organisations, media, groups like market women and artisans (West Akim Municipal Assembly, 2018). Town hall meetings are then arranged, where the MTDPs are presented for discussion and adoption as the draft plans. District assemblies then allocate resources and develop monitoring and evaluation systems. Public hearings are organised for further deliberation on the draft MTDPs where they are adopted as final plans.

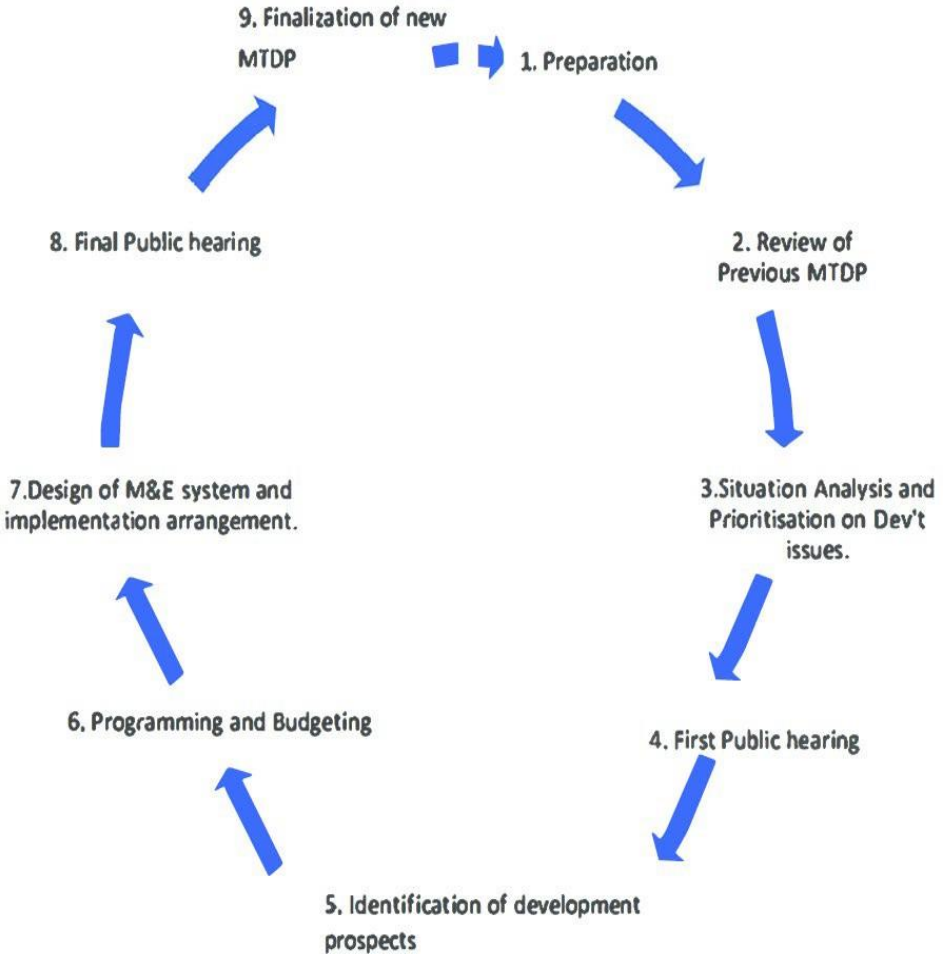


Figure 3: Development planning process for medium term development plans in Ghana (Ackah et al., 2019)

2.4.4 Local government in Zambia

The government system in Zambia comprises of two tiers which are national and local; the local Government Act of 1991 was amended in 2016 and it provides local government with its mandate for integrated development (Siddle, 2019b). Local government comprises of city councils, municipal councils, and district councils, where city councils are in the major cities with the large populations (CLGF Zambia, 2017). Local government is responsible for provision of water and sanitation, electricity, firefighting, road maintenance, wastewater, health, and pollution control services to its residents (Siddle, 2019b). Every five years new councilors are elected to govern through the leadership of a mayor; the mayor is supported by councilors and chiefs representing the districts (Siddle, 2019b).

2.4.4.1 Definition of integrated development plans in Zambia

The IDP is a tool through which spatial and development aspects are integrated, which form a framework for municipalities to plan, allocate resources, make decisions and manage service delivery in a particular area (Zambia Ministry of Local Government and Rural Development, 2019a).

The IDP is the primary strategic development planning tool, which guides a district on its management and finances for delivering services and elevates the importance integrating socio-economic and spatial planning (Bwalya, 2022).

The IDP is the result of a decentralised, public participation local government process where spatial land-use and development planning are integrated to deliver services to municipalities (Banda et al., 2022).

In 2015, the Zambian Government passed the Urban and Regional Planning Act to improve the planning system and make it more inclusive and responsive to local development contexts. According to the Act, all city planning authorities are required to produce strategic urban plans known as Integrated Development Plans. Before the Act was passed, Lusaka City Council (LCC), with the support of various international donors, had already started developing strategic plans. The first Strategic Plan for Lusaka City was developed between 1999 and 2004 and was replaced by the 2010-2015 Strategic Plan. In 2016, the plan was reviewed, and a new process of community and stakeholder engagement was initiated to create a 2017-2021 Strategic Plan for Lusaka that aligned with the decentralisation policy promoted by the national government. The review of the 2010-2015 Strategic Plan emphasised the importance of ensuring ownership of the strategic plan by various stakeholders, including political and administrative leaders in local government, as well as public and private sector actors. Such ownership would help in implementation and measurable improvement in delivering public services to all communities.

2.4.4.2 Development of integrated development plans in Zambia

The beginning of democracy in 1991 brought the enactment of the Local Government Act 22 of 1991 which emphasised decentralisation and empowered all local authorities to undertake more functions (Resnick & Siame, 2022). Municipalities delivered services through strategic plans prior to the introduction of IDPs in Zambia. The previous strategic plans were fragmented and were predominantly focused on sectoral planning which left no room for integration, thus the IDP provides an approach for alignment and co-ordination (Zambia Ministry of Local Government and Rural Development, 2019a). The aim of the IDPs is to integrate socio-economic development and spatial planning while aligning municipal activities with the needs of the various stakeholders within the area.

According to Banda et al. (2020), the Zambian IDP is an adaptation of the South African IDPs. This was done to enable Zambia to better address long-term spatial and economic planning disparities. Integrated development planning was introduced in 2000 (Chitengi, 2015); this came about through a process the government was conducting to amend the 1975 Master Plan; however, the consultants developed an IDP instead, borrowing from the South African experience (Hampwaye, 2008). As the government was already aware of the limitations of the 1975 Master Plan, the IDP provided the new approach to integrated planning that was needed. The IDP is operationalised through the Urban and Regional Planning Act No 3 of 2015 which gives local government its mandate (Banda et al., 2020). The master plan was failing to meet its objective, thus the IDP provided the participatory approach Zambia required in its developmental planning (Hifab, 2008). The integrated development approach aligned Zambia with international practices which enabled the country to access funding from the World Bank (Badescu et al., 2013).

The IDP planning process starts with an assessment to identify issues that need to be prioritised; a development framework is developed which contains various projects with targets and indicators to evaluate performance (Zambia Ministry of Local Government and Rural Development, 2019a). The process includes reflection on how land-use and land management will impact on the activities and projects. Once consultation with the various stakeholders is completed, the IDP is adopted and the municipality can commence implementing it (Zambia Ministry of Local Government and Rural Development, 2019a).

2.5 The extent to which sustainability dimensions are incorporated into development plans

According to Todes (2004), the lack of specific guidance on the nature of environmental sustainability aspects that development plans should address is one of the reasons that sustainability is not mainstreamed successfully, as more emphasis is placed on the process of development and not on the actual content. Municipalities also focus on referring to sustainability in their vision statements and goals; however, this is as far as it goes. Ruwanza and Shackleton (2016) note that many municipalities lack specific programmes, strategies and activities that are aligned to sustainability beyond their vision statements. In order to assess the extent to which environmental sustainability was incorporated into the development plans of various municipalities in South Africa, researchers have used various methodologies. An analysis of whether environmental sustainability featured in the mission statements of development plans was conducted, and examining the type of projects implemented and the budget allocation towards environmental sustainability initiatives provided insight into the successful incorporation of sustainability in IDPs (Ruwanza & Shackleton, 2016).

According to (Ruwanza & Shackleton, 2016; Todes, 2006) both financial and human resources and institutional capacity are enablers to mainstreaming environmental sustainability in development plans; hence, the importance of institutionalising the practice so that it becomes part of the daily operations of municipalities. South African municipalities are poorly resourced and understaffed; thus, this limitation needs to be addressed on a national level.

For development plans to fully deliver on their purpose where all three pillars of sustainability are elevated in their implementation, policy integration is key, and Biermann et al. (2017) has cited poor policy integration in the implementation of SDGs as also being a limitation. Todes (2006) argues that IDPs are a suitable tool to manage municipalities with sustainable development in mind; however, more emphasis is needed on ecological aspects, as was seen in the case study of Integrated Development Planning in the Ugu District Municipality where political and institutional constraints hindered environmental sustainability. Rauch (2002) found that inter-governmental collaborations were one of the barriers that limited participation and thus resulted in poor execution of the development plan. The nature of development plans being participatory and stakeholder collaborations being critical to its implementation, necessitates

municipalities to make every effort to address this aspect to ensure successful implementation. Civil society, NGOs, government organisations and sector partners need to buy into the vision of municipalities to enhance their support and collaboration, thus strengthening of these partnerships is an enabler to effectively mainstreaming environmental sustainability.

Shearing and Pasquini (2014) assert that for environmental sustainability to be embedded in the governance of municipalities, there needs to be a political champion who will elevate sustainability, and there need to be strong partnerships between the municipalities and the organisations around them. Due to the limited resources of municipalities, they can leverage the knowledge of sector partners, obtain funding from the private sector to fund certain key programmes, and lobby civil society to volunteer their time.

Regulatory barriers (such as problems associated with party politics) are reported to be one of the limitations and bring another dimension of the effects of political issues on local government operation and performance (Baker et al., 2012; Measham et al., 2011; Pasquini et al., 2013; Ziervogel & Parnell, 2012). The effects of councilor qualifications on local government operation are another limitation. Although municipalities have the ability to adopt more sustainable and resilient pathways, if there are party politics within the administration, it makes it more challenging. Party politics also hinder the aspect of a political champion if there is a change in the party ranks due to conflict.

The five-year period for elected terms has been cited as a challenge to achieving sustainable development as the results are seen over a period of time (Andersson & Van Laerhoven, 2007; Rakodi, 2001), thus it is critical that certain key aspects within development plans are fixed.

Governance and unwavering decision-making enables municipalities to implement sustainability more successfully (Boamah et al., 2012; Rakodi, 2001), which allows for efficient systems to be put in place which will outlive any administration term. A case study by Shearing and Pasquini (2014) showed that a small municipality in the Western Cape was able to continue with sustainability initiatives even after a change in administration, as some of the staff members from the previous administration were retained, thus indicating the importance of continuity and demonstrating the pivotal role of institutionalisation in entrenching environmental sustainability. The municipality had started incorporating a green agenda in their operations, which became a norm.

Anguelovski and Carmin (2011) note that municipalities formalising and institutionalising environmental work into development plans reinforces its authenticity, enables its successful implementation, and gives municipalities the ability to garner support across sectors and stakeholders. This also ensures that sustainable practices will continue even when political champions are lost and there is a change in administrative staff, as it is unlikely that environmental and climate actions will be reversed. Research shows that politicians and municipal staff who advocate for sustainable practices, are central to entrenching sustainability into IDPs and seeing this approach being maintained (Anguelovski & Carmin, 2011; Holgate, 2007; Measham et al., 2011; Qi et al., 2008; Sanchez-Rodriguez, 2009). The mayor and the council play key roles in facilitating the mainstreaming of sustainability in city development, operation, maintenance, and service delivery. Research has shown that leadership is a driver to embedding sustainability in municipalities; (Pasquini et al., 2015) highlight that leadership through senior officials within the City of Cape Town has been pivotal in mainstreaming climate change adaptation and mitigation, whereas in the small municipality of Hessequa, environmental sustainability was driven by political leadership.

Roberts (2008) states that for environmental sustainability to be embedded in daily operations of municipalities, certain institutional markers need be present. These are the presence of a political champion who will elevate sustainability issues, the allocation of both financial and human resources, and sustainability considerations being part of political and administrative decision-making. Lethoko (2016) notes some of the challenges of mainstreaming environmental sustainability into development plans as being the lack of human resources, inadequate knowledge of environmental sustainability, limited financial resources which results in medium- and long-term environmental sustainability projects being side-lined, and projects which do not meet the political agenda of that particular administration (often fairly brief) not being considered. Due to the short five-year term of politicians, development plans will consistently serve the agenda of a particular administration, and thus certain key components around sustainability need to be entrenched and fixed.

The absence of institutional capacity and adequate administration structures in Ghana has made it challenging for climate change adaptation to be integrated into policy, and district assemblies suggest that designated staff is required to coordinate climate change aspects; this has been the experience of the Bolgatanga Municipal Assembly in Ghana (Alhassan & Hadwen, 2017). Environmental sustainability activities cannot be added

arbitrarily to staff; appropriate resources need to be assigned for development plans. Part of the mainstreaming processes should include developing institutional capacities within municipalities. Sharma and Tomar (2010) highlighted the importance of awareness-raising when mainstreaming environmental sustainability as it is an enabler; local government in Ghana emphasised its importance. Municipal assemblies have alluded to the fact that staff require the capacity to understand climate change and most importantly the way in which sustainability dimensions are integrated into development planning (Alhassan & Hadwen, 2017). This could suggest that the challenges that municipalities have experienced in embedding environmental sustainability into development plans could be linked to lack of understanding of the actual mainstreaming processes. Sowman and Brown (2006) have highlighted the urgency for development plan managers and sector officials to be capacitated on environmental management and sustainability through short courses and continuing education programmes, to ensure that strategies and programmes that stem from development plans contribute towards achieving SDGs.

According to Simon and Leck (2015), African cities have systemic bureaucratic structures which are not agile and open to innovative approaches, thus limiting the ability to focus on environmental sustainability, and business as usual is maintained. Simon and Leck (2015) further states that a champion who will drive sustainability is important to successful mainstreaming; this finding supports research conducted by (Anguelovski & Carmin, 2011; Holgate, 2007; Measham et al., 2011; Sanchez-Rodriguez, 2009).

The lack of an approach that articulates the way in which the integration of environmental sustainability into development planning is done has been a limitation in Ghana (Akrofi & Akanbang, 2021). The failure of national governments in providing a mainstreaming framework for IDPs, strategic plans and MTDPs is a barrier to these documents being instruments for sustainable development.

2.6 Conclusion of literature review

This chapter provides a critical review of the literature, both local and international, related to the area of research on sustainable urban development and developing climate resilient cities. The chapter examined integrated development planning in South Africa, Namibia, Ghana, and Zambia, as well as the processes followed by local government.

The mainstreaming framework was analysed and how it can be contextualised to integrate environmental sustainability into development plans.

In assessing how environmental sustainability dimensions had been incorporated into development plans of African cities, lessons learnt from various case studies were reviewed and summarised.

The vulnerability of communities to climate change depends on the policies and frameworks that the local municipalities put in place through the development plans (Lethoko, 2016). Thus, the lack of success experienced by various African cities in integrating environmental sustainability into their development plans has placed residents at risk, and compromises Africa's efforts for sustainable development. As highlighted in the literature review, research has cited reasons for the inadequate mainstreaming of environmental issues in development planning (Alhassan & Hadwen, 2017; Pasquini et al., 2015; Ruwanza & Shackleton, 2016; Todes, 2006). Lethoko (2016) asserts that if municipalities do not have clear guidelines articulated in their IDP, strategic plan or MTDP to develop sustainably and adapt to climate change, then the community's adaptive capacity is adversely affected. The literature has highlighted that intentionality is critical to realise sustainable development of municipalities, and that mainstreaming is needed.

The literature has shown that although development plans are key to enabling cities to develop sustainably, they are not in a state that can provide a system of planning in which environmental sustainability can be enhanced (Todes, 2006)Thus, should environmental sustainability metrics be embedded in IDPs, strategic plans and MTDPs, and the metrics fixed in the daily operations of the municipalities, climate resilience can possibly be attained within cities. In all four selected countries, integrated development planning was introduced for decentralisation, with the objective of enhancing social, economic and environmental aspects within municipalities. From the literature, it can be seen that there are a few gaps in development plans achieving this objective. This is due to the assumption that IDPs, strategic plans and MTDPs will automatically enhance environmental sustainability (Todes, 2006). In addition, a strategic approach is needed for developing these documents, as in the South African case, no specific methodology is available to develop these, and they are guided by principles of the South African national, provincial and local levels of government (Coetzee et al., 2001);

contextualisation, according to the communities' priorities, is required to provide solutions.

Sowman and Brown (2006) state that mainstreaming is possible when a shared understanding of sustainable development occurs, and environmental aspects intersect with all other issues in local government. This requires local government to adopt transformative and innovative ways of operating.

A case study of a municipality in the Western Cape Province of South Africa indicated that the municipality was able to mainstream environmental issues into their development plans because of strong political leadership that created a paradigm shift where environmental aspects were elevated and municipal staff and council were educated, trained and capacitated on mainstreaming (Shearing & Pasquini, 2014). This enabled the development of institutional capacity where mainstreaming continued even with a change in administration. The need for local champions from both a political and municipal perspective has been highlighted in Africa, Europe and Asia as key to not only initiating mainstreaming of sustainability but also ensuring that it is sustained (Anguelovski & Carmin, 2011; Carmin et al., 2012; Holgate, 2007; Measham et al., 2011; Qi et al., 2008). Strong networks with various stakeholders have enabled institutionalising green governance and stimulating environmental innovation processes within municipalities (Tenkasi & Chesmore, 2003).

The first research question asks what the key elements are of failure in incorporating environmental sustainability into development plans. In this regard, the literature review has provided some insight. Based on the literature review, it can be inferred that the key impediments to incorporating environmental sustainability into development plans are the weak institutional capacity of municipalities, limited prioritisation of sustainability, insufficient human and financial resources, the lack of a champion who will spearhead sustainability, limited knowledge of mainstreaming, and poor governance.

Based on the literature reviewed, it is evident that there are a number of factors that can facilitate the integration of environmental sustainability into development plans. The application and presence of these factors address the second research question on how the successful incorporation of environmental sustainability into development plans can be achieved. These factors include the presence of strong social networks and partnerships with organisations and institutions, which can provide support, funding, and

expertise. Additionally, raising awareness among community members about environmental sustainability and sustainable development can improve their participation in the development planning process. The literature review also indicated that municipal staff members have limited knowledge of environmental sustainability, and it is thus important to educate municipal staff and councilors on the process of mainstreaming environmental sustainability and to equip them with knowledge of climate change and the way in which environmental sustainability can be integrated into development planning. Furthermore, incorporating environmental sustainability metrics into the daily operations and governance of municipalities can help to prioritise environmental sustainability programmes and allocate necessary resources.

CHAPTER 3: RESEARCH METHODOLOGY

3.1 Introduction

This chapter explains the research methodology used to evaluate the level of integration of environmental sustainability in the development planning of certain African countries. It describes the adopted research approach and design, as well as the reasons for selecting this design to address the research questions. Additionally, this chapter outlines the data collection process and the techniques used to analyse the data.

3.2 Research approach

This research study employed a qualitative research approach which entailed interpreting information from development plans, literature, and various other relevant documents. Content analysis was applied as a means of data analysis.

Cypress (2015) states that a qualitative research approach is supported by several theoretical perspectives, which are constructivist-interpretive, critical and postpositivist. Through a qualitative research approach, a better grasp of connotations and perspectives of the research area can be attained and of the way in which these perspectives are affected by social, cultural and physical aspects (Flick et al., 2004; Maxwell, 2012). Punch (2013) defines a qualitative research approach as one that generates results and data in the form of words as opposed to numerical data, and the findings are not obtained through the use of statistical analysis and models (Strauss & Corbin, 1990)(Muzari et al., 2022). This approach is further defined by Cypress (2015) as one that is used to investigate and comprehend a research area where not much is known about it; it is also only through a qualitative approach that better context and in-depth understanding of a phenomenon can be obtained.

A qualitative research approach was selected as it provides a better understanding of the way in which environmental sustainability has been integrated into development plans within African cities. A qualitative research approach provides a better analysis of the challenges and successes experienced by the selected African cities in using their development plans as a tool to develop climate resilience and develop along a sustainable pathway. The data that were analysed in this research were in the form of

words, and as stated by (Punch, 2013), it is important to match research questions with the appropriate method, thus this qualitative approach was deemed appropriate. The research area required a thorough analysis of policy integration, policy documents, observed patterns and repetition in wording in development plans, and thus the qualitative approach is deemed to be ideal to answer the research questions. Qualitative content analysis of development plans, municipal annual reports and other documents enables data to be condensed into themes, resulting in answering the research questions as well as meeting the research objective.

3.3 Research design

The research used a qualitative case study research design, following the steps shown in figure 4. According to (Priya, 2021), case studies involve a qualitative design in which the researcher explores a programme, activity, or process in depth (Hennink et al., 2020). An inductive approach was utilised to understand the extent to which the four cities had integrated environmental sustainability into their development plans and answer the research questions.

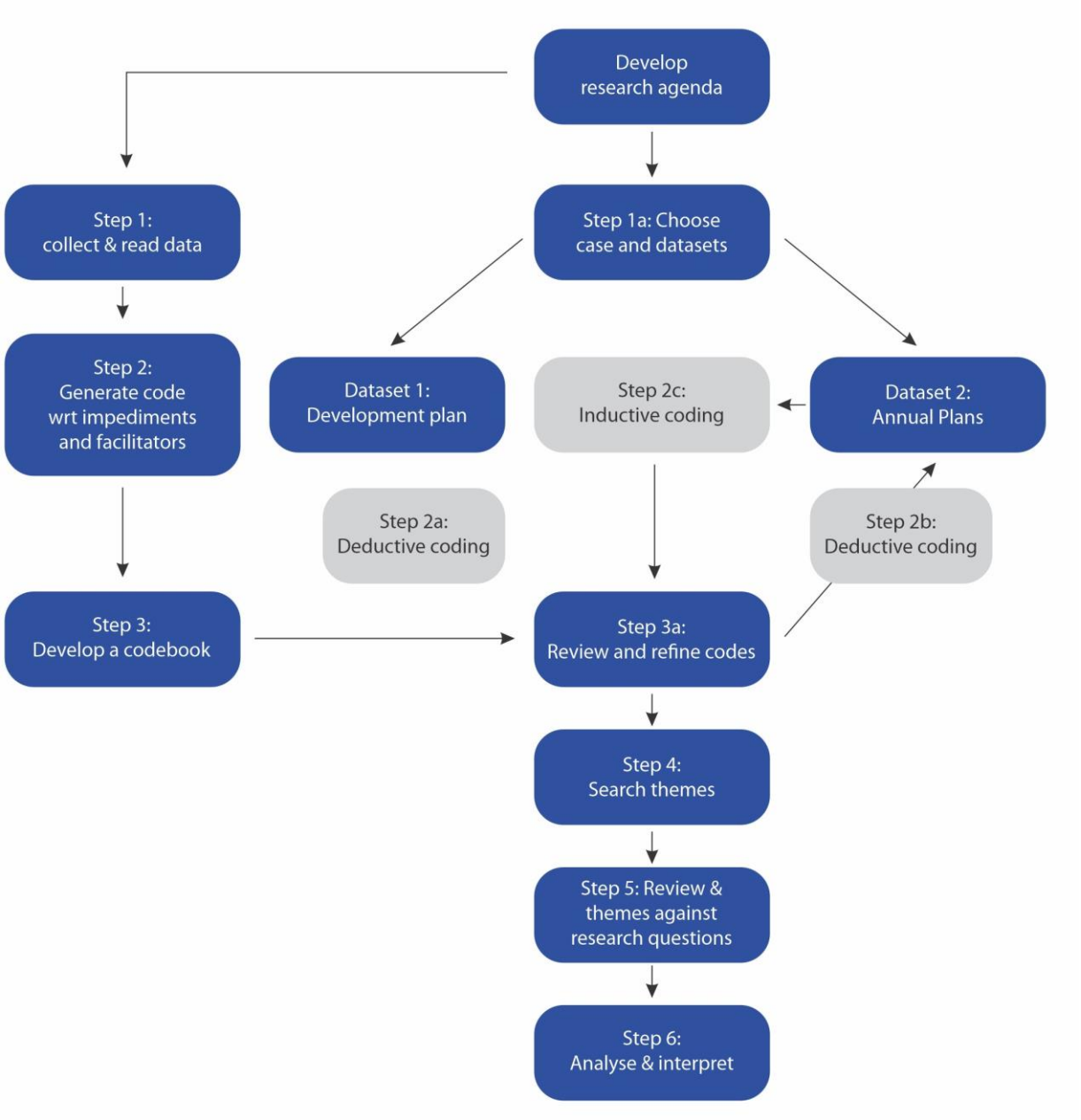


Figure 4: Summary of research methodology

3.4 Data collection methods

Document analysis was the technique that was used for data collection. A qualitative content analysis process was employed to determine the impediments to incorporating environmental sustainability into the development plans of selected African cities. Secondary data was used in this research which included the municipalities' development plans, annual reports, financial reports, and policy documents. These

documents were accessed from the respective municipalities' websites and requested from the municipalities.

3.4.1 Content analysis of integrated development plans and annual plans

This research used content analysis to critically review the development plans of four African cities to determine the impediments to incorporating sustainability into their integrated development planning.

Qualitative content analysis is the primary tool used to analyse textual material, such as written documents. Content analysis is a systematic coding and a classifying method for analysing large amounts of textual data to smaller more specific data to deduce certain patterns, themes and associations (Grbich, 2012; Mayring, 2004). Elo and Kyngäs (2008) assert that content analysis enables theoretical concepts to be assessed in order to gain a better understanding of data and its information can be reduced to manageable classifications. New perceptions and illustrations of information are obtained through content analysis (Krippendorff, 2018), and Elo and Kyngäs (2008) define content analysis as a process of evaluating written and verbal communication.

Stemler (2000) further defines content analysis as using coding to compress substantial amounts of words into smaller categories in a systematic way that is replicable, and interpretations are objectively made. The research area requires an understanding of the theoretical concepts of integrating sustainability into development plans and the way in which it has been done by municipalities. The content analysis method was selected as the appropriate method for this research study, as a critical evaluation of the content of development plans was required, which included the manner in which environmental sustainability is phrased, the various repetitive sustainable development themes in policy documents, and an understanding of how financial resources are allocated for environmental sustainability initiatives. Krippendorff (2018) states that content analysis is an empirically grounded method which is exploratory in process, and predictive in intent.

Sowman and Brown (2006) used content analysis to determine the extent to which environmental aspects were integrated into development plans and how policy frameworks in South Africa guided the successful incorporation.

An analysis of the development plans of the cities of Tshwane, Windhoek, Accra, and Lusaka for the term 2017 – 2021 was conducted to determine the extent to which the municipalities had embedded environmental sustainability in their development plans. The research examined the inclusion of environmental sustainability projects, budget allocations to sustainability projects and priority strategies in the development plans, and the successful implementation thereof. The annual development plans of the municipalities were reviewed to evaluate the performance of municipalities against the indicators or targets set in the development plans.

The development plans will be appraised against key principles and mainstreaming components of the mainstreaming framework as described in Chapter 2. To assess the level of integration of environmental sustainability into the development plans of the CoT, CoW, AMA and LCC, five categories were used. These five categories were based on the literature review and the OECD mainstreaming framework. The categories were: 1) address environmental concerns through projects and programmes in the development plan; 2) allocate resources to environmental sustainability projects, either through the municipal budget or external funding; 3) implement environmental sustainability projects and programmes; 4) inform and influence decision-makers through awareness-raising, stakeholder engagement, and meetings; and 5) monitor and evaluate the impact of implemented projects and programmes.

The content analysis involved a thorough examination of the development plans, municipal annual plans, and financial reports, which are publicly available documents accessed from each municipality's website and directly from the municipalities. The development plans outline the strategic four- or five-year plans of the respective municipalities, covering governance, economic, social, infrastructure, and environmental development goals. The content analysis provides a comprehensive understanding of the development plans' contents, identifies recurring themes, and evaluates the extent to which sustainability has been integrated into development planning.

3.4.2 Sample and sampling method

The following documents were collected and analysed for the four municipalities.

The City of Tshwane

The 2017-2021 integrated development plan (IDP), annual service delivery and budget implementation plans, as well as the annual and financial reports from 2017 to 2022 were reviewed to assess the presence of environmental sustainability projects and programmes in the municipality's development planning. The annual service delivery and budget implementation plans, and annual reports were reviewed to determine the progress of the projects planned, while the financial reports were reviewed to determine the extent to which the budget was allocated to the environmental sustainability projects, activities, and programmes.

The Service Delivery and Budget Implementation Plan (SDBIP) is a comprehensive financial plan that outlines how services will be implemented using the budget approved for IDP terms in a given year (City of Tshwane, 2018). It serves as a contract between the municipality and the community, defining the services that the municipality commits to delivering over a period of twelve months. It ensures that municipalities are accountable for the performance of the programmes and projects in the IDP.

Monitoring and evaluation (M & E) reports provide the City of Tshwane (CoT) with insight into the performance of IDP projects and their actual impact. This information enables the city to make informed decisions, backed by evidence, to enhance the current intervention, identify gaps and limitations, and plan future projects more effectively.

The City of Windhoek

The City of Windhoek's 2017-2022 Transformational Strategic Plan and annual reports were reviewed. The City of Windhoek (CoW) adopted its Strategic Plan in July 2017; it is aligned with Namibia's Vision 2030 and its 5th National Development Plan (NDP5). The plan aimed to lead the municipality towards becoming a smart and caring city by 2022, with effective stakeholder commitment. The mission of the CoW was to enhance the quality of life for all its residents by providing efficient and effective municipal services. The plan proposed a smart cities concept to deliver effective services, as well as inclusive, sustainable, and equitable economic growth to bring prosperity to Windhoek's residents.

The CoW collaborated with the regional council and other key stakeholders to develop the 2017-2022 strategic plan, which aimed to complement the African Union (AU) Agenda 2063. The AU Agenda 2063 is a strategic framework aimed to deliver inclusive and sustainable development across Africa. The key goal for the CoW was to ensure financial sustainability, as the previous term saw the city face financial constraints.

The CoW strategic plan outlines the city's situational analysis and acknowledges the 2016 drought which compromised the city's water security. Thus, the CoW sought to address the water challenges through the 2017-20121 strategic plan. The city's annual reports and M & E reports for the strategic plan term were analysed to ascertain the level of implementation of the indicators or targets set in the strategic plan.

The Accra Metropolitan Assembly

The 2018-2021 Medium Term Development Plan (MTDP) of the Accra Metropolitan Assembly (AMA) served as the blueprint for implementing developmental projects and programmes for the city of Accra (Accra Metropolitan Assembly, 2018). The policy document serves as a master plan of strategies to address development challenges and build Accra into a smart, sustainable, and resilient city. The mission of the AMA was to enhance its residents' quality of life through leadership in socio-economic development, while ensuring a clean, attractive, and secure environment. The MTDP was aligned to the SDGs and the African Union's Agenda 2063. The MTDP was adopted in 2018 and has five thematic goals, namely building a prosperous society, creating opportunities for all, safeguarding the natural environment, and ensuring a resilient built environment, maintaining a stable, united, and safe society, and strengthening Ghana's role in international affairs. The MTDP with the M & E reports were reviewed to evaluate the projects planned during the term and the extent of implementation.

The 2019 and 2020 annual progress reports were reviewed. The reports detailed the progress made in implementing the projects and programmes outlined in the MTDP, as well as how budgets were allocated and spent.

Lusaka City Council

The IDP for the Lusaka City Council (LCC) was not found on their website and requests to the municipality failed to produce the document. However, the guidelines for Integrated Development Planning in Zambia were used in this research. The guidelines were developed in 2019 and they serve as guidance for all local authorities in the preparation of

integrated development plans (IDPs). Volume 1 details a step-by step approach to understanding and preparing for integrated development planning and Volume 2 details how to undertake the planning survey and preparing the issues report (Zambia Ministry of Local Government and Rural Development, 2019b). In this instance, the analysis focused on what the guidelines detailed as key components to be included in the IDP and whether these aspects would assist the LCC in incorporating environmental sustainability in its IDP.

3.5 Data analysis and interpretation

The data analysis was conducted through content and thematic analysis. Thematic analysis was used to analyse the data. Maguire and Delahunt (2017) define thematic analysis as a process of analysing qualitative data to find various themes that will answer the research questions; it provides an interpretation of the data through grouping similar texts. Deductive thematic analysis was used for this study, given the existing framework in place for data analysis. This approach enabled a rigorous and precise analysis, ensuring accurate findings.

Braun and Clarke (2006) define thematic analysis as a descriptive process of analysing patterns within data. Braun and Clarke's six-step framework of thematic analysis was used for the data analysis in this research study. An outline of the six phases of the thematic analysis is given below as follows:

1. Become familiar with the data

(Braun & Clarke, 2006) state that analysis is an iterative process which entails going back and forth between the entire data set. The development plans and annual plans for all four municipalities were thoroughly and repetitively read to ensure that there was a complete understanding of all the key concepts; that there was comprehension of the manner in which the documents were structured; and that there was a clear perception of the process of developing the integrated development plans.

2. Generate initial codes

The qualitative data analysis was conducted using the Atlas.ti software. Coding of the development plans to address the research questions was done through page-by-page

analysis and coding on Atlas.ti where related themes were highlighted. The themes were in reference to challenges faced by cities that led to environmental sustainability not being implemented. In instances where successful implementation of sustainability initiatives was observed in the development plans of the cities, the effective enablers were identified.

3. Search for themes

The initial codes were used to identify themes of the relevant impediments to and enablers of incorporating environmental sustainability into the development plans of the municipalities. A thematic analysis of their annual reports was also conducted to evaluate the enablers of the successful incorporation of environmental sustainability into the development plans of these municipalities, and to determine how incorporation of environmental sustainability into development plans can be improved.

4. Review themes

The various themes identified were assessed to answer the research questions and analysed whether they were enablers of or impediments to incorporating environmental sustainability into development plans.

5. Define themes

The themes were further scrutinised and grouped into categories. A word cloud of frequently used words in all development plans and their respective annual reports was analysed to determine which words were used most frequently and whether aspects of environmental sustainability emerged as the most frequently used words.

6. Write-up

Chapters 4 and 5 include a presentation and discussion of the themes identified and representation of the results of the research. The themes that were identified are consistent with those identified in the literature to address the purpose of the research and identify the elements of the failure and success that the selected African cities have experienced in incorporating environmental sustainability into development plans.

3.6 Trustworthiness

Trustworthiness enables the thorough checking and validation of the accuracy of the collected data (Brgles & Swift, 2022). The research methodology involved the use of triangulation to enhance the quality and credibility of the analysis, which included analysing data using the Atlas.ti software through coding, comparing the findings obtained through page-by-page analysis, the various themes from the codes, and the mainstreaming framework assessment. This also enhanced the rigour and transparency of the analysis process. According to (Patton, 1999), it is crucial to ensure the credibility and quality of data in qualitative analysis by using triangulation techniques and various methods for gathering and analysing qualitative data. Objectivity and repeatability of the methodology should also be considered (Brgles & Swift, 2022). Patton (1999) suggests that using multiple methods in qualitative research helps to gain a comprehensive understanding of a phenomenon and its various aspects (Lune & Berg, 2021). This enabled a better understanding of how the selected four African cities integrated environmental sustainability into their development plans. According to (Heale & Forbes, 2013), triangulation is a research approach where two or more independent measures are used to confirm findings, which leads to more accurate and comprehensive results. Triangulation also helps to increase the validity of research findings by reducing research bias and testing the consistency of results obtained through different instruments (Blaikie, 1991). Content analysis entails aspects of subjectivity that could lead to various biases, thus impacting the trustworthiness and authenticity of the results (Stemler, 2000). In this research, it was crucial to use triangulation to ensure the reliability of the results. Each step of the thematic analysis was repeated, and the documents were read multiple times to ensure dependability, confirmability, and transferability.

The methodology used in this research provided a comprehensive understanding of the challenges faced in integrating environmental sustainability into the development plans of the selected African cities. The same approach can be applied to other African countries and continents. Thematic analysis led to detailed results that answered the research questions. The methodology is replicable, and another researcher can achieve the same results by following the same methodology. The dependability of the research is demonstrated in Chapter 4, where the identified themes and decision trail are documented.

3.7 Limitations of the study

Due to time constraints, this research study focused only on one metropolitan municipality in each of the four African countries selected. The scope of the research included the City of Tshwane, the City of Windhoek, Accra Metropolitan Assembly, and the Lusaka City Council only. These cities were selected as the focus of this research study as they are metropolitan areas with elevated levels of urbanisation from both a commercial and residential aspect. One challenge encountered was the limited accessibility of some policy documents on the municipalities' websites, which had to be requested, resulting in the assessment of only one development plan for the term 2017 – 2021 for each municipality. Furthermore, a problem arose with accessing the Lusaka City Council (LCC) IDP as it was not found on their website and requests to the municipality failed to produce the document. However, the guidelines for Integrated Development Planning in Zambia, developed in 2019, were used in this research. The guidelines were developed in 2019 and they serve as a guidance for all local authorities in Lusaka in the preparation of integrated development plans (IDPs). Volume 1 details a step-by step approach to understanding and preparing for integrated development planning and Volume 2 details how to undertake the planning survey and preparing the issues report (Zambia Ministry of Local Government and Rural Development, 2019b). In this instance, the analysis focused on key components detailed in the guidelines and whether these aspects would assist the LCC in incorporating environmental sustainability in its IDP.

3.7 Ethical considerations

The research was not sensitive and no confidential information was used. Ethical approval was requested from the ethics committee and a waiver was granted. The research study adhered to ethical measures and conduct in collecting and analysing the data and reporting the results honestly and truthfully. The researcher exercised diligence and objectivity in interpreting the data.

3.8 Conclusion

This chapter outlined the methodology, research design, data analysis, trustworthiness, as well as the ethical considerations that were used to answer the research questions.

CHAPTER 4: RESEARCH FINDINGS

4.1 Introduction

This chapter presents the findings of the research. The purpose of this research was to consider whether there are impediments to incorporating environmental sustainability into the development plans of selected African cities. The research sought to address the following questions:

1. What are the key elements of failure and success in incorporating environmental sustainability into development plans.

2. How could the successful incorporation of sustainability into development plans be achieved.

Qualitative content analysis was used to assess the inclusion of environmental sustainability projects, budget allocations to environmental sustainability projects and the prioritisation of sustainability strategies in the development plans of the selected municipalities and the successful implementation thereof. The first section presents the findings of document analysis of the City of Tshwane's Integrated Development Plan (IDP), the City of Windhoek's Strategic Plan, the Accra Metropolitan Assembly Medium Term Development Plan (MTDP) and the Lusaka City Council's guideline documents for Integrated Development Plans (IDP) for the term between 2017 and 2022. The findings of the respective municipality's annual performance in these periods against the indicators or targets set in the development plans are presented.

An evaluation of the factors that can either hinder or support the integration of environmentally sustainable practices in the development plans was done through page-by-page content analysis and thematic coding. This was to identify the impediments and enablers.

The second section presents the findings of the analysis of the development plans against the OECD mainstreaming framework. The framework details the various aspects that are required to be included in the planning of development plans and the implementation process. The development plans of the selected cities are assessed in terms of inclusivity of the mainstreaming aspects.

In this research, the integration of environmental sustainability into development planning is regarded as the explicit inclusion of environmental sustainability projects and policies in the operations of municipalities. It also includes the explicit inclusion of environmental sustainability projects in the budgeting and planning of municipalities through their development plans.

4.2 Results of the thematic content analysis

This section presents the results of the page-by-page content analysis and the coding. The content analysis examined whether the development plans of CoT, CoW, and AMA, and the Zambia IDP guidelines possessed impediments to or enablers of achieving sustainable development, as well as the way environmental sustainability was integrated into the development plans.

In examining the development plans, the analysis focused on environmentally orientated projects, projects that focused on how the municipalities institutionalised environmental sustainability into development planning. The analysis assessed whether the environmental sustainability projects were implemented after being planned and how resources were allocated to them. A review of the implemented projects was done to identify internal and external factors that can either facilitate or impede sustainable development. The municipality's funding sources, and budget allocations were evaluated to determine the way in which funds were allocated to various projects and their prioritisation.

Part of the development process of development plans is extensive stakeholder engagement; this is an ongoing process with specific meetings held on an annual basis when the development plans are reviewed, and performance management is conducted. The analysis examined whether engagements occurred with a wide variety of stakeholders, the level and type of engagements conducted, and the frequency of the meetings.

A review of existing policies, regulations, and incentives related to environmental sustainability within the respective municipalities was conducted to determine whether there were any regulatory barriers or incentives.

An evaluation was conducted to determine institutional capacities by assessing the

municipality’s technical capabilities and human resources. This was to assess whether the cities had competencies within its staff to mainstream environmental sustainability.

The level of public awareness and education on development planning and environmental sustainability conducted by the municipalities was assessed.

When reviewing the extent to which environmental sustainability had been integrated into the development plans of the four municipalities, the research did not focus on normal service delivery. Projects on waste removal, electricity and water supply were not considered as they form part of basic service delivery and are not regarded as being part of environmental sustainability.

Figures 5 and 6, show the frequency of words used in all the development plans and annual reports. The most frequently used word in the development plans was "development" which is to be expected as these documents are meant to enable development in the respective four cities.



Figure 5: Word cloud generated from development plans

The analysis reveals that the term "ecological" is mentioned nine times in the CoT 2020/2021 SDBIP, once in the AMA MTDP, and not at all in the Zambian guidelines, the CoW strategic plan, and the 2018/2019 CoT SDBIP. Additionally, the word "environmental" appears 76 times in the CoT 2020/2021 SDBIP, three times in the CoT 2017/2018 SDBIP, five times in the CoW strategic plan, 300 times in the CoT IDP, 50 times in the Zambian guidelines, and 97 times in the AMA MTDP. Finally, the term "sustainability" is mentioned twice in the CoT 2017/2018 SDBIP, 16 times in the CoT SDBIP, 22 times in the CoW strategic plan, 70 times in the CoT IDP, and eight times in the AMA MTDP.

The content analysis findings reveal that the words "financial" and "services" are frequently used in the annual reports. It is important to note that the words related to environmental sustainability are not frequently used in the development plans and the annual reports.



Figure 6: Word cloud generated from annual reports

The Sankey diagram given in Figure 7 shows the various themes that were generated from the codes in the development plans of the four cities. The themes that emerged include leadership instability, capacity-building and training, leadership gap, institutional challenges, ineffective supply chain systems, absence of key infrastructure facilities, poor stakeholder engagement, competent skilled municipal staff, governance, staff capacity constraints, partnerships and collaborations, stakeholder participation, poor project management, environmental sustainability awareness-raising, indicative budget, and multidisciplinary development plan team.

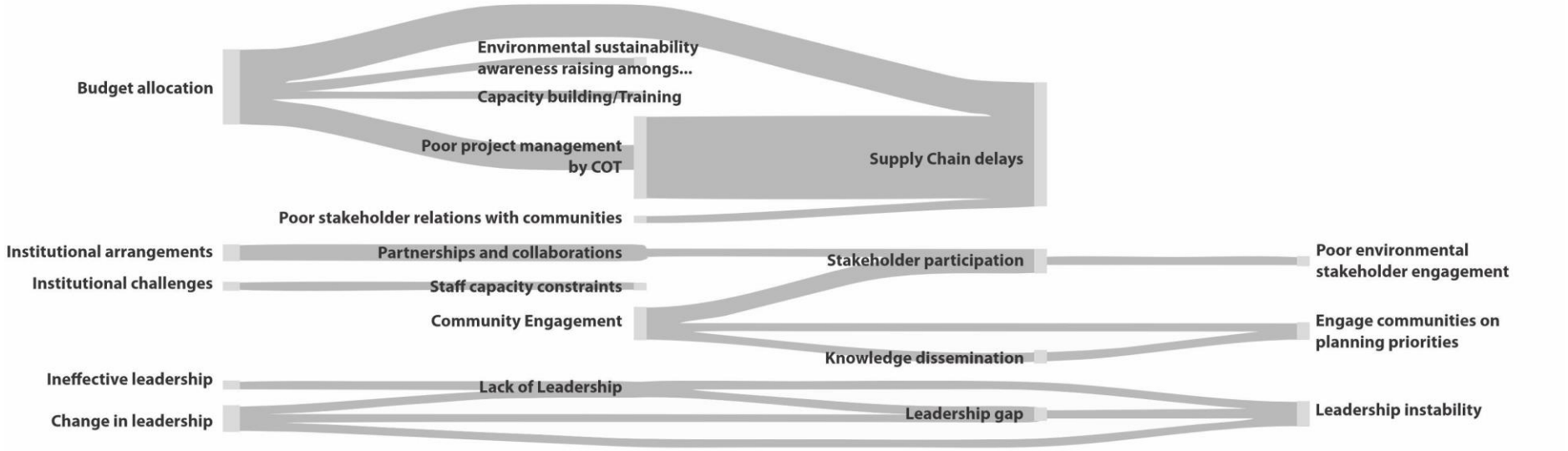


Figure 7: Sankey diagram reflecting impediment and enabler themes

4.3 Analysis through the mainstreaming framework

This section presents the results of the analysis of the development plans against the OECD mainstreaming framework which is discussed in Chapter 2. The framework was used to assess the way in which the four municipalities mainstreamed environmental sustainability into their development plans.

When mainstreaming environmental considerations into policies and development plans, the following aspects must be considered: The extent to which environmental sustainability risks have been taken into consideration in the formulation of the specific projects and programmes; and whether the development plans address these risks and offer opportunities for climate-proofing. As shown in Appendix A, for integration of environmental sustainability into development plans to be successful, the following aspects must be present:

1. Intentionally taking account of environmental concerns and addressing them through specific projects and programmes in the development plan.

2. Allocating resources to environmental sustainability projects and programmes, either through municipal budget or sourcing external funding from donors and partners.

3. Implementation of the environmental sustainability projects and programmes.

4. Informing and influencing decision-makers through awareness-raising, stakeholder engagements and regular meetings.

5. Monitoring and evaluation of the implemented projects and programmes.

4.3.1 Intentionally taking account of environmental concerns and addressing them through specific projects and programmes in the development plan

The content analysis shows that the CoT has not been explicit in addressing environmental concerns through projects. The CoT is aware of the impact of urbanisation and climate change on the environment, but there has been poor reflection of this in addressing it. The findings show that CoT has listed a few projects that have not been

implemented. The content analysis shows that the CoT IDP mentions the maintenance of biodiversity and resorts, developing a green energy business strategy, reduction of landfill waste, facilitation of renewable energy and waste to energy, drafting a Green Building Development By-law, preventing illegal dumping, and stabilising the waste collection and waste disposal services as some of the main interventions that the city is committed to. However, only the maintenance of biodiversity and resorts is articulated in the actual projects.

The content analysis showed that the CoW explicitly addressed its water security risks through including the establishment of an additional Direct Portable Reuse Plant (DPRP) and expanding the aquifer recharge scheme in their projects, to address the effects of the drought. The findings show that renewable energy projects were included and implemented and a small-scale embedded generation system for the residents was introduced along with net metering policies.

The findings show that AMA used the Potential, Opportunities, Constraints and Challenges (POCC) assessment as a tool to analyse the feasibility of implementing its projects identified as per the developmental issues. The POCC analysis is a tool used to streamline development issues and interventions before they are programmed for implementation, which is important to assist in fine-tuning development goals, objectives, policies, and strategies. The resources within AMA's access, which could be harnessed to enhance developments in the city, were the potential. The opportunities were other external factors that the AMA could leverage to enhance the development rate. The constraints were internal weaknesses which could impede development and steps would have to be taken internally to address them. The challenges were external constraints hampering development, which need to be overcome. This enabled a realistic analysis of resources that AMA had to develop projects to address environmental concerns and implement the MTDP. It enhanced the formulation of appropriate strategies for a more pragmatic plan. The analysis shows that AMA recognised the importance of mainstreaming climate change in their development planning and budgeting processes; they established the resilience advisory council and the climate change and resilience steering committee. In 2020, AMA developed a comprehensive five-year Climate Action Plan, which indicated that AMA was serious about their climate and environmental risks. The plan was the second of its kind on the African continent and is fully compatible with the 2015 Paris Agreement (UNFCCC, 2015). The AMA plan prioritised decisive action

on crucial areas such as solid waste and wastewater, buildings and industry, transportation, and land use and physical planning. This was also to ensure that climate threats are thoroughly considered and addressed in their development processes.

The analysis shows that the Zambian guidelines for IDP planning are explicit on how environmental factors should be incorporated into the IDP. The guidelines state that an assessment of the natural environment's condition as well as the effects and ramifications of population growth, settlement, and industrial development must be done. The guidelines specify that the LCC should address environmental risks and its relationship to economic activities and industrialisation through the IDP.

4.3.2 Allocating resources to environmental sustainability projects, either through municipal budget or sourcing external funding from donors and partners

The content analysis shows that the CoT did not prioritise budget allocation to environmental sustainability projects. The projects were planned. However, it can be seen in the annual reports that they were not implemented due to the lack of budget allocation. In 2019, the CoT planned to build a waste-to-energy plant; however, resources were not allocated for this project. The 2018/2019 projects of the CoT are displayed in Appendix F. The CoT intended to build a bicycle lane in the 2018/2019 fiscal year, but no funding was provided for the project in that year. The city subsequently set aside R10 000 000.00 for 2019/2020 and 2020/2021, respectively; however, the project was not implemented as funds were not allocated. According to the findings, the installation of gabion structures and oxygen traps as part of the wetland rehabilitation project was scheduled to begin in the third quarter of 2018. However, the 2020/2021 SDBIP reveals that the CoT is still busy conducting procurement processes.

The CoW was intentional about allocating a budget to its strategic objectives, programmes, initiatives, and projects. They also accessed funding from the Green Climate Fund (GCF) to ensure they could successfully implement the environmental sustainability projects they had planned due to the limitations of the municipal budget.

The findings show that when AMA was planning its MTDP budget, the estimated costs included all mitigation measures that would be adopted to ensure sustainability. The budget needed to successfully implement the MTDP was R6.4 billion which was

sourced from internally generated funds, donor funding and funds from the national government. The analysis shows that AMA allocated R5.5 billion to the environment sustainability programmes.

Although the guidelines for Zambia reiterate that the activities in the planning process of the IDP should be conducted in a cost-effective manner, there is no reference to prioritising budget allocations to the environmental sustainability projects.

4.3.3 Implementation of the environmental sustainability projects and programmes

The results indicate that the CoT tried to prioritise the green economy and preserved ecological infrastructure and ecosystems in the 2019/2020 fiscal year, putting more of an emphasis on environmental sustainability than on the routine waste disposal and water treatment projects the city conducted as part of its regular services. The findings indicate that the CoT only enhanced the atmospheric pollution monitoring network in that fiscal year as part of its targeted environmental sustainability projects. The CoT had intended to build a multimodal rubbish transfer facility in 2018; however, it was never Implemented. The results indicate that the CoT used the DMRE's energy efficiency and demand side management funding to convert two hundred standard streetlights to light-emitting diode (LED) fixtures and fenced three nature reserve spruit areas during the 2018/2019 fiscal year. The CoT planned to build an agricultural park in Soshanguve in 2020–2021, but this project was never carried out because no funding was provided. The project was moved to the 2021/2022 fiscal year, with a R6 500 000.00 allocation for that year and an additional R6 500 000.00 for 2022/2023. However, the implementation of this project cannot be assessed as the 2022/2023 fiscal year falls outside the scope of this research. The CoT annual reports indicate poor implementation of environmental sustainability projects, while prioritising the rehabilitation of wetlands in the Centurion area and fencing nature reserves.

The annual reports show that the CoW implemented the environmental sustainability projects as planned in the five-year term of the strategic plan. From the findings, it is clear that to lessen its dependency on the national utilities, the CoW launched energy and water initiatives. According to the analysis, the CoW increased the capacity of its aquifer recharge scheme to allow for adaptation to variations in rainfall and

temperature. This included storing water underground to prevent evaporation during high rainfall years and preserving it, along with treated water, for years when rainfall was insufficient. By using net metering for small-scale embedded generation, the CoW encouraged its citizens to use renewable energy sources. To include renewable energy sources into the city's electrical networks, the city built a waste-to-energy plant as well as solar and wind power facilities. The analysis shows that the CoW established a second facility for the direct potable reuse of treated wastewater as a means of enhancing the region's water security. As part of the shift to using more environmentally friendly energy sources, the CoW also created a policy on renewable energy.

The annual reports show that AMA implemented energy efficiency projects by conducting energy audits and implementing the recommendations following the energy audits. To construct a sanitary landfill site, AMA secured 200 acres of land. Through the SMART school initiative, AMA installed solar panels, biogas digesters and boreholes at schools they constructed. Strategies on cleaner production and consumption technology and practices were also adopted, as well as promoting waste recycling and waste-to- energy technologies. As part of its resilience strategy, the Accra Greening and Beautification Project was initiated in collaboration with private companies; AMA partnered with the Department of Parks and Gardens, Ecobank Ghana Limited, Ghana Commercial Bank and the Church of Jesus Christ of Latter-day Saints, who funded the initiative. The project was launched in 2018 with the objective of greening the open spaces within Accra. The analysis shows that AMA dredged three of its lagoons to increase the storage capacity of the reservoirs for water security and to prevent flooding. In addition, AMA implemented a training programme to educate fifty vegetable farmers on green labelling and certification. This assisted farmers to attain certification which is an indication of the way in which the environmental impacts of their products are taken into consideration, and they created sustainable values for consumers as well as for the whole society which is in line with sustainable development. This project not only focused on the environmental aspects, but it created income generation for farmers and gave them access to new markets. The annual report details how AMA planted 250 000 trees per year and planted grasses in open spaces to mitigate erosion.

4.3.4 Informing and influencing decision-makers through awareness-raising, stakeholder engagements and regular meetings

The annual reports show that the CoT has annual air quality environmental education and awareness sessions at several schools and communities as well as a pre-winter awareness campaign to curb air pollution particularly for informal settlements. However, the findings of the content analysis show little engagement of the CoT in matters of environmental sustainability engagement with other IDP stakeholders, e.g., NGOs, civil society, and businesses.

The analysis shows that CoW sought input from a broad and diverse stakeholder network during the planning process for the 2017-2021 Strategic Plan, including the city's administrative and technical staff, administrative and political representatives of the Khomas Regional Council and the city's councilors. This approach was to ensure a collaborative planning process. The strategic plan states that the CoW considers community participation to be a key component in the implementation of its strategic plan. The CoW Strategic Plan states that "public participation promotes understanding of residents' expectations, improves the public's understanding of the city's responsibilities, and ensures better compliance through greater ownership of a solution.'' It goes on to say that "public participation is the cornerstone of responsive, inclusive, and caring city government because it empowers communities to best participate in issues that affect them. It also builds consensus for action on complex issues." Regular meetings were held with members of the community and stakeholders. The annual report indicates that the CoW scheduled two cycles of citizen engagement meetings, twenty-six meetings per cycle and additional meetings as needed, annually in all ten of the city's constituencies. The analysis shows that to improve participation and feedback, CoW adapted the methods of engagement and communication, recognising that different circumstances require different communication platforms. In the event of conflict, resources were made available for mediation to ensure that trust in the communities was restored.

In the development of the 2018-2021 MTDP, AMA included community engagement sessions and stakeholder meetings where developmental issues were discussed. One of the twenty-eight primary issues identified was environmental pollution; however, this issue was not addressed from the climate risk perspective. The findings show that AMA held nine resilience stakeholder meetings, of which four were with resilience

organisations, four were for the preparation of the resilience strategy, and one was a dissemination workshop where the resilience strategy was presented and shared with stakeholders. AMA held awareness-raising workshops to educate its residents on the hazardous effect of noise pollution by night clubs in the metropolis and on waste management and disposal. The annual reports reflect capacity-building training programmes that were organised for solid waste collection contractors. A dissemination and communication strategy was developed by AMA as a guidance on updating its stakeholders on the progress made in implementation through various channels. The strategy is depicted in Appendix C and details how AMA used panel discussions, town hall meetings, community engagements and written material to disseminate information to its various stakeholders. The findings show that AMA also held numerous workshops for resilience sensitivity for community members to conscientize them on environmental issues. The analysis shows that AMA conducted community engagements on proper disposal of waste and waste separation at source. Annually, AMA organised seminars, training programmes and workshops on disaster prevention and specific workshops for community members in flood-prone areas.

The content analysis shows that the guidelines place a strong focus on community involvement and stakeholder engagement as an essential aspect of Zambia's IDP implementation. The guidelines emphasise how the LCC should explore different platforms for interaction, develop a participation strategy, and involve the community and stakeholder organisations in every stage of the IDP process. The findings show that, according to the guidelines, the LCC must take into consideration the best available channels for public input and ensure that all relevant stakeholder groups are represented.

4.3.5 Monitoring and evaluation of the implemented projects and programmes

The CoW introduced a Quality Process Results (QPR) tool, a management system to assist in monitoring progress on the performance of the implementation of the strategic plan and quarterly reporting on the implementation was also introduced.

During the implementation of the 2014-2017 MTDP, the AMA experienced some challenges and part of the lessons learnt from that term was to incorporate a rigorous

monitoring and evaluation plan into the 2018–2021 MTDP. From 2018 onwards, the AMA implemented a result-based monitoring and evaluation programme with systems to assist the municipality in assessing the size of financial budgets as well as the extent of resource commitment needed to complete projects, so they could monitor the progress made in the implementation of the MTDP and review their performance. The findings show that ten district cleansing officers and five other waste management department staff members were trained on results-based supervision and monitoring and evaluation (M & E), and the AMA conducted several site visits and held stakeholder meetings to monitor the progress of the projects and programmes. Appendix B shows the M & E plan of the AMA for the four-year term of the MTDP. The annual reports indicate that M & E was conducted at various levels, with the AMA involving members of the town/zonal council, assembly members, traditional authorities, women and youth representatives, religious leaders, unit committees and representatives of non-governmental/community organisations to oversee specific local projects. This helped to create a sense of ownership of the projects and to keep these stakeholders informed of progress through a participatory monitoring and evaluation process. At the assembly level, the various departmental teams conducted monthly site visits to collect data and receive input from the communities.

Although the Zambian guidelines do not detail how monitoring and evaluation should be implemented, a chapter on mainstreaming climate change into the IDP is included in Volume 1, which are the guidelines on undertaking the planning survey and preparing the issue report. Part of the mainstreaming process is to develop a framework of indicators and outputs that appropriately monitors progress towards reducing risk and building resilience as well as indicators linked to key projects. This suggests that the LCC will have a framework for monitoring and evaluating its progress toward implementing the IDP.

4.4 Summary of research findings

This chapter presents the key research findings through thematic analysis and analysis through the mainstreaming framework. The chapter shows how the data and the analysis answer the research questions and objectives.

The coding and page-by-page analysis revealed several key themes, including leadership instability, capacity-building and training, leadership gap, institutional challenges, ineffective supply chain systems, absence of key infrastructure facilities,

poor stakeholder engagement, competent skilled municipal staff, governance, staff capacity constraints, partnerships and collaborations, stakeholder participation, poor project management, environmental sustainability awareness-raising, indicative budget, and multidisciplinary development plan team.

The analysis revealed varying levels of success and challenges in mainstreaming environmental sustainability across four municipalities. Factors like addressing environmental sustainability risks and opportunities for climate-proofing were considered. The CoT poorly reflected urbanisation and climate change impact in their project implementation. The CoW addressed water security risks through projects like the Direct Portable Reuse Plant and renewable energy projects. The AMA used the POCC assessment and developed a five-year Climate Action Plan prioritizing waste management, transportation, and land use. The LCC followed Zambian guidelines for environmental factors in IDP.

Budget allocation challenges hindered the CoT's environmental projects, while the CoW and the AMA allocated funds and accessed external sources for environmental sustainability programmes.

The CoT prioritised green economy and ecological infrastructure projects but faced implementation challenges. The CoW and the AMA implemented projects to enhance water and energy security, waste management, and urban greening. The LCC lacked specific details on project execution though.

The CoT's stakeholder engagement was limited. The CoW and the AMA involved broad stakeholder networks, emphasising community participation and regular feedback. The LCC emphasized the importance of community involvement throughout the IDP process.

Regarding monitoring and evaluation, the CoW implemented the QPR tool for monitoring the strategic plan's implementation. The AMA involved various community and stakeholder groups in a results-based monitoring and evaluation programme, while the LCC guidelines included a framework for monitoring progress and building resilience.

CHAPTER 5: DISCUSSION OF RESEARCH FINDINGS

5.1 Introduction

In the preceding chapter, the findings of the research study were presented. The interpretation and discussion of these findings are detailed in this chapter. The findings are based on the results of the thematic content analysis and the mainstreaming framework. The first section provides a discussion of the themes generated from the coding using thematic analysis, and the second section provides a discussion of the findings from the assessment of the mainstreaming framework. The third and fourth sections respond to the first research question regarding key elements of failure and success in incorporating environmental sustainability into development plans. The fifth section suggests how the successful incorporation of environmental sustainability into development plans can be achieved, thus addressing the second research question, and section six concludes the chapter.

5.2 Thematic analysis

A thematic analysis of the development plans of the four different cities showed that the CoT used words related to environmental concerns such as ecological, environmental, and sustainability more frequently than the other cities. However, this cannot be taken as a sign of successful incorporation of environmental sustainability into development plans because it needs to be translated into actual implementation of environmental sustainability initiatives. Pintér et al. (2017) emphasises that concrete actions and measurable progress are essential for achieving environmental sustainability. Including environmental sustainability in a development plan is a critical first step because it reflects a commitment to considering ecological factors in the planning process, as seen in the CoT. However, simply mentioning environmental sustainability as a concept or goal in a development plan is often not enough without concrete implementation through projects.

The findings of the research reveal that the themes generated from the coding are in alignment with those reported in the literature. The themes that speak to the impediments were leadership instability, leadership gap, institutional challenges, ineffective supply

chain systems, absence of key infrastructure facilities, poor stakeholder engagement, staff capacity constraints, and poor project management.

The themes that speak to enablers were capacity-building and training, competent skilled municipal staff, governance, partnerships and collaborations, stakeholder participation, environmental sustainability awareness-raising, indicative budget, and multidisciplinary development plan team.

5.3 Assessment of selected framework for mainstreaming environmental sustainability into development planning

To assess the level of integration of environmental sustainability into the development plans for the CoT, CoW, AMA and LCC, five categories were used. The five categories were based on the literature review and the OECD mainstreaming framework. The categories were: 1) address environmental concerns through projects and programmes in the development plan; 2) allocate resources to environmental sustainability projects, either through the municipal budget or external funding; 3) implement environmental sustainability projects and programmes; 4) inform and influence decision-makers through awareness-raising, stakeholder engagement, and meetings; and 5) monitor and evaluate the impact of implemented projects and programmes.

The summary given below indicates the way these five categories were included by the four selected cities.

1. Addressing environmental concerns and risks through projects and programmes in the development plan

The findings from the content analysis show that the CoW and AMA explicitly addressed environmental concerns through specific projects they implemented in their development plans. This category was better reflected in AMA where they went a step further in developing their 2020 - 2025 climate action plan that focused on mainstreaming climate change into their MTDP. Al four cities are in semi-arid countries which have experienced sever and prolonged droughts affecting water security. These cities are susceptible to climate change impacts and need to take bold actions in how they continue to develop sustainably. The AMA and CoW were explicit in addressing their water and energy

security risks through their development plans which yielded additional socio-economic benefits for the residents.

2. Allocating resources to environmental sustainability projects, either through municipal budget or sourcing external funding

The category of allocating resources to environmental sustainability projects was better reflected in CoW and AMA where climate financing and partnerships were sourced. The findings show that through leveraging partnership these two cities have successfully received external funding to ensure environmental sustainability projects were implanted and part of the development plans. Municipalities are faced with financial constraints and need to be agile in finding additional resources for successful implementation of all their projects and programmes. This requires leveraging partnerships, accessing climate finance and other funding to meet the development goals of the development plans, and not compromising the environmental sustainability projects. The CoT received R15 million annually from the DMRE energy efficiency and demand side management budget, which was utilised only for retrofitting lights; the CoT could have allocated some of these funds to the renewable energy projects that were planned and were not implemented due to the lack of finance.

3. Implement environmental sustainability projects and programmes

The findings demonstrate that CoW and AMA have successfully implemented environmental sustainability projects, while CoT has failed to do so. Pieterse et al. (2021) states that in addition to dealing with service delivery backlogs, budgetary restrictions, capacity limitations, and a lack of knowledge or data, South African municipalities must also undertake forward development planning that considers climate change impacts. It is clear that the CoT has not effectively implemented its environmental sustainability projects, reflecting poor prioritisation. In the 2019/2020 fiscal year, the city planned to install renewable energy to supply the municipality but failed to allocate a budget for it. The city had not set quarterly targets, and the project was not included in the municipal budget, indicating a lack of priority. The CoT has consistently failed to implement its environmental sustainability projects due to poor prioritisation, focusing instead on providing electricity and water to a backlog of residents, which is equally important. In contrast, both AMA and CoW were found to prioritize prioritise environmental sustainability while ensuring that they meet the needs of residents without water and

electricity. Studies by (Broto, 2014; Faling et al., 2012; Pieterse et al., 2016) suggest that efforts to address climate change are often neglected in favor of immediate development problems, which has been the case in the CoT. The 2020/2021 SDBIP makes mention of ecological infrastructure and its importance to economic development and mitigating against the impacts of climate change. The CoT acknowledges that ecological resources are irreplaceable and that cities must prioritise their preservation and open spaces should not be considered undesirable land (CoT, 2020). The CoT has a biodiversity plan, outlined in Appendix F, which provides guidelines for development projects. However, the projects and programmes in the IDP do not currently support this plan, nor do they focus on enhancing the integrity of ecological infrastructure. The findings suggest that better inclusion of this dimension is achieved by the CoW and AMA than by the other cities.

4. Informing and influencing decision-makers through awareness-raising, stakeholder engagements and regular meetings

The findings suggest that the CoT did not have meaningful stakeholder engagements; the meetings with the communities were focused on community members complaining about the lack of service delivery. The CoT's engagement with the community was too infrequent and seems transactional to meet compliance instead of being relational and effectively engaging the community on the development plan and environmental sustainability issues. The findings show that the CoT had only one meeting in each region when the IDP was being developed. The CoT has acknowledged that it needs to improve its stakeholder engagement and has identified it as a risk in the 2019/2020 annual report. ILEKA (2018) asserts that successful community participation involves residents being part of the development plan process from the beginning and there being continual feedback and engagement from the municipality. It is observed from the findings that engagements with communities and stakeholders have been information sharing where the CoT presents the IDP and what it has done instead of engaging the stakeholders on how to build a sustainable city. The South African Municipal Systems Act compels the MEC (Co-operative Governance & Traditional Affairs) responsible for local government to evaluate the IDPs prepared by the CoT on an annual basis and provide feedback to enhance intergovernmental relations and alignment to ensure prompt and efficient service delivery. The MEC's comments state that "95% of Gauteng City-Region Observatory's (GCRO) 2013 survey respondents

had not heard of IDPs, while 50% of the 5% who knew about it never participated in the process due to a lack of understanding" (City of Tshwane, 2019). The MEC further stated that the CoT must raise awareness of IDPs to increase public participation. The more residents are aware of IDPs, the better the position they would be in to meaningfully participate in IDP processes. Additionally, the CoT must create waste minimisation initiatives and awareness programmes to educate the community about municipal facilities and the environment. "This is essential to reduce littering and fossil fuel burning particularly in the CoT's winter months" (City of Tshwane, 2017a, 2019). Both AMA and CoW have institutionalised capacitating their stakeholders and community members with environmentally centered awareness-raising workshops and training programmes. Ruwanza and Shackleton (2016) and (Roberts & Diederichs, 2002) state that in order to successfully incorporate environmental issues into development plans, it is imperative to bolster the participatory nature and requirements of development plans through creating forums to engage communities, businesses, local authorities, and government stakeholders in discussing environmental issues essential for development and human well-being. To ensure maximum participation and feedback, the CoW tailored methods of engagement and communication as they were cognisant of the fact that different circumstances required different communication platforms. Resources were made available for mediation where conflicts arose, to ensure that trust with the communities was restored.

5. Monitoring and evaluation of the implemented projects and programmes

The CoW introduced a Quality Process Results (QPR) system, which is a management system to assist in monitoring progress on the performance of the implementation of the strategic plan, and quarterly reporting was introduced.

The content analysis findings showed that monitoring and evaluation programmes were in place in CoT, CoW, and AMA, although monitoring and evaluation were poorly reflected in the CoT. Overall, the findings showed that the development plans of the CoW and AMA were inclusive of most of the dimensions as compared to the other two cities. Both municipalities included the five aspects of the mainstreaming framework even though all cities can do more to incorporate environmental sustainability into their development plans. The CoT reflected the least inclusion of the dimensions in its development plan

with poor institutional arrangements and monitoring and evaluation. (Pieterse et al., 2016) emphasise that this stark contrast between the level of mainstreaming in visioning principles and strategic planning and the actual implementation and monitoring and evaluation thereof cannot be ignored; while the CoT development plan promoted environmental sustainability, it was not translated into concrete actions and implementation.

5.3 Impediments to incorporating environmental sustainability into the development plans of selected African cities

The research suggests that there are critical factors that are needed for integrating environmental sustainability into development plans and failure to include these will result in the integration not being successful. The findings show that the key elements of failure in incorporating environmental sustainability into development plans are as follows:

Limited stakeholder and community engagement: development planning is participatory process and is more effective when development plans have inputs from diverse all affected parties. The findings reflect that poor stakeholder and community engagement impedes buy-in of environmental sustainability and leads to poor incorporation of environmental sustainability into development plans.

Lack of integration: The findings show that fragmented efforts at integrating environmental sustainability into development plans leads to failure as a silo approach is not effective. This requires intergovernmental, cross sector and various departments in municipalities to work together.

Weak institutional capacity of municipalities: The absence of experienced environmental sustainability professionals, dedicated environmental sustainability departments, systems and tools has hampered attempts made by municipalities to successfully integrate environmental sustainability into their development plans. Municipalities face challenges in reacting to and being proactive towards climate change and addressing environmental risks due to a lack of data and modelling frameworks. Climate adaptation requires specific knowledge of the vulnerabilities and impacts of each city, which is resource-intensive and necessitates an updated and comprehensive

database. In addition, it requires scaling down the climate change impacts to specific urban locations to develop adaptation strategies.

Limited prioritisation of environmental sustainability: The research reveals that all four cities shared a vision and objectives that were focused on environmental sustainability, combating climate change, and promoting climate resilience to attain the status of sustainable cities. The study also indicates that although the cities had planned environmental sustainability projects, they were quite limited in number. While CoW and AMA gave priority to their environmental sustainability initiatives, CoT failed to prioritise such initiatives. This resulted in the postponement of these projects, which were then carried forward to the following fiscal year without any successful implementation.

According to (Sharma & Tomar, 2010), the lack of financial resources has resulted in local governments being unable to prioritise environmental sustainability issues. This has led to a lack of consideration of climate change impacts on buildings and infrastructure in city development plans. Due to limited funding, municipalities often compete for budget allocation, and there is a belief that incorporating environmental sustainability into development plans would have a negative impact on infrastructure and other project budgets. The findings show that when funds are not allocated to environmental sustainability initiatives, there is poor incorporation of environmental sustainability into development plans.

Limited knowledge of mainstreaming processes: (Measham et al., 2011) showed that councilors have identified a lack of credible, useful and relevant information on how to incorporate environmental sustainability in development planning as one of the key barriers to mainstreaming environmental sustainability. This is also evident in the findings on the way in which the cities have approached environmental sustainability.

Limited prioritisation of funds: The CoT's wetland rehabilitation project was supposed to start in the third quarter of 2018 with the installation of gabion structures and oxygen traps. However, the 2020/2021 SDBIP shows that the CoT is still undertaking procurement processes. In the same fiscal year, the CoT had planned to develop an agricultural park in Soshanguve, but this project was not implemented due to the lack of budget allocated. The project was then moved to the 2021/2022 fiscal year with a provision of R6.5 million and an additional R6.5 million for 2022/2023. These initiatives were neglected because the CoT had prioritised other projects over these, and funding was not allocated. The lack of financial resources is particularly relevant to

mainstreaming environmental sustainability, as this often competes for funding with other needs that may seem more pressing for municipalities (Measham et al., 2011), especially in developing nations with high development needs. Therefore, even if the need for environmental sustainability is acknowledged in legislation, policies, and development plans, it may not be implemented effectively.

Procurement delays: The findings suggest weak integration of environmental sustainability in the development plan of CoT, with only a few ecologically minded initiatives planned. The CoT has not been able to successfully implement those that are planned due to supply chain delays in awarding service provider contracts, and inadequate project management by the CoT in cases when contractors fail to meet agreed-upon timetables. For example, the CoT planned to adapt 60 high masts, 1 042 streetlights, and to replace 9 162 building lights with energy-efficient lights in 2019, but these planned initiatives were not conducted due to delays in appointing a service provider. According to the findings, the CoW and AMA have mentioned procurement processes as a hurdle to implementing environmental sustainability due to lengthy municipal supply chain processes. As a result, the AMA created a renewable energy procurement strategy to allow it to purchase renewable energy plants while streamlining the process.

5.4 Enablers of incorporating environmental sustainability into the development plans of selected African cities

For environmental sustainability to be successfully incorporated into development plans, the process by means of which cities approach development needs to evolve. A new innovative approach is required, where environmental sustainability is at the forefront of how cities operate. The findings show that the enablers to incorporating environmental sustainability into development plans are as follows:

Partnerships and collaborations: The existence of partnerships and networks is an enabler of mainstreaming environmental sustainability into development plans, as municipalities are able to leverage the resources they don't have (Tenkasi & Chesmore, 2003) (Shearing & Pasquini, 2014). The research shows that private sector partnership allowed the AMA to incorporate the efforts of the informal sector in recycling about three hundred tons of plastic daily and to turn this into a circular economy for plastics which created jobs. The case study of AMA, the Accra Greening and Beautification Project

launched in 2018, reflects how a partnership with the Ecobank Ghana Limited, Ghana Commercial Bank and the Church of Jesus Christ of Latter-day Saints facilitated environmental sustainability. Following the success of this project and partnership, in 2020 AMA signed a Memorandum of Understanding with Ecobank Ghana Limited to adopt and continue with the project.

Leveraging a knowledge base of environmental sustainability experts: Access to a knowledge base of sustainability and sustainable development experts and networks helps municipalities to better mainstream an environmental agenda in their development planning. In 2019, AMA organised a C40 climate leadership workshop on waste financing for its staff. The workshop not only trained AMA employees on project development, financing, business planning, climate change, integrating benefits into climate action, and sustainable investing, but also demonstrated AMA's commitment to addressing waste management. In addition, AMA developed its resilience strategy in 2018 through the 100 Resilient Cities network, pioneered by the Rockefeller Foundation. The strategy was launched in 2019 and outlines the city's sustainable development path, which AMA is determined to follow. Institutionalising green governance and promoting environmental sustainability can be achieved by municipalities with the assistance of networks that provide crucial knowledge and opportunities for environmental innovation (Shearing & Pasquini, 2014). The AMA has done well in leveraging its knowledge which has benefited the city in being able to include all the mainstreaming dimensions even though some may not be fully maximised. The AMA also participated in the C40 Cities Deadline 2020 programme and developed the city's climate action plan in 2019. The C40 Cities Climate Leadership Group initiated the programme to assist member cities in reviewing, updating, and adopting integrated and inclusive climate action plans. The aim was to achieve low-carbon and climate-resilient development, consistent with the Paris Agreement target to limit global warming to 1.5 ℃ and adaptation objectives. The objective was for cities to commence implementing a climate action plan before the end of 2020. In 2019, AMA set out and developed its 2020-2025 Climate Action Plan with a particular emphasis on mainstreaming the climate change threat into development processes. Despite its participation in the city’s resilience forum, the CoT has not made any strides in integrating climate resilience into its development planning, based on the findings and needs to make better use of its knowledge base. Pasquini et al. (2013) report that Cape Town has made considerable progress in mainstreaming climate change into its development plan; this success can be attributed to the city's strong knowledge base, which has been effectively translated into the Cape Town Climate Change Think Tank. This platform

brings together city officials, academics, and consultants who provide both free and paid information on climate change, empowering decision-makers to make informed choices.

Presence of environmental sustainability champions: This research and other research has shown that the presence of champions is vital to environmental sustainability being elevated and maintained within a city, whether they are elected politicians and/or municipal staff members (Carmin et al., 2012; Measham et al., 2011; Pasquini et al., 2013; Sanchez-Rodriguez, 2009). Mohammed Adjei Sowah who was Mayor of Accra from 2017 to 2022 exemplified a true environmental sustainability champion, which improved how Accra approached environmental sustainability. The former mayor was known for improving the environmental health of Accra and their work on implementing climate solutions and influencing climate policy. During the mayor's tenure, their policy platform centered on improving the cleanliness and health of the city, including improved waste management, better sanitation and enacting the "polluter pays" scheme to disincentivise environmentally unfriendly behavior. The former mayor also reformed the policy on Building Regulations LI 1630 (1996) to include a section dedicated to Green Building requirements to encourage developers to construct green buildings; he is a climate policy maker. Mohammed Adjei Sowah was voted number 41 in the Apolitical 100 most Influential People in Climate Policy 2022/23 (Apolitical, 2022). Appendix D shows the methodology Apolitical used to select the top 100 individuals with criteria for assessing the individual's climate impact and its relevance today and building of climate partnerships, amongst others. (Pasquini et al., 2015; Shearing & Pasquini, 2014) have noted the building of climate partnerships as a critical facilitator.

Municipal staff that are knowledgeable on environmental sustainability mainstreaming in development planning: For environmental sustainability to be successfully incorporated into development plans, it is crucial to educate municipal staff and councilors on environmental sustainability, sustainability policies and mainstreaming. The findings suggest that cities lack understanding on how to incorporate environmental sustainability into their development planning effectively and are not aware of the appropriate steps to be taken to achieve sustainable development. Among the cities, the CoT demonstrated the least understanding due to its limited inclusion of the mainstreaming dimensions based on the OECD framework to incorporate environmental sustainability into development plans. Unless the CoT takes intentional steps to capacitate its staff on mainstreaming environmental sustainability, future

development plans will continue to have fragmented projects that do not integrate sustainability and do not help the city move towards being climate resilient. The CoT has been developing their development plans in this same manner for almost three decades and has not been innovative in their planning approach. The AMA and CoT are both part of the C40 Cities Network, but AMA has succeeded in more effectively leveraging the partnership to improve its mainstreaming of environmental sustainability in its development plan. (Pieterse et al., 2016) showed that acquiring the necessary knowledge and skills to effectively interpret and mainstream information on environmental sustainability is absolutely essential for successful climate change adaptation and seamless integration of environmental sustainability in development planning. This was the case in the AMA which organised a training programme for its staff on integrated renewable energy, targeting development planners, works engineers and assembly members. The programme was conducted in collaboration with 350 Ghana Reducing our Carbon (350 G-ROC), which is a leading environmental grassroots organisation in Ghana affiliated with 350.org. The main objective of the programme was to equip the participants with the knowledge and skills necessary for integrating renewable energy actions and strategies into their MTDP. Pasquini et al. (2013) state that political champions are essential for driving rapid change, hence, it is imperative that cities prioritise the education of councilors, especially those in senior positions, on environmental sustainability. Pasquini et al. (2013) further urge organisations and stakeholders working closely with municipalities, such as ICLEI and Local Governments for Sustainability, to take a more assertive stance in engaging with senior politicians to achieve this. It is crucial to keep trained staff and capacity to effectively incorporate environmental sustainability into municipal development plans. When staff leave, it creates knowledge gaps, disrupts projects, increases training costs, reduces stakeholder engagement, and weakens strategic planning (Franks, 2015; Morrison-Saunders et al., 2014). To sustain the success of environmental sustainability initiatives, it is important to retain staff and invest in continuous capacity building. This can be done by identifying critical roles, developing internal talent, creating formal succession plans, implementing knowledge management systems, investing in leadership development, and engaging external expertise (Dalkir, 2013; Rothwell, 2010). These steps can help mitigate the impact of staff turnover and maintain momentum in sustainability initiatives.

Awareness raising, effective stakeholder and community engagement: Conducting

awareness-raising workshops and disseminating knowledge to communities helps integrate sustainability into development plans. During the review process of the CoT's development plan in 2018, the COGTA MEC provided critical feedback on community capacity development. The MEC expressed concern regarding the CoT's inadequate community engagements and advised the city to focus on raising awareness about the development plan and environmental issues. The MEC further stated that informed communities are better equipped to participate meaningfully in development plan processes. The findings suggest that the MEC's feedback helped as the CoT was able to improve their awareness-raising activities. The CoT conducted various awareness campaigns to build capacity and promote participation in the protection of biodiversity among residents. The aim of these campaigns was to sensitise residents about local biodiversity threats in protected areas and open spaces and inform communities about actions that could be taken to avoid or minimise the impact of biodiversity loss. Sowman and Brown (2006) showed that for effective mainstreaming of environmental issues into development plans, it is imperative that all key stakeholders, including citizens and marginalised groups, possess adequate knowledge about environmental sustainability. Furthermore, they must be well informed about development plan processes. The AMA has shown commitment in this aspect through workshops to educate the public about the causes of fire disasters in public facilities, markets and schools, flood protection and early warning systems. Between 2018 and 2021, AMA organised 28 sensitisation workshops. Out of these, four were focused on building community resilience, 20 were conducted in flood-prone areas to educate residents on proper waste disposal and disaster prevention, and the remaining four were dedicated to waste separation at the source. Through these workshops, AMA supported and empowered communities to manage their waste effectively, ensuring proper disposal and separation at the source. Increased public awareness allows for more effective communication of the advantages and significance of environmental sustainability activities to communities (Dietz et al., 2003). Effective community engagement is crucial to the success of development planning and the incorporation of environmental sustainability (Sharma & Tomar, 2010; Thebe, 2016).

Setting measurable, achievable, and relevant goals: Setting clear goals, targets and specific projects is a key factor in the success of integrating environmental sustainability into development plans. This structured approach provides a roadmap for implementation, facilitates monitoring and evaluation and improves accountability (United Nations, 2016; Wiek & Larson, 2012). Appendix F presents the progress of the

CoT's projects for the period of 2018/2019. It is worth noting that only four of these projects were related to environmental sustainability, despite numerous projects listed under strategic pillar three. The city planned to develop a bicycle lane, but no budget was allocated for this initiative. Later, ten million rand was allocated in 2019/2020 and 2020/2021, but not implemented due to budget limitations. A bicycle lane could have reduced GHG emissions, traffic congestion, and noise pollution while providing an alternative transportation option and conserving resources. The CoT acknowledges that climate change demands immediate and unwavering commitment to sustainable environmental protection. In its 2019 annual report, the CoT states that protecting the environment is a top priority, and it is committed to implementing sustainable and eco-friendly practices in all its operations. However, the findings show that the city has not set specific and realistic environmental sustainability projects, targets, and indicators to address climate risks. In 2019, the Gauteng Department of Agriculture and Rural Development (GDARD) found that the CoT failed to comply with eighty environmental regulations outlined in the National Environmental Management Act (NEMA). The CoT was found responsible for polluted rivers, malfunctioning water treatment plants, and continuous sewage spills. Setting environmental sustainability targets annually without a clear roadmap for implementation can lead to failed attempts. Instead, environmental sustainability targets should be staggered over a few years, providing cities with a realistic opportunity for implementation. Incorporating environmental sustainability into development plans is a long-term, multifaceted process that requires a comprehensive approach and should not be approached with short-term thinking. The AMA development plan outlines specific environmental projects with financing sources (internal or donor funding) and shows who will lead the effort and who will collaborate and support it. This is an effective way for cities to establish measurable goals. According to the findings, this has aided AMA in successfully implementing its environmental sustainability goals. The training programme, which aimed to teach fifty vegetable producers on how to obtain green labelling and certification, addressed the social, environmental and economic pillars of sustainability. This is why development plans were created as a tool for long-term development. The AMA highlights how a city may address its major challenges while also considering environmental sustainability. This was mirrored in AMA's construction of new school units, where they purposefully installed boreholes to use groundwater, as well as solar panels and methane digesters. The SDG 4 was addressed by AMA, and environmental sustainability was integrated into the execution. Ghana's fisheries resources have long been a foundation of the national economy and contribute significantly to the country's socio-economic progress. The fisheries sector contributes

at least 4.5% of Ghana's GDP and employs an estimated 10% of the population, representing approximately 2.5 million people who are directly or indirectly involved in fishing, including their dependents (MoFAD, 2015). Fish accounts for 60% of the animal protein consumed in Ghana. Therefore, protecting the health of its coasts, wetlands and rivers is of critical importance to Ghana (MoFAD, 2015). According to (Statista, 2021), in 2019, the Ghanaian fisheries contributed 2.2 billion rands to the country's GDP. The AMA protects its wetlands through environmental sustainability projects in its development plan, ensuring that runoff from flooding and liquid waste does not end up in the ocean, contaminating its food sources. The AMA waste minimisation targets have raised the profile of the city's environmental sustainability programmes. The creation of a circular economy framework by the AMA has integrated informal waste pickers into the city's official waste management system, increased waste collection, closed illegal open dumpsites, and created employment opportunities for waste pickers. The AMA received the Bloomberg 2019 Award for this initiative, in which informal waste pickers collected more than three hundred tonnes of waste per day that would have been disposed of in illegal open dumpsites with open burning, resulting in air and groundwater pollution. By officially recognising the informal waste pickers in Accra, waste collection increased from 28% to 48% in just two years, between 2018 and 2019. In 2020, the AMA organised a training course for seventy rubbish collectors to teach them effective plastic waste collection methods. The course was designed to pilot a project that will produce diesel or naphtha from plastic waste using pyrolysis technology. The training workshop outlined the specific types of plastics to be collected for the project and personal protective equipment was provided to ensure the safety of all involved.

Supporting legislation and incentives: Legislation and incentives are helpful tools for municipalities to use to encourage environmental sustainability for residents and business. Legislation plays a crucial role in shaping and promoting environmental sustainability, like green building incentives are important to promoting green building (Olubunmi et al., 2016). The CoW and AMA are good examples of using existing policy to facilitate the successful incorporation of environmental sustainability. The Ghanaian parliament approved the "Polluter Pays Principle" in December 2011 as part of the government's revised environmental sanitation policy, which allowed waste generators to contribute to the long-term financing of waste management services. The policy was implemented by the Ministry of Local Government and Rural Development (MLGRD) after it went through the necessary legislative processes. Every year since the AMA enacted the policy in its MTDP, there has been a dedicated project to monitor and assess

the performance-based solid waste collection service contracts. In 2020, AMA established an energy efficiency revolving fund as part of an incentive package to encourage developers to build green buildings by granting property rate and construction permit discounts. The promulgation of net metering rules by the Namibia Electricity Control Board enabled the CoW to implement them and promote the adoption of small-scale embedded generation. The policy allowed households and businesses to generate their own electricity and feed the surplus back into the grid, thereby offsetting a significant portion of their monthly electricity bill by generating their own electricity and feeding the surplus back into the grid. The net metering policy has also been highly successful in Cape Town, as it not only encourages the uptake of renewable energy but also relieves pressure on the electricity grid.

Moreover, the CoW has developed a robust policy to guide its procurement of renewable energy, as it planned to construct solar and wind power plants. The Let's Respond Toolkit was developed in 2011 by the South African Department of Forestry, Fisheries, and the Environment as part of the government's National Climate Change Response Policy (NCCRP), which was adopted in October 2011 and officially published as a White Paper. The objective was to help municipal practitioners through the necessary steps to integrate climate change response into the planning process through development plans (Khavhagali et al., 2023). South Africa, with this toolkit and other policy documents and frameworks, should be at the forefront of incorporating environmental sustainability into growth plans. However, this exemplifies how South Africa has excellent legislation but poor implementation. Palage et al. (2019) showed how the renewable energy policies facilitated the adoption of renewable energy in the solar PV sector.

Established environmental sustainability department within a municipality: Research has shown that the integration of environmental sustainability into development plans is more effective when municipalities have a fully staffed and qualified environmental sustainability department. Alhassan and Hadwen (2017) show how this enhances the integration of environmental sustainability into development plans, as such departments are able to identify and address environmental issues that are important to the city, respond to residents' environmental concerns, and promote the integration of environmental issues into development plans using a variety of tools such as environmental Monitoring & Evaluation, environmental impact assessment, and integrated waste management. The case of the CoT highlights the critical importance of having a viable environmental sustainability department, as it failed to include mainstreaming dimensions fully as compared to the other cities. In the 2017/2018

financial year, the Environmental and Agriculture Management Department responsible for environmental sustainability initiatives had the highest number of vacancies in the municipality, with only 701 out of 2 360 positions filled (City of Tshwane, 2017a). However, in 2018/2019, the CoT improved this situation with 2 096 vacancies being filled out of 2 373 open positions (City of Tshwane, 2018).

5.5 Factors identified for the successful incorporation of environmental sustainability into development plans

This research has highlighted the enablers of successfully incorporating environmental sustainability into development plans and identified the critical elements of environmental sustainability mainstreaming. Based on the findings, there are nine key factors for the successful incorporation of environment sustainability into development plans: Innovative planning based on sustainable development (Swilling & Annecke, 2012); partnerships and collaborations; leveraging a knowledge base of environmental sustainability experts (Franks, 2015); presence of environmental sustainability champions; municipal staff that are knowledgeable on environmental sustainability mainstreaming in development planning (Rothwell, 2010); effective stakeholder and community engagement (Jabareen, 2013); setting of measurable, clear, achievable and relevant goals; supporting legislation and incentives (Pires et al., 2011); and lastly a fully established environmental sustainability department within a municipality (UN-Habitat, 2020).

5.6 Conclusion

In this chapter, the discussion of the findings on whether there are impediments to incorporating environmental sustainability into the development plans of selected African cities has been presented. These findings are consistent with the literature. Chapter 6 presents the conclusions and recommendations of the research.

From the literature review, it is evident that there are certain factors that can either facilitate or impede the integration of environmental sustainability into development plans of the four selected cities. The thematic analysis through the coding and the mainstreaming framework has yielded similar findings to those revealed in the literature review. To ensure the successful integration of environmental sustainability into development plans, the following aspects must be present and enforced: 1) Intentionally

taking account of environmental concerns and addressing them through specific projects and programmes in the development plan; 2) Allocating resources to environmental sustainability projects, either through municipal budget or sourcing external funding from a donors and partners; 3) Implementation of the environmental sustainability projects and programmes; 4) Informing and influencing decision-makers through awareness-raising, stakeholder engagements and regular meetings; and 5) Monitoring and evaluation of the implemented projects and programmes.

The findings of the content analysis suggest better performance by CoW and AMA in terms of recognising environmental risks and addressing them through specific projects and programmes in their development plans. The two cities have also prioritised budget allocation to environmental sustainability projects through internal municipal funds and sourcing external funding. All four municipalities recognise the importance of stakeholder and community participation in the successful implementation of development plans and have community awareness-raising campaigns. The findings show that AMA reflects most of the aspects that are required in the mainstreaming framework as an indication of successful incorporation of environmental sustainability into its development plan.

Furthermore, the findings show that the themes generated from the codes as either an impediment or enabler are as follows: leadership instability, capacity-building and training, leadership gap, institutional challenges, ineffective supply chain systems, absence of key infrastructure facilities, poor stakeholder engagement, competent skilled municipal staff, governance, staff capacity constraints, partnerships and collaborations, stakeholder participation, poor project management, environmental sustainability awareness-raising, indicative budget, and multidisciplinary development plan team.

CHAPTER 6: CONCLUSIONS AND RECOMMENDATIONS

6.1 Introduction

The purpose of this research was to consider whether there were impediments to incorporating environmental sustainability into the development plans of the selected African cities. The study investigated the way in which the four selected cities had incorporated environmental sustainability into their development plans and explored the impediments to and enablers of successful incorporation. Chapter 4 gave a detailed account of the research findings and Chapter 5 presented a discussion of the research findings. The purpose of this chapter is to draw conclusions and make recommendations for present and future research based on the findings. This research adds to existing empirical knowledge of how development plans can be used effectively as a tool for sustainable development and assist policymakers and municipalities to better integrate environmental sustainability into development plans.

6.2 Key conclusions of the research study

The purpose of the research was to determine whether there are impediments that African cities face in incorporating environmental sustainability into their development plans. The study sought to identify the key elements that contribute to the failure or success and to recommend ways to improve the integration of environmental sustainability into development planning. The literature review indicated that certain factors enable the successful mainstreaming of environmental sustainability into development planning. These include strong institutional capacity, prioritisation of environmental sustainability, adequate human and financial resources, effective leadership and governance, and knowledge of mainstreaming. Equally, the literature review also revealed that some factors could impede the successful incorporation of environmental sustainability into development plans; they include weak institutional capacity, inadequate prioritisation of environmental sustainability, limited human and financial resources, lack of environmental sustainability champions, poor governance, and limited understanding of mainstreaming.

All four cities that were selected showed constraints in terms of financial, human capital, technology, and expertise. These constraints hindered their ability to successfully

incorporate environmental sustainability into their development plans. However, it was shown that the CoW and AMA were more effective in implementing environmental sustainability initiatives due to their strong leadership, the presence of environmental sustainability champions through both mayors, and strong institutional capacities. Cities will always face financial constraints and limited human resources, which requires them to pivot innovatively to find new funding sources; the CoW and AMA demonstrated this. They leveraged their knowledge base networks and utilised partnerships effectively, which helped them to close the human resource gaps. Development plans can serve as tools for sustainable development; however, their inadequate implementation, lack of support, and current bureaucratic structures within municipalities hinder this potential. The integration of environmental sustainability into development plans is crucial for achieving long-term and sustainable growth. By equally prioritising social, environmental, and economic factors, cities can create development plans that are not only profitable but also benefit the communities and the planet. Prioritising environmental sustainability and ensuring that it is a key component of any development plan is important to ensure a better future for all and to build climate-resilient cities that can withstand the impacts of climate change, which have led to frequent natural disasters in Africa.

Integrating sustainability into development planning is a multi-layered and constantly evolving process, but it is possible, and it is crucial to take a comprehensive approach that considers different perspectives and factors. Regularly reviewing and updating project implementation helps to ensure that environmental sustainability remains a core element of a development plan. Therefore, a monitoring and evaluation plan with clear indicators is important to track progress so that municipalities can close gaps.

The research showed that for the four selected African cities, the CoW and AMA prioritised environmental sustainability and saw its importance not only in addressing the risks of water and energy insecurity, but also in the cities' ability to become climate resilient and promote socio-economic development. The research also showed that the CoT does not prioritise environmental sustainability in its development planning, does not prioritise environmental issues, and does not take a long-term perspective on climate resilience and sustainable development. Instead, the CoT focused on delivering basic services and infrastructure projects without prioritising environmental sustainability, while

addressing the backlog of residents without access to clean and safe water and electricity.

The CoT's development plan includes a regional spatial development framework aimed at providing an integrated regional spatial framework for sustainable development. The framework aims to guide local development towards realising the vision of sustainability and urbanism, with ecological transformation taking priority. However, it is concerning that the CoT has yet to effectively translate its goal of becoming a sustainable city by 2021 into pragmatic environmental sustainability initiatives, despite mentioning this objective in its vision and Strategic Pillar 3, "A City that Delivers Excellent Services and Protects the Environment". Furthermore, the CoT's action plans do not clearly articulate how this goal will be achieved. The development plan highlights that safeguarding water and energy security and protecting the natural environment are among the CoT's priorities. However, the research reveals that the CoT's approach to environmental sustainability lacks clarity and balance. Merely having a vision and aspirations to become a sustainable and climate-resilient city is not enough. According to Simon and Leck (2015), African cities have systemic bureaucratic structures which are not agile and open to innovative approaches, thus limiting the ability to focus on environmental sustainability, and business as usual is maintained. The research results confirm this finding by indicating that the CoT has been developing their development plans for almost three decades and has not been innovative in their planning approach; the lack of an agile innovation approach has led to the limited inclusion of the mainstreaming dimensions in their development plan. The CoT must implement practical environmental sustainability projects, which require building institutional capacities and providing funding for successful implementation.

6.2.1 Key elements of failure to incorporate sustainability into development plans

The research reveals that the key elements of the failure of cities to incorporate environmental sustainability into development plans are as follows:

Limited stakeholder engagement: It is imperative to involve stakeholders in environmental sustainability efforts to gain unwavering community buy-in and support. The research demonstrates that in the case of the CoT, neglecting to interact effectively

with stakeholders and communities resulted in shallow interactions. This lack of involvement led to a lack of community support for the environmental sustainability initiatives within the development plans. Communities were unaware of the purpose of the development plan and the way in which they could participate, which was one of the attributes that hindered the success of the CoT's environmental sustainability efforts.

Lack of integration: Integrating sustainability into various sectors is not just an option, it is a necessity. Fragmented efforts and missed opportunities for synergy can be the outcome of failure to do so. According to (Lebel et al., 2012), cross-sectoral planning is the only way to ensure that development plans incorporate crucial themes like environmental protection, climate change resilience and mitigation, social protection, poverty reduction, and gender equality. It is absolutely essential to undertake cross-sectoral planning to achieve sustainable development (Zambia Ministry of Local Government 2019).

Institutional capacity: Proper training and knowledge transfer for municipal staff on mainstreaming environmental sustainability are essential for the successful implementation of environmental sustainability initiatives. Such initiatives are likely to be inconsistent and ineffective without strengthening institutional capacity.

Short-term focus: It is crucial to prioritise long-term sustainability and resilience over short-term gains. Councillors must realise that their five-year or four-year term is not more important than building long-term environmental sustainability for the municipality.

Resistance to change: The success of the development plan may be hindered if there is resistance from stakeholders or the municipality to adopt new practices. (Sowman & Brown, 2006) assert that the failure to implement new sustainable development approaches is caused by a lack of knowledge, understanding, and municipal managers' fear of experimenting with new ideas.

Insufficient funding: Insufficient funding for sustainability initiatives severely hampers their implementation and significantly reduces their impact.

Limited prioritisation of funds: Failure to allocate sufficient funds towards environmental sustainability initiatives will inevitably result in the non-implementation of these projects.

Lack of monitoring and evaluation: Regular assessment is essential to accurately measure the effectiveness of the development plan and make any necessary adjustments.

6.2.2 Key elements of success in incorporating sustainability into development plans

The research established that the key factors listed below are enablers of effectively incorporating environmental sustainability into development plans.

Political will and strong leadership: Political commitment and leadership must be strong and unwavering to drive environmental sustainability initiatives. It is imperative that city officials, including the mayor and council members, prioritise environmental sustainability and set the tone for its incorporation into the development plans. The research highlights the Mayor of Accra from 2017 to 2022 as an exemplary leader in this regard.

Regular and effective stakeholder engagement: It is imperative to regularly engage a wide range of stakeholders, including residents, businesses, civil society organisations, NGOs, and experts, to gather diverse perspectives and create a consensus around environmental sustainability goals and strategies. This approach ensures that development plans accurately reflect the community's needs and aspirations. By involving stakeholders, it fosters ownership and support for environmental sustainability goals, which is vital for achieving success.

Capacity-building: Developing the skills and knowledge of municipal staff members to understand and implement environmentally sustainable practices is essential. Training programmes and workshops can help build capacity among employees responsible for IDP development and implementation and ensure that the plan can be executed effectively.

Inter-governmental alignment and integrated planning: It is crucial to integrate environmental sustainability into all aspects of development, including infrastructure, transportation, housing, and waste management. A comprehensive approach that considers environmental, economic, and social considerations is necessary for successful development plans. Environmental sustainability must be integrated into

various sectors, such as transportation, energy, water, and urban planning, for plans to be effective. When this is done in silos, progress can be impeded, and unintended consequences can arise.

Clear goals, targets, and projects: Defining environmental sustainability goals and targets within a development plan that are specific, measurable, achievable, relevant, and time-bound allows for a clear roadmap for progress and aids in tracking performance. Well-defined and quantifiable sustainability targets provide a clear direction for the development plan. Goals should be specific, attainable, and in line with local priorities.

Public awareness and education: Raising awareness about environmental sustainability among residents and involving them in the planning process can generate support for initiatives. According to (Sowman & Brown, 2006), it is imperative that all key stakeholders have sufficient knowledge about environmental sustainability to ensure successful mainstreaming of environmental issues into development plans. Additionally, they must be fully informed about the processes, municipal plans, and management strategies of the development plans.

Incentives and regulations: Offering incentives, like tax breaks or grants, to businesses and individuals can be a powerful motivator to encourage them to adopt environmentally sustainable practices. In addition, the implementation and enforcement of regulations promoting environmental sustainability, such as building codes for energy efficiency, can be a strong driver of change, as has been shown by the CoW and AMA.

Collaboration, networks, and partnerships: Collaborating with neighboring municipalities, regional organisations, NGOs, and academic institutions can lead to shared resources, knowledge exchange, and collective problem-solving. Building partnerships fosters a collective effort towards sustainability. Leveraging the knowledge base of networks assists cities to access environmental sustainability expertise that does not exist internally.

Long-term perspective: Sustainable development is a critical and ongoing process that demands a long-term vision. Incorporating environmental sustainability into development plans requires cities to look beyond immediate challenges and focus on building a resilient and thriving city for the future. Successful development plans must consider the

long-term implications of current decisions and prioritise those creating lasting positive impacts.

Regular monitoring and evaluation: Monitoring and evaluating progress towards environmental sustainability goals using clear indicators allows for adjustments, success celebration, and addressing challenges in a timely manner.

Data and research: Accurate and up-to-date data on environmental, social, and economic indicators are necessary to understand the city's current state and to identify areas for improvement. Research can provide insight into best practices and innovative approaches to sustainability. Evidence-based planning using accurate data and research helps in identifying challenges, setting targets, and measuring progress effectively. Other research has shown that the City of Cape Town has detailed climate change projections and assessments available and is able to conduct in-house research on the impact of climate change on the city and to develop appropriate response plans. The significant role of information and data in being able to support the process of integration into planning instruments is apparent from the analysis of the two cases (Pieterse et al., 2021; Runhaar et al., 2018).

Integration of environmental sustainability into their development plans can only be achieved by addressing a combination of the above enablers of success, with a strong emphasis on leadership, clear goals, a long-term perspective, stakeholder engagement and partnerships. Neglecting these elements can lead to unsustainable outcomes and missed opportunities for positive change and sustainable development. This research highlights the importance of integrating environmental sustainability into development plans and how it builds resilient cities and stimulates socio-economic development. Furthermore, the research highlights that without explicit planning and intentionality, and inclusion of enablers, environmental sustainability cannot be incorporated successfully into municipal operations. This research and other studies have shown that African cities do recognise the impact of climate change; however, they do not fully understand how to mainstream environmental sustainability into their development plans and have not fully achieved the successful incorporation of environmental sustainability (Pieterse et al., 2021; Ruwanza & Shackleton, 2016; Shearing & Pasquini, 2014).

Achieving sustainable development goals is a complex dilemma, especially for African cities and the rest of the world. The challenge lies in closing the gap in meeting goals related to equitable access to clean water and sanitation, equitable access to affordable

and clean energy, sustainable cities and communities, and life on land. While striving to achieve these specific goals, it is crucial to mainstream environmental sustainability into development plans and address immediate challenges to improve the quality of life (Sachs, 2015). A delicate balance between addressing immediate needs and ensuring long-term ecological resilience is the key to overcoming this dilemma. Developing countries, represented by the four selected cities, are facing the challenge of providing crucial energy. However, the dilemma arises in choosing between fossil fuel power generation, which may meet short-term energy demands, and investing in renewable energy to mitigate climate change in the long term (Allen et al., 2018). It is imperative to invest in renewable energy sources to address the challenges of climate change and ensure a sustainable future. It is important to strike a balance between ensuring water security through large-scale infrastructure projects while preserving ecosystems and maintaining water quality (Donoghue & Khan, 2019), It involves finding ways to achieve food security without endangering biodiversity and healthy ecosystems (Boillat & Ifejika Speranza, 2019) and ensuring that industrialisation and development do not harm vulnerable communities who bear the brunt of the environmental degradation associated with such projects (Schlosberg & Collins, 2014). The UNSDG (United Nations Development Group (2017) states that collaborations between the government, private sector, and civil society actors is crucial to integrate environmental sustainability into policies across all sectors. To navigate this dilemma, a holistic and integrated approach to development is necessary, which development plans already provide. However, these plans must be effectively utilised, and policymakers, practitioners, businesses, and researchers should work together to identify innovative solutions that address immediate needs while contributing to the long-term sustainability outlined in the SDGs. According to the (IPCC, 2018), urban planning plays a crucial role in achieving transformational adaptation to address the fundamental causes of environmental sustainability risks and vulnerabilities. The IPCC suggests that transformational adaptation necessitates changes in behavior and operation, systemic changes, and novel approaches to development planning in cities. Achieving true sustainable development requires a balance between economic, social, and environmental considerations, and development plans are the most effective tool to achieve this balance.

6.3 Recommendations

This section provides recommendations on how the selected African and other cities can integrate environmental sustainability more effectively into their development plans. The research outcomes could be beneficial for municipalities to identify impediments in the processes that have hindered the successful incorporation of environmental sustainability and provide useful insight into the way cities can use the OECD mainstreaming framework more effectively. Most importantly, the research outcomes could be beneficial for policymakers, councilors, and municipal staff in identifying aspects that can facilitate and enhance environmental mainstreaming. The recommendations are listed below; municipalities should:

- Benchmark themselves against other municipalities to identify best practices, performance metrics and learn from cities who are doing well in mainstreaming environmental sustainability;
- Balance quality service delivery, cost control, preserving ecological infrastructure, developing renewable water and energy sources, and customer expectations amidst evolving demographics;
- Review policies, regulations, and incentives related to environmental sustainability to address legal barriers;
- Establish a robust Monitoring & Evaluation system to monitor the progress of environmental sustainability integration and adjust as needed;
- Promote public awareness and education on environmental sustainability and its benefits to development planning. An informed and engaged community can often be a powerful facilitator;
- Leverage international partnerships such as SA Cities Network, C40 Cities Climate Leadership Group, Rockefeller Foundation, UN-Habitat and ICLEI for training of municipal staff, funding, and environmental sustainability initiative support;
- Participate in city exchange programmes for skills transfer;
- Establish environmental sustainability departments within municipalities with qualified staff;
- Improve succession planning and institutional development; and

- Institute compulsory training focused on environmental sustainability and mainstreaming environmental sustainability into development planning for its staff and councilors

6.4 Recommendations for further research

The scope of this research was to determine the impediments to and enablers of integrating environmental sustainability into the development plans of the selected African cities and to recommend the way this integration can be improved. Future research should use city case studies to integrate environmental sustainability dimensions within the municipalities using the key enablers that were highlighted in this research.

The literature review has emphasised the need for municipal staff members and councilors to gain a better understanding of mainstreaming environmental sustainability into development plans. Further research is needed on the extent of mainstreaming environmental sustainability in development planning in Africa as a whole and building institutional capacity for environmental mainstreaming. 'Environmental mainstreaming' is defined by the International Institute for Environment and Development (IIED) (United Kingdom) as the informed inclusion of relevant environmental concerns into the decisions of institutions that drive national, local and sectoral development policy, rules, plans, investment and action (International Institute for Environment and Development, 2017). It is recommended to conduct an experimental quantitative research study on the incorporation of environmental sustainability into the development plans of selected African cities, using the OECD mainstreaming framework mentioned in chapter 2.

The study identified the presence of a political champion as an enabler of effectively incorporating environmental sustainability into development plans. Therefore, further research should be conducted on the role of political leadership in integrating environmental sustainability into development plans. This research can shed light on the skills, experiences, qualifications, and affiliations that city mayors should possess to build institutional capacity for successful environmental sustainability mainstreaming. Additionally, there is a need for further research on the impact of cities generating their own electricity, sourcing additional water sources, and introducing net metering policies on their financial sustainability. This research can determine whether these actions can assist municipalities in generating additional income.

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APPENDICES

APPENDIX A: Process of integrating climate change considerations

The steps below show how climate change considerations are integrated into sectoral policies, plans and programmes through strategic environmental assessment.

Strategic Environmental Assessment (SEA) refers to “a range of analytical and participatory approaches that aim to integrate environmental considerations into policies, plans and programmes (PPPs) and evaluate the inter-linkages with economic and social considerations” (OECD, 2006) It offers a structured approach to integrating environmental considerations into policies, plans, and programmes at different levels, including the sector level. The OECD/DAC Good Practice Guidance document on Strategic Environmental Assessment (OECD, 2006) suggests the following key stages for carrying out an SEA: establishing the context, implementing the SEA (including undertaking the necessary analysis with appropriate stakeholders), informing and influencing decision-making, and monitoring and evaluation.

The questions outlined below demonstrate the way in which climate change considerations can be integrated into each of the key stages of an SEA. The questions address i) possible effects of climate change impacts on the objectives of the sectoral policies, plans, programmes, and ii) possible effects of the policies, plans, and programmes on the vulnerability of the natural and human systems that are affected by the sector. They are intended to stimulate ideas rather than to cover all aspects that may need to be considered. They will have to be adapted to partner countries’ circumstances, development agency mandates, and the specificities of the targeted sector.

Step 1: Establishing the context

Assessing the need for climate change considerations in the context of SEA

- What are the main risks from climate change to the sector in question? (e.g., loss of coastal systems for tourism, reduced runoff and recharge of water, increased rainfall variability for agriculture, expansion of disease vector ranges for health);
- Is there any reference to climate change adaptation needs in the national development plans or poverty reduction strategies? Is there a national climate

change strategy in place (e.g., a National Adaptation Programme of Action (NAPA)) that the PPPs would need to be fully aligned with or at least consistent with?

- Is reference made to climate change in the PPPs; and
- Have climate change risks been considered in the PPPs?

Setting objectives

Concluding from the general assessment, is climate change a relevant consideration in the SEA process? (If so, the objectives of the SEA could include assessing the viability of sectoral PPPs under different climatic scenarios, ensuring sustainability of sectoral reform, or identifying vulnerabilities of natural and human systems to the sector in question).

Identifying stakeholders

- Which decision-making bodies are most involved with affected sectors or activities? Which groups (e.g., demographic or socio-economic groups) and geographical areas experience the highest exposure to existing climate-related risks? (e.g., for PPPs related to coastal zone management, communities in low-lying coastal areas will be key stakeholders);
- Which groups will be most affected (both positively and negatively) by adaptation interventions? (e.g., poor households by water pricing, energy-intensive businesses by increased fuel costs, coastal communities by managed realignment); and
- Are there other stakeholders and decision-making bodies that have been dealing with climate risks for the sectors or activities of interest? For example, links to the disaster risk reduction/management community could be identified at this stage

Step 2: Implementing the SEA

Scoping

- Are climate change signals already apparent, and if so, do they affect social and economic development? (e.g., impacts of reduced rainfall or increased rainfall variability on food production, or changes in rainfall or temperature correlated with increased incidence of climate-sensitive diseases);
- Do existing studies based on extrapolation of current trends or climate change projections identify specific likely or plausible impacts on development? If so,

through which mechanisms? (e.g., future loss of productive land or salinisation of groundwater due to accelerating coastal erosion and sea-level rise);

- How is the exposure and vulnerability to existing and anticipated climate change risks and hazards distributed over diverse groups?

Collecting baseline information

- Which data are available at scales relevant to the sectoral PPPs (e.g., projections from global and regional climate models; specialised models as for coastal change, water resources, agricultural productivity)? Are there any major information gaps?
- If crucial information is not available or is inconsistent, which ad hoc studies should be commissioned to fill these critical information gaps?
- Is there sufficient institutional capacity for the collection, management, and interpretation of information?

Analysing the potential effects of the proposals and any alternatives

- Are the development objectives of the proposed PPPs at risk of being undermined by projected climate change impacts?
- Is there any risk that the PPPs may lead to increased vulnerability of the affected natural and human systems?

Identifying how to enhance opportunities and mitigate impacts

- Could measures to reduce disaster risk support adaptation to climate change? (e.g., preparedness planning, improved zoning laws and building codes, risk education and early warning systems);
- How can the proposed PPPs help to enhance the resilience of people affected by climate change impacts?

Identifying alternatives

- Where the proposed PPPs might fail to deliver their development outcomes because of climate change impacts, are there any alternative options that are likely to be more effective under the given climate change scenario? (e.g., where reduced rainfall may affect viability of hydropower generation, hydro could be substituted or complemented with micro-generation, including biogas, solar, etc.);

- Which measures could be built into the proposed PPPs to enhance sustainability under climate change scenarios?
- Which key policy and legislative changes are required to promote adaptation in the context of the PPPs? Which mechanism or structure could be established to prompt lower-level decision-makers (e.g., regional, project levels) to adopt climate change responses?
- To what extent are the different adaptation options robust under different climate change scenarios? Do they represent “no regrets” interventions, particularly where climate change impacts are associated with elevated levels of uncertainty?

Step 3: Informing and influencing decision-makers

- Is there sufficient awareness among decision-makers and stakeholders of climate change, its impacts, and appropriate adaptation responses? How can relevant information be communicated to decision-makers?
- Are there are any reasons why decision-makers may be likely to neglect (long-term) climate change impacts or to object to integrating adaptation measures into sectoral PPPs? Which incentives can be set to ensure that the identified adaptation measures are integrated? (e.g., policy drivers, new legislation, development and enforcement of regulation, taxes on carbon emissions, etc.)

Step 4: Monitoring and evaluation

- Which tools and indicators might be used to assess adaptation measures in terms of development outcomes?
- How and by whom (e.g., those responsible for developing the PPPs, climate change experts, an independent commission) should these indicators be tracked? Are any capacity development measures needed to ensure effective monitoring and evaluation?
- Did any climatic event or trend affect the attainment of the objectives of the PPPs? If so, had the SEA taken such risks into account?
- Are there any indications that the PPPs led to increased vulnerability to climate change impacts of the recipient system? Were such impacts anticipated? (Feedback should be solicited from stakeholders throughout the SEA and the PPP implementation process so that negative or counter-productive impacts may be identified at an early stage);
- Did the SEA improve the capacities of senior decision-makers, civil servants, and other stakeholders to understand climate change issues and management?

- Did SEA enhance the transparency and accountability of decision-making processes on climate change issues in general, and those specifically related to the PPPs?

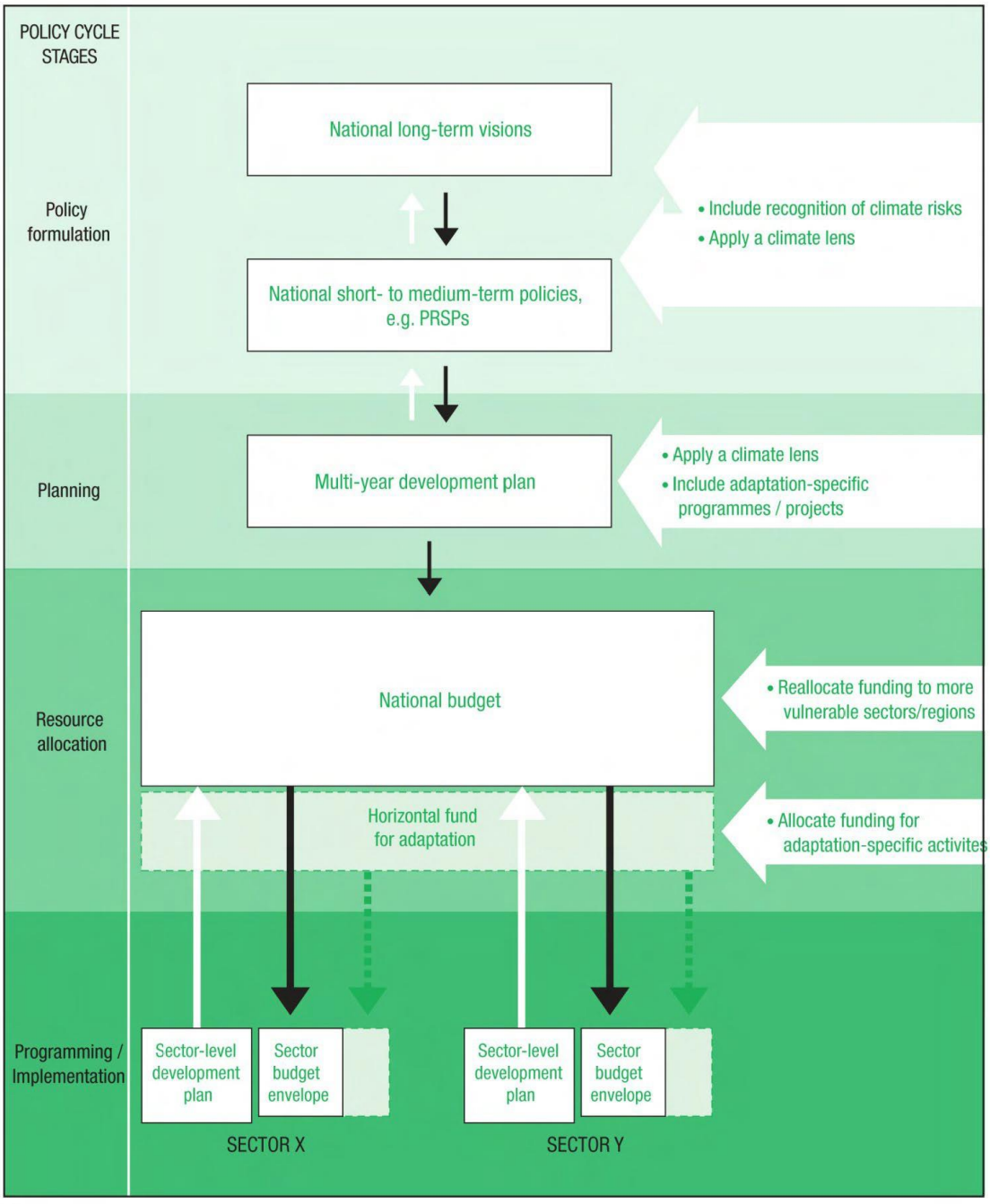


Figure 8: Key interventions for mainstreaming (OECD, 2009)

APPENDIX B: Accra Metropolitan Assembly (AMA) monitoring and evaluation work plan

Table 2: AMA MTDP M & E Plan (Accra Metropolitan Assembly, 2018)

Activities	**Time Frame 2018 - 2021**	**Actors**
Review of MTDP and development of indicators and targets	Yearly	Metropolitan Planning Coordinating Unit/ stakeholders
Inspections by the Works Department	Monthly	Works Department
Quarterly field visit to project site	The last week of each quarter	Metropolitan Planning Coordinating Unit
Feedback to stakeholders	1st week of each month	Metropolitan Planning Coordinating Unit
Quarterly review	At the end of every quarter	Metropolitan Planning Coordinating Unit/ stakeholders
Quarterly report	Beginning of subsequent quarters	Metropolitan Planning Coordinating Unit
Mid-year reviews	At the end of mid-year	Metropolitan Planning Coordinating Unit/ stakeholders

Mid-year report	Early July	Metropolitan Planning Coordinating Unit
Annual review	Beginning of January every year	Metropolitan Planning Coordinating Unit
Final evaluation of project	After project completion	Metropolitan Planning Coordinating Unit/ stakeholders

Appendix C: AMA MTDP communication strategy

Table 3: Accra Metropolitan Assembly MTDP Dissemination and Communication Strategy (Accra Metropolitan Assembly, 2018)

Activity	Purpose	Audience	Method/Tool	Timeframe	Responsibility
Meeting with Assembly Members	To create awareness on the DMTDP	Assembly Members, Heads of Departments	Meeting	First Quarter	Metropolitan Planning Co-ordinating Unit
Meeting with Community Members	• To create awareness on the DMTDP 2018-2021 • To solicit views on current development issues	Community members, Traditional Rulers, religious leaders, NGOs, etc	Public Fora, Audio-visuals	First Quarter	Metropolitan Planning Co-ordinating Unit
Meeting with Political Heads	To create awareness on the DMTDP	District Chief Executive, Presiding Member and	Round Table Discussion	First Quarter	Metropolitan Planning Officer /Metropolitan Co-ordinating Director

		Member of Parliament			
Meet the Heads of Departments	To create awareness on the DMTDP and their roles	Heads of Departments	Round Table Discussion	First Quarter	Metropolitan Planning Co-ordinating Unit
Public Hearing	• To present the Draft Development Plan • To show social accountability and transparency	Assembly Members Community Members, Traditional Authorities	Public Fora	Third Quarter	Metropolitan Planning Co-ordinating Unit
Meeting with Political leadership	1. To get them to appreciate the DMTDP 2014-2017 2. To update them on the status of implementation on	Mayor, Presiding Member, MP, and chairpersons of the sub-committees	Meetings with audio-visuals	Third Quarter	Metropolitan Planning Officer /Metropolitan Co-ordinating Director
Quarterly Progress Reports	To know the level of implementation on for each quarter	Regional Co-ordinating Council	Reports	Quarterly	Metropolitan Planning Co-ordinating Unit
Annual Progress Reports	To know the status of implementation on of the DMTDP	Regional Co-ordinating Council	Reports	Annually	Metropolitan Planning Co-ordinating Unit

Appendix D: Apolitical methodology to select influential people in climate list

Apolitical used the following methodology to select the 100 most influential people in the climate list for 2022.

The climate crisis is this generation's defining struggle. Slowing the damage, and preparing for the future, is a decades-long process. In this time, stars of the climate movement rise and fall, and possibilities, change with politics, possibilities, technology, and ideas.

This list aims to shine a light on the people driving real impact in climate right now. It is weighted towards current relevance, reach, emerging trends, and underrepresented voices.

The first component of this methodology is based on the individual's climate impact and its relevance today. Climate impact is a wide category but can be split into two broad themes. The first is whether an individual has been instrumental in a process that has sequestered, or prevented the emission of, significant amounts of greenhouse gases into the atmosphere. For example, perhaps an individual has prevented the exploitation of an untapped oilfield, decarbonized a municipal energy system, or preserved/restored a native rainforest.

The second aspect is the building of climate partnerships. Whilst these are less directly connected to sequestration/prevention of greenhouse gases, they are instrumental to it occurring and to other aspects of climate change mitigation and resilience. So that this list remains relevant and showcases the new work being done in the field, a major determinant of inclusion on the list is whether their "major climate impact" occurred recently, ideally within the last two years. It is also considered whether the individual if acting in a specific role or organisation remains within the position they created the impact within. This helps to clarify their relevance to contemporary debates and action, as an influential policymaker who has recently retired whilst having made a significant climate impact is less relevant to the ongoing world of climate action.

This list considers individuals who have made a significant impact on climate change, but also aims to highlight those with specific characteristics that make them more impactful or to redress systemic bias or underrepresentation relative to their real impact. For this reason, three of the factors determining inclusion are whether they are a civil servant, whether they are from the global south, or whether they are from an unrepresented group. Civil servants rarely receive the limelight, but have a significant impact on climate change, so it is important to include as many as possible within this list. Likewise, most successful climate action occurs in the global south, but various factors combine to give such actions less media presence, so this list aims to redress this problem. The influence of their professional networks is also evaluated to determine their ability to affect real action on climate change. This helps create a balance between popular communicators and decision-makers with less media presence. This is, however, not a key determinant of inclusion within the list but an additional consideration because influence does not translate directly to climate action. Often, it is activists working against influential groups who have a significant climate impact, despite their relatively small and unknown professional networks.

Finally, we have considered their social media influence. This is separated from professional influence as communication does not directly translate to an ability to steer decision-making, but is still vital to the climate struggle. Media influence helps spread the word on climate change and educates a broad audience. Whilst not a vital determinant for inclusion on the list, social media presence and influence are considered to represent the many avenues that climate change impact can be created through.

Figure 9: Apolitical methodology (Apolitical, 2022)

APPENDIX E: City of Tshwane progress of implemented projects

Table 4: 2018/2019 projects progress (City of Tshwane, 2018)

Project Name	**Project Objective**	**Annual Delivery target**	**2018/2019 Budget**	**2019/2020 Budget**	**2020/2021 Budget**	**Adjusted budget 2018/19**	**Budget Q4 2018/19**	**Milestone Q4 2018/19**
Atmospheric Pollution Monitoring Network	Environmental management infrastructure project: Establishment, installation, procurement, and repair Tshwane wide and in region 1 to 7	NOx and O3 instruments for Ekandustria and Booysens; Met instruments for Pretoria West	R500 000.00	R4 000 000.00	R0	R500 000.00	R500 000.00	Delivery and installation of instruments. Issue of final Completion certificate
Fencing off spruit areas citywide (ecologically sensitive and insecure areas)	Environmental management infrastructure project: Rehabilitation of ecologically sensitive landscapes	Protect ecological sensitive nature areas (fencing of 3 spruit areas)	R2 750 000.00	R2 750 000.00	R4 000 000.00	R2 750 000.00	R1 512 500.00	Completion of Fence off Bromberick spruit, Rietvlei NR fence & Die Draai

Rehabilitation of wetlands	Environmental management infrastructure project: Rehabilitation of 60 oxygen traps in wetlands between Hennops River catchment area and The Reeds	Rehabilitation of wetlands: Olievenhoutbosch wetland	R2 750 000.00	R5 000 000.00	R3 000 000.00	R2 750 000.00	R1 650 000.00	Completion of installation gabion structures and oxygen traps, clearing of invasive alien plants, installation of information boards
Development of waste transfer stations	Erection of fence at the Bronkhorstspruit transfer station	Establishment and development of a multipurpose waste transfer facility/storage	R5 000 000.00	R10 000 000.00	R0	R400 000.00	R4 700 000.00	Detailed drawings with specifications & cost estimates for construction submitted. Final payment of PSP for the designs of City and Bronkhorstspruit waste Station
Kalula bicycle project	Public transport infrastructure project: Construction of cycle paths throughout Tshwane	No Budget	R0	R10 000 000.00	R10 000 000.00			Not Completed

Appendix F: City of Tshwane (CoT) Biodiversity Plan

Table 5: CoT Biodiversity Plan (CoT, 2020)

Ecological support area 1	Natural, near-natural or degraded areas required to be maintained in an ecologically functional state to support critical biodiversity areas or protected areas.	Maintain in an ecologically functional state to maintain ecological processes.	Implement appropriate zoning and land management guidelines to avoid impacting ecological processes, such as key landscape corridors and linkages and avoiding areas important for hydrological processes (eg floodplains). Avoid intensification of land use.	Conservation and associated activities. Extensive game farming and eco-tourism operations. Extensive livestock production. Urban open space systems. Low-density rural residential, smallholdings or resorts where development design and overall development densities allow maintenance of ecological functioning.	Urban land uses including residential (including golf estates, rural residential, resorts), business, mining and industrial. Infrastructure (roads, pipelines), excluding power lines which are compatible with ecological support areas as long as they are designed to avoid impacting on processes, such as water flow. Intensive animal production (all types including dairy farming associated with confinement, imported foodstuffs, and improved/irrigated pastures). Arable agriculture (forestry, dry land and irrigated cropping). Small holdings. Note: Certain elements of these activities could be allowed subject to detailed impact assessment to ensure that developments were designed to maintain overall ecological functioning of ecological support areas.
Ecological support area 2	Areas with no natural habitat which retain potential importance for supporting ecological processes.	Avoid additional impacts on ecological processes.	Avoid intensification of land use, which may result in additional impacts on ecological processes.	Existing activities (eg cultivation) should be maintained or where possible a transition to less intensive land uses should be favoured.	Any land use or activity which results in additional impacts on ecological functioning, mostly associated with the intensification of land use in these areas (eg change of floodplain from cultivation to urban land use, or from recreational fields and parks to housing).
Other natural areas	Natural, near-natural or degraded areas not required to meet biodiversity targets, and not identified as critical biodiversity areas or ecological support areas.	No management objectives, land management recommendations or land use guidelines are provided as these areas are outside the ambit of the Bioregional Plan. These areas are nevertheless subject to all applicable town and regional planning guidelines and policies. Where possible, existing severely modified areas should be favoured for infrastructure development before other natural areas as other natural areas may later be required, either due to the identification of previously unknown important biodiversity features on these sites, or alternatively where the loss of critical biodiversity areas has resulted in the need to identify alternative sites as critical biodiversity areas to meet biodiversity targets.			

Category on the critical biodiversity area map	Description	Land management objective	Land management recommendations	Compatible land use	Incompatible land use
Protected areas	Formal protected areas and protected areas pending declaration under the Protected Areas Act.[4]	Maintain in a natural or near-natural state. Rehabilitate degraded areas to a natural or near-natural state, and manage for no further degradation.	Maintain or obtain formal protection.	Conservation and associated activities. See the management plan for the protected area concerned.	All other land uses.
Critical biodiversity area 1	Areas required to be maintained in a natural or near-natural state to meet targets for biodiversity pattern (features) or ecological processes.	Maintain in a natural or near-natural state. Rehabilitate degraded areas to a natural or near-natural state, and manage for no further degradation.	Obtain formal protection where possible. Implement appropriate zoning to avoid loss of intact natural habitat or intensification of land use.	Conservation and associated activities. Extensive game farming and eco-tourism operations with strict control on environmental impacts and carrying capacities, where a biodiversity compatible land use is secured across a property. Extensive livestock production on natural rangeland with strict control on environmental impacts and carrying capacities. Urban open space systems.	Urban land uses including residential (including golf estates, rural residential, resorts), business, mining and industrial, infrastructure (roads, pipelines and power lines[5]). Intensive animal production (all types including dairy farming associated with confinement, imported foodstuffs, and improved/irrigated pastures). Arable agriculture (forestry, dry land and irrigated cropping). Small holdings.
Critical biodiversity area 2	Cultivated landscapes which retain importance for supporting threatened species.	Maintain suitability for key threatened species.	Maintain as an agricultural landscape.	Maintain current agricultural activities. Ensure that land use is not intensified and that activities are managed to minimise impact on threatened species.	Avoid conversion of agricultural land to more intensive land uses which may have a negative impact on threatened species or ecological processes.