2023

WINDHOEK INTEGRATED CLIMATE CHANGE STRATEGY AND ACTION PLAN 2023-2030

City of Windhoek

The Gateway to Endless Opportunities

TABLE OF CONTENTS

TABLE OF FIGURES

ACKNOWLEDGEMENTS

Strong leadership from the Municipal Council of Windhoek (Council) and the Executive Management Team is instrumental in the successful development of this Windhoek Integrated Climate Change Strategy and Action Plan (WICCSAP).

The WICCSAP was commissioned and developed by the Health and Environment Services Division under the Department of Economic Development and Community Services of Council. Invaluable support was given to the Council by various stakeholders. The Ministry of Environment and Tourism's Climate Change Unit is commended for its support and advice. The Council is especially grateful to the enormous financial and technical contributions made by the University of Namibia and the Future Resilience for African CiTies and Lands (FRACTAL) Project and its partners.

In addition, Council acknowledges various inputs received from stakeholders that made a contribution towards the development of this Strategy and Action Plan at the various workshops and one-on-one meetings organised for this purpose.

ACRONYMS AND ABBREVIATIONS

BURs	Biennial Update Reports
CCSC	Climate Change Steering Committee
CCU	Climate Change Unit
CEO	Chief Executive Officer
CMIP	Coupled Model Intercomparison Project
CO_2	Carbon dioxide
COP	Conference of the Parties
Council	Municipal Council of Windhoek
ECB	Electricity Control Board
EDCS	Department of Economic Development & Community Services
EIF	Environmental Investment Fund
EMP	Environmental Management Plan
FRACTAL	Future Resilience for African CiTies and Lands
GCM	General Circulation Model
GDP	Gross Domestic Product
GHG	Greenhouse Gases
HPMHS	Department of Housing, Property Management and Human Settlements
ICLEI	International Council for Local Environmental Initiatives
IPCC	Inter-governmental Panel on Climate Change
IPPs	Independent Power Producers
IWTS	Department of Infrastructure, Water and Technical Services
KRC	Khomas Regional Council
M&E	Monitoring and Evaluation
MET	Ministry of Environment and Tourism
MOU	Memorandum of Understanding
MME	Ministry of Mines and Energy
NamWater	Namibia Water Corporation
NCCC	National Climate Change Committee
NCs	National Communications
NDCs	Nationally Determined Contributions
NDC-ISAP	NDC Implementation Strategy and Action Plan
NDP5	Namibia's 5th National Development Plan
NEI	Namibia Energy Institute
NGOs	Non-Governmental Organizations
NMT	Non-Motorised Transport
NPCC	National Policy on Climate Change
NUST	Namibia University of Science and Technology
RCP	Representative Concentration Pathway

SBI	Subsidiary Body for Implementation
SBSTA	Subsidiary Body for Scientific and Technical Advice
SDGs	Sustainable Development Goals
SUTMP	Sustainable Urban Transportation Master Plan
UN	United Nations
UNAM	University of Namibia
UNFCCC	United Nations Framework Convention on Climate Change
WATSAN	Water and Sanitation Committee
WICCSAP	Windhoek Integrated Climate Change Strategy and Action Plan

GLOSSARY

The definitions below indicate the meaning of how the listed terms are used in this Strategy and Action Plan in order to facilitate understanding of their usage and application.

Adaptation: Adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects.

Adaptive Capacity: The general ability of institutions, systems, and individuals to adjust to potential damage, to take advantage of opportunities, or to cope with the consequences.

Anthropogenic: Made by people or resulting from human activities. Usually used in the context of emissions that is produced as a result of human activities.

Carbon dioxide (CO_2): The principal anthropogenic greenhouse gas that affects the Earth's radiative balance. It is the reference gas against which other greenhouse gases are measured.

Climate: The average weather conditions of a given place or the statistical description in terms of the mean and variability of relevant quantities over a period of time ranging from months to thousands or millions of years.

Climate Change: Refers to a change in global or regional climate patterns, in particular the change experienced from the mid to late 20^{th} century onwards and attributed largely to the increased levels of atmospheric carbon dioxide produced by the use of fossil fuels.

Climate proof development: Climate proof development refers to development that considers or takes into account the potential or predicted effects of climate change. For instance, development of new infrastructure such as roads, buildings, sewerage works, rail networks, water and energy systems must be designed and constructed with consideration of the future impacts of climate change.

Climate Variability: Climate variability refers to the commonly observed departures of every day weather and climate from the usual expectations that are often manifested as droughts, severe storms such as hailstorms, floods, etc. These events occur naturally, and recur year by year.

Contingency plan: A plan designed to address a possible future event or circumstance.

Deforestation: Practices or processes that result in the conversion of forested lands for non-forest uses. Deforestation contributes to increasing carbon dioxide concentrations for two reasons: 1) the burning or decomposition of the wood releases carbon dioxide; and 2) trees that remove carbon dioxide from the atmosphere through the process of photosynthesis are no longer present.

Disaster risk reduction: The systematic development and application of policies, strategies and practices to minimize vulnerabilities and disaster risks throughout a society, to avoid (prevention) or to limit (mitigation and preparedness) adverse impact of hazards.

Early warning: The provision of timely and effective information, through identified institutions, that allow individuals at risk of a disaster to take action to avoid or reduce their risk and prepare for effective response.

Ecosystem services: The benefits people obtain from ecosystems. These include provisioning services such as food and water; regulating services such as flood and disease control; cultural services such as spiritual, recreational, and cultural benefits; and supporting services such as nutrient cycling that maintain the conditions for life on Earth.

General Circulation Model (GCM): A global, three-dimensional computer model of the climate system which can be used to simulate human-induced climate change. GCMs are highly complex and they represent the effects of such factors as reflective and absorptive properties of atmospheric water vapour, greenhouse gas concentrations, clouds, annual and daily solar heating, ocean temperatures and ice boundaries.

Global warming: Global warming refers to the gradual increase, observed or projected, in global surface temperature, as one of the consequences of radiative forcing caused by anthropogenic emissions.

Greenhouse Effect: Trapping and build-up of heat in the atmosphere (troposphere) near the Earth's surface. Some of the heat flowing back toward space from the Earth's surface is absorbed by water vapour, carbon dioxide, ozone, and several other gases in the atmosphere and then reradiated back toward the Earth's surface.

Greenhouse Gas (GHG): Any gas that absorbs infrared radiation in the atmosphere. Greenhouse gases include carbon dioxide, methane, nitrous oxide, ozone, chlorofluorocarbons, hydro chlorofluorocarbons, hydro fluorocarbons, perfluorocarbons, sulphur hexafluoride.

Hazard: A potentially damaging physical event, phenomenon or human activity, which may cause the loss of life or injury, property damage, social and economic disruption or environmental degradation.

Implementation: The process of putting a decision or plan into effect; execution.

Mitigation: These are structural and non-structural measures undertaken to limit the adverse impact of natural hazards, environmental degradation and technological hazards as well as climate change in general.

Proliferation: Rapid increase in the number or amount of something.

Renewable Energy: Energy resources that are naturally replenishing such as biomass, hydro, geothermal, solar, wind, ocean thermal, wave action, and tidal action.

Resilience: A capability to anticipate, prepare for, respond to, and recover from significant multi-hazard threats with minimum damage to social well-being, the economy, and the environment.

Risk: A function of probability and consequences of an event, with several ways of combining these two factors being possible. There may be more than one event; consequences can range from positive to negative and risk can be measured qualitatively or quantitatively.

Risk Management: Systematic process of using administrative decisions, organizations, operational skills and capacities to implement policies, strategies and coping capacities of the society and communities to lessen the impacts of natural hazards and related environmental and technological disasters.

Sustainability: The ability to be maintained at a certain rate or level or avoidance of the depletion of natural resources in order to maintain an ecological balance.

Urbanization: The conversion of land from a natural state or managed natural state (such as agriculture) to cities; a process driven by net rural to-urban migration through which an increasing percentage of the population in any nation or region come to live in settlements that are defined as ‘urban centres’.

Vulnerability: A set of conditions and processes resulting from physical, social, economic and environmental factors, which increase the susceptibility of a community to the impact of hazards.

Water Reclamation: The restoration of wastewater to a state that will allow its beneficial reuse. Comprehensive water recycling.

Weather: Atmospheric condition at any given time or place. It is measured in terms of such things as wind, temperature, humidity, atmospheric pressure, cloudiness, and precipitation.

MAYORAL FOREWORD

I am delighted to present to the residents of our City, Windhoek's Integrated Climate Change Strategy and Action Plan (WICCSAP). As the Municipal Council of Windhoek we are aware that the impacts of climate change are already felt in Windhoek and have the potential to detrimentally affect our ability to deliver effective and efficient municipal services to our residents. We therefore took a commitment to take action in order to increase our city's adaptive capacity. The Council's strong commitment to climate change action and our relentless pursuit of environmental excellence triggered the development of this Strategy and Action Plan.

It is predicted that 70% of the earth's residents will live in cities by the year 2050. As the world becomes increasingly urbanized, cities are fast becoming the most important battlegrounds against the impacts of climate change.

Through our *Transformational Strategic Plan (2017-2022),* we have committed ourselves to become a "SMART and Caring City by 2022". For this dream to be realised we take cognisance of the fact that action on climate change needs to be at the heart of our plans and actions.

The specifics of climate change are still a very complex issue for many to comprehend. I therefore hope that with the implementation of this Strategy and Action Plan, we will develop strong communication, which is essential to get our residents and the business community on board and incite climate action.

The development of this Strategy and Action plan will provide an opportunity for the Council to coordinate decision-making and planning efforts in order to reduce vulnerabilities to climate change and build resilience. Furthermore, this Strategy and Action Plan will assist the Council in its effort to institutionalise and mainstream climate change action.

As a city in a developing country with limited resources, I also hope that this Strategy and Action Plan aligns with existing organisational priorities and build on Council's existing strengths.

I urge all Windhoek residents to contribute to our ongoing efforts to tackle climate and make our beautiful city livable and sustainable. With the support of the community, I believe that Windhoek can truly become a climate resilient city.

HIS WORSHIP CLLR. JOSEPH UAPINGENE
MAYOR CITY OF WINDHOEK

EXECUTIVE SUMMARY

The Council has mandated its Economic Development and Community Services Department (through its Health and Environment Services Division) to develop Windhoek's Integrated Climate Change Strategy and Action Plan (WICCSAP). The Strategy and Action Plan aims to provide a framework to coordinate the Council's climate change response actions for a period of seven years.

Windhoek is the Capital City of Namibia and a very arid city. Like many African cities, Windhoek is experiencing a high rate of urbanisation. This combined with the aridity and frequent droughts make the city most vulnerable to the effects of climate change.

In order to support the ongoing national effort to tackle climate change, this Strategy and Action Plan is developed in line with Namibia's NDC Implementation Strategy and Action Plan (NDC-ISAP) 2022-2030 and the associated National Policy on Climate Change (NPCC), which was promulgated in Namibia in 2011. The adaptation and mitigation focus areas contained in this document are adopted and adapted from the NDC-ISAP.

Climate change vulnerable sectors for Windhoek were identified and the various Council Departments and Divisions are to implement the Strategies and Action Plans through various projects and actions. The Adaptation measures listed in this document are addressing: (1) Water Security and Efficiency; (2) Biodiversity and Ecosystem Goods and Services; (3) Human Settlements; (4) Healthy Communities; (5) Disaster Preparedness and (6) Sustainable Urban Agriculture. While the Mitigation measures are addressing (1) Sustainable Energy and Low Carbon Development; (2) Waste Minimization and Management; and (3) Sustainable Transportation. The Cross-cutting issues measures are addressing: Public Awareness and Capacity Building.

1. INTRODUCTION

Windhoek like many cities in the developing world is already experiencing the impacts of climate change. This is further exacerbated by a high level of urbanisation and the proliferation of informal settlements. This has a direct impact on the Council's ability to provide efficient municipal services and to build resilience to climate change. Due to the nature of its operation the Council's response to climate change was ad hoc and uncoordinated before the development of this framework. The CoW also mainly relied on Namibia's NDC Implementation Strategy and Action Plan (NDC-ISAP) 2022-2030 which does not fully address city level specific climate change challenges in details.

At the international level, Namibia is a signatory to a number of UN conventions and agreements that are relevant to climate change. Such instruments include amongst others the three Rio Conventions which directly emanated from the 1992 Earth Summit (Convention on Biological Diversity, United Nations Convention to Combat Desertification and United Nations Framework Convention on Climate Change) and Sustainable Development Goals (SDGs). The Rio Conventions share a concern for many of the same environmental and sustainable development issues such as climate change, and operate within the same ecosystems. The SDGs that focuses on cities and climate change are: SDG 11 (to make cities inclusive, safe, resilient and sustainable) and SDG 13 (to take urgent action to combat climate change and its impacts). The Namibian government is expected to implements these conventions and agreements at all levels of government.

It is against this background that the Council mandated its Department of Economic Development and Community Services to develop Windhoek's Integrated Climate Change Strategy and Action Plan (WICCSAP) to facilitate its response to climate change. The development of this Strategy and Action Plan commenced in 2017 and interactive consultations took place over a period of one year with CoW stakeholders. This Strategy and Action Plan is largely based on the inputs gathered during the consultation workshops and meetings that leveraged expertise and local knowledge of City officials and politicians and other stakeholders. Other stakeholders included representatives from national government ministries, NGOs, youth based organisations, research institutions, academic institutions, and other civil/civic society organisations.

This Strategy and Action Plan will be used as the management and performance monitoring tool that will be used to assess the effectiveness of the Council's climate change response efforts. The Strategy and Action Plan is also developed in line

with and to support the National Policy on Climate Change (NPCC) and the NDC-ISAP.

This document is intended to be a living document and will be revised and updated at an interval of seven years and/or as climate change science evolves. As the first WICCSAP, the actions proposed here are confined to the focus areas that have been identified during the consultation process. These focus areas represent the burning environmental challenges faced by the City and they can also be easily mainstreamed into regular municipal functions as they are part of the Council's mandate.

2. OVERVIEW OF GLOBAL CLIMATE CHANGE ISSUES

Climate change is the most serious global challenge of our time. The impacts of climate change are already being felt globally and locally. The earth's climate has been stable for the 11 000 years or so. However, changes in the global climate have been observed in the last century, this has resulted in the increase of the global average temperature by more than 0.7 °C (IPCC, 2013). The beginning of the 21st century has been recorded as the warmest period in the history of global temperature records (Garrard *et al.*, 2017).

This rapid warming of the earth is attributed to human activities such as the burning of fossil fuels which releases Greenhouse Gases (GHGs) such as carbon dioxide (CO_2). Other GHGs are water vapor, methane (CH_4) and nitrous oxide (N_2O). These gases are released during the combustion of fossil fuels, such as coal, oil, and natural gas, to produce electricity. Global CO_2 equivalent concentrations have increased from 280 parts per million per volume (ppmv) in the pre-industrial era (1850s) to 430 ppmv CO_2 today. The GHGs contribute to the warming of the atmosphere by trapping heat (Lindsey, 2018).

The Intergovernmental Panel on Climate Change (IPCC) Report (2018) stated that human activities are estimated to have caused approximately 1.0°C of global warming above pre-industrial levels, with a likely range of 0.8°C to 1.2°C. Global warming is likely to reach 1.5°C between 2030 and 2052 if it continues to increase at the current rate. This means that climate-related risks to health, livelihoods, food security, water supply, human security, and economic growth are projected to increase with global warming of 1.5°C and increase further with 2°C (IPCC, 2018).

Climate change affects weather patterns and increases the frequency and severity of extreme events such as droughts, heat waves, floods, cyclones and fires. Namibia is especially vulnerable to the impacts of climate change due to its aridity and developmental stage amongst other factors.

To address the global impacts of climate change, the United Nations adopted the United Nations Framework Convention on Climate Change (UNFCCC) in 1992 and has established a Secretariat located in Bonn, Germany to support global response to the threat of climate change. The parties to the convention meet annually to assess progress in dealing with climate change. Namibia ratified the UNFCCC in 1995 and as such has developed a national policy framework to mitigate and adapt to the effects of climate change on the environment.

The objective of UNFCCC is the “stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system.” UNFCCC has 26 Articles and established the following:

A. The Intergovernmental Panel on Climate Change (IPCC) was created to provide policymakers with regular scientific assessments on climate change, its implications and potential future risks, as well as to put forward adaptation and mitigation options.
B. Conference of the Parties (COP): The COP is the supreme decision-making body of the UNFCCC. All States that are Parties to the Convention are represented at the COP, at which they review the implementation of the Convention and any other legal instruments that the COP adopts and take decisions necessary to promote the effective implementation of the UNFCCC, including institutional and administrative arrangements.
C. Subsidiary Body for Scientific and Technical Advice (SBSTA) and the Subsidiary Body for Implementation (SBI). The SBSTA and SBI work together on cross-cutting issues that include the vulnerability of developing countries to climate change and response measures, discussions under the Technology Mechanism, the Adaptation Committee and the Warsaw International Mechanism for Loss and Damage associated with Climate Change Impacts.

The Kyoto Protocol is an international agreement linked to the UNFCCC, which commits its Parties by setting internationally binding emission reduction targets. Recognizing that developed countries are principally responsible for the current high levels of GHG emissions in the atmosphere as a result of more than 150 years of industrial activity, the Protocol places a heavier burden on developed nations under the principle of "common but differentiated responsibilities." The Adaptation Fund was established to finance adaptation projects and programmes in developing countries that are Parties to the Kyoto Protocol.

The Paris Agreement was established at COP 21 in Paris, on 12 December 2015. The Paris Agreement’s aim is to strengthen the global response to the threat of climate change by keeping a global temperature rise this century well below 2 degrees Celsius above pre-industrial levels and to pursue efforts to limit the temperature increase even further to 1.5 degrees Celsius. The Paris Agreement requests each country to outline and communicate their post-2020 climate actions, known as their Nationally Determined Contributions (NDCs).

Furthermore, all United Nations Member States in 2015 adopted the Sustainable Development Goals (SDGs), as a universal call to action to end poverty, protect the planet and ensure that all people enjoy peace and prosperity by 2030. The SDGs

that focuses on cities and climate change are: SDG 11 (to make cities inclusive, safe, resilient and sustainable) and SDG 13 (to take urgent action to combat climate change and its impacts). SDG 13 specifically calls for the strengthening of resilience and adaptive capacity to climate-related hazards and natural disasters in all countries; integrating of climate change measures into national policies, strategies and planning; and to improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning.

All this has compelled Namibia to develop its national climate change response framework and various programs aimed at addressing climate change issues nationally. Third tier government institutions such as local authorities are also expected to support national government in its efforts to meet its international climate change obligations as stated in the NCCSAP.

3. OVERVIEW OF CLIMATE CHANGE IN NAMIBIA

Namibia is a semi-arid country with very low rainfall compared to other countries in southern Africa. These climatic conditions make Namibia to be one of the most vulnerable countries to the impacts of climate change.

Temperature increase projected for Namibia will be higher than the global average. For instance, temperature for 2100 global predictions is expected to rise between 2 °C and 6 °C. Rainfall is also expected to decrease with a higher variability than it is now. The frequency of droughts will therefore increase in Namibia and this will be exacerbated by the higher evaporation rates resulting from increased temperatures.

It is expected that climate change will exacerbate the droughts already experienced in Southern Africa especially in Namibia and Botswana. When rainfall does come, it will have greater intensity resulting in floods and soil erosion. According Reid *et al.*, (2007) climate change could account for annual losses to the Namibian economy of up to 6% of Namibia's Gross Domestic Product (GDP) over 20 years. This will significantly affect the socio-economic growth of the country and will further reduce the adaptive capacity of Namibia especially the most vulnerable members of society. Limited financial resources, skills, technologies and high levels of poverty makes most Namibians especially in rural areas vulnerable to the impacts of climate change.

4. THE NATIONAL STRATEGIC CLIMATE CHANGE CONTEXT

Chapter 11, Article 95 (l) of the Namibian Constitution encourages policies that ensure: The maintenance of ecosystems, essential ecological processes and biological diversity of Namibia and utilization of living natural resources on a sustainable basis for the benefit of all Namibians, both present and future. This constitutional provision forms the foundation of environmental legislation in Namibia.

Namibia tabled its Green Plan of 1992 at the United Nations Conference on Environment and Development "Earth Summit" in Rio de Janeiro in the same year. The Green Plan was the country's first attempt to bring the above-mentioned constitutional provision into reality. This plan also forms the environmental foundation of subsequent legislations and national plans such as the Environmental Management Act (EMA) and National Development Plans (NDP).

4.1 National Policy on Climate Change

The National Policy on Climate Change (NPCC), which was, approved in 2011 presents the Namibian Government's vision for an effective climate change response. This policy aims to provide a framework through which Namibia as a country can respond to climate change in a timely, effective and appropriate manner. This policy advocates for the exploration of adaptation and mitigation approaches that are relevant to different sectors at local, regional and national level in order to improve the quality of life of the Namibian citizens. This NPCC has five objectives:

1. To develop and implement appropriate adaptation strategies and actions that will lower the vulnerability of Namibians and various sectors to the impacts of climate change.
2. To develop action and strategies for climate change mitigation.
3. To integrate climate change effectively into policies, institutional and development frameworks in recognition of the crosscutting nature of climate change.
4. To enhance capacities and synergies at local, regional and national levels and at individual, institutional and systemic levels to ensure successful implementation of climate change response activities.
5. To provide secure and adequate funding resources for effective adaptation and mitigation investments on climate change and associated activities (e.g. capacity building, awareness and dissemination of information).

4.2 Nationally Determined Contributions Implementation Strategy and Action Plan 2022-2030

The Nationally Determined Contributions Implementation Strategy and Action Plan (NDC-ISAP) 2022-2030 lays out the guiding principles responsive to climate change that are effective, efficient and practical. It further identifies priority action areas for adaptation and mitigation. The NDC-ISAP aims to build Namibia's adaptive and mitigative capacities to bring the country on to a low-carbon development pathway.

Under the NDC-ISAP, local authorities are responsible for the implementation and coordination of activities at a local level and support resource mobilization for NCCSAP implementation. Local authorities will also contribute to the mid-term review, and contribute to reporting on the NDC-ISAP implementation through Regional Councils.

The Ministry of Environment and Tourism (MET) through its Climate Change Unit (CCU) has the overall responsibility of coordinating the implementation of the NDC-ISAP with technical and policy relevant guidance from the National Climate Change Committee (NCCC). The NCCC is a multi-stakeholder platform that coordinates and advises sector-specific and cross-sector implementation of activities, and advice on monitoring and evaluation outcomes as well as future directions of NPCC and NDC-ISAP. The Council is also a member of this committee. The MET's CCU is responsible for submissions of the National Communications and GHG Inventory Reports to UNFCCC to track progress and compliance of signatory States.

4.3 Vision 2030

The Namibian Vision 2030 is the collective wish of the Namibian people, and the Vision for 2030 and beyond, that Namibia enjoys prosperity, interpersonal harmony, peace, and political stability. One of the major objectives of Vision 2030 is to ensure the development of Namibia's 'natural capital' and its sustainable utilization, for the benefit of the country's social, economic and ecological well-being.

4.4 Namibia Fifth National Development Plan

Namibia's Fifth National Development Plan (NDP5) is Namibia's blueprint for national development between 2017-2022 (extended until the NDP6 come into

operation in 2025). It outlines a development strategy that aims to improve the living conditions of every Namibian. Under the chapter of Environmental Sustainability, NDP6 takes cognisance of the fact that Namibia is one of the most vulnerable countries to the impacts of climate change. It further highlights the need to pursue a low-carbon and climate-resilient development. It therefore sets a target that by 2027 Namibia is sustainably managing its environment and climate resilient. This goal will be achieved by amongst other things re-use and recycling of waste in line with the National Solid Waste Management Strategy of 2018, generating income for re-investment into environmental protection and Strengthen mechanisms and capacity for improved environmental protection.

4.5 Harambee Prosperity Plan 2

The Office of the President produced Namibia's Harambee Prosperity Plan (HPP) in 2016, to cover the period from 2016/17 to 2019/20 and subsequently this was replaced by HPP2 which will be effective from 2021-2025. The HPP2 is supplementary to NDPs and Vision 2030. It is based on five pillars: effective governance; economic advancement; social progression; infrastructure development; and international relations and cooperation.

5. CLIMATE CHANGE CONTEXT FOR THE COUNCIL

5.1 Overview

Windhoek is one of the cities that will be most affected by climate change due to its aridity and socio-economic situation. All projections indicate that Windhoek will be much drier and warmer because of climate change. This will result in many climate related impacts.

Such impacts will include the reduction in water availability due to high evaporation rates and changes in rainfall patterns. The impact on water resources will further be exacerbated by the high rate of urbanization currently experienced in Windhoek and the lack of investments in alternative water sources.

Windhoek is also vulnerable due to the fact that most of its water comes from open dams and underground sources. All these sources will be affected by climate change. For instance, it is projected by the IPCC that if the global average temperature exceeds 1.5 °C the annual rainfall in Namibia will reduce by 4% and the evapotranspiration rate will increase by 10%. This will have dire consequences for Windhoek's water sustainability as both the groundwater recharge rate and runoff which replenishes Windhoek's water sources will be significantly affected. The experts further indicate that the 1.5 °C threshold could be breached within the next 10 years if much is not done to address global climate change.

As a developing city, Windhoek is already struggling to render efficient and effective municipal services to its residents. The impacts of climate change will put a further strain on all Council departments and their ability to deliver services. Concerted efforts from all City stakeholders is therefore required to adapt to and mitigate this global phenomenon and sustain our livelihoods in order to make Windhoek a climate resilient city.

Through this Strategy and Action Plan, Windhoek is ensuring that it is playing its part in meeting local, national, regional and international targets. Apart from our obligation to build a climate resilient city, this strategy is also driven by our ambitions to become a smart and caring city.

5.2 Khomas Region Climate

The climate information for Windhoek contained in this section will be looked at from a regional perspective. Most data and information presented here will therefore refer to the Khomas Region. The Khomas is one of the fourteen regions of Namibia and Windhoek is located in this region.

Namibia is a very dry country with seasonal rainfall that occurs mainly from November to April. The Khomas Region is typically slightly wetter in central and northern areas and drier in the south-west. The Rainfall peaks in Khomas Region in February with around 75mm in total on average. Rainfall is very variable in Khomas Region with rainfall totals in each season often well below or well above the mean in some years.

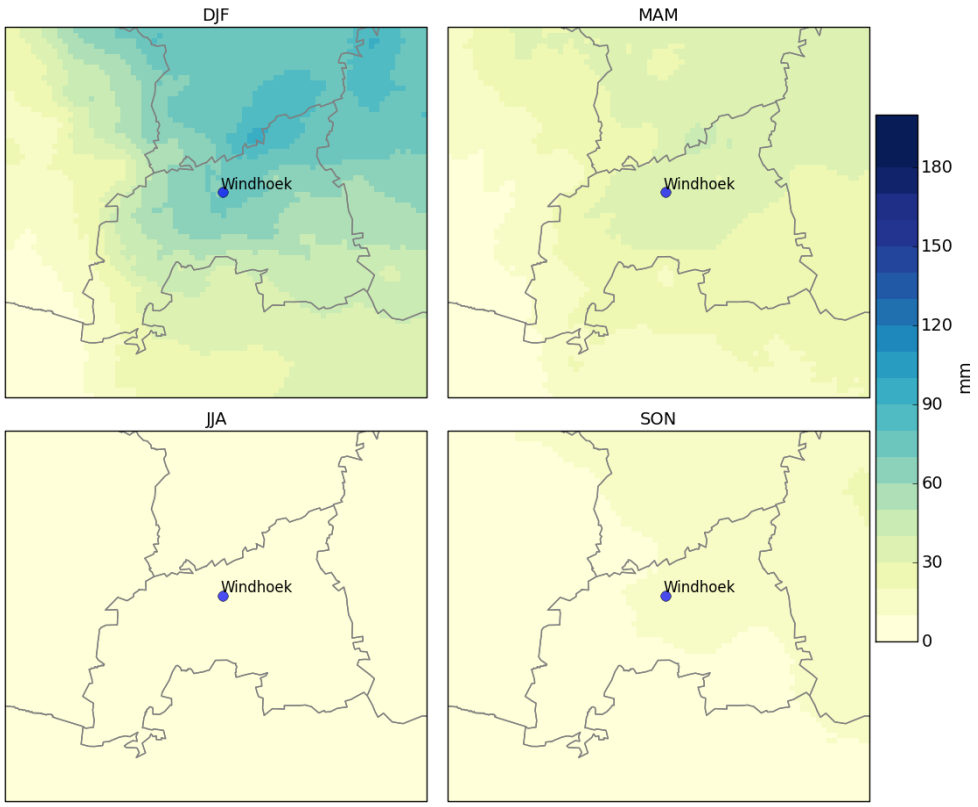


Figure 1: Map of Khomas Region showing average monthly rainfall totals over four 3-monthly periods during January 1983 to December 2013. CHIRPS dataset.

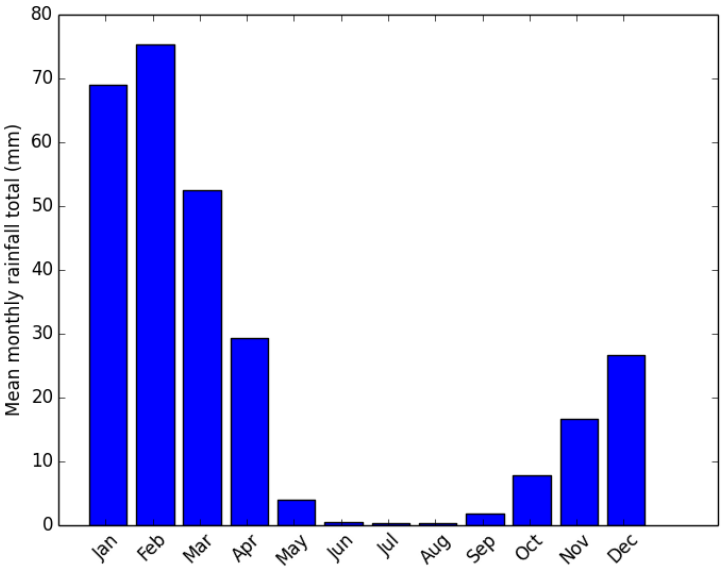
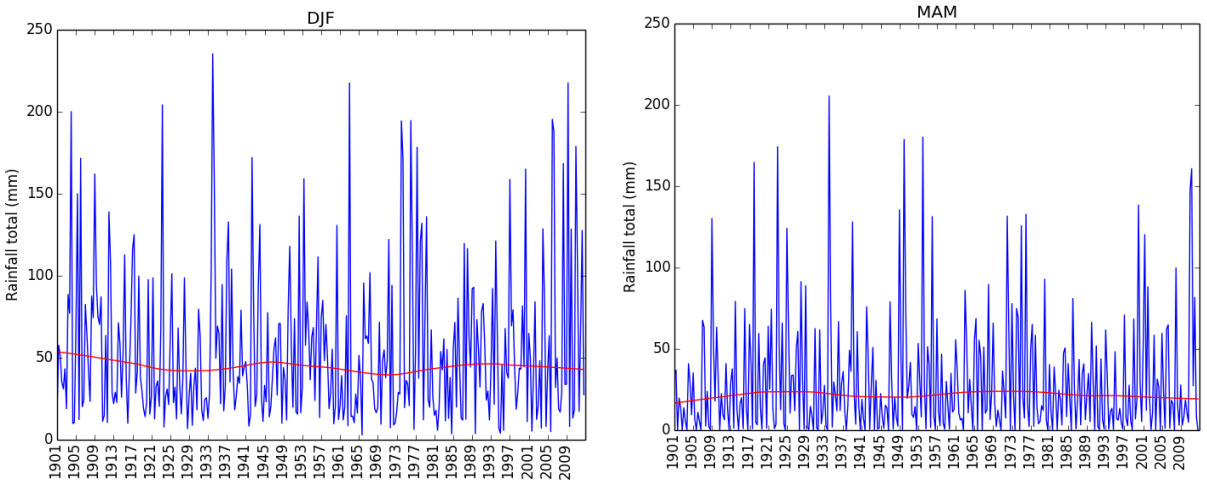


Figure 2: Bar graph showing the average total rainfall in Khomas Region for each month calculated over the period from January 1983 to December 2013. CHIRPS dataset.



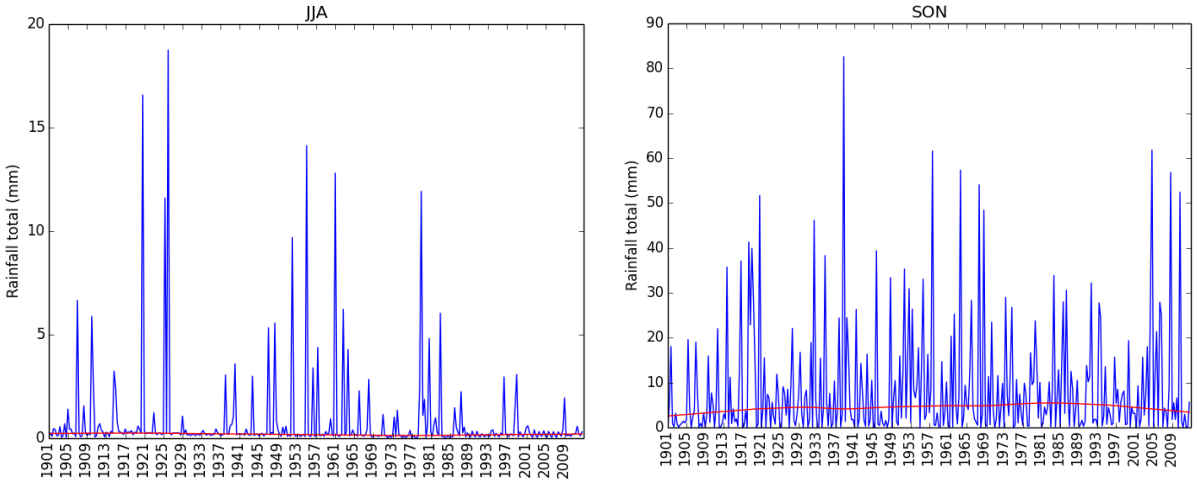


Figure 3: Line graphs showing the variation in monthly totals of rainfall over Khomas Region from 1901 to 2013 (blue line) as an average over four seasons. A trend line (lowess fit) is shown in red. GPCC dataset.

The Temperatures are typically hot and vary across the year as shown in Figure 4, Figure 5 and Figure 6 (Burgin *et.al*, 2018). The warmest period occurs during December to February and there is a cooler period in June to August. Mean temperatures in Khomas Region vary from around 14-26ºC across the year. The Daily maximum, daily mean and daily minimum temperatures have all shown an increasing trend in the past century of at least 1°C.

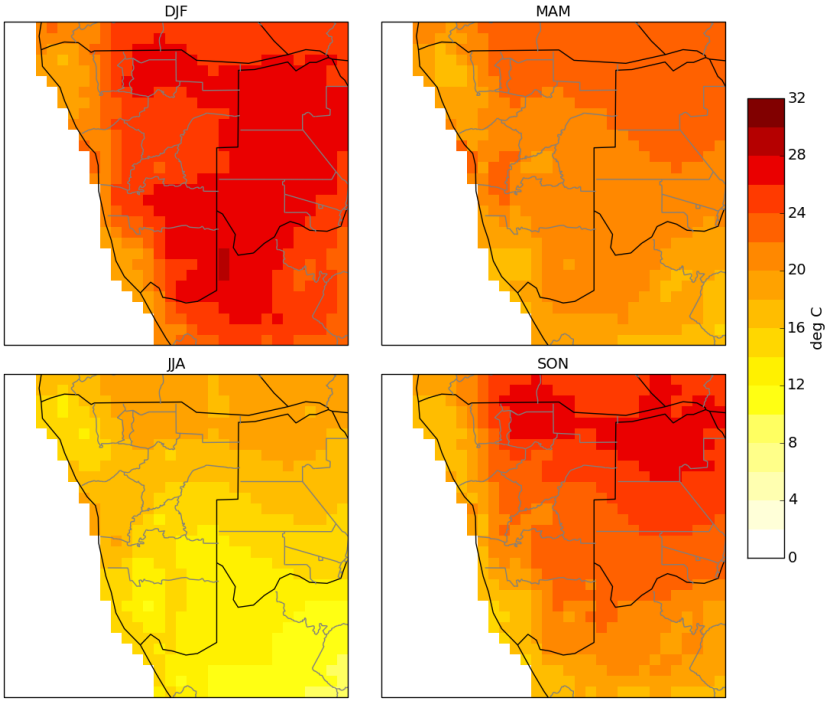


Figure 4: Map of Namibia showing average temperature over four 3-monthly periods during January 1983 to December 2013. CRU TS4.01 dataset.

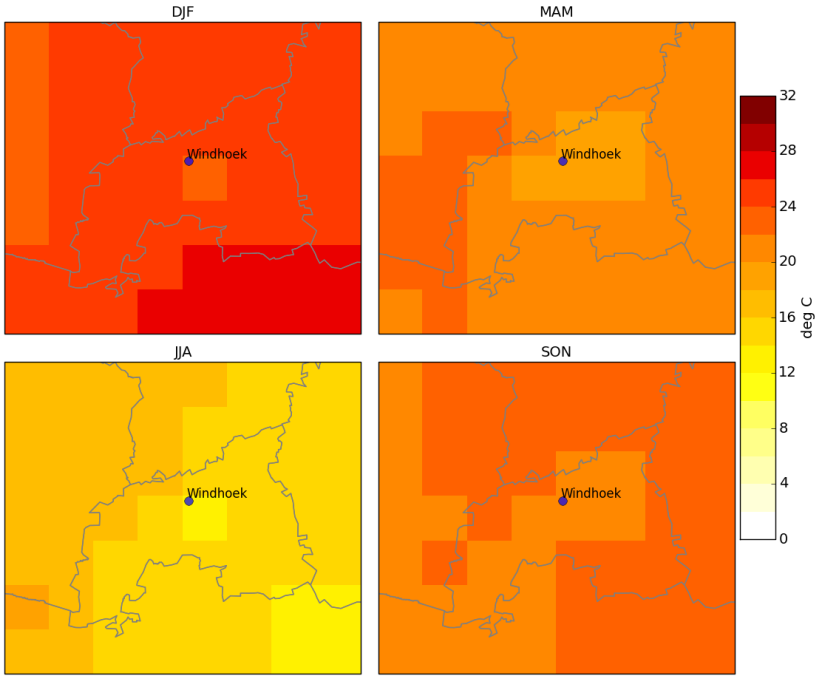
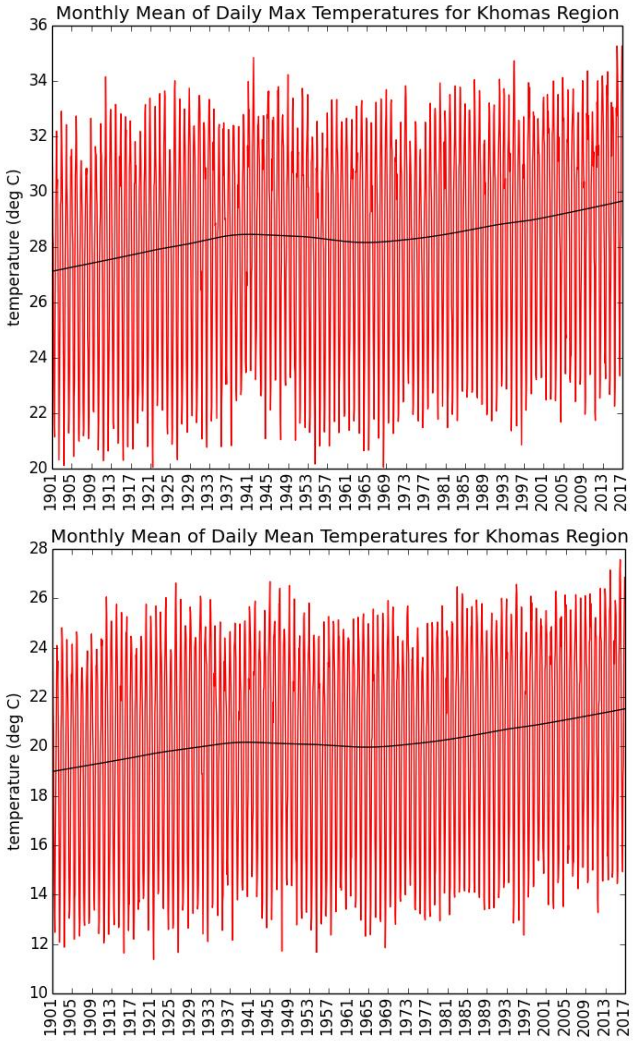


Figure 5: Map of Khomas Region showing average temperature over four 3-monthly periods during January 1983 to December 2013. CRU TS4.01 dataset.


Monthly Mean of Daily Max Temperatures for Khomas Region
temperature (deg C)
Monthly Mean of Daily Mean Temperatures for Khomas Region
temperature (deg C)

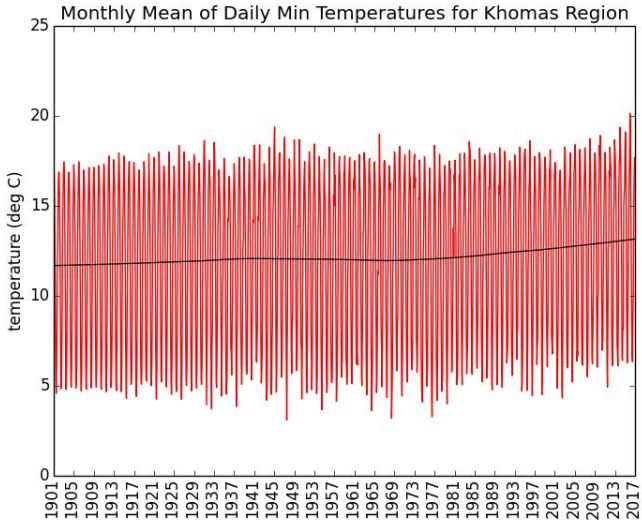


Figure 6: Trends in monthly mean of daily max (top), daily mean (middle) and daily min (bottom) temperatures across Khomas Region from 1901 to 2017. The black line shows a trend line (lowess fit). CRU TS4.01 dataset.

5.3 Climate Change Projections for Khomas Region

Southern Africa is a region with a complex climate, influenced by the Atlantic, Pacific and Indian Oceans and their currents such as the Benguela and Aghulas. Relatively small amounts of climate research and model development have occurred for this region compared to others in the world. Furthermore, Africa also has sparse coverage of surface meteorological observations on which to base assessments of model reliability and model development. As such, the climate processes which drive rainfall in the region are not entirely understood and may not be captured well within climate models.

As part of the development of this Strategy and Action Plan, the Future Resilience for African CiTies and Lands (FRACTAL) Project assisted the Council to do future projections of climate in Windhoek and the Khomas Region as a whole.

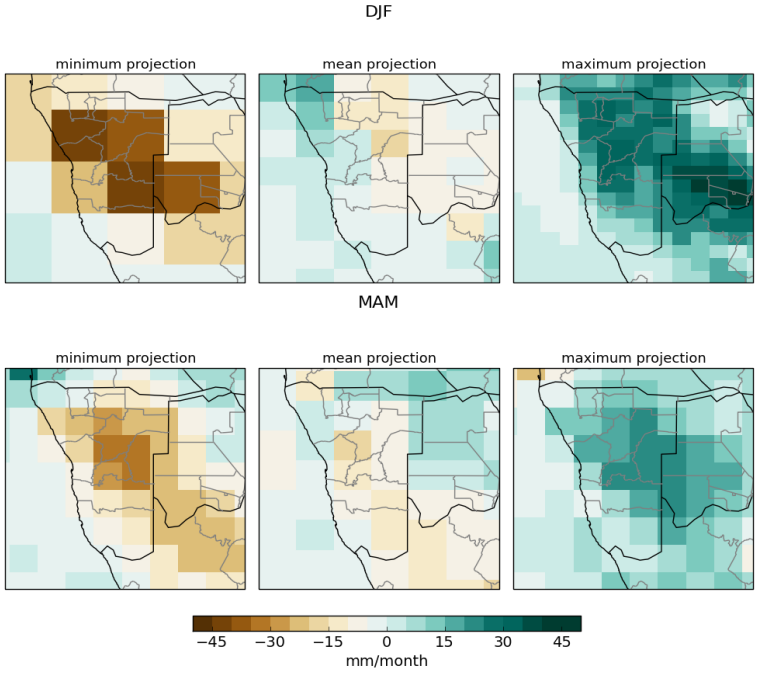
Various models were used to do future projections and the compilation of other information presented in this section. The models that were used to do projections are discussed below:

- The General Circulation Models (GCMs) are mainly used to show the broad changes in climate projections and their outputs should not be directly interpreted at local scales but instead used to get an overall picture so country scale is more appropriate. The GCMs are the best tool to examine a broad range of uncertainty.

- The plume plots are from Coupled Model Intercomparison Project (CMIP5). Unfortunately, the FRACTAL Project did not do analysis of the Coordinated Regional Downscaling Experiment (CORDEX) models so the Regional Climate Model (RCM) data were not included due to budget constraints. CORDEX is a program sponsored by World Climate Research Program (WCRP) to develop an improved framework for generating regional-scale climate projections for impact assessment and adaptation studies worldwide within the IPCC Fifth Assessment Report (AR5) timeline and beyond. The Representative Concentration Pathway (RCP) RCP8.5 was used as it gives the largest range of uncertainty. RCP8.5 is most representative of a 'business as usual' path.

5.3.1. Projected Rainfall

Many of the models show rainfall projections within the range of variability found in the present day. A few models show drier projections in all seasons for Khomas Region and a few shows a wetter signal for Khomas Region, particularly in December to February and in March to May.



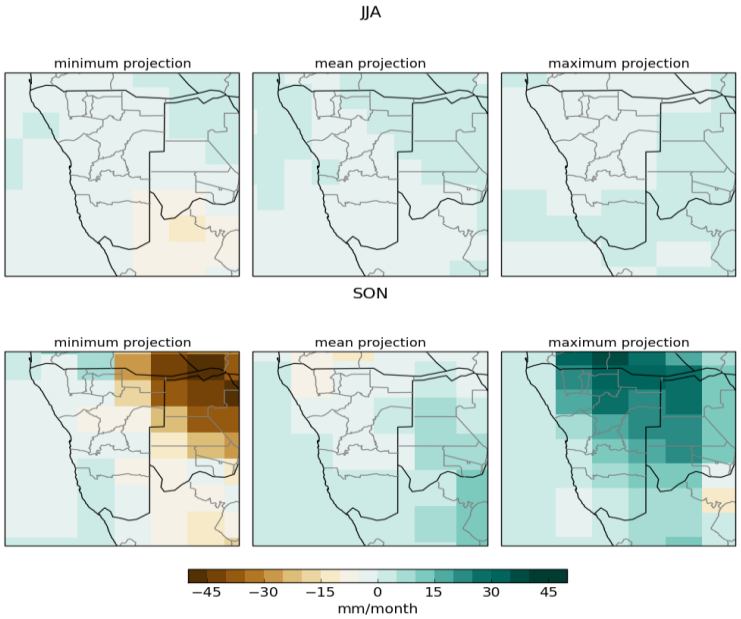


Figure 7: Maps showing future rainfall change for Namibia from the CMIP5 models for the four three-month periods.

Figure 7 show the change between 1983-2013 and 2020-2050. For each season the model showing the most drying (left), the median change (middle) and the largest increase in rainfall change (right) for Namibia on average are displayed. The models have been run assuming high concentrations of greenhouse gases (Representative Concentration Pathway 8.5 (RCP8.5)).

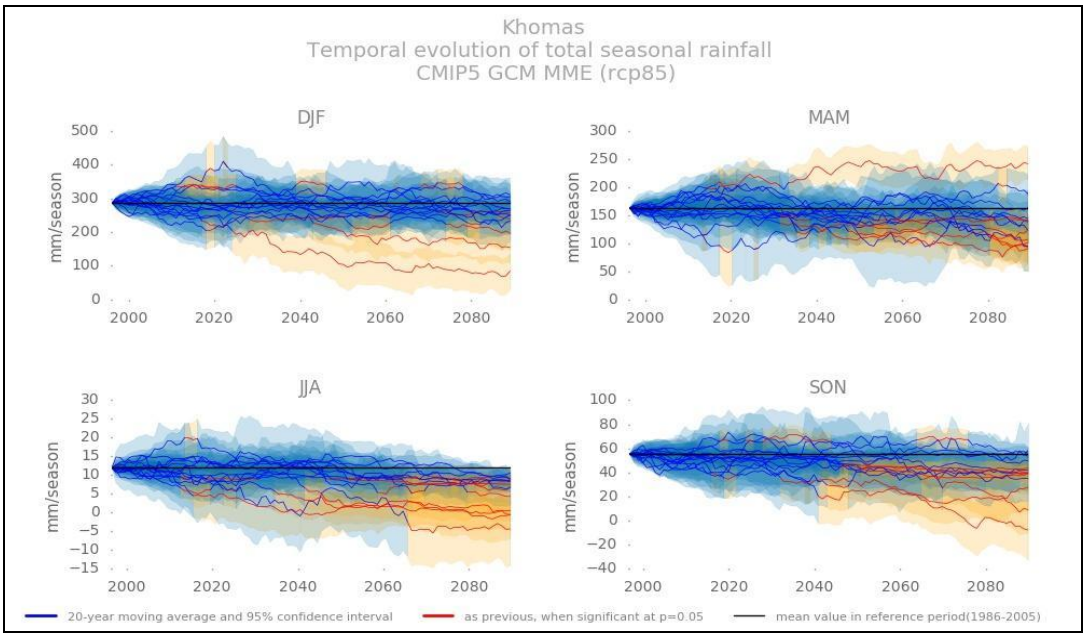


Figure 8: Total seasonal rainfall variations in time for Khomas as projected by CMIP5 global climate models using a very high concentrations scenario (RCP8.5). Lines become orange when the change from the baseline period is statistically significant.

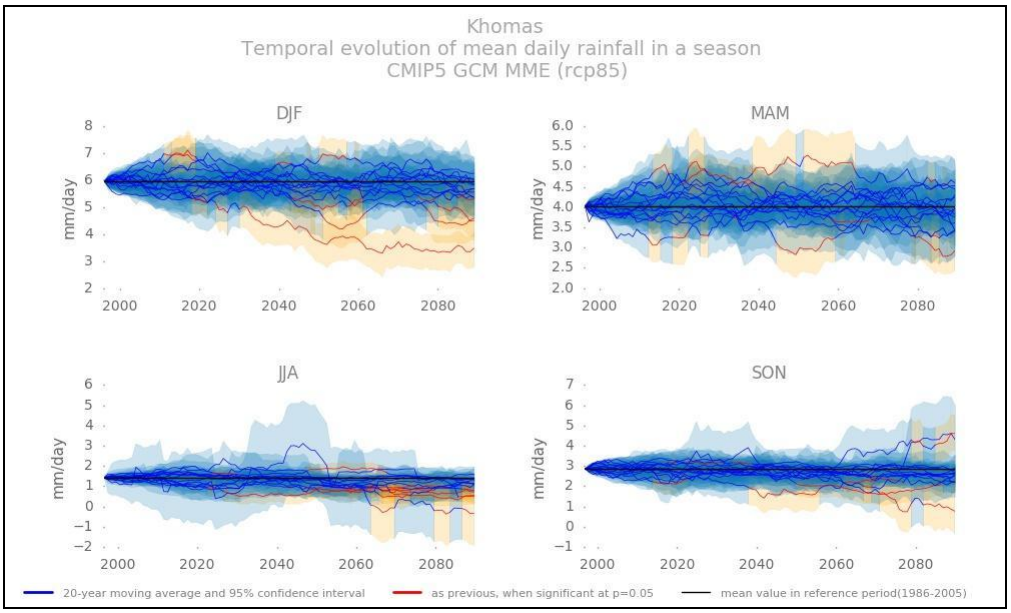
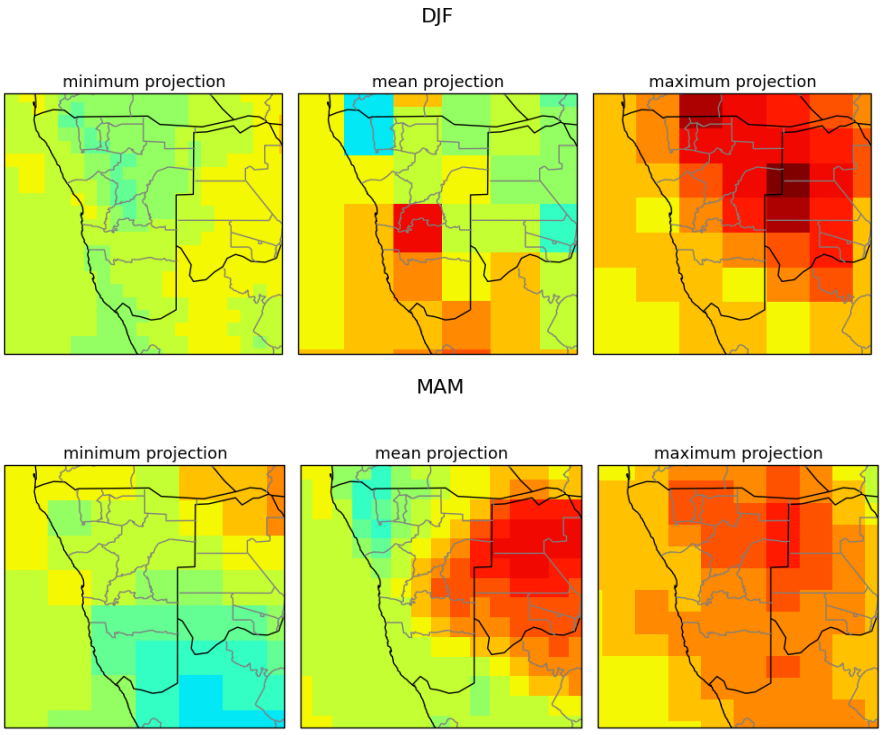


Figure 9: Mean daily rainfall variations in time for Khomas as projected by CMIP5 global climate models using a very high concentrations scenario (RCP8.5). Lines become orange when the change from the baseline period is statistically significant.

5.3.2. Projected temperature

The IPCC Third Assessment Report suggests that by 2050, temperatures over southern Africa will be 2-4 ^{0}C higher compared to the 1961-1990 baselines (IPCC, 2001). Thus, cities like Windhoek are expected to face even greater droughts, floods, loss of biodiversity and depletion in the water supply.

Similarly, the Climate Models ran by the FRACTAL Project show good agreement on warming across all seasons from the mid-century onwards. Future projections of temperature change for the Khomas Region range from 0-2ºC averaged over the 2020-2050 period. Also of note is an increase in extremely hot days (where temperatures rise above 35°C) across most of the year by 2050 compared to the reference period of 1986-2005. The June–July-August (JJA) could see an increase of up to 5 ºC extremely hot days, December-January-February (DJF) could experience 20 more days over the season and September-October-November (SON) and March-April-May (MAM) show increases of up to 30 days. For each season the model showing the minimum, the mean and the maximum temperature change for Namibia on average are displayed in the Figure below.



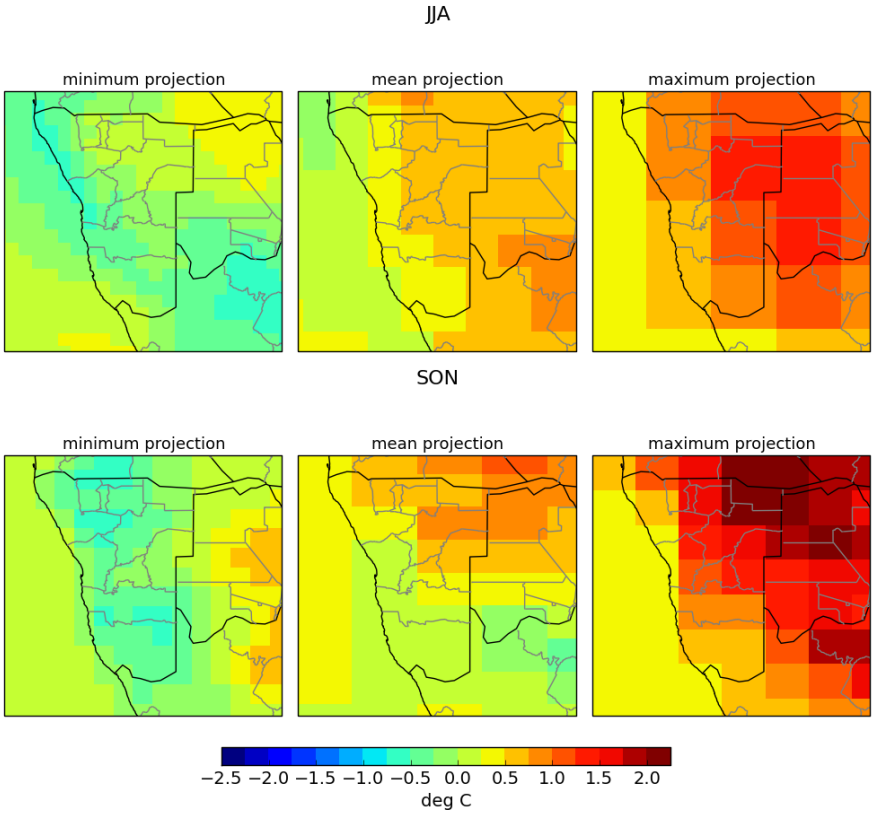


Figure 10: Maps showing future temperature change for Namibia from the CMIP5 models for four seasons. These show the change between 1983-2013 and 2020-2050. The models have been run assuming high concentrations of greenhouse gases (RCP8.5).

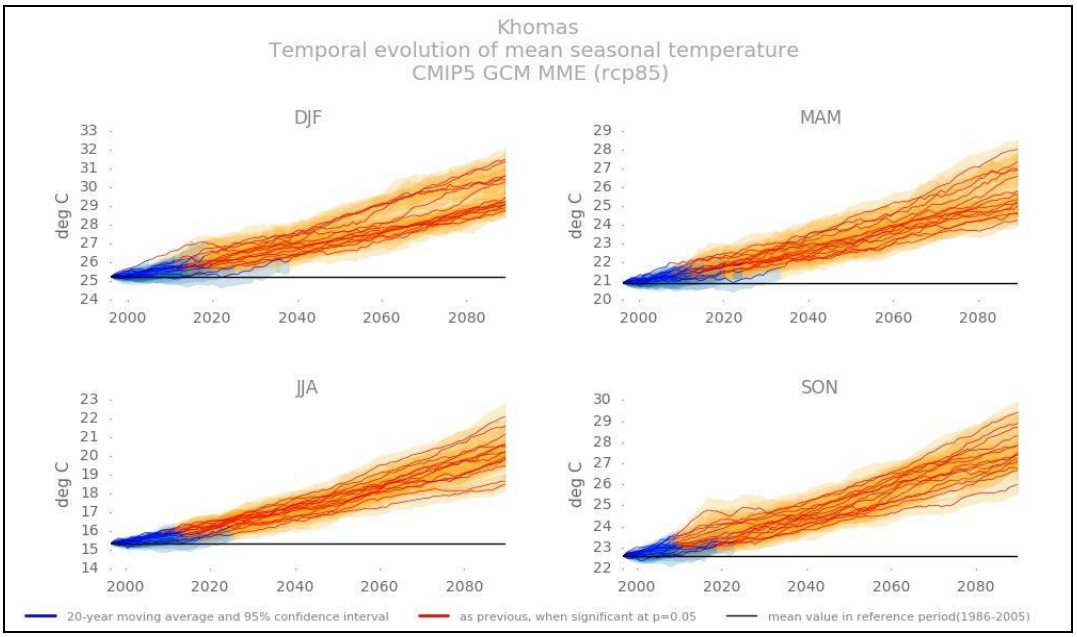


Figure 11: Mean temperature variations in time for Khomas as projected by CMIP5 global climate models using a very high concentrations scenario (RCP8.5). Lines become orange when the change from the baseline period is statistically significant.

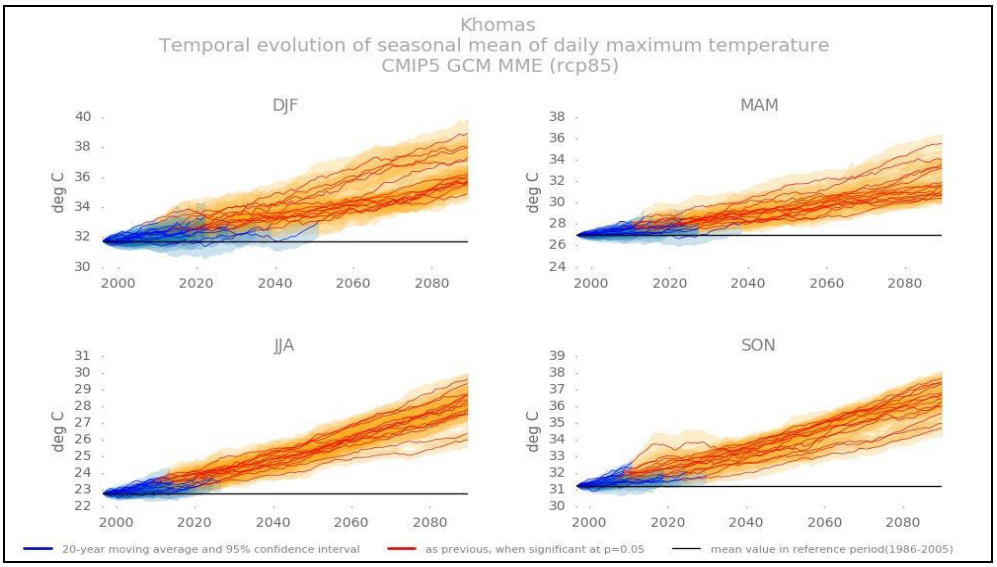


Figure 12: Daily maximum temperature variations in time for Khomas Region as projected by CMIP5 global climate models using a very high concentrations scenario (RCP8.5). Lines become orange when the change from the baseline period is statistically significant.

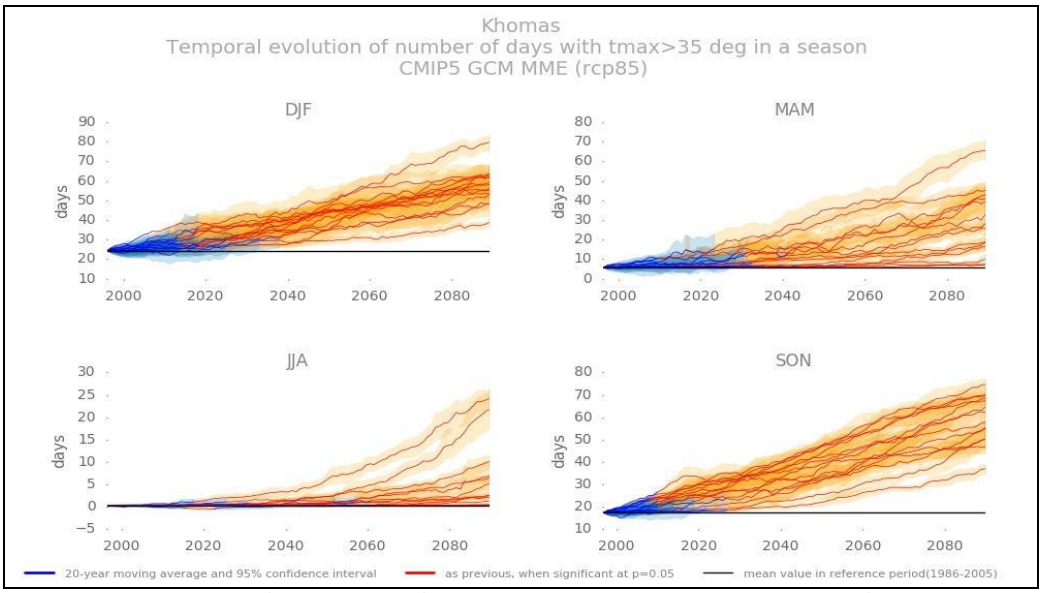


Figure 12: Variation in time for the number of days in a season with temperatures above 35°C for Khomas Region as projected by CMIP5 global climate models using a very high concentrations scenario (RCP8.5). Lines become orange when the change from the baseline period is statistically significant.

The future climate for Windhoek as projected above is summarised on figure 14 below using infographics.

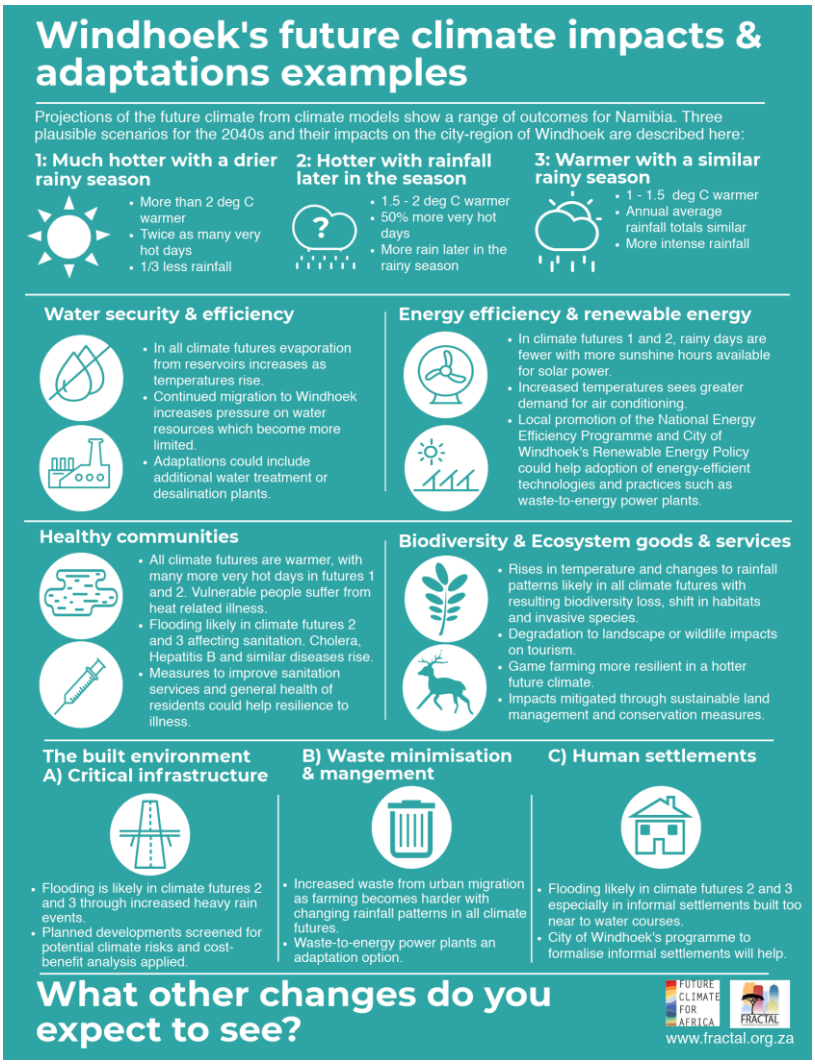


Figure 14: Windhoek's future climate and adaptation examples.

6. WINDHOEK CLIMATE CHANGE VULNERABILITY AND RESPONSE APPROACH

6.1 Climate Change Adaptation

Adaptation refers to adjustments to current systems in response to experienced or expected negative effects of climate change. Namibia's contribution to global GHG emissions is negligible. Although this is the fact, we are also cognizant of the fact that we will suffer from some consequences of climate change that cannot be avoided hence the need to adapt to these impacts and take advantage of opportunities. Adaptation in the context of the Council comprise of various actions that the Council takes to improve its ability to cope with the resulting impacts (positive and negative) of changes in climatic conditions across time and policy scales which will benefit its residents.

From an adaptation perspective, the Council intends to build its capacity to cope with impacts such as droughts and increased temperatures. In the same vein the Council intends to inform and raise awareness of residents about the climate change risks they face and the steps they can take to contribute to the overall resilience building efforts, reduce pressure on our sensitive environment and promote a sustainable developmental trajectory.

6.2 Climate Change Mitigation

Mitigation refers to the actions that an institution or individuals take to reduce the emissions or enhance the sinks of greenhouse gases. Mitigation is focused on the pursuance of a low-carbon and climate-resilient developmental trajectory. This Strategy and Action Plan will put more emphasis on the reduction of energy consumption in municipal buildings and facilities, promotion of sustainable modes of transport, the promotion of renewable energy sources, raising public awareness for rational energy use and the development of systems to monitor GHGs emissions in the city.

7. CLIMATE CHANGE FOCUS AREAS

The sectors below were identified as vulnerable to climate change thus this Strategy and Action Plan will first put emphasis on the focus areas listed below. This is mainly due to limited resources and the fact that these focus areas represents the burning challenges that are hampering the city from achieving its sustainability

goals and climate resilient status. Various adaptation and mitigation activities are also ongoing in the selected focus areas.

7.1 Water Security and Efficiency

Namibia is a semi-arid country, with the lowest average rainfall in the Southern Africa region (Mendelsohn *et al.*, 2002). The water supply for Windhoek is sourced from groundwater, reclaimed wastewater and surface water purchased from NamWater. All these water sources rely on rainfall. Water security for the city is threatened by climate change coupled with an increase in demand due to high rate of urbanisation, invariable and unpredictable rainfall which causes drought and high evaporation rates.

With climate change projections pointing to a drying trend, water security is a primary concern for the Council and should therefore be addressed through the implementation of the Council's Water Demand Management Strategy and other policies aimed at improving the sustainable utilization of water resources.

7.2 Sustainable Energy and Low Carbon Development

According to the IPCC (2011), the high concentration of GHG in the atmosphere experienced from the dawn of the industrial revolution is mainly as a result of energy generation. This is made worse by the fact that the demand for energy and associated services, to meet social and economic development and improve human welfare and health, is increasing. Therefore, the fight to reduce the emissions of GHG cannot be won without aggressively pursuing sustainable energy sources (renewable energy). In addition to its great potential to mitigate climate change, renewable energy can provide wider benefits. Renewable energy may, if implemented properly, contribute to social and economic development, energy access, a secure energy supply, and reducing negative impacts on the environment and health.

The Council has heeded to the global call to promote renewable energy sources by approving its Renewable Energy Policy in 2017. This policy provides guidance to the Council on how to develop renewable energy and to upscale the contribution of power from renewable sources within the City's electricity mix. This policy should also be viewed as a demonstration of Council's commitment to global and multilateral objectives such as combating climate change, in furtherance of its obligations under the UNFCCC.

It is therefore important for the Council to implement this policy and develop other policies and programs aimed at promoting renewable energy and low carbon development.

7.3 Public Awareness and Capacity Building

The success of this Strategy and Action Plan is largely depended on the support of Windhoek residents and businesses. It is therefore crucial to develop and implement tailor-made education and awareness programs to raise awareness of Windhoek residents on climate change and its impacts on their livelihoods.

Councillors should be at the forefront of planning for climate change resilience and improve the adaptive capacity of their communities. They should also take a leadership role in educating and inspiring their communities to plan and take action to adapt to a changing climate. It is therefore important to also develop capacity building programs aimed at improving the capacity of Councillors (including Junior Councillors) and their support staff to deal with climate change issues.

In addition, there is also a strong need to mainstream climate change and environmental sustainability into the school's program. This will raise environmental awareness and instil environmental values into school children who are the future of our city. Studies have proven that children are strong agents of change and when empowered with information on climate change, children can reduce the vulnerability of themselves and their communities to climate change risk (Coco-Klein & Mauger, 2018). It is therefore very crucial for this Strategy and Action Plan to also put emphasis on the development of plans and programs aimed at raising awareness of school children on climate change.

7.4 Biodiversity and Ecosystem Goods and Services

Biodiversity, through the ecosystem services it supports, also makes an important contribution to both climate-change mitigation and adaptation. For instance, plants remove carbon dioxide from the atmosphere, thus helping to address climate change by storing carbon. In the case of Windhoek, biodiversity also plays a role in adapting to the impacts of climate change, for example the vegetation especially along water courses can help reduce the disastrous impacts of climate change such as flooding.

However, the integrity of ecosystems and biodiversity in Windhoek is threatened by factors such as the proliferation of informal settlements that Windhoek is currently experiencing (e.g. residents of informal settlements heavily rely on firewood for

cooking and heating) and escalating development. The Council should therefore develop and implement policies that are aimed at conserving its biodiversity and associated ecosystems to reduce climate vulnerability and improve resilience to climate change impacts.

The Council also embraces the concept of ecosystem-based adaptation to the adverse effects of climate change. In addition to the conservation of biodiversity, the integration of the sustainable use of biodiversity and ecosystem services into an overall adaptation strategy is a cost-effective option. This option also has socio-economic and cultural co-benefits.

7.5 The Built Environment

7.5.1 Waste Minimization and Management

Windhoek was for many years considered as one of the cleanest cities in Africa, a status that it has since lost due to many factors (Tshabalala, 2015; Kabir, 2018). High rate of urbanisation and proliferation of informal settlements are some of the factors that have led to the loss of this status.

The amount of waste generated in Windhoek is steadily growing and this trend will continue unless action is taken. As Windhoek's population grows and standards of living increases, more goods are consumed and waste is produced. Trends over the five years have shown a significant increase in waste generation and disposal (Solid Waste Management Division, 2019). The data shows an increase in the domestic waste generation of 13 percent between 2003 and 2011 (Namibia Statistics Agency, 2012 & 2013).

Waste generation has an environmental impact in that resources are being continuously extracted for consumption and are being disposed of in landfills that have to be managed at cost in a manner that limits pollution of the underground water. Even the disposal of waste into well-designed and managed landfills can create environmental impacts from transporting waste for disposal to potential leachate, odour and greenhouse gas emission impacts. Landfills are used as the primary means for the disposal of waste materials in Windhoek.

Reducing waste generation and diverting waste from disposal has become imperatively important in our efforts to turn Windhoek into a climate resilient and sustainable City. This need to be encouraged at all spheres of governance and industry.

7.5.2 Human Settlements

Windhoek is experiencing a high rate of urbanisation. This growth is mainly seen in the informal sector of society and it is mainly characterized by the proliferation of informal settlements on the outskirts of the city. According to Weber & Mendelsohn (2017), the economic, social and environmental costs of informal growth and unplanned urban development are huge for Namibia as a country. The 2011 National Census found that 32% of homes in Windhoek were shacks / informal structures (Namibia Statistics Agency, 2012). Informal settlements result in environmental problems such as vegetation degradation, pollution of water courses and increase the risk of flooding. This coupled with the lack of necessary municipal services makes the informal population of Windhoek the most vulnerable sector of society to the impacts of climate change. The Council needs to institute various measures to address the challenges posed by informal settlements and help these communities cope with climate change.

7.6 Healthy Communities

Climate change is expected to have a direct and indirect impact on human health in most developing countries and Namibia, particularly Windhoek is no exception. This will be exacerbated by the high levels of poverty in our poor areas such as the informal settlements. For instance, extreme weather events might result in changes in disease prevalence and patterns and the predicted increase in temperature might result in an increase in thermal stress, skin cancer and eye diseases amongst other ailments. Indirect impacts such as malnutrition, famine, droughts, vector-borne diseases and water-borne diseases might also occur. It is therefore important for the Council to develop policies and programs that will assist to monitor and address the potential health impacts of climate change.

7.7 Sustainable Transportation

Transport accounts for about 26% of global CO_2 emissions (Sims at al., 2014; Ekholm & Rockström, 2019). It is also a concern that emissions from this sector is still growing. There is a global call to reduce emissions in this sector by embracing sustainable transportation systems.

The Council is striving to improve transportation in the City. Currently, Windhoek is experiencing traffic congestion. Furthermore, the Windhoek's road infrastructure is not friendly to pedestrians and cyclists. As such, the City of Windhoek along with the Ministry of Works and Transport (MWT) with the support and funding

from the GIZ, embarked on the process of developing a Sustainable Urban Transport Master Plan (SUTMP) for Windhoek. The SUTMP is a 20-years plan that identifies the types of investment in infrastructure and services that are required to improve the public transport (PT) services and non-motorised transport (NMT) in Windhoek. The Council approved its SUTMP in July 2014.

Following the launch of the Master Plan, the City of Windhoek developed a Non-motorised Transport Strategy & Infrastructure Design Guidelines, which was approved by Council in May 2019. Investing in non-motorised transport infrastructure is the City's effort to make reduce the noticeable peak-hour congestion, accidents, pollution, and greenhouse gas emissions associated with cars.

These two (2) policy documents will serve as the guiding documents for the successful planning of NMT (infrastructure and facilities) and for integrating NMT into Windhoek transport system.

7.8 Disaster Preparedness

As climate change continues, it will likely lead to more frequent and severe natural hazards. This will result in an increase in disasters especially in developing countries with poor adaptive capacities. Windhoek will also face an increase in disasters such as outbreaks of communicable diseases (due to poor sanitation especially in informal settlements), floods and droughts. It is, therefore, imperative to address these threats and their impacts.

The Council will therefore embrace the principles of *The Sendai Framework for Disaster Risk Reduction 2015-2030* and the provisions of the City's Disaster Risk Management Plan and will accordingly develop and update existing policies on Disaster Risk Management. This will help the city to prevent new and reduce existing disaster risks, and thus strengthen resilience.

7.9 Sustainable Urban Agriculture

Urban Agriculture is key to food security and poverty alleviation in cities and it refers to the growing, processing, and distribution of food and other products through intensive plant cultivation and animal husbandry in and around cities. Urban agriculture also offers other benefits to a city on top of food production. Such benefits include amongst others energy conservation, waste management, biodiversity, nutrient cycling, microclimate control, urban greening, economic revitalization, community socialization and human health.

In order for urban agriculture to contribute to the fight against climate change it must adapt sustainable best practices.

Windhoek is experiencing a high rate of urbanization and unemployment. The poor harvest experienced by subsistence farmers in the northern communal areas of the country due to persistent droughts will also have an effect in food security in Windhoek. This is mainly because the communal farmers in northern Namibia shares some of the food produced there with relatives in Windhoek.

It is therefore important for the Council to develop policies aimed at promoting the production of food within the city boundaries on a sustainable basis. This will also contribute to climate resilience by increasing food security.

8. WINDHOEK'S CLIMATE CHANGE ACTION PLAN FRAMEWORK

The Action Plan focuses on a series of actions that outline our aspirations for addressing climate change in Windhoek. The specifics are contained in the various existing departmental strategies and policies.

The Action Plan is divided into three parts: Agenda A (Adaptation), Agenda B (Mitigation) and Agenda C (Crosscutting issues).

8.1 AGENDA A: ADAPTATION

Focus Area A1: Water Security and Efficiency

Strategic aim	Targets	Activity	Timeframe	Lead Department
1. Promote conservation and sustainable utilization of water resources	*Conservation and sustainable use of water promoted and measures implemented*	a) Upgrade the current Gammams Waste Water Treatment Plant to increase its capacity and efficiency.	2022 - 2026	Infrastructure, Water and Technical Services
		b) Commission a study to determine losses in the Council's water supply network and implement measures to reduce losses.	2022 - 2026	Infrastructure, Water and Technical Services
		c) Implement the Council's Water Demand Management Strategy to reduce water demand in the face of projected climate change impacts.	2022 - 2026	Infrastructure, Water and Technical Services
		d) Explore options for reducing evaporation of water in dams.	2022 - 2026	Infrastructure, Water and Technical Services
		e) Develop and implement a Cleaner Production Policy and Water Sensitive Urban Design Principles to help reduce water use in industries and other bulk users.	2022 - 2026	Infrastructure, Water and Technical Services
		f) Develop the Windhoek Integrated Water and Wastewater Master Plan	2022 - 2026	Infrastructure, Water and Technical Services
2. Augment current water supply to the City to meet water demand	*By 2025 the capacity of the CoW's aquifer is increased to 24 million cubic meters per annum*	a) Expand the capacity of the Windhoek aquifer by drilling additional boreholes and installation of recharging equipment.	2022 - 2028	Infrastructure, Water and Technical Services
	Increase the CoW's alternative water	a) Develop a new water reclamation plant to increase the City's	2022 - 2026	Infrastructure, Water and Technical

	sources	reclamation capacity.		Services
		b) The Council should participate, contribute to discussions and be represented at the Cabinet Technical Committee of Experts on water.	2022-2028	Infrastructure, Water and Technical Services
3. Improve water governance in the Council	*Water governance in the City improved by 2025*	a) Improve the efficiency of the existing committees and other platforms to improve communication between national and city stakeholders.	2022-2028	Infrastructure, Water and Technical Services

Focus Area A2: Biodiversity and Ecosystem Goods and Services

Strategic aim	Targets	Activity	Timeframe	Lead Department
1. Maintenance of the integrity of ecosystems to ensure climate resilience and environmental sustainability	*By 2025 the CoW's ecosystems and Public Open Spaces of conservation significance accorded formal protection and are managed sustainably*	a) Identify and assess vulnerable ecosystems and accord them appropriate zoning (conservation) to ensure its protection	2022 - 2026	Department of Economic Development and Community Services **Partner Agencies:** • All other city departments
		b) Develop and implement Windhoek Biodiversity Management Plan	2022 - 2026	Department of Economic Development and Community Services **Partner Agencies:** • All other city departments
		c) Develop area specific management plans for conservation areas	2024-2026	Department of Economic Development and Community Services **Partner Agencies:** • All other city departments
		d) Conduct an assessment and prioritize the immediate costs and long-term financial and environmental benefits of the protection and maintenance of areas that provide key ecosystem services and ecological infrastructure.	2022 - 2026	Department of Economic Development and Community Services **Partner Agencies:** • All other city departments
2. Promote conservation and sustainable utilization of natural resources	*The regulation of the use of natural resources improved*	a) Develop Windhoek Environmental Management Regulations to regulate the use and harvesting of natural resources	2022-2028	Department of Economic Development and Community Services **Partner Agencies:** • All other city departments
		b) Improve the enforcement of legislations to curb the unsustainable and illegal utilization of natural resources	2022-2028	Department of Economic Development and Community Services in collaboration with City Police

Focus Area A3: The Built Environment (Human Settlements)

Strategic aim	Targets	Activity	Timeframe	Lead Department
1. Secure the provision of and access to basic municipal services	*Increase access to 80% of resident to (100m radius water and 200m toilets) basic municipal services by 202*5.	a) Provide and maintain general basic services (water and sanitation services as well as regular refuse removal) to the informal settlement areas in line with national guidelines.	2022-2028	Department of HPMHS (Human Settlements Division) **Partner Agencies:** • All other city departments • Khomas Regional Council • Central government • Donor agencies • NGOs
		b) Conduct a pilot study to address shortcomings in the existing approach and find a sustainable solution to providing basic services in the informal settlement areas.	2022-2028	Department of HPMHS (Human Settlements Division) **Partner Agencies:** All other city departments
2. Promote secure land tenure for informal settlement households	*Informal settlement house owners have land tenure by 2025.*	a) Investigate various land tenure systems and implement the appropriate one in the informal settlements	2022-2028	Department of HPMHS (Human Settlements Division) **Partner Agencies:** All other city departments
		b) Fast track the implementation of Flexible Land Tenure Act	2022-2028	Department of HPMHS (Human Settlements Division) **Partner Agencies:** All other city departments
3. Eradicate the proliferation of informal settlements	*At least three Informal settlements must be formalized per year.*	a) Implement the Upgrading and Development Strategy which aims to formalize informal settlements.	2022-2028	Department of HPMHS (Human Settlements Division) **Partner Agencies:** All other city departments

		b) Reduce the minimum plot size from 300m^2 to 200m^2 to accommodate more people.	2022-2028	Department of HPMHS (Human Settlements Division) **Partner Agencies:** All other city departments
		c) Initiate and implement an affordable Housing Scheme in the informal settlements.	2022-2028	Department of HPMHS (Human Settlements Division) **Partner Agencies:** All other city departments
		d) Review policies to consider alternative building methods the structures must be climate resilient (such as the building regulations	2022-2028	Department of HPMHS (Human Settlements Division) **Partner Agencies:** • All other city departments. • Financial Institutions. • Central Government.
	By-laws to curb land invasion and informal structures successfully implemented	a) Improve law enforcement to prevent the further erection of illegal structures	2022-2028	Department of HPMHS (Human Settlements Division) and City Police
		b) Engage all relevant stakeholders for the successful implementation of, and law enforcement to curb informal settlements.	2022-2028	Department of HPMHS (Human Settlements Division) and City Police

Focus Area A4: Healthy Communities

Strategic aim	Targets	Activity	Timeframe	Lead Department
1. Strengthen disease prevention, surveillance and emergency response for those diseases expected to increase due to climate change	*Disease surveillance, prevention and emergency response measures strengthened, Contingency plans developed and in place.*	a) Implement the Healthy City Programme to protect and enhance the health of city dwellers.	2022-2028	Department of EDCS (Health and Environment Services Division) **Partner Agencies:** All other city departments
		b) Develop the Healthy Cities Profile and Plan and update it on a regular basis.[1]	2022-2027	Department of EDCS (Health and Environment Services Division) **Partner Agencies:** All other city departments
		c) Institute programs to raise awareness of Windhoek residents on various communicable and non-communicable diseases and how to prevent them e.g. Hepatitis E and Cholera.	2022-2027	Department of EDCS (Health and Environment Services Division) **Partner Agencies:** All other city departments
		d) Implement the Health and Hygiene Promotion Strategy	2022-2027	Department of EDCS (Health and Environment Services Division) **Partner Agencies:** • All other city departments. • UN Agencies. • Donor Agencies.
2. Improve access of vulnerable groups to health facilities and basic services	*Existing mechanisms for vulnerable groups strengthened and ready for climate related emergencies.*	a) Put in place contingency plan to all vulnerable groups to access basic services during disasters such as floods, fire, drought and extreme heat events	2022-2028	Department of EDCS (Health and Environment Services Division) **Partner Agencies:** All other city departments
3. Improve access to sanitation and safe drinking water for all	*Access to sanitation and safe drinking water improved.*	a) Restructure and review the mandate of the WATSAN (Water and Sanitation) Committee of Council to better respond	2022-2026	Department of EDCS (Health and Environment Services Division) and WATSAN

[1] The Council Health Profile will provide accurate, up to date, unbiased and independent information about citizen's health which is crucial for development of interventions.

Windhoek residents particularly in informal settlements		to sanitation needs especially in informal settlements.		**Partner Agencies:** All other city departments
		b) Develop a Windhoek Water and Sanitation Plan to guide the provision of water and sanitation services.	2022-2026	Department of EDCS (Health and Environment Services Division) and WATSAN **Partner Agencies:** All other city departments

Focus Area A5: Disaster Preparedness

Strategic aim	Targets	Activity	Timeframe	Lead Department
1. Strengthen the City's disaster management strategy, forecasting and early warning systems	*Climate risk induced disaster management strategy and plans and early warning systems improved*	a) Conduct city wide vulnerability assessment to identify critical hazards and areas at risk	2022-2024	Department of EDCS (Emergency and Disaster Management Division) **Partner Agencies:** All other city departments
		b) Develop hazard specific plans to address the hazards identified in the vulnerability assessment	2022-2024	Department of EDCS (Emergency and Disaster Management Division) **Partner Agencies:** All other city departments
		c) Work with national government and relevant stakeholders to research, cost, develop and implement early warning systems for climate related hazards.	2022-2024	Department of EDCS (Emergency and Disaster Management Division) **Partner Agencies:** All other city departments
		d) Review Council's Disaster Risk Management Plan to make it proactive and mainstream disaster risk into development plans	2022-2024	Department of EDCS (Emergency and Disaster Management Division) **Partner Agencies:** All other city departments
2. Improve the disaster preparedness and disaster response mechanism	*The Council's response to disasters, recovery and rehabilitation improved*	a) Implement and report on the Ten Essentials for Making Cities Resilient as part of the Sendai Framework for Disaster Risk Reduction.	2022-2028	Department of EDCS (Emergency and Disaster Management Division) **Partner Agencies:** All other city departments
		b) Develop and maintain firebreaks around the City to act as a buffer against grass fires from surrounding Farms.	2022-2028	Department of EDCS (Emergency and Disaster Management Division) **Partner Agencies:** All other city departments
3. Strengthen the Windhoek residents' awareness on disaster risk to improve resilience	*Windhoek residents are well informed about potential disaster risks and measures to reduce vulnerability*	a) Increase the coverage of the Integrated Community Awareness Program to target all communities in the city particularly the youth, vulnerable communities, women, children and elderlies.	2022-2028	Department of EDCS (Emergency and Disaster Management Division) **Partner Agencies:** All other city departments
		b) Implement the Disaster Risk Management Schools Initiative	2022-2028	Department of EDCS (Emergency and Disaster Management Division) **Partner Agencies:** All other city departments

Focus Area A6: Sustainable Urban Agriculture

Strategic aim	Targets	Activity	Timeframe	Lead Department
Strengthen the City's food security and production capacity	*Sustainable Urban Agriculture plan and policy developed and in place.*	a) Convene a stakeholder's workshop on how to improve food production in Windhoek.	2022-2024	**Department of EDCS** (Social and Youth Development Division) **Partner Agencies:** • All other city departments. • Donor Agencies
		b) Commission the development of the Council Sustainable Urban Agriculture Policy.	2022-2025	**Department of EDCS** (Social and Youth Development Division) **Partner Agencies:** • All other city departments. • Donor Agencies

8.2 AGENDA B: MITIGATION

Focus Area B1: Sustainable Energy and Low Carbon Development

Strategic aim	Targets	Activity	Timeframe	Lead Department
4. Enable access to modern, clean and affordable energy services for all Council's inhabitants by diversifying the electricity bulk supply to the City.	*The Council to become a leading off taker of Renewable Energy in Namibia by 2025*	a) Create an enabling environment for investment in renewable energy projects.	2022-2028	Department of Electricity **Partner Agencies:** • NamPower • Ministry of Mines and Energy • Environmental Investment Fund • Electricity Control Board • Khomas Regional Council • Namibia Energy Institute
		b) Develop a renewable energy solar plant for the Council.	2022-2028	Department of Electricity **Partner Agencies:** All relevant city departments
		c) Promote investment in Independent Power producers.	2022-2028	Department of Electricity **Partner Agencies:** All relevant city departments
		d) Collaborate with key partners in renewable energy sector to mobilize resources for renewable energy investment in the city.	2022-2028	Department of Electricity **Partner Agencies:** • All relevant city departments. • External stakeholders.
		e) Investigate the feasibility of constructing a Waste-to-Energy Power Plant in Windhoek.	2022-2028	Department of Electricity **Partner Agencies:** • All relevant city departments. • External stakeholders.

5. Improve energy efficiency in public and municipal buildings	*Reduce energy consumption in public and municipal buildings.*	a) Initiate, implement and strengthen energy efficiency programmes (such as retrofitting of municipal buildings and street lights).	2022-2028	Department of Electricity **Partner Agencies:** • All relevant city departments
		b) Amend building regulations to ensure that all building plans meet/incorporate energy efficiency as criteria for approval.	2022-2028	Department of Electricity **Partner Agencies:** • All relevant city departments
		c) Initiate and implement energy efficiency awareness programs to developers, private residents and public institutions.	2022-2028	Department of Electricity **Partner Agencies:** • All relevant city departments

Focus Area B2: Waste Minimization and Management

Strategic aim	Targets	Activity	Timeframe	Lead Department
1. Improve waste management systems in the Council	*The Council to become the cleanest city in Africa by 2025*	a) Increase environmental education by introducing waste management programs to all residents, businesses and institutions.	2022-2028	Department of IWTS (Solid Waste Management Division) **Partner Agencies:** All relevant city departments
		b) Conduct regular audits of the Council's Waste Management Systems to improve efficiency and effectiveness.	2022-2028	Department of IWTS (Solid Waste Management Division) **Partner Agencies:** Health and Environment Service Division
		c) Implement Environmental Management Plans (EMPs) for all waste disposal sites	2022-2028	Department of IWTS (Solid Waste Management Division) **Partner Agencies:** All relevant city departments
		d) Update and implement the Integrated Waste Management Plan	2022-2028	Department of IWTS (Solid Waste Management Division) **Partner Agencies:** All relevant city departments
		e) Explore innovative technologies for sanitation especially in informal settlements to improve health and avoid environmental pollution.	2022-2028	Department of IWTS (Solid Waste Management Division) **Partner Agencies:** All relevant city departments
2. Increase efforts to reduce waste, increase re-use and recycling in the Council	*The quantity of waste generated in Windhoek and the toxicity thereof significantly reduced.*	a) Implement the Council's Waste Reduction Strategy.	2022-2026	Department of IWTS (Solid Waste Management Division) **Partner Agencies:** All relevant city departments
		b) Investigate the feasibility of constructing a Waste-to-Energy Power Plant in Windhoek.	2022-2026	Department of IWTS (Solid Waste Management Division) **Partner Agencies:** All other city departments

Focus Area B3: Sustainable Transportation

Strategic aim	Targets	Activity	Timeframe	Lead Department
1. Adopt other modes of transportation that creates a quality urban environment, improves resilience and environmental sustainability	*Efficient, integrated and intermodal transportation system implemented.*	a) Implement the City's Non-Motorised Transport (NMT) Strategy which seeks to change individual travel behaviour in favour of more sustainable options and to effectively utilise the available capacity in the overall transport system.	2022-2028	Office of the CEO (Strategy Advisor: Smart Cities & Transport) **Partner Agencies:** All relevant city departments
2. Reduce traffic congestions and emissions from vehicles in Windhoek	*Flexible working options rolled out by 2025.*	a) Implement the Flexible Working Project. This project comprises some options, including flexi-time, compressed work weeks, remote working or telecommuting options. This project will first be implemented at the Council.	2022-2028	Office of the CEO (Strategy Advisor: Smart Cities & Transport) **Partner Agencies:** All relevant city departments

8.3 AGENDA C: CROSS-CUTTING ISSUES

Focus Area C1: Public Awareness and Capacity Building

Strategic aim	Targets	Activity	Timeframe	Lead Department
1. Investigate the feasibility of developing a Sustainability Institute in Windhoek that will facilitate the dissemination of climate change and other environmental information	*The feasibility of a Windhoek Sustainability Institute investigated by 2026*	a) Conduct a feasibility assessment for the development of a Sustainability Institute in Windhoek through partnership with the private sector.	2022-2028	Department of EDCS (Health and Environment Services Division) **Partner Agencies:** • All relevant city departments. • City of Bremen
2. Coordinate Environmental Education activities in Windhoek	*Windhoek Environmental Education Coordination Unit operational by 2023*	a) Create and approve a Windhoek Environmental Education Coordination Unit Structure. b) Secure partnership / MoU's with relevant stakeholders to fully participate in the activities of the Unit. c) Integrate Climate Change information in all Cities awareness activities to increase coverage.	2022-2026 2022-2026 2022-2026	Department of EDCS (Health and Environment Services Division) **Partner Agencies:** • All relevant city departments. • City of Bremen Department of EDCS (Health and Environment Services Division) Department of EDCS (Health and Environment Services Division)
3. Develop an online newsletter to inform the public about the various climate change activities	*Quarterly Online Newsletter initiated by 2023*	a) Design and launch the citywide online newsletter in conjunction with other stakeholders.	2022-2026	Department of EDCS (Health and Environment Services Division) **Partner Agencies:** • All relevant city departments.

in Windhoek				• City of Bremen
4. Develop basic capacity for City officials in Climate change management.	*Tailor-made training program developed for Council officials by 2022*	a) Identify relevant training needs for the Officials for both formal and informal trainings.	2022-2027	Department of EDCS (Health and Environment Services Division) **Partner Agencies:** • All relevant city departments. • City of Bremen
		b) Allocate/Secure funds to implement the training program.	2022-2027	Department of EDCS (Health and Environment Services Division) **Partner Agencies:** • All relevant city departments. City of Bremen

Focus Area C2: Monitoring and Evaluation

Strategic aim	Targets	Activity	Timeframe	Lead Department
1. Promote the monitoring of GHGs emissions within Windhoek	*GHGs emissions within Windhoek monitored and reported.*	a) Develop a framework for the monitoring of GHGs emissions	2022-2026	Department of EDCS (Health and Environment Services Division) **Partner Agencies:** • All relevant city departments • ICLEI

9. IMPLEMENTATION FRAMEWORK

Ultimately, the successful implementation of this Strategy and Action Plan is the responsibility of all City departments, residents, public institutions, businesses and NGOs. However, to ensure efficiency and effectiveness in the implementation of the Strategy and Action Plan there is a need to have a governance structure. As such, the following stakeholders will play a role in the implementation of this Strategy and Action Plan.

A. Windhoek City Council

Council has the responsibility for high-level oversight of the city's climate change commitments and this Strategy and Action Plan as a whole.

B. Implementing Agency

The city department (Economic Development and Community Services through its Health and Environment Services Division) that is tasked with the responsibility of ensuring environmental sustainability in the city will serve as the Implementing Agency for this Strategy and Action Plan. The Implementing Agency will be responsible for the overall management of the actions, champion, coordinate and facilitate the implementation of this Strategy and Action Plan. The Implementing Agency will also be responsible for the provision of secretarial services to the Windhoek Climate Change Steering Committee.

C. Windhoek Climate Change Steering Committee

The Windhoek Climate Change Steering Committee (CCSC) will be established to oversee the overall implementation of the WICCSAP and to facilitate the corporation between the various departments of the Council and prepare updates and reports to the responsible Council Committee. The committee will comprise of a variety of stakeholders to be drawn from various civic and governmental organisations and from within the Council.

D. Partnerships

The Council has collaborated with a lot of organizations and cities around the world to scale up municipal climate action. These partnerships will significantly contribute to the success of this Strategy and Action Plan. Twinning partnerships with other Namibian Local Authorities, Regional Cities and Global Cities is

important such as the Bremen-Windhoek Climate Partnership. Twinning arrangements promote direct collaborations, benchmarking, and collective problem solving, among others.

E. Ministry of Environment and Tourism and National Climate Change Committee

The Ministry of Environment and Tourism (MET) through its Climate Change Unit (CCU) has the overall responsibility of coordinating the implementation of the NDC-ISAP with technical and policy relevant guidance from the National Climate Change Committee (NCCC). The MET and NCCC will therefore be updated about the progress in the implementation of this strategy and will from time to time be called upon to assist with the mobilization of resources required to implement the actions in this strategy.

The CCU also ensures that the country's reporting obligations to the UNFCCC are met. The MET is the national focal point to the UNFCCC, and is responsible for coordinating the implementing climate change activities – including preparation of National Communications (NCs) and Biennial Update Reports (BURs) – through the CCU established within the Department of Environmental Affairs.

F. Ministry of Urban and Rural Development

This WICCSAP will be promoted to other local authorities with the support and coordination of the Ministry of Urban and Rural Development that is the line ministry for local authorities in Namibia.

G. Windhoek residents and civic organizations

The Windhoek residents and civic organizations will also be encouraged to take up some actions and activities aimed at improving the overall resilience of the City to climate change. Focus will be given to the youth, women, vulnerable people and children and marginalized people in Windhoek.

10. MONITORING, EVALUATION AND REPORTING

The WICCSAP will be subjected to Monitoring and Evaluation (M&E) and Reporting as part of best practice. M&E will focus on inputs into the Strategy and Action Plan, the process followed, activities implemented and the final output of the ICCSAP. These will be targeted in order to assess and demonstrate the extent to which the strategic aims of the Strategy and Action Plan have been achieved at the end. The M & E of ongoing activities will be carried out not only to support the ongoing implementation of activities but to also track the progress of the implementation of the ICCSAP in order to facilitate identification of success factors as well as challenges or barriers to attainment of strategic aims of the WICCSAP.

We envisage that mid-term evaluation of the progress of ICCSAP will serve to readjust or improve planned activities or propose new activities during the remaining half of the duration of WICCSAP to address challenges or barriers to success. At the lapse of the duration of WICCSAP, an M&E will be conducted to assess overall what will have been achieved based on strategic aims of the WICCSAP. The outcomes of the final evaluation will be used during revision of the WICCSAP for the next duration of the climate change strategy. M & E will also ensure accountability to the Council itself due to budgeted activities of the WICCSAP but also to donor agencies and other stakeholders that will fund activities of the WICCSAP.

The M & E will be under the mandate of the Department of Economic Development and Community Services at the Council. In addition, a Council Climate Change Steering Committee (CCSC) that will be established will also serve as additional body to monitor implementation of the WICCSAP. The targets and associated activities of the WICCSAP of each strategic aim will be the basis for assessing progress of the WICCSAP.

There will be periodic reporting of progress of activities of the ICCSAP to the Council Management and City Council on a second year basis. These reports will also be shared with stakeholders and other partners including the Ministry of Environment and Tourism's NCCC to update them on the progress of implementation of the WICCSAP.

11. FINANCIAL STRATEGY

Financial and other resources will be mobilized in order to implement activities outlined in the action plan to achieve strategic aims of the WICCSAP. The Council will set aside a portion of its annual budget to fund climate change activities identified in this Strategy and Action Plan.

The Council also intends to enlist the financial commitment of various stakeholders through public and private partnerships to fund some city specific climate change activities. The Environmental Investment Fund of Namibia (EIF) and the national focal ministry (MET) are very important stakeholders to source local, national, regional and international funding to enable climate change response of the Council.

The Stakeholders of the Council will also contribute financially and other resources to implement climate change activities that fall directly under their jurisdiction within the Council and its surrounding catchment areas.

Furthermore, the Council will access international climate change finance through the national designated authority (MET) and entities accredited to manage funds from Green Climate Fund, Global Environment Facility (GEF) and other climate funds such as Climate Adaptation Fund amongst others.

Climate change mitigation and adaptation will require substantial investments across many levels of government on a wide range of activities. The cost breakdown below is a conservative attempt to put monetary value to the actions that are proposed in the Action Plan of this strategy. It should be noted that the true costs of these actions might be much higher, these estimates are just there for appreciating the level of investment required to adapt and mitigate climate impacts.

Furthermore, it is worth noting that the financing of climate action is not centralized in Namibia. Central government have reiterated that it is the responsibility of each stakeholder to budget and prioritize the financing of climate action in its area of jurisdiction. The government can support such efforts through multilateral funding opportunities and other sources of financing.

It is conservatively estimated that it will cost around **2.2 billion** to implement the actions in this strategy for the first 7 years. Detailed cost estimates are summarized in the tables below.

Table 1: Focus Area A1: Water Security and Efficiency

Strategic aim	Targets	Activity	Estimated Cost (N$)	Lead Department
4. Promote conservation and sustainable utilization of water resources	*Conservation and sustainable use of water promoted and measures implemented*	g) Upgrade the current Gammams and Otjomuise Waste Water Treatment Plants to increase its capacity and efficiency.	982,000,000	Infrastructure, Water and Technical Services
		h) Commission a study to determine losses in the Council's water supply network and implement measures to reduce losses.	3,000,000	Infrastructure, Water and Technical Services
		i) Implement the Council's Water Demand Management Strategy to reduce water demand in the face of projected climate change impacts.	10,000,000	Infrastructure, Water and Technical Services
		j) Explore options for reducing evaporation of water in dams.	3,000,000	Infrastructure, Water and Technical Services
		k) Develop and implement a Cleaner Production Policy and Water Sensitive Urban Design Principles to help reduce water use in industries and other bulk users.	1,000,000	Infrastructure, Water and Technical Services
		l) Develop the Windhoek Integrated Water and Wastewater Master Plan	Already funded	Infrastructure, Water and Technical Services
5. Augment current water supply to the City to meet water demand	*By 2025 the capacity of the CoW's aquifer is increased to 24 million cubic meters per annum*	b) Expand the capacity of the Windhoek aquifer by drilling additional boreholes and installation of recharging equipment.	500,000,000	Infrastructure, Water and Technical Services
	Increase the CoW's alternative water sources	c) Develop a new water reclamation plant to increase the City's reclamation capacity.	To be funded by GRN	Infrastructure, Water and Technical Services
		d) The Council should participate, contribute to discussions and be represented at the Cabinet Technical Committee of Experts on water.	N/A	Infrastructure, Water and Technical Services
6. Improve water governance in the Council	*Water governance in the City improved by 2025*	b) Improve the efficiency of the existing committees and other platforms to improve communication between national and city stakeholders.	N/A	Infrastructure, Water and Technical Services
		TOTAL ESTIMATED COST	**1,499,000,000**	

Table 2: Focus Area A2: Biodiversity and Ecosystem Goods and Services

Strategic aim	Targets	Activity	Estimated Cost (N$)	Lead Department
3. Maintenance of the integrity of ecosystems to ensure climate resilience and environmental sustainability	*By 2025 the CoW's ecosystems and Public Open Spaces of conservation significance accorded formal protection and are managed sustainably*	e) Identify and assess vulnerable ecosystems and accord them appropriate zoning (conservation) to ensure its protection	150,000	Economic Development and Community Services
		f) Develop and implement Windhoek Biodiversity Management Plan	3,000,000	Economic Development and Community Services
		g) Develop area specific management plans for conservation areas	200,000	Economic Development and Community Services
		h) Conduct an assessment and prioritize the immediate costs and long-term financial and environmental benefits of the protection and maintenance of areas, which provide key ecosystem services and ecological infrastructure.	200,000	Economic Development and Community Services
4. Promote conservation and sustainable utilization of natural resources	*The regulation of the use of natural resources improved*	c) Develop Windhoek Environmental Management Regulations to regulate the use and harvesting of natural resources	To be funded by the European Union through GIZ	Economic Development and Community Services
		d) Improve the enforcement of legislations to curb the unsustainable and illegal utilization of natural resources and initiate a program to promote sustainable cooking technologies.	3,000,000	Economic Development and Community Services
		TOTAL ESTIMATED COST	**6,550,000**	

Table 3: Focus Area A3: The Built Environment (Human Settlements)

Strategic aim	Targets	Activity	Estimated Cost (N$)	Lead Department
4. Secure the provision of and access to basic municipal services	*Increase access to 80% of resident to (100m radius water and 200m toilets) basic municipal services by 2025.*	c) Provide and maintain general basic services (water and sanitation services as well as regular refuse removal) to the informal settlement areas in line with national guidelines.	120,000,000	Housing, Property Management & Human Settlement
		d) Conduct a pilot study to address shortcomings in the existing approach and find a sustainable solution to providing basic services in the informal settlement areas.	500,000	Housing, Property Management & Human Settlement
5. Promote secure land tenure for informal settlement households	*Informal settlement house owners have land tenure by 2025.*	e) Investigate various land tenure systems and implement the appropriate one in the informal settlements	200,000	Housing, Property Management & Human Settlement

		f) Fast track the implementation of Flexible Land Tenure Act		Housing, Property Management & Human Settlement
6. Eradicate the proliferation of informal settlements	*At least three Informal settlements must be formalized per year.*	c) Implement the Upgrading and Development Strategy, which aims to formalize informal settlements.	50,000,000	Housing, Property Management & Human Settlement
		d) Reduce the minimum plot size from 300m^2 to 200m^2 to accommodate more people.	N/A	Housing, Property Management & Human Settlement
		g) Initiate and implement an affordable Housing Scheme in the informal settlements.	100,000,000	Housing, Property Management & Human Settlement
		h) Review policies to consider alternative building methods the structures must be climate resilient (such as the building regulations	500,000	Housing, Property Management & Human Settlement
	By-laws to curb land invasion and informal structures successfully implemented	c) Improve law enforcement to prevent the further erection of illegal structures	5,000,000	City Police
		d) Engage all relevant stakeholders for the successful implementation of, and law enforcement to curb informal settlements.	200,000	City Police
		TOTAL ESTIMATED COST	**276,400,000**	

Table 4: Focus Area A4: Healthy Communities

Strategic aim	Targets	Activity	Estimated Cost (N$)	Lead Department
6. Strengthen disease prevention, surveillance and emergency response for those diseases expected to increase due to climate change	*Disease surveillance, prevention and emergency response measures strengthened, Contingency plans developed and in place.*	e) Implement the Healthy City Programme to protect and enhance the health of city dwellers.	250,000	Economic Development and Community Services
		f) Develop the Healthy Cities Profile and Plan and update it on a regular basis.[2]	350,000	Economic Development and Community Services
		g) Institute programs to raise awareness of Windhoek residents on	150,000	Economic Development and Community Services

			various communicable and non-communicable diseases and how to prevent them e.g. Hepatitis E and Cholera.		
		h)	Implement the Health and Hygiene Promotion Strategy	300,000	Economic Development and Community Services
7. Improve access of vulnerable groups to health facilities and basic services	*Existing mechanisms for vulnerable groups strengthened and ready for climate related emergencies.*	b)	Put in place contingency plan to all vulnerable groups to access basic services during disasters such as floods, fire, drought and extreme heat events.	2,000,000	Economic Development and Community Services
8. Improve access to sanitation and safe drinking water for all Windhoek residents particularly in informal settlements	*Access to sanitation and safe drinking water improved.*	c)	Restructure and review the mandate of the WATSAN (Water and Sanitation) Committee of Council to better respond to sanitation needs especially in informal settlements.	100,000	Economic Development and Community Services
		d)	Develop a Windhoek Water and Sanitation Plan to guide the provision of water and sanitation services.	300,000	Economic Development and Community Services
			TOTAL ESTIMATED COST	**3,450,000**	

Table 5: Focus Area A5: Disaster Preparedness

Strategic aim	Targets	Activity	Estimated Cost (N$)	Lead Department
4. Strengthen the City's disaster management strategy, forecasting and early warning systems	*Climate risk induced disaster management strategy and plans and early warning systems improved*	e) Conduct city wide vulnerability assessment to identify critical hazards and areas at risk	3,000,000	Economic Development and Community Services
		f) Develop hazard specific plans to address the hazards identified in the vulnerability assessment	2,000,000	Economic Development and Community Services
		g) Work with national government and relevant stakeholders to research, cost, develop and implement early warning systems for climate related hazards.	1,000,000	Economic Development and Community Services
		h) Review Council's Disaster Risk Management Plan to make it proactive and mainstream disaster risk into development plans	500,000	Economic Development and Community Services
5. Improve the disaster preparedness and disaster response mechanism	*The Council's response to disasters, recovery and rehabilitation improved*	c) Implement and report on the Ten Essentials for Making Cities Resilient as part of the Sendai Framework for Disaster Risk Reduction.	5,000,000	Economic Development and Community Services
		d) Develop and maintain firebreaks around the City to act as a buffer against grass fires from surrounding Farms.	10,000,000	Economic Development and Community Services
6. Strengthen the Windhoek residents' awareness on disaster risk to improve resilience	*Windhoek residents are well informed about potential disaster risks and measures to reduce vulnerability*	c) Increase the coverage of the Integrated Community Awareness Program to target all communities in the city particularly the youth, vulnerable communities, women, children and elderlies.	1,500,000	Economic Development and Community Services
		d) Implement the Disaster Risk Management Schools Initiative	1,000,000	Economic Development and Community Services
		TOTAL ESTIMATED COST	**24,000,000**	

Table 6: Focus Area A6: Sustainable Urban Agriculture

Strategic aim	Targets	Activity	Estimated Cost (N$)	Lead Department
Strengthen the City's food security and production capacity	*Sustainable Urban Agriculture plan and policy developed and in place.*	c) Convene a stakeholder's workshop on how to improve food production in Windhoek.	200,000	Economic Development and Community Services
		d) Commission the development of the Council Sustainable Urban Agriculture Policy.	350,000	Economic Development and Community Services
		TOTAL ESTIMATED COST	**550,000**	

Table 7: Focus Area B1: Sustainable Energy and Low Carbon Development

Strategic aim	Targets	Activity	Estimated Cost (N$)	Lead Department
Enable access to modern, clean and affordable energy services for all Council's inhabitants by diversifying the electricity bulk supply to the City.	*The Council to become a leading off taker of Renewable Energy in Namibia by 2025*	f) Create an enabling environment for investment in renewable energy projects.	200,000	Electricity
		g) Develop a renewable energy solar plant (25 MW) in Windhoek.	Will be funded through a Public Private Partnership on a Build Own and Operate (BOO) Model.	Electricity
		h) Promote investment in Independent Power producers.	200,000	Electricity
		i) Collaborate with key partners in renewable energy sector to mobilize resources for renewable energy investment in the city.	200,000	Electricity
		j) Investigate the feasibility of constructing a Waste-to-Energy Power Plant in Windhoek.	20,000,000	Electricity
Improve energy efficiency in public and municipal buildings	*Reduce energy consumption in public and municipal buildings.*	d) Initiate, implement and strengthen energy efficiency programmes (such as retrofitting of municipal buildings and streetlights).	2,000,000	Electricity
		e) Amend building regulations to ensure that all building plans meet/incorporate energy efficiency as criteria for approval.	300,000	Electricity
		f) Initiate and implement energy efficiency awareness programs to developers, private residents and public institutions.	200,000	Electricity
		TOTAL ESTIMATED COST	**23,100,000**	

Table 8: Focus Area B2: Waste Minimization and Management

Strategic aim	Targets	Activity	Estimated Cost (N$)	Lead Department
3. Improve waste management systems in the Council	*The Council to become the cleanest city in Africa by 2025*	f) Increase environmental education by introducing waste management programs to all residents, businesses and institutions.	5,000,000	Infrastructure, Water and Technical Services
		g) Conduct regular audits of the Council's Waste Management Systems to improve efficiency and effectiveness.	500,000	Infrastructure, Water and Technical Services
		h) Implement Environmental Management Plans (EMPs) for all waste disposal sites	3,000,000	Infrastructure, Water and Technical Services
		i) Update and implement the Integrated Waste Management Plan	500,000	Infrastructure, Water and Technical Services
		j) Explore innovative technologies for sanitation especially in informal settlements to improve health and avoid environmental pollution.	10,000,000	Infrastructure, Water and Technical Services
4. Increase efforts to reduce waste, increase re-use and recycling in the Council	*The quantity of waste generated in Windhoek and the toxicity thereof significantly reduced.*	c) Implement the Council's Waste Reduction Strategy.	30,000,000	Infrastructure, Water and Technical Services
		TOTAL ESTIMATED COST	**49,000,000**	

Table 9: Focus Area B3: Sustainable Transportation

Strategic aim	Targets	Activity	Estimated Cost (N$)	Lead Department
3. Adopt other modes of transportation that creates a quality urban environment, improves resilience and environmental sustainability	*Efficient, integrated and intermodal transportation system implemented.*	b) Implement the City's Non-Motorised Transport (NMT) Strategy, which seeks to change individual travel behaviour in favour of more sustainable options and to effectively utilise the available capacity in the overall transport system.	400,000,000	Office of the CEO
4. Reduce traffic congestions and emissions from vehicles in	*Flexible working options rolled out by 2025.*	b) Implement the Flexible Working Project. This project comprises some options, including flexi-time, compressed work weeks, remote working or telecommuting options. This project will first be	N/A	Office of the CEO

Windhoek		implemented at the Council.		
		TOTAL ESTIMATED COST	**400,000,000**	

Table 10: Focus Area C1: Public Awareness and Capacity Building

Strategic aim	Targets	Activity	Estimated Cost (N$)	Lead Department
5. Investigate the feasibility of developing a Sustainability Institute in Windhoek that will facilitate the dissemination of climate change and other environmental information	*The feasibility of a Windhoek Sustainability Institute investigated by 2026*	a) Conduct a feasibility assessment for the development of a Sustainability Institute in Windhoek through partnership with the private sector.	2,000,000	Economic Development and Community Services
6. Coordinate Environmental Education activities in Windhoek	*Windhoek Environmental Education Coordination Unit operational by 2023*	a) Create and approve a Windhoek Environmental Education Coordination Unit Structure. b) Secure partnership / MoU's with relevant stakeholders to fully participate in the activities of the Unit. c) Integrate Climate Change information in all Cities awareness activities to increase coverage.	3,000,000	Economic Development and Community Services
7. Develop an online newsletter to inform the public about the various climate change activities in Windhoek	*Quarterly Online Newsletter initiated by 2023*	a) Design and launch the citywide online newsletter in conjunction with other stakeholders.	300,000	Economic Development and Community Services
8. Develop basic capacity for City officials in Climate change management.	*Tailor-made training program developed for Council officials by 2022*	a) Identify relevant training needs for the Officials for both formal and informal trainings. b) Allocate/Secure funds to implement the training program.	1,000,000	Economic Development and Community Services
		TOTAL ESTIMATED COST	**6,300,000**	

Table 11: Focus Area C2: Monitoring and Evaluation

Strategic aim	Targets	Activity	Estimated Cost (N$)	Lead Department
2. Promote the monitoring of GHGs emissions within Windhoek	*GHGs emissions within Windhoek monitored and reported.*	b) Develop a framework for the monitoring of GHGs emissions	1,500,000	Economic Development and Community Services
		TOTAL ESTIMATED COST	**1,500,000**	

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