ASSESSING THE ROLE OF LOCAL AUTHORITIES IN MITIGATING THE EFFECTS OF CLIMATE CHANGE: A CASE OF THE CITY OF WINDHOEK

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ABSTRACT

The African continent is faced with critical climate change challenges which need immediate attention. Local Authorities are mandated to play a crucial role in safeguarding the environment for areas under their jurisdictions. They are closer to the people; hence they are the immediate implementers of climate change mitigation activities. This study assessed the role of local authorities in mitigating the effects of climate change. Although there are many studies on climate change focusing on mitigation, there is a dearth of literature that addresses the role of local authorities. A qualitative case study was carried out in the City of Windhoek. Person-centred face-to-face semi-structured interviews were used as the data collection method with an interview guide as the research instrument. Interview questions were structured in a way that captured information for all the objectives formulated. A sample of 22 respondents was purposively selected. Results indicate that the City of Windhoek is doing relatively well in mitigating the effects of climate change. The City of Windhoek is coordinating with other local and international organisations and it has managed to implement various mitigation activities such as water infrastructural development and road improvement amongst others. However, insufficient funds due to budget cuts from the City as well as shortage of experts working at the City, have adversely affected the mitigation efforts relating to climate change. The results also show that the City of Windhoek did not make deliberate budget provision for climate change mitigation due to lack of funds. While this research provides some ground breaking discoveries; a number of limitations exist. These include the use of a purely qualitative methodological approach with a small sample size. In future, research can be conducted using a quantitative research method and a bigger sample size, allowing for more generalisable outcomes and recommendations.

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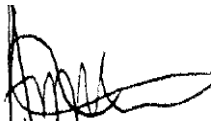
DEDICATION

This Thesis is dedicated to my husband Tawanda and my daughter Ruth for their love, support, patience, encouragement and understanding. They gave me the will and determination to complete my Masters' studies.

DECLARATIONS

I, Aina Amunkete, hereby declares that this study is my own work and is a true reflection of my research, and that this work, or any part thereof has not been submitted for a degree at any other institution.

Aina Amunkete		October 2022
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CHAPTER 1: GENERAL INTRODUCTION

1.1 INTRODUCTION

The climate is changing world over, and assessments of projected climate-related effects show that, many cities are beginning to engage in mitigation planning (Khayyam & Alvis, 2020). Rosenzweig (2017) reports that sixty-eight percent of cities worldwide are pursuing mitigation planning, with Latin American and Canadian cities having the highest rates of engagement (95% and 92% respectively) and the U.S.A. having the lowest (59%). Cities are engaged in different activities associated with mitigation planning.

At the extremes, 37% are reported being in the preparatory stages while 18% are working on implementation. Many, though in this latter group may be linking implementation to ongoing work activities, such as land use and coastal zone planning, rather than pursuing dedicated mitigation activities (Rosenzweig, 2017). The effects of climate change are manifested in erratic rainfall intensity, falling dam levels, storm surges, flooding, urban heat islands and rising temperatures which are likely to disturb many activities of local governments and impact severely on the populations and services they support (Carmin, 2012).

Studies have shown that in addition to direct impacts, there are also indirect climate change impacts that are projected. These range from: loss of production from impact on construction and other industries; high costs of water, liquid fuels and electricity as industrial inputs; increased costs of labour linked to energy, food, water and transport costs and reduced productivity, caused by possible disruptions to water and electricity supply (Mason, 2017). Another paper by Carterkar *et al.* (2016) highlighted the potential

physical and socio-economic risks associated with climate change on cities as being: an increase in intense rainfall events; heat waves; increased incidence and prevalence of tropical diseases. Also, increased demand for public services, such as health.

In recent years, notable impacts of climate change have been observed, with the City of Cape Town in South Africa being an exceptional case. Years of limited rainfall and insufficient drought resilience planning threatened the water security of the City of Cape Town. This resulted in the local authorities imposing strict 50 litres per capita per day for its residents (Taing *et al.,* 2015) in order to avoid a 'Day Zero' scenario when taps would completely run dry.

Local authorities are mandated to play a crucial role in safeguarding the environment of areas under their jurisdictions. They have to articulate government policy and implement government regulations and standards relating to certain aspects of the environment (Hall & Pfeiffer, 2000). Fundamental to creating a climate change culture, is to bring all strategic decisions, budgets and approaches in line with a shift to climate resilience. This includes planning decisions, council investments, pensions and tenders. Political and leadership teams should lead from the top, embedding this work in all areas, taking responsibility for significantly reducing the effects and creating resilience. They should also take the lead in local partnerships on mitigation and response to physical events (Carter, 2020).

A paper by Zurich (2020) highlights the role local authorities play towards climate change mitigation. The author suggests that the role includes: structuring local responses to local impacts; mediating between ratepayers and collective responses to vulnerability and

lastly, governing the delivery of resources to facilitate the mitigation activities. The mitigation activities are therefore measured to determine the extent to which local authorities are mitigating the effects of climate change. For this study, efficacy refers to the ability of local authorities to mitigate the effects of climate change and their capability to produce the desired results (Mason, 2017).

Windhoek is Namibia's largest and capital city. It acts as an economic, educational, political and social Centre; while occupying the position of the largest municipality in the country (Berry, 2017). The population is growing at an annual rate of 4% and climate change effects are putting pressure on the city's resources. The City is inundated with the mushrooming of informal settlements and subsequent pressure on the provision of basic services such as clean running water, electricity, waste removal and sewage management (Berry, 2017). The rapidly growing City of Windhoek is grappling with the impacts of climate change: rising temperatures, falling dam levels and erratic rainfall that has led to both drought and flash floods.

Drought is a pressing concern. In May 2019, Namibia's President declared a State of Emergency, the second in three years because of poor rains. In Windhoek, the rural poor are flocking to informal settlements on the City's outskirts that lack basic services such as clean running water, proper housing, sewage management, electricity, and waste disposal. People in these fast-growing, makeshift neighbourhoods are especially vulnerable to the effects of climate change (Carmin, 2019). Therefore, this study seeks to assess the role of the local authority in mitigating the effects of climate change using the City of Windhoek as a case study.

1.2 STATEMENT OF THE PROBLEM

Windhoek has been experiencing rising temperatures and erratic rainfall that have significantly affected human health, wellbeing and the entire development of the town (Dirkx, 2019). Dirkx (2019) further argues that, erratic rainfall has severely affected houses, buildings, roads, sewerage and drainage systems. Water level readings taken from the dams supplying water to Windhoek during April 2019 show low water levels in most of them. For example, von Bach Dam read as low as 28 percent full, while Goreangab Reclamation Plant was 46 percent full. Windhoek is, therefore, faced with the threat of running dry and residents will have to adopt new water-saving methods to avoid a Day Zero (City of Windhoek, 2015).

To mitigate the effects of climate change, the City of Windhoek (CoW) put in place a Water Demand Management Strategy (WDMS) and the Drought Response Plan (DRP), to avert critical water shortages and manage water supply for use during drought (CoW, 2015). The purpose of the water demands management systems is to outline guidelines the City of Windhoek will use to manage water supply and water use during varying supply situations. The guidelines are designed to maintain the health, safety and economic vitality of the community; to avoid adverse impacts to public activity and quality of life for the community; and to consider individual customer needs as much as possible. The drought response plan is to ensure that supplies of water will be available for the most essential uses for the duration of the drought through Water Demand Management.

A variety of actions, rather than one single approach, is generally more effective at creating an overall atmosphere that promotes water use reductions. These include the

water use education and enforcement, monitoring and evaluation, water scarcity tariff restrictions (CoW, 2015). City of Windhoek continuously evaluate the effectiveness of these strategies. There are indications that these strategies are yielding positive results. However, due to the complexity of these plans, the outcomes can only be expected over a period of ten to fifteen years.

In 2016, the City of Windhoek launched a public water saving campaign "Save Water" urging residents to save 40% of their water consumption (CoW, 2015). The City of Windhoek has also embarked on a mass tree planting campaign of 'Cut One, Plant Two' along with the adoption of town planning standards and principles to make the city more climate-resilient (Dirkx, 2019). Despite the efforts made by the city, there are still complaints over climate change effects, particularly those relating to low rainfall around the city (Dirkx, 2019). It seems that the City of Windhoek has not been able to effectively address the effects of climate change. This study aimed at assessing the role of the City of Windhoek in mitigating the effects of climate change.

1.3 OBJECTIVES OF THE STUDY

The objectives of this study were, to:

(a) assess the institutional arrangements put in place by the City of Windhoek to mitigate effects of climate change
(b) analyse the specific mitigation activities of climate change implemented by the City of Windhoek
(c) examine the implementation capacity of the City of Windhoek in mitigating the effects of climate change

1.4 SIGNIFICANCE OF THE STUDY

The findings from this study can be used by the City of Windhoek in evaluating progress in the mitigation of the effects of climate change. The findings also provide useful information to other local authorities who are considering embarking on mitigation of climate change, useful experiences and strategies in dealing with this dreadful global phenomenon. Policy makers in the field of environment change can also find the study useful in identifying policy issues of concern.

1.5 LIMITATIONS OF THE STUDY

Given the qualitative phenomenological orientation of the research design, which was supplemented by desk-based content analysis, this study was limited to the capital city, Windhoek. In view of its size and statistical scope, the generalisation of the findings from this study is limited. Being a case study, interviewees were employees of the City of Windhoek alone. Climate change mitigation involves many other stakeholders such as the Ministry of Environment, Forestry and Tourism. By focusing on the City of Windhoek alone, experiences of other local authorities in mitigating the effects of climate change were not taken into consideration. Due to COVID-19 regulations, some of the planned interviews were cancelled, while the interviews that were to be conducted face to face had to be changed to virtual interviews. This posed some limitations on the amount and quality of data collected as the researcher could not observe non-verbal communications.

1.6 DELIMITATION OF THE STUDY

Although climate change is a national issue which would demand countrywide assessment, this study focused on the City of Windhoek and it analysed the role of mitigation measures relating to rising temperatures and erratic rainfall. The study navigated the role of Local Authorities in mitigating the effects of climate change and paid particular attention to the role of the City of Windhoek in mitigating the effects of climate change. The City of Windhoek was used as the case study.

1.7 THESIS OUTLINE

This thesis is composed of a total of six chapters. Chapter 1 provides a detailed discussion on the background to the study, statement of the problem and an outline of how the research was conducted. Chapter 2 provides a review of literature on the role of local authorities in mitigating the effects of climate change. Based on the theoretical and empirical literature review, the chapter explores the existing gap in the current literature in relation to the study objectives. The divergent and complementary views of different authors are reviewed.

Chapter 3 deals with the research methodology used. In this chapter, issues such as the research design, sample size and sampling procedures; research instruments and, data collection, analysis and presentation are presented.

Chapter 4 presents the findings from the documents and responses in line with the research objectives of the study. Chapter 5 discusses the findings presented in chapter four in line with the research objectives. Chapter six gives the conclusions and recommendations

based on the research findings. It also presents the areas for further research, and the contributions of the study to the body of knowledge.

CHAPTER 2: LITERATURE REVIEW

2.1 INTRODUCTION

This Chapter provides a review of the literature on how local authorities are involved in the mitigation of the effects of climate change. It brings out the current understanding of the concept of climate change, its effects and mitigation measures. More specifically, the chapter mainly reviews the literature relating to institutional arrangements, mitigation activities and the implementation capacity of the relevant authorities. It explores gaps existing in current literature so as to correctly position this research, and shows the diverging and complementary views of different authors. The chapter is structured into two main sections, namely: the theoretical literature review and empirical literature review.

2.2 EMPIRICAL LITERATURE

2.2.1 Impending climate change threats

Namibia is situated on the south-western part of Africa. The climate is generally hot and dry with sparse and erratic rainfall. Ninety-two percent of the land area is defined as hyper-arid, arid or semi-arid. The country ranks second in aridity after the Sahara Desert (Midgley *et al.,* 2004). Rainfall is extremely variable in space and time such that conventional statistical descriptors, such as mean and median are often difficult to use. Likewise estimates of rainfall characteristics and patterns based on point measurements are also problematic. The inherent annual and decadal variability in climate is severely affected by climate change (Midgley *et al.,* 2004).

An accumulating body of empirical evidence is revealing that climate change is becoming increasingly manifest. Although climate change is perceived by many as a serious problem, the nature of the problem and its potential solutions in terms of policies remain the subject of sometimes fierce debate (Betsill & Bulkeley, 2007). It is therefore fair to state that climate change is a 'wicked' or ill-structured problem. In response to climate change, governments throughout the world have framed problems and challenges often in their own specific ways and have proceeded to formulate their own climate change policies accordingly, in terms of goals, strategies, and means (Betsill & Bulkeley, 2007).

2.2.2 Global response to climate Change

Globally, the response to climate change is gradually gaining momentum as the impacts of climate change unfold. In Africa, it is increasingly apparent that delays of local governments in responding to climate change over the past decades have jeopardized human life and livelihoods. While slow progress with mitigation has garnered much attention, focus is now shifting to developing plans and systems to mitigate the impacts of climate change (Adger, 2009). These responses are in line with the SDG 13 which includes amongst others, strengthening resilience and adaptive capacity to climate related disasters, integrate climate change measures into policies and planning, build knowledge and capacity to meet climate change as well as to implement the UN Framework Convention on climate change.

The impact of rises in temperature is especially marked in occupational settings, particularly in the local governments. Impacts, including measurable vulnerability effects, are heightened in those living in informal settlements, where houses are often constructed

of sheets of corrugated iron. In addition, heat increments are pronounced in many schools and health facilities as these have not been constructed to withstand current and future temperature levels (Knox *et al.*, 2012).

According to Lewis (2013) African cities face a lack of adequate financing, widespread poverty, housing shortages and unemployment, which weaken their ability to mitigate the effects of climate change. There is great concern that the poor, whose livelihoods and well-being depend directly on nature and on the ecosystem services that nature provide, will be the most negatively impacted by climate change. Africa's cities therefore urgently require solutions that empower people and allow nature to respond to the climate change challenge (Lewis, 2013).

Namibia has made significant progress since independence in 1990. This progress is increasingly extending towards the country's fight against climate change, with a national climate change policy having been put in place along with a supporting institutional framework. The national climate change policy was established in 2011.This policy presents information about the main expected impacts of climate change in Namibia and about those most vulnerable. The policy also proposes objectives that the Government of Namibia will aim to achieve through an effective and efficient response to climate change.

The Policy aims in particular at enabling a sustainable access to water, food security, human health and wellbeing, access to fisheries and marine resources, making infrastructure resilient to climate risks, low carbon energy and economy, education, public awareness, research. It further seeks to improve disaster risk management, better allocate financial resources and foster international cooperation (MEFT, 2014).

The NCCP provides a legal framework and overarching national strategy for the development, implementation, and monitoring and evaluation of climate change mitigation activities in Namibia. To succeed, the NCCP will require institutional structures that are adequately equipped and that are able to provide facilities and finances necessary to support climate change adaptation programs and activities (MEFT, 2014). The guiding principles of the policy include: mainstreaming climate change into policy, legal frameworks, and development planning. Also, to develop and implement appropriate strategies and actions that will lower the vulnerability of Namibians and various sectors to the impacts of climate change. The policy also seeks to integrate climate change effectively into existing policy, institutional and development frameworks in recognition of the cross-cutting nature of climate change. Furthermore, to enhance capacities and synergies at local, regional and national levels and at individual, institutional and systemic levels. All this, to ensure successful implementation of climate change response activities. The policy further seeks to provide through Government, secure and adequate funding resources for the effective adaptation and mitigation investments to climate change and associated activities such as capacity building and raising of awareness (MEFT, 2011).

According to Roberts (2008) the extent to which an issue such as climate change becomes successfully institutionalised in day-to-day operations, planning and decision making at the local level by using institutional markers is outlined as follows: There is the emergence of an identifiable political or administrative champion(s) for climate change issues. These champions will assist the municipalities to ensure that climate change issues are involved and taken care of in all municipal operations. Climate change is one of the most significant issues in the mainstream Municipal plans such as the IDP, Integrated Waste Management

Plan, Environmental Plan, Spatial Plan and many more. This will be followed by the allocation of dedicated resources (human and financial) to climate change issues. Lastly, there will be a need to incorporate climate change considerations into political and administrative decision making (Roberts, 2008)

Local governments have an important role to play in society's response to climate change (Betsill & Bulkeley, 2007). In a broader sense, local governments have been named in many studies as key actors in the transformation towards a more sustainable society. Several arguments can be adduced for focusing on the local level (Betsill & Bulkeley, 2007). First, of all tiers of government, it is the local level that has most contact with citizens and local businesses, which offers opportunities to act as an example and to facilitate local action. Second, there is a great deal of transformative potential, since many local decisions directly affect the environment, such as local authorities' regulation of local transportation, building construction, spatial planning, and economic matter (Betsill & Bulkeley, 2007).

On the African context, local authorities such as eThekwini Municipality in South Africa, is identified as having the capacity to tackle the effects of climate change. According to the Municipality's website (Constable & Cartwright, 2009) in 2004 eThekwini Municipality initiated a Municipal Climate Protection Programme (MCPP). An important intervention included in the MCPP is the mainstreaming of climate change considerations into all aspects of the work undertaken by the municipality. While it appears that national and local policy and planning frameworks can influence programme and funding allocations, at least to some extent, their impact needs to be monitored closely, using appropriate indicators. These data can help decision-makers to identify programmatic

areas to target, researchers to analyse and benchmark programme performance (Topfer & Hunter, 2002).

On the Namibian context the burden imposed by climate change means that municipalities need to minimize the effects, by putting in place appropriate mitigation plans and mechanisms such as sound analysis of climate change, adequate financing, timely and adequate information, communication and Community awareness and involvement in place (Mfune & Ndombo, 2017). Local institutions can shape the impacts of climatic shocks in their locality.

The success of mitigation efforts is based on the nature of existing formal and informal institutions. Institutional arrangements are the main key to mitigation; institutional and social factors play a vital role in shaping the vulnerability on households depending on local governance and institutional arrangements. A study by Chipo & Paramu (2017) in semi-arid areas in Zimbabwe, found that none of the institutions being studied were effectively set up to deal exclusively with climate and environmental change. Instead, they dealt with development issues that include specific areas of focus; that are deemed more of a priority than climate issues.

Institutions have the tendency of performing their objectives upon which the institution was formed, and the problems it has come to address over the course of its existence. The same authors proceeded to describe the challenges facing local authorities in their quest to integrate climate change impacts on their local communities. Firstly, public institutions in the study areas play a key role in facilitating mitigation activities, which appears to be in contrast to previous research in which societal configurations indicate greater state

retreat over the past two to three decades. Secondly, there are discrepancies between public, private and civic institutions in terms of they function and how they ought to embrace the cross linkages and synergies in order to maximize their potential for enhancing climate change mitigation (Chipo & Paramu, 2017)

Cities and local authorities are key players in climate change adaptation and mitigation as a result of the spatial concentration of people and economic activities. However, the processes of identifying, planning, implementing and monitoring mitigation measures has proved to be a challenging and resource consuming task in most cities and local authorities. Moreover, a major part of societies' assets and economic activities are located in cities; making cities not only contributors to climate change but subsequently vulnerable to its impacts (Carterkar *et al.,* 2016).

A paper by Carterkar *et al.*(2016) found that many cities and local authorities focus primarily on mitigation measures only, and in other cases are starting to prioritize the development of implementation strategies once they have been affected by extreme weather events. However, studies have shown that cities do not have comprehensive mitigation strategies because they are not adequately equipped to implement the necessary measures required to respond to expected climate change impacts (Betsill *et al.,* 2007). Consequently, the performance of cities and local authorities which are actors in the implementation and monitoring of mitigation strategies and respective measures, has been limited due to several factors. These include, lack of enabling legislation; conflicting interests of administrative units; incomplete and unreliable knowledge of climate change and its impacts on the specific area; limited financial and human resources; the density,

size and structure of the city; cultural habits; operational capability and the interests of stakeholders (Curtis, 2008).

Carter (2020) explains the discrepancy in achieving the mitigation goals for the forefront institutions in the implementation of mitigation measures as follows: there appears to be a knowledge gap between the available spatial and temporal information with regards to land coverage, rainfall distribution, soil conditions and wind turbulence. Also, the local and/or regional information on the part of the stakeholders. Most studies focused more on adaptation strategies of local authorities to climate change rather than mitigation. Moreover, stakeholders do not have an idea on what their data needs are nor the type of information that they require to answer the pressing questions.

Communication of uncertainties and the necessity to use information from climate models has been similarly cited as a hindrance due to the use of few climate projections. Furthermore, it has been acknowledged that the current 'top-down' approach of the dissemination of information from scientists to local practitioners ought to be replaced by new approaches in which knowledge is produced as a result of cohesion collaboration between scientists and the stakeholders. In order to foster the implementation of measures that create collaborations and co-benefits, it is vital to integrate local stakeholders who have background knowledge on the impact on local communities (Cortekar *et al*, 2016).

2.2.3 Implementation capacity of local authorities

The notion of institutional mitigative capacity has been developed in the framework of climate change vulnerability and resilience, which is shaped by the ability of the system to control risk exposure and sensitivity. The capacity of local authorities and

municipalities is critical in determining their resilience to climate change impacts, which will require two types of capacities, namely, climate specific capacities and climate-relevant capacities (William *et al.,* 2020).

The impacts of climate change are experienced locally, thus action must be locally-driven with focus placed on local governance. A study assessed the capacity of local governments in implementing climate adaptation strategies using a combination of two approaches, namely Capital Approach Framework (CAF) and participatory interactive workshops (William *et al.,* 2020). The CAF is beneficial as it encompasses five types of vital capital, namely: environmental, financial, human, political and social.

Environmental capital incorporates environmental management strategies, while financial capital is the availability of capabilities, resources, properties or funds for the implementation of climate change mitigation strategies and disaster preparedness. Human capital consists of human resources; this includes the knowledge and skills that would be required for implementation.

On the aspect of the political capital, it covers the organisation of the institution, level of transparency and accountability and political support. Lastly, social capital includes internal and external collaboration on climate change issues, participation of stakeholder and information sharing. The use of the framework was found to benefit greatly by using a governance baseline tool to monitor the progress made on the implementation thereof while also informing the practice of adaptive governance. The second approach of using participatory workshops was found to enable high quality democratic governance and

strengthen civil capacity through the involvement of local communities (William, *et al.*, 2020)

2.3 THEORETICAL FRAMEWORK

Protection Motivation Theory introduced by Rogers in 1975 was used in the understanding of the efficacy of local authorities in mitigating the effects of climate change in the study area. The central notion of this theory is that individuals and institutions' decision to participate in risk preventive behaviours is made based on their motivation to mitigate threats such as natural disasters and global climate change (Janmaimool, 2016). This contention is supported by the U.S. EPA (2010) that our planet's climate is changing and current scientific evidence proves that global climate change is induced by humans (Alley, 2007). Many scientists agree that climate change is one of the greatest threats faced by our planet. The climate change literature demonstrates that fear appeals can be used to encourage behavioural changes that will mitigate climate change (Nelson, 2011).

According to the Prevention Motivation Theory by Rogers (1983) response of local authorities are aligned to the perceived effectiveness of the recommended risk preventative behaviours. The author elaborated on coping appraisal which considers the response cost as the cost of performing the recommended behavior. A high cost of performing preventative behaviours might hinder people from being involved in recommended behaviours. Rogers 1983 further asserts that the coping appraisal is the product of the appraisals of the self-efficacy and the response efficacy minus the costs of performing the recommended preventive behaviour. The model predicts that the higher the response efficacy, self-efficacy, and the lower response cost, the more possible one

will decide to perform adaptive behaviours. The decision of individuals and institutions towards risk preventive behaviour is, therefore, based on the results of both threat appraisal and coping appraisal.

Perceived vulnerability reflects individuals and institutions perceptions of their susceptibility to the harms. Threat appraisal also includes the perception of the reward, which refers to perceived benefits of current practices. These perceptions of vulnerability, severity, and the reward can motivate individuals to perform mitigation responses such as pro-environmental behaviours. Higher perception of severity and vulnerability is likely to enhance individual motivation to perform risk preventative behavior, while higher perception of rewards from current practices will inhibit risk preventative behaviours (Chinda, 1986).

In addition to threat appraisal, coping appraisal, which refers to the estimation of an individual and institutions capacity to perform risk preventative behaviours, also influences the protection motivation. The coping appraisal includes self-efficacy and response efficacy. Self-efficacy is an individual's perception of their capability to perform the behaviours (Bubeck, 2012). Two important elements of mitigation of climate change effects are: Assessment of the perceived severity of the threat and the perceived probability of receiving adverse impacts from the threat (vulnerability).

Accordingly, perceived severity of the threat means the degree of seriousness of the possible harms that is perceived by an individual or institutions while perceived vulnerability reflects an individual's perception of their susceptibility to the harms. These

perceptions of vulnerability and severity motivate individuals and institutions to perform mitigation responses, such as climate change response measures (Janmaimool, 2016).

Several studies tested the application of Protection Motivation Theory in identifying climate change mitigation strategies. The basic assumption was that behavioural change of the people is important for practicing climate change mitigation strategies. Therefore, responding to climate change threats involves two conditions. The general people must perceive that climate change is occurring and threatening their wellbeing. This is followed by adopting certain practices, considered feasible to their context, in order to avert the threat believed to be induced by the change in climatic vagary (Asrat & Simane, 2018).

Another study by Bockarjova and Steg (2014) on the application of PMT on local governments and climate change mitigation indicated that the more vulnerable people are, the more willingness to implement mitigation measures. People in cities and towns are more vulnerable to climate change effects the more they implement mitigation strategies. Concurring with other studies conducted in different towns in Ethiopia, they stressed that risks of climate change were increasing. Climate change threats such as flooding, shortage of precipitation and ultimately recurrent drought was reported to be higher than ever and were perceived irreversible (Deressa, *et al.*, 2009).

CHAPTER 3: RESEARCH METHODS

3.1 INTRODUCTION

This chapter describes how the research was conducted and how the data was collected, processed and analysed. It describes the research design, research population, sampling procedures and the sample size; research instruments used for data collection as well procedures for data analysis. Finally, there is a presentation of ethical issues that were considered before, during and after the data collection.

3.2 RESEARCH DESIGN

The research design provides the appropriate framework for a study. It requires the researcher to make a choice regarding the research approach in determining how the relevant information for the study must be obtained (Sileyew, 2019). Alternatively, Mukherjee (2017) describes research design as the theoretical configuration inside which investigation is performed. A case study research design was applied to assess the efficacy of local authorities in mitigating the effects of climate change using the City of Windhoek.

Cresswell (2007) defines a case study as a research approach that is used to generate an in-depth, multi-faceted understanding of a complex issue in its real-life context. Similarly, Williams (2007) asserts that a case study is used by researchers when they wish to explore in-depth, a phenomenon in social science disciplines; and the collection of data can be derived directly or through participant observations, including archival records or documents, audio-visual materials, interviews or through physical artefacts.

This study employed qualitative research methodology, which can be described as an approach rather than a particular design or set of techniques (Welman *et al.,* 2005). Data collection was done through interviews and focus group discussions. The content analysis component was complemented by phenomenological research, which entails the qualitative exploration of the field involving experts of climate change mitigation through systematic observation of the existing mitigation activities. A phenomenological design was used in this study in order to assess climate change mitigation strategies using the experiences of the experts. The term phenomenology, first expressed by Immanuel Kant in 1764 is derived from the Greek *phainein,* meaning 'to appear' this includes themes and biases and their detailed systematic examination (Leedy & Ormrod, 2013).

The researcher identified themes by choosing features of participants' accounts characterising particular perceptions and experiences that the researcher sees as relevant to the research objectives in the interview's scripts. The Researcher defined features as themes where they recur several times in the data set, within and across transcripts. Data was also coded according to the themes.

3.2.1 POPULATION

Population is defined as the target group that the study intends to enquire (Majid, 2018). Polit and Hungler (1999) define population as an aggregate or totality of all the objects, subjects or members that conform to a set of specifications. It is important to include and describe the socioeconomic and demographic characteristics of the individuals, groups, organisations, human products and events of interest, and can include characteristics such as: age, educational level, and gender, level of work experience, socioeconomic status and

work status – the units of analysis about which the researcher wishes to make conclusions (Majid, 2018; Welman *et al.,* 2005).

The human resources records show that by October 2020 the City of Windhoek had a total of 623 employees. The population of study consisted of key stakeholders who were able to provide information on the efficacy of the City of Windhoek in mitigating the effects of climate change. The respondents who were considered relevant included those who were involved as planners and policymakers on environmental issues in the Department of Environmental Health, Disaster Risk Management, Emergency and Solid Waste; others were Strategic Executives and Management Councillors.

3.3 SAMPLING AND SAMPLE SIZE

The researcher took time to study different documents which were addressing the issue of climate change in Windhoek, and selected respondents who could explicitly discuss the historical back-ground, the current situation and the foreseeable future of climate change mitigation. Purposive sampling was used to select key informants. Purposive sampling (also known as judgmental, selective or subjective sampling) is a sampling technique in which a researcher relies on his or her own judgment when choosing members of a population to participate in the study (Saunders, 2012). Purposive sampling was the best method for this research because only a limited number of people could serve as primary data sources in line with the research design and objectives.

The study involved 22 employees from the City of Windhoek as follows: Environmental Health Department (5), Strategic Executives (4), and Councillors (6), disaster risk management Division (2), Emergency (2), solid waste (3) - in line with Cresswell (2007).

The selected participants provided information needed from their areas of specialisation. The information sought from the participants was in line with the objectives of the study: the institutional arrangements put in place by the City of Windhoek to mitigate effects of climate change; the specific mitigation activities of climate change implemented by the City of Windhoek, and the implementation capacity of the City of Windhoek in mitigating the effects of climate change.

3.3 RESEARCH METHODS AND INSTRUMENTS

A research instrument is a tool used to collect, measure, and analyse data related to the research interests. The choice of specific research instruments to use was strongly related to the actual methods used in this study. Interview guides with non-structured questions were used for in-depth interviews, for experts and focus group discussions (Mays, 2000; Wai-Ching, 2001).

The researcher used person-centred face-to-face semi-structured interviews as the main research method. However, due to the COVID-19 regulations, some of the face-to-face interviews were changed to virtual meetings. Semi-structured interviews are flexible and have a fluid structure. As such, these are the key data collection methods for phenomenological studies that seek to understand the participant's experiences (Denscombe, 2007). The interview questions were carefully designed and presented so as to generate meaningful data. Systematic observation complemented the range of research instruments, taking photographic evidence of the impressions gained and/or documenting it by taking notes. The researcher audio-recorded all the face-to-face semi-structured interviews and produced field notes during the interviews describing the

physical appearance, facial expressions and emotions of the participants and transcribed them verbatim to prepare for analysis.

3.5 PROCEDURES

Firstly, a pilot study was conducted with two (2) participants, with the aim of refining the semi-structured interview questions. The interviews were conducted at a venue of the research participant's choosing, so as to put the participant at ease. At the start of the interview, the researcher briefly introduced herself and explained the purpose of the study. Upon agreement, the participant signed a consent form. A consent form, not only establishes trust between the participant and the researcher, but it also shows that the researcher possesses ethical standards and expresses concern towards the participants (Thomson, 2013). Before starting the actual interview, the researcher asked a series of ice-breaking questions to put the participant at ease and to relinquish any feelings of anxiety.

Data was collected from a body of material and documents that included books, research reports, policy documents, newspapers and many other with information relating to mitigation of the effects of climate change in Namibia and particularly in the City of Windhoek. Under the phenomenological design, individuals were selected as part of the research sample for interviews, based on their expertise in the topic under discussion. The experts provided insights on the current mitigation situation and predicted the future of climate change mitigation in Windhoek, considering the current trajectory of urbanisation.

Officials from the City provided information on the institutional arrangements, the mitigation activities as well as the implementation capacity of the City of Windhoek in mitigating the effects of climate change. The researcher suspended all preconceived

notions or “personal experiences that may unduly influence the participants’ responses” (Leedy & Ormrod, 2010). Most of the interviews were recorded on a digital voice recorder with the consent of the informants, while handwritten notes were taken in order to supplement the recordings and to keep the researcher engaged. The researcher also scrutinised the documents and arranged pieces of information that are related and grouped them into themes and categories.

3.6 DATA ANALYSES

3.6.1 Content analysis

Elo & Kyngas (2007) define content analysis as a method of analysing written, verbal or visual communication messages. Stemler (2001) further defines content analysis as a systematic, replicable technique for compressing many words of text into less content categories, based on explicit rules of coding; and that it is any technique for making inferences by objectively and systematically identifying specified characteristics of messages.

The researcher used the relational analysis model for content analysis. Wilkinson & Peter (2003) say that relational analysis begins by identifying themes or issues to explore. However, unlike the majority of other analyses, this approach attempts to explore and identify relationships between the themes or issues.

In this study, the qualitative exploration which was phenomenological in character, engaged experts of the environmental health department, strategic executives, employees from the emergency division and the councillors. Based on in-depth interviews, the

phenomenological component of the study attempted to understand perceptions and perspectives of a particular situation (Leedy & Ormrod, 2013). Content analysis allowed the researcher to analyse data throughout the course of data collection. The researcher then interpreted the coded and grouped data, and confronted them with the interview data. Interviews were transcribed and translated together with data obtained from the desk-based content analysis into a narrative in relation to the research objectives. The researcher transcribed audio recordings. Handwritten notes were converted into write-ups, which were further analysed. Codes are defined by Welman *et al.* (2005) as tags or labels that attach meaning to raw data or notes collected during field work.

The researcher employed the process of data reduction through coding and categorisation since qualitative methods produce large amounts of data as argued by Sekaran & Bougie (2013). The process allowed the researcher to clearly visualise how the data would be presented and to draw some conclusions. The researcher then commented on and analysed the data from the field, together with that obtained from desk-based content analysis so as to present a new narrative, based on what came from the respondents. The researcher also identified and documented themes during data analysis. Ryan and Bernard (2002) as quoted in Welman *et al.* (2005) argue that theme identification is one of the most fundamental tasks in qualitative research. “Themes are umbrella constructs which are usually identified by the researcher before, after and during data collection” (Welman *et al.* 2005). The researcher was able to identify themes in the discussions around the efficacy of the City of Windhoek in mitigating the effects of climate change. The themes allowed the researcher to present and discuss the findings in a manner responsive to the research objectives.

3.7 RESEARCH ETHICS

It is crucial for any researcher to adhere to ethical issues throughout the research process in order to protect participants. Measures adapted from the ethical considerations as discussed by Neuman (2014) and those listed by Patton (2002) were taken during the research procedures to ensure that the respondents did not suffer physical or emotional harm. The researcher had a moral obligation to strictly consider the rights of the participants who were expected to share their experiences (Patton, 2002). According to Punch (2016) "the researcher's ethical responsibilities include the overarching principle of academic integrity and honesty and the respect of the other people".

Ethical considerations were an important aspect of this study; due to the sensitive nature of the study, possible risks were continuously examined to increase sensitivity to the participants and not to expose them. In this study, the researcher considered it very important to establish trust with the participants, and to respect the participants as self-directed individuals, thus enabling the participants to make a sound decision.

Ethical measures and ethical conduct towards participants' information as well as honest reporting of the results were important in this research. The ethical measures that were taken in this study, include permission, assent and consent, confidentiality and anonymity, privacy, right to withdraw from the study, right to protection from exploitation and harm, the involvement of the researcher and dissemination of results. Moreover, the student also obtained an ethical clearance certificate from the University of Namibia

3.7.1 Permission

The research proposal was submitted to the University of Namibia's Postgraduate Studies Committee and approval was granted to conduct the study. Research permission to conduct the research study was obtained from the University of Namibia's Centre for Post Graduate Studies as well as from the City of Windhoek's Chief Executive Officer.

3.7.2 Assent and consent

The voluntary, informed and written assent form was signed by the participants. Informed consent generally meant that the participants were free to choose to take part or refuse, having been given full information concerning the nature and purpose of the research, including any risk to which they personally would be exposed (Thomas, 1998). Thus, the purpose of the study was explained to the participants before the interviews. The respondents were informed that their names were not to be recorded or mentioned anywhere in the study, the researcher would simply use their position and if information provided is sensitive or confidential, the researcher would not disclose the participant's position. Permission to audio-record each interview was sought from each participant.

3.7.3 Confidentiality and anonymity

Polit & Hungler (2004) argue that confidentiality is guaranteed when the researcher can identify a given person's response but promises not to do so publicly. Unwanted intrusion into the participant's privacy was minimised by interviewing them privately, and that no information that the participants divulged was made public or available to others. To ensure anonymity, the participants were not asked to provide their names. Transcriptions

of interviews were done according to numbers, so as to conceal the identities of participants. Furthermore, the researcher ensured that the place where the interviews were conducted was friendly and conducive. Confidentiality was guaranteed by ensuring that data obtained was used in such a way that only the researcher knew the source (Burns & Grove, 2011).

3.7.4 Right to withdraw from the study

Participants were encouraged to indicate any discomfort or unwillingness to answer a specific question(s). The participants were informed that they could skip the question(s) or withdraw from the interview at any time if they wished to, without any negative consequences. This right was part of the assent and consent forms.

3.7.6 Dissemination of Results and Data storage

Results are disseminated in the form of a research report (Devos, 2007). The report does not expose the secrets or weaknesses of the institution to the readers but should recommend improvements of the service.

In this study, the participants were informed that a copy of the findings would be handed to the City of Windhoek where the study was conducted. Anonymity is assured because the results do not mention the participants' names. Data is being stored in a lockable safe for a period of 5 years and will be shredded thereafter. Only the researcher has access to the data.

CHAPTER FOUR: RESULTS

4.1 INTRODUCTION

This chapter presents the results of the research in line with the research objectives. It gives data through themes, while descriptive data is presented through figures and tables. The chapter presents the results based on the documents and responses to the questions posed during the semi-structured interviews, on the institutional arrangements, mitigation activities and implementation capacity of the Local Authority.

4.2 CHARACTERISTICS OF THE PARTICIPANTS

The study used demographic information in the form of gender, education qualifications, including the area of specialisation and the level of experience in years. The study involved 22 participants from the City of Windhoek categorised according to the divisions under which they were employed, namely: Strategic Executives, Environmental Management and Health Sciences Division, Disaster Management Division, Emergency Management Division, Solid Waste Management Division and Councillors.

4.2.1 Gender of the Respondents

All the four (4) Strategic Executives interviewed from the Department of Economic Development and Community Services, Department of Infrastructure, Water and Technical Services, Department of Human Capital and Corporate Services and the Department of Urban and Transport Planning were male. From the Environmental Management and Health Services Division, there were two (2) male Senior Environmental Health Officers, one (1) female and two (2) male Environmental Health Assistants.

Environmental health officers are the technical implementers of climate mitigation policies.

The Emergency and Disaster Management under the Department of Housing, Property management and Human Settlement is responsible for emergency responses to the community. Two (2) male employees were interviewed from this division. The Division of Solid Waste Management had three (3) employees, two (2) male and one (1) female who participated in the study. Lastly, six (6) Councillors from the City of Windhoek were interviewed, who consisted of two (2) male and four (4) female respondents. Figure 4.1 shows the gender of the respondents in their respective divisions, where, out of twenty-two (22) respondents, only four (4) were female and eighteen (18) were male. The gender distribution was skewed towards males. About 82% were male and 18% were female.

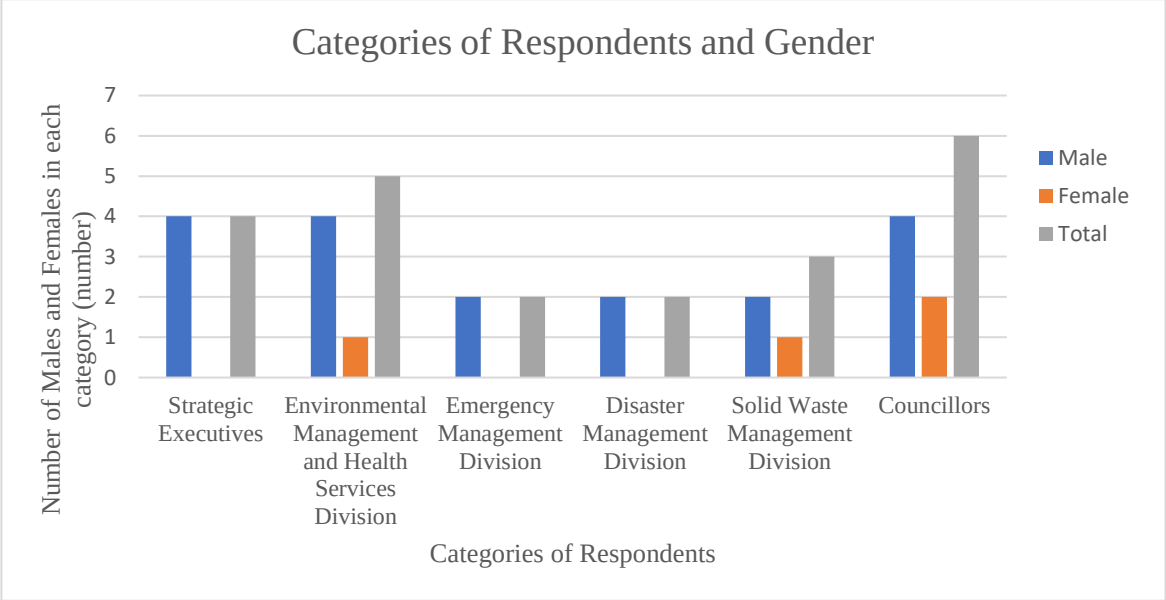

Figure 4.1: Gender of the respondents

4.2.2 Respondents' Level of Educational and Years of Experience

Figure 4.2 shows that eleven respondents had Master's Degrees. Of these, four were Strategic Executives, four Environmental Health Management and Health Services, one from the Division of Disaster Management, one from Solid Waste Management and one Councillor. The total number of respondents with Bachelors' degrees were eight: one from the Division of Environmental Management and Health Services, two from the Division of Emergency Management, one from the Disaster Management Division, two from Solid Waste Management Division and two were Councillors. Four Councillors had Diplomas. This therefore implies that City of Windhoek has set minimum standards for every position with a minimum being Diploma. This implies that the employees able to synthesize theoretical information faster and convert it into practical

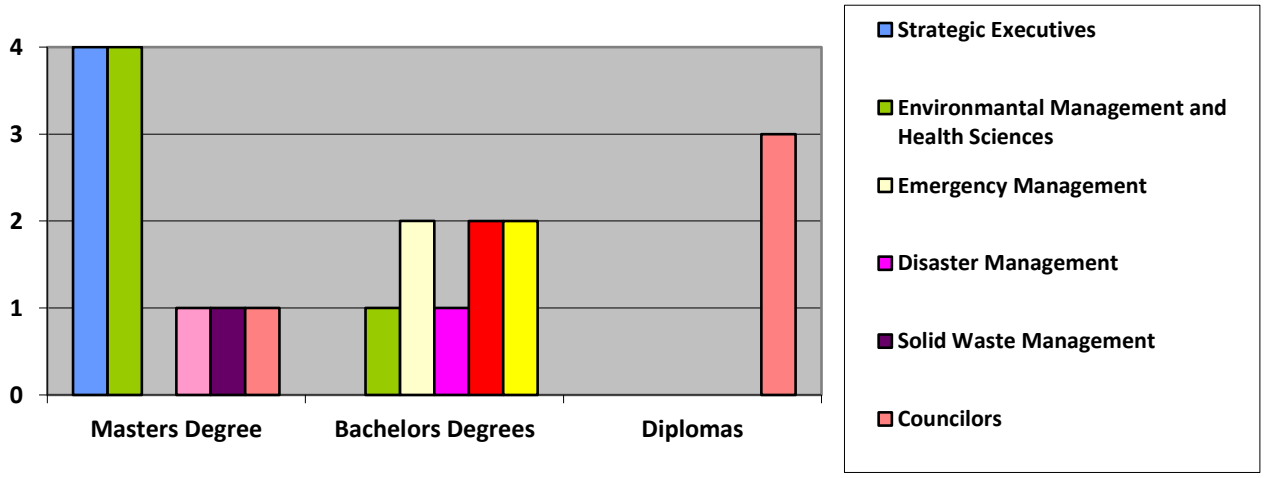

Figure 4.2: Educational qualifications of respondents

It was also imperative to know the professional strength of the respondents in terms of their areas of speciality within their broad professions. This was important in establishing their suitability and ability in implementing climate change mitigation activities. Table 4.1 provides the areas of speciality for the respondents.

Categories	Area of specialisation
Strategic Executives	1 Public management (1) 2 Engineering (1) 3 Urban planning (1) 4 Economics (1)
Environmental Management and Health Sciences	Environmental Health Sciences (5)
Emergency Management	Emergency Medical Care (2)
Disaster Risk Management	Environmental Health Sciences (2)
Solid Waste Management	Civil Engineering (3)
Councillors	Politicians (6)

Table 4.1: Areas of Speciality of Respondents

The study found that the respondents, with the exception of the Councillors, were duly qualified in the fields that were relevant to their jobs (Table 4.1). The Strategic Executives' qualifications were in line with the position they occupied, specialized in diverse fields ranging from economics, engineering, public management to urban planning. The respondents from the Environmental Management and Health Sciences Division and the Disaster Risk Management were specialized in the field of Environmental Health Sciences. The respondents from the Emergency Management Division majored in Emergency Care. Similarly, respondents from the Solid Waste Management Division specialized in Civil Engineering. The Councillors are, however, not appointed based on their areas of specialisation, but rather on their political affiliations.

The respondents indicated that job specialisations help the effectiveness of the implementation of climate change activities. The respondents also indicated that climate change mitigation measures require both scientific and social understanding and therefore implementers of climate change mitigation activities need to be experts in those areas.

4.3 LEVELS OF EXPERIENCE OF THE RESPONDENTS

The respondents were asked to state their level of experience with respect to their occupations. Determining the level of experience helped the researcher to see if the institution had staffs who were competent enough in mitigating the effects of climate change. Samuels (2017) asserted that employee experience has a direct positive correlation with employee productivity. It simplifies everyday operations, making it easier for employees to work. Similary, inexperienced employees have a negative impact on the productivities. Figure 4.3 shows the levels of eperience of the respondents .

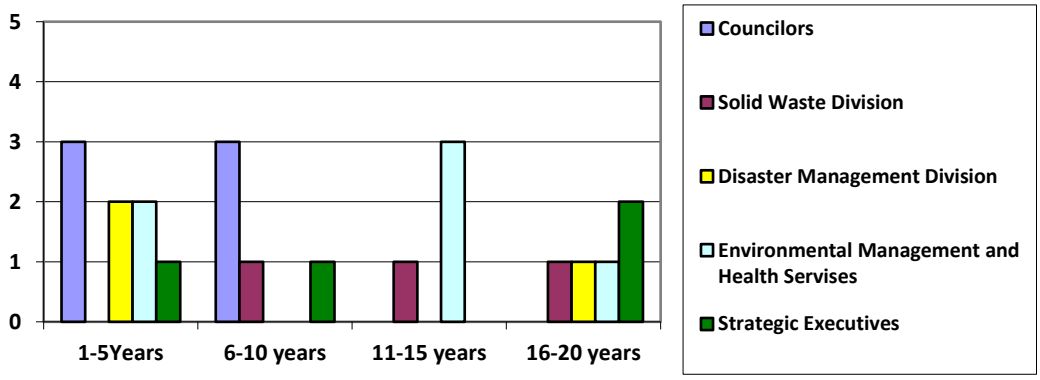

Figure 4.3: Level of experience of respondents.

The figure 4.3 above shows various levels of experiences for the respondents. The figure shows that strategic executives formed a larger number of respondents with more experience. Out of four Strategic Executives interviewed, two had 16-20 years of

experience; one had 6-10 years of experience and another with 1-5 years of experience. Environmental Management and Health Services had two respondents with 1-5 years of experience, three respondents with 11-15years of experience and one respondent with 16-20 years of experience. The Solid Waste Division had one respondent with 16-20 years of experience, one with 11-15 years of experience and another with 6-10 years of experience. The Disaster Management Division had one respondent between 16-20 years of experience, and two respondents with 1-5 years of experience. The results show that more people have more than five years' experience. This therefore implies that the people are more experienced hence they will be able to utilise their experiences in migration of climate change using their past encounters.

4.4 INSTITUTIONAL ARRANGEMENTS

4.4.1 Introduction

The first objective of this study was to assess the institutional arrangements put in place by the City of Windhoek to mitigate effects of climate change. It was considered important to identify the institutional arrangements in which the mitigation activities were taking place in order to assess their roles and effectiveness. All three categories of interview guides prepared for the Councillors, Department of Environmental Management and Health Services staff and the strategic executives had questions that required the respondents to give detailed information on the institutions responsible for mitigation of the effects of climate change. Further information was gathered from the documents. The respondents were also asked for their opinion on the effectiveness and challenges of these institutional arrangements as well as their recommendations.

According to UNDP (2017) institutional arrangements are the policies, systems, and processes that organisations use to legislate, plan and manage their activities efficiently and to effectively coordinate with others in order to fulfil their mandates. These include the responsible organisations, their human resources, funding, equipment and supplies, leadership, effectiveness and, the communication links between and among organisations. In this study institutional arrangements refers to institutions (both formal and informal) that are involved in climate change mitigation and how they are coordinated and working together with city of Windhoek in mitigating the effects of climate change.

The respondents indicated that, institutional arrangements were considered essential in the implementation of climate change mitigation strategies because they are expected to play a vital functional role to reduce uncertainty. In the context of the study, institutional arrangements referred to the established range of organisations' rules and regulations, structures and networks that are a prerequisite through which successful resource mobilisation and management (including human capital, funding and information) is governed in order to achieve the envisaged objectives of mitigating climate change.

This section presents some of the institutions involved in mitigation activities of climate change and how they are coordinated and their relationship with the City of Windhoek in mitigating the effects of climate change. The Protection Motivation theory was used in discussing these institutions. The respondents identified the following institutions as the ones dealing with in climate change Namibia: Cabinet of Namibia, Ministry of Environment, Forest and Tourism (MEFT) Ministry of Urban and Rural Development (MURD) Ministry of Finance (MoF,) Green Climate Fund (GCF) Environmental

Investment Fund, (EIF) United Nation Development Program (UNDP) and the City of Windhoek itself.

4.4.2 City of Windhoek

The City of Windhoek is the biggest local authority in Namibia. The Municipality hosts the biggest population and hence is a key player in climate change. The Strategic Executive for the Department of Economic Development alluded that, through the MEFT, the City of Windhoek is part of the Namibia National Climate Change Committee. Respondents from the Environmental Management and Health Services indicated that, the Municipality and University of Namibia are key players to African Cities in Future Resilience for African Cities and Lands (FRACTAL). They further said that FRACTAL is an association of several African cities and universities which promote information sharing on dealing with climate change and mitigation strategies through workshops and research. The FRACTAL research project aims to provide sampled cities in southern Africa with relevant and appropriate climate information in order to facilitate climate sensitive development decisions and so contribute to the building of more resilient cities.

The City of Windhoek coordinates the implementation through the Department of Economic Development and Community Service which has a subdivision of environmental Management and Health Services. About four staff members are employed by City of Windhoek to deal specifically with climate change issues. The municipality is one of the African cities that have managed a massive recycled waste water system. The plant is located at Windhoek's Goreangab dam which recycles waste to reusable water again. This has been necessitated by the fact that water sources are erratic due to its

location in semi-arid area. There is also a strategy within the City, where all building plans approval will have an aspect of climate change mitigation assessed while green technologies are encouraged. The City of Windhoek works closely with community members through community meetings where information is conveyed to community members to adhere to water saving measures and others strategies that will promote mitigation of climate change.

It was indicated that with the help of FRACTAL, the City of Windhoek was able to share various information regarding the mitigation of climate change through various engagements. This includes Climate Change Awareness Workshop for City of Windhoek Junior Council that was held on 12 April 2019. This workshop was aimed to engage and inform youth on facts about climate change, climate change negotiations, impacts and mitigation measures. The workshop provided a platform for youth to engage with one another and share their experiences of climate change impacts, vulnerabilities and discuss their actions in order to address these challenges.

The workshop brought together City of Windhoek Junior Councillors to discuss and raise awareness on climate change and how they can use the information in becoming future leaders on climate change actions. The workshop was facilitated by the City of Windhoek, University of Namibia and the Namibian Youth Coalition on Climate Change (NYCCC) through FRACTAL. The workshop also provided an opportunity for the youth to engage, discuss and deliberate on climate change issues. The youth also had an opportunity to assess the current climate change impacts affecting them, their vulnerabilities and possible actions (personal or on national levels). The youth were also briefed on current framework, policies, strategies and action plans and how they can become climate change

actors on a local and international level through youth engagement and networking on climate change issues.

It was also obtained from the Strategic Executive of the Department of Economic Development and Community Services that FRACTAL also assisted in facilitating various workshops for City of Windhoek's employees. One notable workshop was that of the City of Windhoek's strategic executives. The Strategic Executives undertook a range of activities to explore how climate change could be mainstreamed into city planning processes and decisions during this workshop.

All respondents from the Division of Environmental Management and Health Services agreed that one of the notable projects implanted by FRACTAL is what is known as Co-producing climate information for Windhoek decision-making. The project, emphasis on collaborative learning and engagement with Windhoek stakeholders and decision-makers, the project has a research team that worked to co-produce, communicate and share climate information that was relevant to identified priority concerns in the city.

This project consolidates the learning, considering the process that the team went through to develop the Climate Risk Narratives in Windhoek. It also considers and identifies gaps that could still be addressed. The respondents indicated that the project assisted the City of Windhoek's Department of Environmental Management and Health Services in drafting relevant climate change policies needed by the decision makers.

4.4.3 The Cabinet of the Republic of Namibia

The cabinet is responsible for approving strategies and regulation governing the mitigation on a national level. The approved guidelines are then executed at the local level by Municipality, town councils, village Councils and traditional authorities.

The interviewed Strategic Executives indicated that the Department of Environmental Management and Health Services had immense pressure on the overall allocation of funds hence climate change was relegated to donor funders. the Strategic executive from the Department of Finance indicated that the Ministry of Environment and, Forestry and Tourism is looking upon Environmental Investment Fund (EIF) to also provide funds to the general public for use towards climate change. Documents reviewed indicated Municipalities across Namibia sit down monthly to debate issues submitted by the executive; send their inputs to the Ministry for consolidation, and then the Minister passes them to the cabinet. Climate change issues have been relegated from 2020 due to Corona virus which has taken the centre stage.

4.4.4 Ministry of Environment, Forest and Tourism

The Ministry of Environment, Forest and Tourism (MEFT) is responsible for all environmental issues in the country. the Ministry is also the climate change coordinating Ministry through the Climate Change Unit (CCU) established within the MEFT. The coordinating unit is mainly composed of staff from the Department of Environmental Affairs in MEFT. The respondents indicated that this Unit was identified as the implementing agency independent of government, but would fit into the government's development policies and programs. The respondents from the Disaster Management

Division shared the same sentiments and indicated that the core function of this Unit is to promote and support the implementation of all environmental policies and legislations related to biodiversity, sustainable land management and climate change. It also negotiates on behalf of the Government of Namibia at conferences and meetings of the CBD, UNCCD and UNFCCC including climate change policies.

Documents reviewed indicated that the MEFT ensures that municipalities translate overall strategies for mitigation into tangible actions. With the national 2012 Action Plan, all municipalities are required to complete a comprehensive plan for local climate mitigation by the end of 2022, either as a supplementing plan to the Municipal Plan or as integrated in the Municipal Plan. Each plan includes a flood risk mapping and sets the priorities for local climate adaptation measures.

The specific national action plan related to management of cloudbursts and rains required local authorities to take a short and medium-term perspective. This was also comfirmed by a respondent from the the Division of Environmental Management and Health Servises who indicated that one of the core mandates of Ministry of Environment, Forests and Tourism is to strive for excellence to address climate change as a challenge by responding in a timely, effective and appropriate manner via exploring adaptation and mitigation approaches relevant to different sectors at local, regional and national level in order to improve the quality of life of its citizens.

The respondents indicated that, MEFT was making substantial progress in its national climate change response. It has also been active in international climate processes especially by implementing the recommended climate change mitigation measure by the

international governing bodies such as the United Nation. However, the respondent from City of Windhoek's environmental Management and Health Services indicated that efforts like additional budget from the government may go a long way.

4.4.5 Namibia National Climate Change Committee.

The Department of Environmental Affairs of the Ministry of Environment, Forestry and Tourism (MEFT) is responsible to develop, implement and coordinate climate change activities at the national, regional and local levels. Given the cross-sectoral nature of climate change, the Ministry initiated the establishment of a National Climate Change Committee (NCCC) in 2001.

The core functions of the NCCC are to develop national communications to the UNFCCC as well as climate change projects and programmes, develop national positions on climate change, define climate change capacity needs and institutional requirements, advise a national strategy for adaptation to climate change and oversee the implementation of the Clean Development Mechanism (CDM). Two employees from the Division of Environmental Management and Health Services that are assigned to work with issues of climate change are permanent members of the Namibian Climate Change Committee.

A respondent from the Environment Health Division indicated that the National Climate Change Committee helped the City of Windhoek in terms of experts of Climate Change with development, implementation, monitoring and evaluation of climate change mitigation within the City activities. Documents reviewed indicated that the Government of Namibia under the Labour Act, Act of 1992 make provision for the Government Ministries to exchange or avail experts from one Ministry to the other when need be. It is

with this agreement that the City of Windhoek through the Ministry of Urban and Rural Development requested experts to assist them with development, implementation, monitoring and evaluation of climate change mitigation within Windhoek City. Four experts from MEFT are availed to assist City of Windhoek with issues of climate change.

About 86% of the respondents agreed that as much as the NCCC have been very effective in executing its mandates, it is still faced with a challenge of political interference. This is so because most of the decisions are passed at the cabinet level by politician and those politicians have a huge influence on the approving or disapproving the recommendations from the NCCC. Politicians are not experts of climate change and their approval and recommendations have a huge impact of the effectiveness of the NCCC in addressing issues of climate change.

4.4.6 Environmental Investment Fund

The Ministry of Environment, Forestry and Tourism through the Environmental Investment Fund of Namibia act 13 of 2001established Environmental Investment Fund (EIF) as a funding scheme. The overall aim is that of supporting individuals, institutions and communities and ensure the sustainable use of natural resources as well as to provide monetary assistance in mitigating the effects climate change.

The Funds are sourced from international organisation including non-Governmental Organisations like UN, Deutsche Gesellschaft für Internationale Zusammenarbeit (GiZ) which have funds for climate change resilience. A respondent from the division of Solid Waste Management indicated that, the purpose of Environmental Investment Fund is to mobilize funding, and allocate funding to activities and projects, which promote the

sustainable use and efficient management of natural resources for the benefit of all Namibians and particularly one that promote climate change mitigations. The documents reviewed also indicated that the fund is designed to complement Namibia's overall development agenda, which is spearheaded by high-level sustainability goals cemented in the country's Vision 2030, the fifth National Development Plan 2017 – 2022 (NDP5) and the first Harambee Prosperity Plan (HPP).

About 96% of the respondents indicated that the EIF funded various climate change-related projects within the Windhoek City. One of the notable projects was the construction of 400 ablution facilities at Mix informal settlement. The Mix informal settlement is located 15 Kilometres from the Windhoek town. The settlement has not been having ablution facilities since its establishment in 1997. The settlement is prone to floods and as a result there has been an increase of cases of Hepatitis E. It was against this background that the City of Windhoek Engaged the EIF to get funds to provide ablution facilities to the residents of the Mix informal settlement.

The EIF availed an amount of three million Namibian dollars to the City of Windhoek to provide the ablution facilities. The project started in 2019 and was completed in November 2020. About 286 residents of Mix informal settlement have now access to the ablution facilities. The respondents Strategic Executive from the Department of Economic Development and Community Services indicated that the provision of basic services such as ablution facilities is one of their mandates to mitigate the effects of climate change. he was however quick to point out that the Environmental Investment Fund is faced with challenges of shortage of funds. This is mainly because climate change effects are increasing on a daily basis and the funds are not sufficient to cover all aspects of climate

change. The Strategic Executive from the Finance Department indicated that climate change investment fund plays a pivotal role in mitigating the effects of climate change. Availability of funds enables institutions such as the local authorities to effectively execute their climate change mitigations plans. The Environmental Investment Fund has a role to play in tackling key investment barriers, and is particularly well-suited for advancing investments in cutting-edge technologies and low-carbon and climate-resilient infrastructure.

4.4.7 Non-Governmental Organisations

All the respondents interviewed indicated that NGOs played an active role by partnering with City of Windhoek in various mitigation activities. It was reported that Hanns Seidel Foundation Namibia (HSF) was one of the Windhoek-based NGOs that worked with the City of Windhoek in climate change awareness campaigns. The respondents from the department of environmental management and health services pointed out that the Hanns Seidel Foundation (HSF) Namibia was busy with Environmental Awareness and Climate Change project that complemented the public awareness efforts of the City of Windhoek in empowering stakeholders to participate in climate change responses.

This three-year project, run from 2018 to 2020 is in support of the guiding principles of the National Climate Change Policy (NCCP) particularly in terms of awareness generation, education, training and capacity building as key building-blocks for the national response to climate change. The respondents provided satisfactory responses to the first objective of this study that looked at the institutional arrangements put in place to mitigate the effects of climate change. However, the respondents were quick to point out

that these institutions were also faced with shortfalls such as financial constrains that sometimes limited their capacity to mitigate climate change effects.

4.4.8 Training, Research Institutions and media

Two respondents one from the Division of Environmental Management and Health Services and another one from the Division of Disaster management indicated that, Climate change policies are coordinated through a number of institutions in Namibia such as the University of Namibia, Namibia University of Science and Technology and the Institute for Public Policy Research (IPPR) which are the leading institutions on research while the Environmental Investment Fund (EIF) sponsors students who will do environment studies in climate change among others.

Documents reviewed indicated that the National Policy on Climate Change for Namibia 2011 also recognizes the role of training institutions in providing training at different levels including pre-primary, as the kids are given early education including effects of litre and how it affects climate. The schools are also encouraged to teach agriculture as compulsory subject at primary level and then decide to drop it at secondary if they need. This notion is supported by the Protection Motivation theory which state that the basic assumption was that behavioural change of the people is important for practicing climate change mitigation strategies. Therefore, responding to climate change threats involves two conditions. The general people must perceive that climate change is occurring and threatening their wellbeing. This is followed by adopting certain practices, considered feasible to their context, in order to avert the threat believed to be induced by the change in climatic vagary (Asrat & Simane, 2018).

The documents reviewed also indicated that, research institutions played an important role in generating relevant climate change scientific information that could be accessible to the public and decision makers. The policy envisions that tertiary and research institutions shall undertake research to quantify likely impacts of climate change and develop practical solutions for mitigation of climate change. City of Windhoek's employees in the department of Environmental Management and Health Services interviewed indicated that Researches on climate change need to be properly coordinated to meet the needs of decision makers in Namibia.

They further alluded that careful attention needs to be focused on projects that will assist with mitigation of effects to climate change and address specific areas of vulnerability. Further development and demonstration projects are required to show the advantages and acceptability of a variety of technologies related to climate change. the Environmental Health Practitioners interviewed recommended that, Research results obtained in Namibia should therefore form basis of the development and implementation of strategies and action plans for mitigation of the effects of the climate change.

Furthermore, they explained that, research institutions such as the National Commission on Research Science and Technology, the Centre of Research and Publications at the University of Namibia and the Namibia Science and Technology (NUST) had collaboration with the City of Windhoek in areas of identifying national research priorities of climate change across sectors, providing funds for research to undertake needs-based research in priority areas of climate change, strengthen and encourage relevant research and technological development in institutions of higher learning, research on indigenous knowledge mitigation strategies, coordinate, manage and encourage research and

information sharing; capacity building for knowledge production on climate change. Respondents indicated that, the research institutions are doing good job, but lacked funding for experimentations and further studies.

More than 65% of the respondents indicated that medias are important stakeholders that plays a crucial role in the mitigation of climate change effects when it comes to informing and educating the public regarding issues of climate change. They have an active role in obtaining accurate information about the causes and impacts of climate change in Namibia and interventions to address climate change.

The Strategic Executive from the Department of Housing, Property Management and Human Settlements singled out that the media was at the forefront to facilitate public awareness. It also formed the interface to translate scientific information on climate change and disseminate it to various stakeholders in a manner that was easy to understand. This included information which empower local communities to undertake appropriate action or interventions.

Two Councillors interviewed shared similar sentiments that Namibia press freedom had enabled media houses to cover climate change topics without fear of intimidations. They also explained that, Namibia is one of a free press country in Africa ranked 23/ 180 countries in the 2019 and 2020 World Press Freedom Index with a score of 18.95. Therefore, through Media, a strong influence on policy-makers (government) about climate change and how to address it could be very successful and useful. The Councillors further pointed out the specific role that the media played in the information dissemination in 2009 when the city was faced with heavy floods that resulted in Hepatitis E that affected

more than 4000 people in the city. The media houses such as The Namibia Newspapers were actively involved in disseminating information on what the city was doing to mitigate the effects of climate change so as to send a message of hope to the residents of Windhoek.

4.4.9 Cooperation with International Organisations

Further to the understanding of institutional arrangements put in place by the City of Windhoek in mitigating the effects of climate change, the researcher enquired from the respondents if the City of Windhoek had any agreements with international organisations dealing with climate change and how those agreements affected the City of Windhoek in mitigation of climate change. It was found that City the of Windhoek had signed a Memorandum of Understanding with two international Cities to collaborate on mitigation of the effects of climate change. One was the City of Bremen of Germany, and the second was with the Durban/Ethekwini Municipality of South Africa.

Documents of Council resolutions obtained from City of Windhoek indicated that Windhoek enjoys a project-based relationship with the City of Durban and the City of Bremen. Over the past three years the three cities had been sharing valuable experiences on projects of mutual interest. The latest of these exchanges was the Decentralized Water and Sanitation System (DEWATS) on which Windhoek dispatched a team of Council's committee on basic services supported by a team of technical services to Durban to benchmark on the Ethekwini Municipality's DEWATS plant in March 2019. The exchange came at a time when Windhoek was preparing for the implementation of its own

Decentralized Water and Sanitation System (DEWATS) project in the Mix informal settlement.

One respondent from the Environmental Management and Health Services indicated that the sister cities of Windhoek and the Free Hanseatic City of Bremen, German enjoys fraternal relationship under a cooperation agreement signed in 2000 the Namibia-German Friendship. The two cities have over the years been jointly planning and implementing projects of the City of Windhoek focusing mainly on environmental management. In 2017 the two cities joined the Municipal climate partnership with the aim to mitigate the effects climate change. The respondent further indicated that through the established relationship with the Cities of Ethekwini and Bremen, the City of Windhoek had received 15000.00 Euros from the City of Bremen to assist to strengthen its climate change mitigation activities.

A report obtained from the City of Windhoek website indicated that in 2017 the City of Windhoek partnered with the City of Bremen in German to form what is known as Windhoek-Bremen Partnership Action. The main aim of the partnership was to help each other on issues of climate change. This was done through the exchange of experts as well as projects' funding. Through this agreement, the City of Windhoek acquired funds to build a water treatment plant in mixed informal settlements. The cost of the plant was four million Namibian Dollars (N$ 4 000 000.00).

4.5 CLIMATE CHANGE MITIGATION ACTIVITIES UNDERTAKEN IN THE CITY OF WINDHOEK

The second objective of this study was to analyse the specific mitigation activities of climate change implemented by the City of Windhoek. This section of the Chapter presents the results obtained from the respondents and documents relating to the climate change mitigation activities.

4.5.1 Water Infrastructure Development

Through documentary review it was found that, Windhoek has a long history of using innovation to adapt to harsh environmental conditions. Fifty years ago, Windhoek became the world's first city to produce drinking water directly from treated municipal wastewater, and the city has recently begun "banking" this recycled water in underground aquifers to reduce evaporation losses. The Strategic Executive from the Department of Infrastructure, Water and Technical Services indicated that the most probable long-term effects of climate change on water supply are increased temperatures with accompanying higher evaporation rates from surface reservoirs and more frequent droughts with an estimated decline of 20% of the average rainfall in the Central Area of Namibia. He further indicated that it was for the above reason that, the Municipality opted to increase the aquifer's storage and recovery capacity to its maximum potential. He also explained that, the City of Windhoek had introduced what is known as 'Windhoek managed aquifer recharge project'. The project was involved in drilling of additional boreholes to increase the abstraction capacity.

One of the Strategic Executives indicated that the project has enabled more boreholes to be constructed at the eastern side of Windhoek about 20 km before the Hosea Kutako International Airport. The City of Windhoek is mainly relying on these boreholes. However, the one of the Environmental Health officers pointed out that the project needed to be expanded by constructing more boreholes to catch up the growing population. He further added that there is a need for upgrading of the existing pipelines because they are aging, resulting into wastage of thousands of cubic metres of waters every year

One of the participants had this to say:

> *The population of the City is increasing exponentially; and in the near future, the amount of water produced now by the existing boreholes will fall far short of the needs of the entire population. We therefore need to find ways of drilling more boreholes so as to keep up with the growing population.*

One Environmental Health Officer remarked that the City of Windhoek had embarked on water recycling. The water reclamation project was planned to help in saving water and make it sufficiently available during the years of low rainfall. He further indicated that currently, 30% of running water in Windhoek was reclaimed water. In addressing the challenge of insufficient water infrastructure, it was reported that the City of Windhoek had received a loan from the African Development Bank to upgrade the water reclamation infrastructure so that the reclaimed running water is above 50% in four years' time. However, it was found that the project was facing formidable challenges which include inadequate funds to purchase advanced technologies and upgrade the existing infrastructures, as well as getting experts to run the project.

4.5.2 Roads Improvement

The respondent from the Department of Road and Transport indicated that, climate change effects have resulted in destruction of roads. He indicated that in 2017 most of the roads especially in informal settlements such as Havana and Goreangab dam were washed away. It was reported that the traditional way of road construction was one of the reasons for continued poor roads in the city.

> "*The change in climatic conditions in the past few years has taught us a lot; and one of the lessons we have learnt is that we need to look at other ways of constructing our roads. We have been experiencing floods in the city, such as that of 2017/2018 which washed away many roads in Windhoek…"* echoed one of the respondents from the Department of Roads and Transport.

Two Councillors interviewed collectively agreed that, there was a need to establish strong water runways in the city to enable water run smoothly to the water storages without damaging the infrastructure. It is for this reason that the City of Windhoek had given priority to the construction of bridges in the town suburbs such as that on the New Hosea Kutako International airport road.

An Environmental Health Assistance alluded that most of the roads in the City of Windhoek were constructed more than 30 years ago. During that time, issues of climate change were not really given much attention. He also indicated that the City of Windhoek's sustainable road plan of 2016 included the construction of climate resilient roads with climate change effects being taken into consideration during road constructions. One of the respondents from the department of urban planning said:

"We are planning to construct roads that are ecologically responsive using materials that align to challenges posed by global warming. At the same time roads in the Windhoek City need to withstand increasingly extreme weather patterns as direct results of climate change".

4.5.3 Housing improvement project

Documents reviewed indicated that, the City of Windhoek had signed an agreement with the Central Government to provide to make housing available on a subsidized price. Our interview with one of the respondents from the Department of housing revealed that efforts were already on the ground to assist the poor to build good houses:

> *"We want to make sure that quality housing is provided to all in the city, with special focus on those living in the informal settlements. We have already finalized our agreement with various banks for loans to low-income earners as well as those who do not have regular incomes. The City of Windhoek with the help of the government, can subsidize them. This move is meant to help our residents to own proper houses which are climate change resilient".*

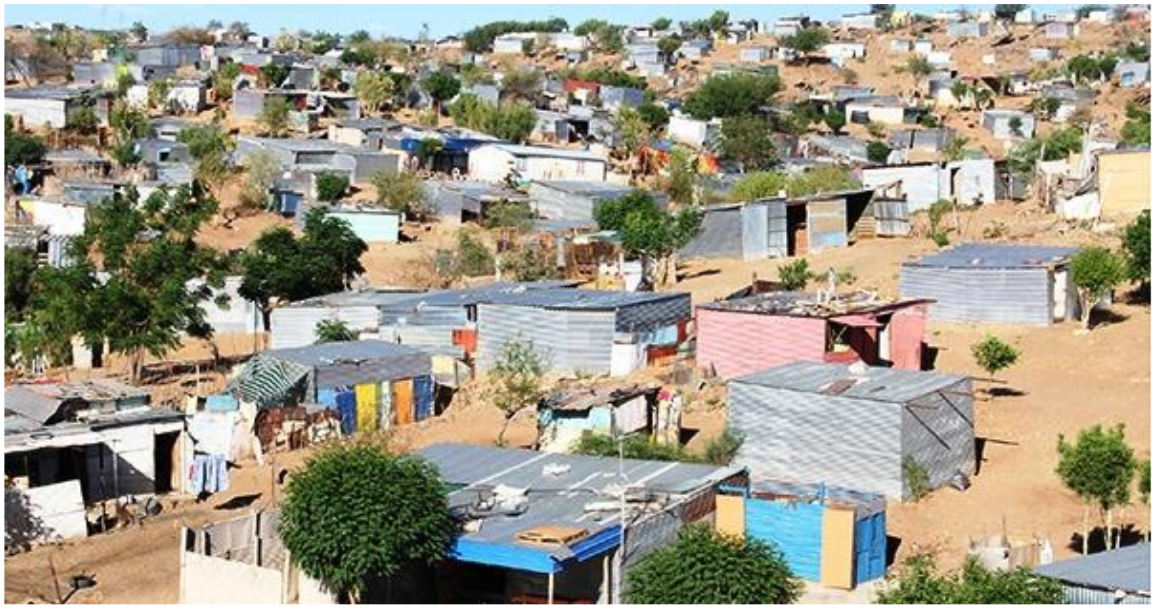

Figure 4.4: Shacks in Havana Informal settlement

Source: The Namibian Newspaper

4.5.4 Environmental Impact Assessment and Environmental Audits

All respondents from the Division of Environmental Management and Health Services collectively agreed that there is a bi-annual evaluation exercise which was meant to assess progress made in dealing with the effects caused by climate change. They pointed out to the fact that Environmental Impact Assessment (EIA) was being conducted in order to make sure that all the activities within the City complied with the environmental regulations. It is for this reason that the City of Windhoek enforced conduction of EIAs for all listed activities undertaken in its area of jurisdiction.

All Environmental Health Officers interviewed pointed out various activities and projects that took place and were subjected to the EIA. This included the construction of the road to the Hosea Kutako International Airport on the MR49 Mandume Ndemufayo Avenue

that commenced in 2016 and is anticipated to be completed in 2021. Another project was the construction of the SWAPO Head Office Along the Independence Avenue close to the B1 Complex. The Environmental Health Officers also pointed out that there were some projects that were not complying with the EIA and were stopped until they met all the requirements. One of it being the construction of 55 houses in Khomasdal ext. 16 by Ongoshi Construction and Renovation Company.

The Strategic Executive for the Department of Economic Development and Community Services alluded that, in addition to the need to comply with the Environmental Management Act, EIAs were also used to understand and address the environmental consequences of particular projects and activities. The City of Windhoek was also reviewing all EIAs conducted for various development projects in Windhoek before submitting them to the Ministry of Environment and Tourism for the issuance of Environmental Clearance Certificates. The review of EIAs ensured that the impact of development on the environment was minimized.

Documents reviewed indicated that to ensure that the mitigation strategies were maintained and that, there was a control over the effects of climate change, the City of Windhoek had also initiated environmental audits for all major industries. This is a systematic, documented, periodic and objective evaluation of how well the environmental management system of these industries is performing.

The respondents from the Division of Environmental Management and Health Services indicated that the EIAs and the environmental audits were important tools in measuring their progress in mitigating the effects of climate change. With the EIAs, the City of

Windhoek was in a better position to judge its efforts. It was reported that the City of Windhoek achieved 65% during the period 2016-2018. However, some respondents were sceptical on these EIAs and the environmental audits arguing that their results were likely to be manipulated.

4.5.5 Disaster resilience Scorecard

Documents reviewed indicated that, City of Windhoek was in the process of establishing a Disaster Resilience Scorecard which would measure the City's ability to understand possible disaster risks, to mitigate those risks and to respond to emergencies or disasters related to long-term loss of life or damage to livelihoods, property, infrastructure, economic activity and the environment. The scorecards would further track the ability of the City to withstand and recover from acute shocks (e.g., natural and man-made floods, earthquakes, wild-fires, chemical spills, power outages) as well as chronic stresses occurring over longer periods such as groundwater depletion, deforestation or socio-economic issues such a homelessness and unemployment.

The disaster risk scorecard was estimated to be completed by the end of June 2021 and would be launched in September 2021. The scorecard would then go for approval by line organisation*s such as the Ministry of Environment and the Ministry of Agriculture, Land Reform and Resettlement before it is implemented*. Participant from the Disaster Risk Management Division explained.

The respondents from the Environmental Management and Health Services Division indicated that the implementation of the Disaster Resilience Score Card would be a game changer in the Windhoek City especially when it comes to climate change mitigation. The

implementation of this project would assist them to assess the effectiveness of the City in mitigating the effects of climate change, and give them a clear indication of what needs to be done and what needs to be improved.

However, a criticism was echoed among Councillor respondents over efficacy of the Disaster Resilience Scorecard, and its related costs. They felt that despite the importance of a scorecard, Cities such as Windhoek were not in a position to fully utilize it and get the actual expected results. The project itself required a lot of financing beyond the ability of the City of Windhoek for it to be fully operational. They also were of the opinion that, such types of projects required high skilled experts of which Windhoek did not have.

4.6.6 Information sharing and community mobilisation

The Strategic Executive from the Department of Human Capital and Cooperate Services reported that community mobilization and information sharing activities were among the strategies put in place by City of Windhoek to mitigate the effects of climate change. This included awareness workshops for the community members where the City of Windhoek held various workshops with the youths and the community leaders to equip them with climate related information that they could also share with other peers and community members.

Respondents from the Department of Environmental Management and Health Services indicated that more efforts were being directed to youth by conducting youth workshops. Documents indicated that, The Local Authorities Act 23 of 1992 section 32, subsection 1 (w) makes provision for the establishment of the Junior Council. The City of Windhoek initiated the establishment of the Junior Council in 1999 to act as an advisory committee

to the City Council through the Management Committee. One of the Councillors interviewed indicated that the Junior Council contributes towards the development of the Windhoek through projects identified and approved by the Council. The respondent further added that the junior councillors had an influence in decision making at the management level, and by giving them information on climate change mitigations it would help them understand issues of climate change and be able to include them in their discussions at the management level.

The Strategic Executive from the Department of Urban and Transport Planning indicated that, the City of Windhoek celebrates the so called 'Arbor day', an international day that is always observed on the last Friday in April to commemorate pioneers of environmental conservation efforts. The City of Windhoek on this day go to various schools in Windhoek and surrounding areas to plant trees and educate students on the effects of climate change and their mitigation strategies. One of the respondents from the Division of Environmental Management and Health Services alluded that the Arbor Day awareness campaign plays a significant role as it seeks to educate the young generation on the effects of climate change.

The respondents further added, the City of Windhoek had agreements with various local radio stations and television such as the Namibian Broadcasting Cooperation, One Africa Televisions and Eagle FM radio station; whereby they are given time slots to educate the general public on the issues of climate change as well as allowing listeners to participate and give their opinions, views and contributions on climate change effects.

The Environmental Health Officers continue adding that also said that, information sharing and mobilization activities played an important role in mitigating the effects of

climate change. However, they recommended more efforts be directed to training various stakeholders because when people are aware of the effects of climate change it becomes easier to establish climate change mitigation activities. That's exactly what the Environmental Management and Health Services Division has been doing as claimed by one of the participants:

"*We are trying to educate our communities on the effects of climate change. We have embarked on information mobilization campaign whereby we share information with dwellers in informal settlements in the town. We have also conducted several workshops with the informal settlement community leaders to educate them on the effects of climate change and mitigation measures. The community leaders play an important role in climate mitigation as they can disseminate such information faster to the wider community. Our last awareness and education campaign was on 15 October 2020. The workshop was specifically organised for the City of Windhoek Junior Councillors. The aim was to educate them on various issues of climate change so that they can also educate their peers about the effects of climate change"*

Figure 4.5: Climate Change Awareness Workshop for Windhoek Junior Councillors (April, 2019)

Source: http://www.windhoekcc.org.na

4.6 IMPLEMENTATION CAPACITY

The third objective of this study sought to examine the implementation capacity of the City of Windhoek in mitigating the effects of climate change. This section therefore looks at the results obtained from the respondents and the documents analysed in line with this objective.

4.6.1 Human resources capacity

On the question whether the Division that deals with issues on climate change had enough staff, the Strategic Executive from the Department of Human Capital and Cooperate

Services indicated that there was a shortage of staff. He further explained that, that there were four open vacancies in the Division of Environmental Management and Health Services. This on its own already indicated that more human capacity was needed than the current one. The Strategic Executive for Economic Development and Community Services agreed and also pointed out that due to budget cut for 2019/2020 financial year, the Division was unable to advertise the vacancies. Other divisions had also shortages of staff. The table below summarises the required number of employees per division that deals with climate change relative to the current number of employees in post.

Department/Division	**Number of required staff**	**Number of available staff**
Environmental Management and health Services	10	7
Emergency Management	15	6
Disaster management	16	12
Solid waste management	27	22

Table 4.2: Required employees per division for climate change mitigation issues

As shown in table 4.2, City of Windhoek have about 31% shortage of staff that deals with issues of climate change. It was also obtained from the respondents from the Division of Environmental Management and Health Services that City of Windhoek had not only shortage of staff to deal with climate change; but some of the available staff in the Division were not specifically committed to deal with climate change mitigation *per se*, but had

other responsibilities. One of the interviewed respondents from the Environmental Management and Health Services Division had this to say:

> *"One of the challenges that we are facing in mitigating the effects of climate change in this institution is lack of staff. We are only seven who are directly working with issues of climate change. We hope the Council will see the need to employ more staff in the Environmental Management and Health Sciences Division for efficient work."*

There was however, a mixed opinion from the respondents on whether the available staffs were adequate or not. Some respondents were of the opinion that the current number of employees that deals with climate change was sufficient. This was raised by the Strategic Executive for Human Capital and Corporate Services, who argued:

> *"Climate change issues are diverse in nature and their mitigation activities cannot be carried out by the Department of Environmental Management and Health Sciences alone; but rather by the whole institution. This is so because mitigation activities fall under different departments of the City Council. The seven employees in the Environmental Health Department who deal with climate change are enough because they always get support from other departments in of the City."*

In addition to level of staffing in the relevant departments, respondents were asked of their skills in terms of educational qualifications, and experiences in dealing with the effects of climate change. The Strategic Executive for the Department of Human Capital and

Cooperate Services indicated that the recruitment of staff strictly observed the recruitment criteria that are specified for each job category. Consequently, the City of Windhoek had fully qualified environmental health practitioners and engineers for management of climate change maters, with all respondents having a degree or a master's degree as previously illustrated table 4.2.

It was reported by a strategic executive respondent who was responsible for Human Capital and Corporate Services that the City of Windhoek provided regular training to all its employees and those who worked on matters of climate change. From a local standpoint, the Transformational Leadership Training on Climate Change is one of the important workshops that employees had attended on a regular basis. The workshop was established in 2006 and takes place from 18 - 19 April annually in Windhoek. He further explained that training is organized for City Councillors and technical staff to equip them with knowledge that will allow them to move away from the 'business as usual' of decision-making by mainstreaming climate change planning and practices. Such trainings doubtlessly, have kept the employees abreast with new changes and provided them with innovative ways of tackling the effects of climate change in the city.

One Councillor reported that the City of Windhoek had twinning agreements with cities and other local authorities in South Africa, Botswana, Germany, Zambia, Malaysia and Zimbabwe. Through such agreements, City of Windhoek could send employees to those cities to gain first-hand experience and knowledge on climate change mitigation best practices.

4.6.2 Climate Change funding and resource mobilization

Documents reviewed revealed that the City of Windhoek is categorized as class "A" Municipality, which means, the City can generate its own funds and, therefore, was not entitled to the funds from the Ministry of Urban and Rural Development for development projects and activities like other local authorities. The Ministry supports projects that are considered as priority only; such as servicing of land. Documents also indicated that the City allocates each department with funds for operations on each financial year, given in accordance with budgets, needs and availability of funds**.** Table 4.3 summarizes the allocation of funds to the Department of Economic Development and community Services for financial years 2016/17 – 2019/20.

FINANCIAL YEAR	**BUDGET REQUIREMENT**	**BUDGET ALLOCATION**
2016/2017	N$ 61 258 516.00	N$ 45 668 883.00
2017/2018	N$ 60 468 572.00	N$ 45 562 241.00
2018/2019	N$ 59 827 817.00	N$ 51 895 854.00
2019/2020	N$ 59 258 231.00	N$ 44 658 661.00

Table 4.3: Budget Requirements versus Allocation (2016/17 – 2019/20)

Table 4.3 shows the variation in the budget allocation of the Department of Economic Development and Community Services against the budget. It shows that for the past four

financial years, the Department has been experiencing budget cuts, with negative impact on the project implementation.

Based on the views of the respondents from the Environmental Management and Health Services it was established that, although issues related to climate change were addressed by almost all the departments of the City; the Department of Economic Development and Community Services plays a leading role. Since the budget allocated to the Department was always insufficient, and most of the departmental funds were being given to other economic and community development projects for youth and business development; the climate change issues remained with no funds.

One of the environmental health officers made the following remarks:

> *"Activities of climate change are somehow underrated in this department. What people do not know is that climate change mitigation activities need more funds than skilled people, to effectively run the projects. For example, due to budget cut last year, we could not fully run our annual workshops and educational campaigns as we usually do"*

He further added that, the biggest challenge faced by the Environmental Management and Health Sciences Division was that no specific budget allocated for climate change activities. The Division had to work with the budget that was allocated to the entire department.

All respondents from the Division of Environmental Management and Health Services agreed that, due to shortage of funds, the Environmental Management and Health Sciences

Division decided to initiate external funding mechanism to ensure that they received sufficient funds to execute their climate change related duties. In 2019, the City of Windhoek through the Department Economic Development and Community Services approached the Environmental Investment Fund (EIF) for assistance to establish a water banking project. The Environmental Health Officers further reported that the application was in the final stages of approval, with the Department being directed to make final corrections and revert it back for final approval. The Strategic Executive for the Department of Finance also added that, other institutions were similarly approached by the City of Windhoek such as the Bank of Windhoek and the Development Bank of Namibia (DBN). The City of Windhoek successfully received a total of four billion Namibian dollars (N$ 4 000 000 000) from the year 2000-2019 to finance climate change projects. The City of Windhoek remains, however, the major source of finance for its climate change related issues as shown in Figure 4.6.

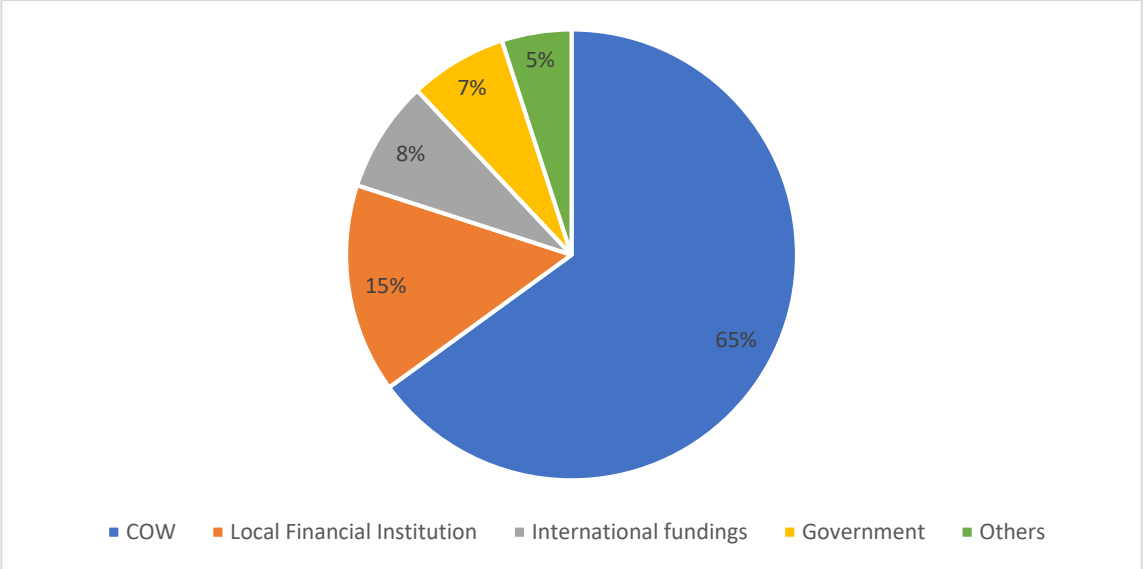

Figure 4.6: Sources of funds for Windhoek climate related issues

Source: http://www.windhoekcc.org.na

Figure 4.6 indicates that the Department of Environmental Health was getting its biggest amount of funds (65%) for climate change mitigation activities from the City of Windhoek. The financial institutions such as the Bank Windhoek and the Development Bank of Namibia (DBN) were the second largest source of funding (15%); while NGOs, local businesses, companies and individuals contributed the least (5%). The pattern of sources of funds for City of Windhoek has an implication on the implementation of climate change activities. As indicated on figure 4.6, City of Windhoek relies heavily on revenues in terms of climate change funding.

4.8 SUMMARY

This chapter has presented the results from the assessment on whether the City of Windhoek has the capacity to mitigate the effects of climate change or not. The chapter's objective was to source information from the respondents and documents from City of Windhoek's website. This was done in an effort to address the three objectives of this study which were: to assess the institutional arrangements put in place by the City of Windhoek to mitigate effects of climate; to analyse the specific mitigation activities of climate change implemented by the City of Windhoek and, to examine the implementation capacity of the City of Windhoek in mitigating the effects of climate.

The findings indicate that the City of Windhoek is doing relatively well in mitigating the effects of climate change. This can be evidenced by the institutional arrangements put in place such as the coordination with other local and international organisation. City of Windhoek's mitigations activities are also applaudable; the results indicated that City of Windhoek has various mitigation activities in place.

However, it was also noted that the institution is still faced with various challenges such as insufficient fund for mitigation activities. results on the implementations capacity also indicated that the institution have various implementations activities put in place such as that they ensure that the employees working with climate change are well equipped in terms of training etc. However, it was also found out that City of Windhoek is still faced with challenges such as the shortage of staffs and in a way hinders the effective implementation of climate change activities.

CHAPTER FIVE: DISCUSSIONS

5.1 INTRODUCTION

This chapter discusses the findings presented in chapter four in line with the research objectives and literature reviewed in Chapter 2 of the study.

5.2 INSTITUTIONAL ARRANGEMENTS FOR CLIMATE CHANGE

5.2.1 City of Windhoek

Results that were gathered confirmed that city of Windhoek is doing its mandate in trying to mitigate effects of climate change. As much more was done, there remain a number of limitations like lack of funds to implement projects, lack of knowledge and expertise with proper climate change knowledge. City of Windhoek as a local authority is mandated with implementation and building of infrastructure across Windhoek. Infrastructure that is used in mitigation strategies fits in the budget of the city. It was noted from the findings that the municipality has started to implement climate change strategies in approval of infrastructure development. City of Windhoek has accelerated housing, roads, drainage construction as part of infrastructure that addresses climate change.

In addressing housing needs in informal settlement like Havana the Municipality was in a way mitigation the effect of climate change as most of the residents were affected by floods. Across the city there were also taxi ranks and bus stop sheds that were constructed to avoid direct sunlight. The city also claimed that there was approval of solar systems. Approval of solar systems for domestic use was done to complement electricity and promote clean energy. These efforts are milestone towards mitigation of climate change. The City of Windhoek was one of first Cities in Namibia to establish the Environmental

Management and Health Services Division and was then adopted by all cities/towns in Namibia.

This department deals with environmental issues and issue certificate to companies' years and manage the emission of gases, littering of waste and several environmental issues. This plan, as in other cities has proven to work effectively in ways to mitigate climate change effects. Effectively implementing and enforcing ways that promote mitigation strategies is the best way city of Windhoek is participating in mitigation strategies. The City of Windhoek is part of Future Resilience for Africa Cities and Lands (FRACTAL) an association of several cities and universities which promote information, sharing and dealing with climate change and mitigation strategies through workshop and research. This information is deemed necessary as stakeholders share strategies and ideas on dealing with climate mitigation.

It is however important to note that the City of Windhoek is faced is various pressing challenges that made it very difficult to effectively mitigate the effects of climate change. The researcher observed that the City of Windhoek's internal structures and decision making also contributes to the ineffective mitigation of climate change. This can be seen through their allocation of budget.

It was established that the City of Windhoek does not have a defined budget for the climate change mitigation activities but rather use the budget for the Economic Development Department and budgets from other departments. This makes it very difficult for the climate change implementers at the City of Windhoek to effectively execute their duties. Having a subdivision that deals specifically with matters of climate change is a

commendable thing but a subdivision without sufficient financial support will not help anything. It is therefore important for the City of Windhoek to re-evaluate their budget allocation and also allocate some fund to the subdivision that deals with climate change issues.

5.2.2 The Cabinet of the Republic of Namibia

City of Windhoek`s climate change mitigation strategies hinges on the support they receive from the cabinet. The major role of the cabinet of Namibia is to approve strategies and regulations which govern mitigation levels as well as implication. Namibia cabinet doesn't have a clearly defined role of climate change in the cabinet. It was found that institutions responsible for climate change operated on tight budgets. This was due to limited amounts being approved by the cabinet. According to Lewis, (2013) strategies are slowly being advanced due to the bureaucratic nature of the reporting structure and time it takes for the government to approve them. This has its roots in the lack of sufficient budget allocation.

In the time of budget debates there is virtually less debates on climate change even from grassroots which then leaves the Cabinet with few or no issues to debate. Local authorities as implementing agents are not also properly organized to pass information to Cabinet. The biggest gap is that there is no clear reporting structure to Cabinet. No one really know who to collect information to and who to report to. At the present moment there is discourse between several local authorities and several ministries. This discourse has resulted in non-implementation of strategies or non-development of them leaving the country trailing behind in climate change mitigation.

Climate change mitigation is a commitment that span through a longer period of time however, over the last ten years there has been a major change of cabinet misters who then changed their strategies and this is true of Ministry of Environment. This has not only affected climate change but most of the projects in Namibia. Additionally, The Ministry of Environment has actually been more focused on Tourism than climate change. Lack of priorities to climate change has also inherently filter through the cabinet thinking who priorities other economic activities as climate is not so much a political issue but a social issue. Presumably the understanding of climate change in the cabinet isn't there at all hence as much as Cabinet approves strategies and funding, this are rarely coming through.

According to Nakhooda & Amin, (2015) the Climate change mitigation and air quality management issues are mostly addressed separately by the Cabinet of South African legal acts and policies. This is to ensure that climate change issues are given full attention and deliberated solidly. The discussions of climate change in South Africa also take into consideration the funding of climate change and the decisions taken thereof are then incorporated in the budget allocation discussion.

This does not only help issues of climate change to be discussed but also assist the cabinet members to have a full understanding of climate change and therefore make informed decisions on issues of climate change. South Africa is the second country in Africa with proper Climate change mitigation strategies after Rwanda (Nakhooda & Amin 2015). The above discussion therefore highlights that it is important for the Cabinet to priorities issues of climate change and therefore the Cabinet of Namibia should do the same.

5.2.3 Ministry of Environment, Forestry and Tourism

According to Midgley *et al.* (2004) the Ministry of Environment forestry and Tourism MEFT is also the climate change coordinating Ministry through the Climate Change Unit (CCU) established within the MEFT. The CCU is supported directly by a formalised multi-sectoral National Climate Change Committee (NCCC) for sector-specific and cross-sector implementation and coordination advice and guidance. Ministry of Environment, Forestry and Tourism coordinates with local authorities which are municipalities, town councils, village councils, regional councils and traditional authorities for implementation of policies and strategies. This coordination is very important and as information is shared among the stakeholders the ministry plans and delegates the implementation to regional and local levels.

This also contributes to the strategic achievements of climate change mitigation as it is almost impossible for the ministry to be at grassroots levels. This coordination works very well and has been implemented in other countries like UK (Jessye 2019). Having a centralized coordination point assures that efforts are uniform and systematic. This has made the efforts of ministry so easy and its commendable. However, on the other hand the decentralization strategy hasn't been very effective due lack of proper effort but a very important link to climate change mitigation which involve the residence and general populace through stakeholder engagements from local authorities.

5.2.4 Environmental Investment Fund

Another key institution identified by the respondent that plays a significant role in mitigating the effects of climate change is the Environmental Investment fund. The EIF

provides funds for climate change mitigation to various institutions including the City of Windhoek. From the information obtained from the respondent, the EIF is an important institution in mitigating the effects climate change in Windhoek. It was however, gathered from the interviews that initially the fund wanted to fund wide variety of projects in environment sector through awarding of funds but the funds quickly depleted hence the project stopped funding bigger projects. Continuous source of funding from government coffers become impossible and the funds started relying more on donor funding.

Analysis of several projects that were funded by the EIF, such as the establishment of the ablution facilities in the Mix informal settlement proved that every donor has few strings attached and some of the requirements were beyond the fund reach hence the sole biggest funder of EIF was United Nations (UN). The lack of adequate access to capital, particularly and the presence of both real and perceived risks (sovereign risks, technology risks, financing risks and first-mover risks) are holding back the mitigation of climate change especially when EIF is the one to be looked upon. Sustained access to concessional sources of finance to overcome these barriers will be critical to support countries in meeting their goals.

5.2.5 Non-Governmental Organisations

Non-Governmental Organisations play an important role in the mitigation of climate change. The respondents indicated that there was inadequate government support for climate change, but greater financial and humanitarian support by NGOs. They were of the views that Namibia had limited NGOs which could work freely in the country for climate change.

While some of the barriers were beginning to be lifted across the board there were still many areas which required further reform and support in order to assist NGOs in namibia to conduct their work. These areas include: the need for a legal framework to recognize NGOs and enable them to access more diverse funding sources; high-level support/endorsement from local figureheads; and engaging NGOs in policy development and implementation. Climate change mitigation requires a coodinated effort of a number of stakeholders who can collaborate freely. NGOs operates under the umbrella of Namibian NGO Forum Trust (NANGOF). hence have to abid by strict laws when registered and in operations. This has its own merit in that it maintains order in the country and gather against terror threaths, however the regulations setup may also discourance potential NGOs to operate in the Country.

5.2.6 Training, Research Institutions and Media

The City of Windhoek through FRACTAL together with The University of Namibia (UNAM) Namibia University of Science and Technology (NUST) and other NGOs coordinate research in climate change issues. It was observed that, there is a strong relationship between the City of Windhoek and the training, research and the media. Workshops that are held together have promoted information sharing that has then filtered through to the media.

In their workshops, findings are shared and research data is advanced, which is then publicised and criticised and used with in the implementation of mitigation strategies. The roles that these entities are playing have an impact in mitigation the effects of climate change. This is supported by the Protection Motivation theory that indicates that

information sharing leads to behavioural change of the people which is important for practicing climate change mitigation strategies. Therefore, responding to climate change threats involves two conditions.

The general people must perceive that climate change is occurring and threatening their wellbeing. This is followed by adopting certain practices, considered feasible to their context, in order to avert the threat believed to be induced by the change in climatic vagary (Asrat & Simane, 2018). Similar findings indicated that the relationship between the training, research institutions and climate change is highly complex (Nelson, 2011). Universities are not only sites for creation of knowledge, but also institutions of teaching and learning, of formation of professionals, of services provided to communities and government, and are micro-societies and economies in their own right. These varied functions and roles have diverse and sometimes contradictory interactions with climate change and with its immediate and root causes. Given the multi-faceted nature of anthropogenic global warming, all of these functions will need to be engaged if the university is going to contribute substantially to addressing it (Nelson, 2011).

A practical example of the training institutions that are actively working closely with local authorities is the South African Institute of Traning and Technology (SITT). South Africa is the largest contributor to greenhouse gas (GHG) emissions in Africa and the 11th largest emitter globally, the SITT find it necessary to spearheard climate change research related in collaboration with the institutions of high learning (Knox, *et al.*, 2012). In all these, the medis place a very sisgnificant role in publicising this information.

5.2.7 Coordination with International Organisations

The respondent also alluded on the international cooperation especially non-Governmental organisation like the United Nation Development Programme (UNDP) is necessary to significantly mitigate climate change because of the global nature of the problem. Respondents mentioned various international organisation that contribute to mitigation the effect of climate change. From the information provided by responded, one can conclude that City of Windhoek has good relationship with international organisation such as the City of Bremen of Germany as they assisted them in experts and knowledge sharing. Good coordination with international institutions is supported by IPCC (2001) which alluded that Cooperating with international institutions has the potential to address several challenges such as the emissions sources that are unevenly distributed; heterogeneous climate impacts that are uncertain and distant in space and time; and mitigation costs that vary.

According Knox, *et al.,* (2012) the Dawid Kruiper Municipality in South Africa has a long-time standing cooperation with the Sydney Municipality of Australia in addressing the issues of climate change and this has brought tremendous success story between the two local Authorities. The two Municipalities exchange experts of climate change as well as hosting various familiarization visits between the two Municipalities so as to learn the best practices from one another.

The two Municipalities also assist each other with seeking funds and in some instances funding. The Sydney Municipality availed about six million Rands to the David Kruiper Municipality towards climate change related issues. This shows how the David Kruiper

Municipality has managed to collaborate with other institutions in mitigating the effects of climate change and the same can work for the City of Windhoek.

Having collaborations with local and international institutions plays an important role in helping local authorities mitigating the effects of climate change. Local authorities such as the Botswana City Council have successfully completed various climate change mitigation projects by collaborating with other institutions like another Ministry of Environment. Botswana City Council worked together with Botswana Climate change Network a Non-Governmental Organisation (NGO) in Botswana dedicated to protecting Botswana's unique biodiversity and assist in mitigating the effects of climate change. This unit in Namibia is coordinated by Ministry of Environment then collaborated with City of Windhoek and is expected to produce same positive results. This collaboration helps to overcome the communication barriers in trans-disciplinary engagement through the building of transparency and trust by enabling focused conversation and deliberation across the science-policy-practitioner spectrum on climate sensitivities and impacts facing the city.

5.3 MITIGATION ACTIVITIES

5.3.1 Introduction

The second objective of this study was to analyse the specific mitigation activities of climate change implemented by the City of Windhoek. Exploring the implementation of relevant activities was considered important in assessing the Role of the City of Windhoek in mitigating the effects of climate change. By climate change mitigation activities, it

referred to any actions or efforts taken to reduce or prevent the long-term risks of climate change on human life and property by reducing the sources (Calvin 2008).

The various mitigation activities which were analysed included amongst others: water infrastructure construction and management, roads construction, and housing project. Respondents were asked to clearly identify the mitigation activities and give their opinions on whether these activities were effective and sufficient to mitigate the effect of climate change. The implication of each mitigation activity was discussed under this section.

5.3.2 Water Infrastructure Development

Water infrastructures development and management system is on the most emphasized mitigation activities by most of the respondents. It was found that City of Windhoek has various ways of making water available to the residents especially given the fact that Namibia is one of the driest countries in the Sub-Saharan Africa. The water recycling plant and the drilling of boreholes as additional water sources to the available dams is a commendable thing.

However, it was also found that most of these projects could be even better should the City had enough funds to pump into their water infrastructures and management plans. Most of these projects were done on a tight budget hence their outcome was not 100% as expected. It was also observed that City of Windhoek does not have proper water restriction to ensure that residents do not waste water. Water restriction allows local Authorities to control and limit the water wastage by the residents. Literature reviewed indicated that water usage restriction as a water saving method can help local authorities to mitigate the effects of climate change.

According to Taing (2015) water usage restrictions methods allow the local authorities to pose limitations on water usage to the residents. Residents are informed on the amount of water they are permitted to use and if they exceed that amount, they therefore have to pay double or triple the normal rates. According to Zurich, 2020 Local Authorities in Canada use the same method to ensure they restrict the water usage and therefore save water.

As much as the drilling of boreholes is a good initiative, it is also very costly at the same time. It was found that due to low rainfall for the past three years the underground water have gone even deeper making it very expensive to drill boreholes. To cut cost City of Windhoek need to also expand their catchment areas so as to ensure that they bank as much water as possible which is less costly.

5.3.3 Roads Improvement

As indicated by the respondents, City of Windhoek have innovative ways of constructing their road infrastructures as way to mitigate the effects of climate change. Information obtained from the respondents indicated that the City of Windhoek is trying its best to in terms of road infrastructures; however, lack of finances continues to hinder the efficacy of mitigating these effects. Roads are some of the expensive infrastructures and therefore need a lot of capital.

Road transport plays an important role in the overall socio-economic development of a country. Other Cities World-wide are also battling with the effects of climate change in terms of roads development. According to Chipo *et al.* (2017) in Bhutan, roads are the main transport infrastructure enabling trade, public services delivery, governance, tourism, and so on. The local authority aims to provide road connectivity to all the 205

town primarily to reduce poverty and promote rural development. However, road infrastructure, especially in the geologically fragile mountain terrain of Bhutan, is extremely environmentally challenging and highly vulnerable to the impacts of climate change such as flash floods and landslides caused by heavy rains in addition, rapid growth in vehicle numbers and movement make road infrastructure vulnerable.

The road networks of developing countries are generally more vulnerable to climate change impacts due to poor condition, a high proportion of unpaved roads and limited resources and technology to adapt. The City of Windhoek is faced with various challenges in trying to construct climate resilience roads. The institution is faced with a shortage of funds to run road projects. City of Windhoek is also not prioritizing roads infrastructures but mainly focusing on other development such as servicing of land which therefore makes it very difficult for it to effectively implement mitigation activities. The lack of funds has an implication in the establishment of climate resilient roads. Availability of funds plays an important role in the implementation of any project. It was noted that in recent years, City of Windhoek was diverting the budget from infrastructural development to the servicing of land etc and mostly wait to get money from road fund administration to construct and upgrade roads.

The government has been cutting the budget of local authorities and this also affected City of Windhoek. To address this, the City of Windhoek need to re-evaluate their budget allocation and ensure that road infrastructures are prioritized. City of Windhoek should also ensure that the fund they get from international organisations such as the United Nations is shared equally and part of it be used to construct roads in the City. According to Roberts (2008) the Municipalities such as Mangaung (Bloemfontein) use interlock and

blocks to construct roads. The interlocks and block are cheaper and stronger at the same time. This types of roads are said to be more climate resillience since they can not easly washed away as compared to the tired roads. City of Windhoek can therefore use the same strategies taking into consideration that interlocks roads are also cheaper that tired roads in Namibia

5.3.4 Housing improvement Projects

It was very clear from the respondents' narratives that one of the biggest challenges faced by City of Windhoek in mitigating the effects of climate change in the lack of proper housing, this mean that most people in the informal settlement live in houses that a prone to harsh weather and floods. This can be evidenced by the fact that about 40% residents of Windhoek live in the informal settlement whereby they are exposed to harsh weather and floods. However, it was also indicated that the City of Windhoek has partnered with the government and financial institutions so as to provide decent low-cost houses for the Windhoek informal settlement residents. Studies such as that of Adger, (2009) indicated that the right to adequate housing should be integrated into strategies for the mitigation of climate change, as well as in planning, preparing and implementing strategies for addressing climate change displacement in local authorities.

Local authorities must work with their government and affected communities to develop and promote environmentally sound housing construction and maintenance to address the effects of climate change while ensuring the right to housing. It is important to note that housing projects are expensive exercises to do and it is therefore fair to question whether housing improvement project will help in mitigating the effects of climate change. To

address this, City of Windhoek should find means of providing cheap quality houses for the residents. Countries such as the Sweden are known to build fabricated houses for their low-income earners and those who cannot afford to purchase houses.

According to Monis (2015) the general rule of thumb is that prefab construction is cheaper than Bricks-built homes by an average of 10 to 25 percent. The cost of labour is also less because you don't have to send carpenters, plumbers, and electricians to individual construction sites. And a faster build time saves money too. City of Windhoek should also maximally utilize it MOUs to source funds to construct houses for the informal settlement settlers as a way of mitigating the effects of climate change.

It is a well-known fact that various housing programme in Namibia has failed to provide housing for informal settlement people. Housing projects such as the Shack Dwellers federation and the Mass housing projects that were administered through local authorities failed dismally. As indicated by the respondents, the City of Windhoek is partnering with financial institutions in an effort to provide housing for the informal settlers. What this means is that the project will only benefit those who have income to repay back the loans they are given to buy the houses.

However, most of the informal settlement residents do not have any means of income and therefore will not be able to afford these houses. This therefore means that the housing improvements project as a climate change mitigation project may be very difficult to implement. To address this, City of Windhoek should have negotiations with the financial institutions and housing enterprises to re-evaluate their regulations on qualification of beneficiaries as well as ensuring that these projects benefit people of all categories.

5.3.5 Environmental Impact Assessment, Environmental Audits and the Disaster scorecards

Scrutiny of information obtained from the respondents and documents revealed indicated that, City of Windhoek's Environmental Impact Assessment is commendable and City is doing well so far in ensuring that all activities happening withing the Windhoek city are subjected to the EIA. It was also noted that City of Windhoek has set up strong compliance guidelines to EIA as a way to mitigate the effects of climate change. City of Windhoek is also ensuring that all projects that are not complying with the EIA will not be permitted to operate until such a time that they are in full compliance and are issued compliance certificates. However, it was observed that City of Windhoek and the Department of Environmental health in particular that deals with issues of EIA have a shortage of staffs and this makes it very difficult to effectively execute their duties.

It was noted that the City of Windhoek only have 3 Environmental Health Officers who are assigned to assess projects. This therefore makes it very difficult to timely attend to issues of EIA. To address this, the City of Windhoek need to liaise with the Ministry of Environment, Forestry and Tourism so that they can get assistance in terms of human capacity.

The environmental impact assessment, environmental Audits and the disaster score cards plays an important role in mitigating the effects of climate change since they are able to determine the severity and vulnerability of the City in mitigating the effects of climate change, this is supported by the protection motivation theory that indicates that the two important elements of mitigation of climate change effects are: Assessment of the

perceived severity of the threat and the perceived probability of receiving adverse impacts from the threat (vulnerability).

According to Constable & Cartwright (2009) the Kampala Capital City Authority of Uganda has a separate division that deals with the issues of EIA. The division recieves fund from the City's budget and well as from the government. This division is well funded and therefore is able to run its activities propery. Constable & Cartwright (2009) further indicated that Kampala was awarded the best City in 2011 by the International Assossiation for Impact Assessement for having sufficient enforcement mechanism in palce and ensuraring that all the environmental activities within their jurisdictions are subjected to the EIA. It is therfore recomendable that City of Windhoek need to have a separate division that also allocated funds that are specifically for Environmental Impact Assesment activities. This division should also liase with the government especialy with the Ministry of Environment, forestry and Tourism and ensure that it also benefit from the MEFT budget.

5.4 THE IMPLEMENTATION CAPACITY

The third objective of this study sought to examine the implementation capacity of the City of Windhoek in mitigating the effects of climate change. It was considered imperative to examine the implementation capacity of the City of Windhoek in order to clearly establish the areas of strengths and weaknesses in mitigating the effects of climate change. In order to get this information, the researcher asked all the groups of respondents to give their opinions on climate change implementation capacity in the context of human

resources availability against their educational and professional qualifications; availability of funds and the needed equipment/tools.

5.4.1 Human resources capacity

As indicated by the results, City of Windhoek has a lack of sufficient employees than required to mitigate the effects of climate change. The number of employees has an impact on the implementation of any project. The lack of sufficient employees leads to amongst other things slow pace of implementations of climate change projects, leads to some project not to be implemented at all while others are ineffectively implemented due to non-availability of staff.

It was noted that there is a direct link between human capacity and mitigation of climate change. Local authorities that have sufficient human capital have evidently managed to mitigate the effects of climate change. The local Government of Nunavut in Canada is one of the institutions that manage to mitigate the effects of climate change through having sufficient human capacity. According to Critchley (2015) Nunavut has put in place measures to ensure that an organisation has a sufficient number of qualified people in the right place at the right time to achieve its objectives in ensuring the implementation of climate change mitigation activities. The institution recognized that the lack of capacity has a direct impact on an organisation's ability to deliver programs and services and perform certain tasks.

Nunavut also provides regular training for its employees especially those that work directly with issues of climate change to ensure that their staffs are well equipped with the necessary skills needed to implement climate change mitigation activities. Nunavut was

awarded the Champion of the year in 2019 in mitigating climate change effects (Critchley *et al.,* 2015). From the foregoing discussion, it is apparent that the City of Windhoek has implemented concerted measures to improve the capacity of human resources in mitigating the effects of climate change. It has done relatively well in ensuring that it has employees that are directly working with the issues of climate change as well as ensuring that the staff are well equipped with necessary skills to effectively execute their duties.

However, some challenges raised by the respondents including staff shortages and inadequate in-depth training cannot be underestimated. Although climate change is a multi-disciplinary field and the mitigation thereof of the impacts require a robust staff complement, the seven (7) staff members working directly on climate change under environmental management and health services signify a severe shortage of manpower that can sabotage effective mitigation of climate change effects.

Lack of sufficient employees dealing with issues of climate change at City of Windhoek has negative implications on the implementation of climate change projects. Which include amongst others not able to fully implement all the needed projects because the few staffs available are also tasked to deal with other non-climate change issues such as issuing of fitness certificates. The inability to implement climate change projects will therefore affect the City of Windhoek's efficacy to mitigating the effects of climate change.

5.5 SUMMARY

This chapter focused on discussing the results from the respondents and documents analysed in line with the three objectives of this study. The chapter also compared the

results with other studies on similar topics as covered in the literature review earlier. From the discussions above, it was clear that the City of Windhoek has various measures to mitigate the effects of climate change.

The efforts of City of Windhoek are also commendable. However, the institution lacks sufficient human capacity and finances to effectively mitigate the effects of climate change in the City. It is also important to note that, it seems as the main purpose of implementing the above stated projects is not really to mitigate the effects of climate change but rather to provide basic services to the residents of Windhoek such as providing proper roads and housing etc. This therefore has an implication on the role of City of Windhoek in mitigating the effects of climate change since the issues of climate change will always be treated as secondary and will not be prioritised.

Mobilisation of funds from other institutions and organisations plays a crucial role in mitigating the effects of climate change. As indicated above, it is clear that the City of Windhoek does not have the financial capacity to finance all climate change mitigation activities. This is especially true for large developmental projects such as the construction of dams, bridges and roads that require large financial injections. The budget allocated to the Department of Economic Development and Community Services (LEDCS) has an implication on the mitigation of climate change.

As indicated, the LEDCS budget have been decreasing over the years, however, issues of climate change are on an increase over the years, this therefore mean that City of Windhoek is faced with more challenges in mitigating the effects of climate change and the question remain that will City of Windhoek be able to mitigate the effects of climate

change with their budget status. The budget allocation therefore has an implication on the implementation because as mentioned earlier, City of Windhoek is already faced with shortage of funds which has resulted in diverting of funds from climate related programs to the ones that are seen to be important such as the servicing of land. On the other hand, the sourcing of fund from government, financial institutions and others has a positive impact on the implementation of climate change projects.

CHAPTER SIX

CONCLUSIONS AND RECOMMENDATIONS

6.1 INTRODUCTION

In this chapter, conclusions are drawn and recommendations made based on the research, discussions and literature review in the previous chapters. Recommendations are made on the areas of concern that were identified by the research. It also presents the areas for further research, and the contributions of the study to the body of knowledge.

This study aimed to assess the Role of Local Authorities in mitigating the effects of climate change, using the City of Windhoek as a case study. In order to get the information needed, the study focused on three specific objectives which were:

(a) To assess the institutional arrangements put in place by the City of Windhoek to mitigate effects of climate change
(b) To analyse the specific mitigation activities of climate change implemented by the City of Windhoek
(c) To examine the implementation capacity of the City of Windhoek in mitigating the effects of climate change

The respondents were those directly working on issues of climate change on a daily basis.

6.2 CONCLUSIONS

(a) The first objective of this study looked at institutional arrangements put in place by the City of Windhoek to mitigate the effects of climate change. institutions such

as the Cabinet of Namibia, the Ministry of Environment, Forestry and Tourism, the Namibian National Climate Change Committee (NNCCC) NGOs and the Training Research and media institutions were presented and discussed. The above institutions play an important role as partners of the City of Windhoek in mitigating the effects of climate change. Issues such as lack of coordination between the City of Windhoek and government institutions, lack of political will and no prioritisation of measures to mitigate the effects of climate change are some but a few challenges contributing to the inefficacy of the City of Windhoek in mitigating the effects of climate change

(b) Various mitigation activities were put in place by the City of Windhoek to mitigate the effects of climate change. These include: Water Infrastructure Development, Roads, Housing, the Environmental Impact Assessment and disaster score card and information sharing and mobilisation. The above listed mitigation activities assisted the city of Windhoek in mitigating the effects of climate change. However, it was also noted that there is a shortfall in all the mitigation activities. Issues such as the insufficient and diverting of funds, budget allocation are some of the challenges faced by City of Windhoek in effectively mitigating the effects of climate change.

(c) In addressing the third objective on examining the implementation capacity of the City of Windhoek, human resources capacity in terms of number of staff and their qualifications and experience was discussed. It was observed that all the departments working with issues of climate change fall short of more than three employees and that made it difficult for the City to effectively implement climate change mitigation activities. However, it was also noted that employees were

provided with regular trainings; and also had agreements with other international local authorities to visit and learn the best practices on climate change mitigation.

(d) Funding plays a crucial role in the implementation of all climate change mitigation activities, it was noted the City of Windhoek was in category 'A' municipalities and thus, ineligible for funds from the Central Government. There were also variations in budget allocation to the Department of Economic Development and Community Services by the City. This was coupled with non-specified budget allocation for the 'low priority' climate change activities within the Department. All these made it difficult to smoothly implement the climate change mitigation activities. However, the City of Windhoek has engaged various financial institutions which have provided additional funds for climate change related projects. Although the City has good plans to mitigate the effects of climate change, most of the plans could not be implemented due to shortage of funds.

6.3 RECOMMENDATIONS

(a) Although there are many relevant institutions that collaborate with the City of Windhoek in mitigating the effects of climate change, the coordination between them and within the City of Windhoek is somehow weak. It is recommended that the coordination between the City of Windhoek and these institutions be strengthened to ensure issues of climate change are given due priority and attention. There is a need for a direct link between the City of Windhoek employees dealing with climate change, MEFT and the policy makers. Perhaps a committee should be established that will have members from City of Windhoek, MEFT and some

cabinet members so as to ensure that a mutual understanding on how to tackle issues of climate change is achieved.

(b) The City of Windhoek needs to have separate divisions within the Economic Development Department and Community Services that strictly deal with issues of climate change. The Division should be able to get a separate budget from that of the entire department. The division should also have its own staff who are only dedicated to deal with issues of climate change.

(c) In addition to the infrastructural Development in place, the City should also consider upgrading its existing catchment areas such as Dams so that they would be able to catch and store more water. Restrictions should also be imposed on water usage and penalties should be introduced for those misusing water. The city should also focus on upgrading of existing pipelines to avoid wastage of thousands of cubic waters every year. Alternatively, dual systems in which separate pipe networks can be constructed for potable and non-potable water have the potential to improve water safety and reduce cost of drinking water distribution infrastructure, ultimately achieving maximum resource recovery from wastewater.

(d) It was reported during the interviews that most of the roads which were constructed before independence were being reconstructed to become climate resilient. It is recommended that the City of Windhoek includes provision for sufficient water runways during their construction. This can be done through building enough storm water drainage systems to allow water to run freely without damaging the infrastructures particularly in informal settlements.

(e) Providing affordable housing to residents is one of the important projects that City of Windhoek is also looking into to mitigate the effects of climate change such as

flood and heat. Since most of the housing projects have failed to yield fruitful results, it is therefore recommendable that City of Windhoek should look into other method of constructing quality affordable houses such as constructing prefabricated houses that are more affordable.

This study has come up with a shocking finding that the City of Windhoek does not have a specific budget for climate change mitigation activities. This has made it very difficult for the custodians of climate change at the city to make independent decisions and allocate resources when it comes to climate change mitigation activities. It is therefore, recommended that the City of Windhoek should establish a separate budget, specifically for climate change activities.

(f) It was found that the City of Windhoek does not have sufficient employees dealing with climate change. It is therefore recommended that City of Windhoek needs to look for funds to set up a division that employs people to work directly with issues of climate change.

(g) The researcher experienced a challenge in getting hold of the respondents during data collection, the politicians in particular were not willing to participate. It is therefore recommended that the University of Namibia should have agreements with public and private institutions relating to data collection so as to ease the burden on students of rejections and inability to obtain information from these institutions. The ethical clearance and permission letters alone are not enough.

(h) It was observed that there is not much research done on the efficacy of Local Authorities in mitigating the effects of climate change in Namibia. There is gap in knowledge. It is therefore recommendable that more research of this nature be done

to provide sufficient and quality information to both Local Authorities and also add to the body of knowledge.

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APPENDICES

APPENDIX 1: ETHICAL CREARANCE CERTIFICATE

UNAM
UNIVERSITY OF NAMIBIA

ETHICAL CLEARANCE CERTIFICATE

Ethical Clearance Reference Number: HREC-NH/15/10/2020 **Date:** 27-10-2020

This Ethical Clearance Certificate is issued by the University of Namibia Research Ethics Committee (UREC) in accordance with the University of Namibia's Research Ethics Policy and Guidelines. Ethical approval is given in respect of undertakings contained in the Research Project outlined below. This Certificate is issued on the recommendations of the ethical evaluation done by the Faculty/Centre/Campus Research & Publications Committee sitting with the Postgraduate Studies Committee.

Title of Project: ASSESSING THE EFFICACY OF LOCAL AUTHORITIES IN MITIGATING THE EFFECTS OF CLIMATE CHANGE: A CASE OF CITY OF WINDHOEK

Nature/Level of Project: M.A. (NON-HEALTH) (NQF9)

Researcher: AINA AMUNKETE

Student Number: 218231030

Faculty: HUMANITIES AND SOCIAL SCIENCES

Supervisor(s): PROF. T. MDENDEMI & PROF. I. MAPAURE

Take note of the following:

(a) Any significant changes in the conditions or undertakings outlined in the approved Proposal must be communicated to the UREC. An application to make amendments may be necessary.
(b) Any breaches of ethical undertakings or practices that have an impact on ethical conduct of the research must be reported to the UREC.
(c) The Principal Researcher must report issues of ethical compliance to the UREC (through the Chairperson of the Faculty/Centre/Campus Research & Publications Committee) at the end of the Project or as may be requested by UREC.
(d) The UREC retains the right to:
(i) Withdraw or amend this Ethical Clearance if any unethical practices (as outlined in the Research Ethics Policy) have been detected or suspected,
(ii) Request for an ethical compliance report at any point during the course of the research.

REC wishes you the best in your research.

Prof. H.L. Beyer, Deputy Chair: HREC-NH
pp Chair: HREC-NH

APPENDIX 2. UNAM PGSC RESEARCH PERMISSION LETTER

CENTRE FOR POSTGRADUATE STUDIES

University of Namibia, Private Bag 13301, Windhoek, Namibia
340 Mandume Ndemufayo Avenue, Pioneers Park
☎ +264 61 206 3275/4662; Fax +264 61 206 3290; URL.: http//www.unam.edu.na

UNAM
UNIVERSITY OF NAMIBIA

28 October 2020

RESEARCH PERMISSION LETTER

Student Name: **Aina Amunkete**
Student number: **218231030**
Programme: **Master of Arts in Development Studies**

Approved research title: Assessing the efficacy of local authorities in mitigating the effects of climate change: A case of the City of Windhoek

TO WHOM IT MAY CONCERN

I hereby confirm that the above mentioned student is registered at the University of Namibia for the programme indicated. The proposed study met all the requirements as stipulated in the University guidelines and has been approved by the relevant committees.

Permission is hereby granted to carry out the research as described in the approved proposal.

Best Regards,

DR. SETH J. EISEB
ACTING DIRECTOR
CENTRE FOR POSTGRADUATE STUDIES
Tel: +264 61 2063414
E-mail: seiseb@unam.na

APPENDIX 3 RESEARCH INSTRUMENTS

Interview Guide for Councillors

Introduction

My name is Aina Amunkete, student number 218231030, I am doing a Master of Arts Degree in Development Studies at the University of Namibia. My research topic is: **Assessing the Role of Local Authorities in Mitigating the Effects of Climate Change: A case of City of Windhoek**. Thank you for agreeing to participate in this research. Please take note that this interview is voluntary and you have the right to decline or withdraw anytime if you feel like. There are no wrong or right answers, what is required is your opinion on each question you are asked. If you do not understand some or part of the questions please do not hesitate to ask for clarification. We will have a one-hour interview which will be a face-to-face discussion. With your permission, the recorder will be used for this interview to capture in-depth responses which will then be used to decode data.

1. How long have you been a Councillors at City of Windhoek?

2. What is your understanding of climate change and climate change mitigation strategies?

3. Generally, how would you describe the standing of the City of Windhoek in mitigating the effects of climate change?

Institutional arrangements

4. In your opinion do you think the City of Windhoek is doing enough to mitigate the effects of climate change?

5. What political support is given to City of Windhoek to help mitigate the effects of climate change?

6. Is the government giving enough budgetary support to city of Windhoek towards climate change mitigation?

7. What are some of the strategic alliance, institutional arrangements that City of Windhoek has with government institution or any other private player for climate change?

8. From a political point of view, can you tell me the strength, weakness or opportunities that city of Windhoek can exploit for climate change?

Mitigation activities

9. What are the duties of the councillors in mitigating the effects of climate change?

10. As a follow up on the above, what is currently happening concerning climate change mitigation?

11. In your opinion what should City of Windhoek do to ensure effective implementation of climate mitigation activities?

Implementation capacity

12. To your own knowledge, does City of Windhoek have any climate change experts, if yes how many?

13. Does City of Windhoek have enough budget for climate change? In your opinion is the actual spending reflective of the budget and where do you see areas of improvement?

14. In your opinion would you say City of Windhoek have done enough in mitigating the effects of climate change, if your answer in no what do you suggest should be done?

15. As a Councillor, do you think you have all needed skills and knowledge to oversee the staff involved in mitigation activities? If not, which areas would you like to be capacitated?

Please take note that this guide only represents the main themes to be discussed with the City of Windhoek Councillors and does not include the various prompts that may also be used (examples given for each question). Non-leading and general prompts will also be used, such as "Can you please tell me a little bit more about that?" and "What does that look like for you".

Interview guides for environmental health practitioners

Introduction

My name is Aina Amunkete, student number 218231030, I am doing Masters of Arts in Development Study at the University of Namibia. My research topic is: **Assessing the Role of Local Authorities in Mitigating the Effects of Climate Change: A case of City of Windhoek**. Thank you for agreeing to participate in this research. Please take note that this interview is voluntary and you have the right to decline or withdraw anytime if you feel like. There are no wrong or right answers, what is required is your opinion on the questions you are asked. If you do not understand some or part of the questions please do not hesitate to ask for clarification. We will have a one-hour interview which will be a face-to-face discussion. With your permission, the recorder will be used for this interview to capture in-depth responses which will then be used to decode data.

1. How long have you been working for the department of environmental health?

2. Are you aware of climate change and climate change mitigation strategies of the City of Windhoek?

3. Generally, how would you describe the standing of city of Windhoek in mitigating the effects of climate change?

Institutional Arrangements

4.What are some of the institutional arrangements put in place by the City of Windhoek to mitigate the effects of Climate Change in Windhoek City?

5. In your opinion, do you think the City has done enough in mitigating the effects climate change?

6. Do you think the division that deals with climate change is well staffed and funded to execute its duties in mitigating the effects of climate change?

7. Beside the existing arrangements that City of Windhoek has put in place, what else do you think the City can do to improve its mitigation strategies?

8. Do you think the Department of health is having enough qualified and experienced staffs that are needed to deal with climate change in Windhoek?

Mitigation activities

9. What are some of the mitigation activities that are put in place by the City of Windhoek to mitigate the effects climate change?

10. What else do you think the City of Windhoek should do to address the effects of climate change?

11. What challenges does the City of Windhoek have in terms of climate change mitigation activities?

12. What mitigation strategies you suggest for effective mitigation of effects of climate change?

13. How has the budget allocated to mitigation activities for the past five years affected City of Windhoek in meeting the requirements?

Implementation Capacity

14.Does the department of environmental health have the sufficient required machineries, equipment's and vehicle needed to effectively implement climate change mitigation strategies? Explain.

15. What infrastructures and facilities does the City of Windhoek put in place to mitigate the effects of climate change?

16. In your opinion, does the City of Windhoek have sufficient infrastructures and facilities to mitigate the effects of climate change?

17. How does City of Windhoek measure the effectiveness of climate change mitigation strategies?

18. Do you think you still lack some skills and knowledge to enable you discharges your duties better? Explain.

19. Does City of Windhoek have any Environmental plans, policies or strategies for climate change mitigation?

Please take note that this guide only represents the main themes to be discussed with environmental health practitioners and does not include the various prompts that may also be used (examples given for each question). Non-leading and general prompts will also be used, such as "Can you please tell me a little bit more about that?" and "What does that look like for you".

Interview Guide for the Strategic Executives of City of Windhoek

Introduction

My name is Aina Amunkete, student number 218231030. I am doing Masters of Arts in Development Study at the University of Namibia. My research topic is: **Assessing the Role of Local Authorities in Mitigating the Effects of Climate Change: A case of City of Windhoek**. Thank you for agreeing to participate in this research. Please take note that this interview is voluntary and you have the right to decline or withdraw anytime if you feel like. There are no wrong or right answers, what is required is your opinion on the questions you are asked. If you do not understand some or part of the questions please do not hesitate to ask for clarification. We will have a one-hour interview which will be a face-to-face discussion. With your permission, the recorder will be used for this interview to capture in-depth responses which will then be used to decode data.

Opening questions

1. How long have you been working for City of Windhoek?
2. What is your understanding of climate change and climate change mitigation strategies?
3. Generally, how would you describe the standing of City of Windhoek in mitigating the effects of climate change?

Institutional Arrangements

4. How does City of Windhoek's decision making affect the resources allocation towards the climate change mitigation measure?

5. How would you describe the expertise of City's employees who are directly involved in climate change mitigation?

6. Are there any special allocations of funds towards Climate change mitigation?

7. Do you think City of Windhoek is doing enough in mitigating the effects of climate change? If no, what else can be done to increase the climate change mitigation measures?

Mitigation Activities

8. Would you say the mitigation strategies that are put in place by City of Windhoek effective in mitigating the effects of climate change?

9. How much resources are actually needed for mitigation activities? How much are made available?

10. How does resources allocation affect the implementations of mitigation strategies of City of Windhoek?

11. How do Municipal competencies affect the implementations of mitigation strategies of City of Windhoek?

12. Besides the existing mitigation activities, do you think there is still a need for more to be established? If yes, how?

Implementation Capacity

13. What are some of the challenges faced by City of Windhoek with regards to the provision of sufficient infrastructures and facilities to mitigate the effects of Climate Change?

14. Does the City of Windhoek have enough human capacity to mitigate the effects of Climate change?

15. Does City of Windhoek have evaluation strategies put in place to assess its effectiveness in mitigating the effects of Climate Change?

16. As Strategic Executive, do you think you need more capacity building to do your work more effectively?

Please take note that this guide only represents the main themes to be discussed with strategic executives and does not include the various prompts that may also be used (examples given for each question). Non-leading and general prompts will also be used, such as "Can you please tell me a little bit more about that?" and "What does that look like for you".

APPENDIX 4: LANGUAGE EDITING CERTIFICATE

Dr.GM

The Rev. Dr. Greenfield Mwakipesile

ThD, MBA, HBS | mwakipg@outlook.com

CONTACT

PO Box 99539,
UNAM,
Namibia

LANGUAGE & COPY-EDITING CERTIFICATE

4th June 2022

RE: LANGUAGE, COPYEDITING AND PROOFREADING OF AINA AMUNKETE's THESIS FOR THE MASTER OF ARTS IN DEVELOPMENT STUDIES DEGREE OF THE UNIVERSITY OF NAMIBIA

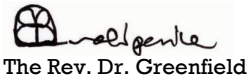
This certificate serves to confirm that I copyedited and proofread **AINA AMUNKETE's** Thesis for the **MASTER OF ARTS IN DEVELOPMENT STUDIES DEGREE** entitled: **ASSESSING THE ROLE OF LOCAL AUTHORITIES IN MITIGATING THE EFFECTS OF CLIMATE CHANGE: A CASE OF THE CITY OF WINDHOEK**

I declare that I professionally copyedited and proofread the thesis and removed mistakes and errors in spelling, grammar, and punctuation. In some cases, I improved sentence construction without changing the content provided by the student. I also removed some typographical errors from the thesis and formatted the thesis so that it complies with the University of Namibia's guidelines.

I am a trained language and copy editor and have edited many Postgraduate Diploma, Masters' Thesis, Dissertations and Doctoral Dissertations for students studying with universities in Namibia, Zimbabwe, Eswatini, South Africa and abroad. I have also copy-edited company documents for companies in the region and abroad.

Please feel free to contact me should the need arise.

Yours Sincerely,



The Rev. Dr. Greenfield Mwakipesile