NATIONAL CLIMATE CHANGE ADAPTATION AND MITIGATION STRATEGY

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Contents

Abbreviations and acronyms

ANE	National Roads Entity
CC	Climate change
CCU	Climate Change Unit
CDM	Clean Development Mechanism
CERUM	Multiple Uses Resource Centres
CGCMC	Centre for the Management of Climate Change Knowledge
CH_4	Methane
CNA	Capacity Needs Assessment
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
CONDES	National Council for Sustainable Development
CT-CONDES	Technical Council of CONDES
CTGC	Technical Council for Disaster Management
DNA	Designated National Authority
DNGA	National Directorate for Environmental Management
DNTF	National Directorate of Land and Forests
DPO	Development of Policy Operations
ENDe	National Development Strategy
FCPF	Forest Carbon Partnership Facility
FDA	Fund for the Agricultural Development
FNC	First National Communication
FUNAB	National Environmental Fund
FUNAE	National Energy Fund
GDP	Gross domestic product
GHG	Greenhouse gases
GIIMC	Inter-Institutional Group for Climate Change
GWP	Global-warming potential
HFCs	Hydrofluorocarbons
INAM	National Institute for Meteorology
INE	National Institute of Statistics
INGC	National Institute for Disasters Management
IPCC	(United Nations) Intergovernmental Panel on Climate Change
LDCs	Least-developed countries
MCT	Ministry of Science and Technology
MDG	Millennium Development Goals
MEA	Multilateral Environmental Agreements
MICOA	Ministry for the Coordination of Environmental Affairs
MINAG	Ministry of Agriculture
MISAU	Ministry of Health
MITUR	Ministry of Tourism

MOPH	Ministry of Public Works and Housing
MPD	Ministry of Planning and Development
MPescas	Ministry of Fisheries
MRV	Measuring, reporting and verification
N_2O	Nitrous oxide
NAPA	National Adaptation Plan of Action
NCCAMS	National Climate Change Adaptation and Mitigation Strategy
NF_3	Nitrogen trifluoride
NGOs	Non-governmental organizations
NUCP	National Unity of Civil Protection
OCB	Community-based organizations
OE	State budget
PARP	Poverty Reduction Action Plan
PEDSA	Strategic Plan for Agricultural Development
PES	Central-level Social and Economic Plan
PESOD	District-level Social and Economic Plan
PESS	Strategic Plan for the Health Sector
PFCs	Perfluorocarbons
PPCR	Pilot Programme for Climate Resilience
R-PP	Readiness Preparation Proposal
REDD+	Reducing Emissions from Deforestation and Forest Degradation
SADC	Southern African Development Community
SETSAN	Technical Secretariat for Food Security and Nutrition
SF_6	Sulphur hexafluoride
SNC	Second National Communication
SPCR	Strategic Programme for Climate Resilience
TNA	Technology Needs Assessment
UNCED	United Nations Conference on Environment and Development
UNCSD	United Nations Conference on Sustainable Development
UNEP	United Nations Environment Programme
UNFCCC	United National Framework Convention on Climate Change

Glossary

Adaptation actions: to put in practice physical or management agreements that respond to the opportunities or threats posed by climate change (CC), such as: resettling people or goods in safer locations, relocating installations to avoid the risk of flood or changing crop varieties to those better able to cope with the climate. Enterprise associations and professional bodies, as well as central and local governmental departments, should assist in this task.

Adaptation: adjustment in a system in response to current or future changes in climate, and to its impacts. Includes changes and adjustments designed to moderate or offset potential damages or to take advantage of CC.

Adaptive capacity: the potential capacity or ability of a system, region or community to adapt successfully to the effects or impacts of climate variability or change.

Adverse effects of climate change: changes in the physical environment or biota resulting from CC, which have significant deleterious effects upon the composition, resistance or productivity of natural and managed ecosystems; the functioning of socioeconomic systems; and/or human health and welfare.

Carbon sequestration: the process of removing carbon dioxide from the atmosphere that occurs mainly in the oceans, forests and other systems in which organisms capture the gas through photosynthesis.

Climate Change (CC): any change in climate that is directly or indirectly related to human activity altering the composition of the atmosphere, additional to the natural climate variability observed during comparable time periods.

Climate sensitivity: the degree to which a system is affected (adversely or positively) by climatic stimuli.

Climate vulnerability: the degree to which human and environmental systems react when experiencing a disturbance or stress. Usually it is described as a function of three main characteristics: degree of exposition to climate phenomena, climate sensitivity, and adaptive capacity.

Global Warming Potential (GWP): a relative measure of how much heat is trapped in the atmosphere by specific greenhouse gases (GHG), compared to the same quantity of carbon dioxide (which has a GWP of 1). GWP is calculated for a specific time interval, and the values to use are defined by IPCC. The GWP of emissions/reductions are expressed in units of carbon dioxide equivalent (CO_2e).

Green economy: improvement of people's living conditions, well-being and social equity while significantly reducing environmental risks and ecological scarcities. At its simplest, a green economy can be thought of as one which is low carbon, resource efficient and socially inclusive[1]. In a green economy, growth in incomes and employment result from public and private investments that reduce carbon and other GHG emissions and pollution, enhance the efficient use of energy and other resources, and prevent the loss of biodiversity and ecosystems. The green economy is a vehicle for achieving sustainable and low-carbon development.

Greenhouse effect: GHGs in the atmosphere absorb a portion of the infrared radiation emitted by the Earth's surface. As a consequence, heat is trapped instead of being released into space. The greenhouse effect – within a certain range – is vital; it keeps the planet warm and ensures the maintenance of life. However, a stronger greenhouse effect could become catastrophic if it destabilizes the balance on the planet and gives rise to a phenomenon known as 'global warming' – an increase

1 - http://www.unep.org/greeneconomy/AboutGEI/WhatisGEI/tabid/29784/Default.aspx

in the average temperature of the Earth's surface. The Intergovernmental Panel on Climate Change (IPCC), established by the United Nations and the World Meteorological Organization in 1988, in its latest report notes that most of the warming observed over the last 50 years, has most likely originated from the increase in the concentration of GHGs in the atmosphere.

Greenhouse gases (GHG): gaseous constituents of the atmosphere, both natural and synthetic, that absorb and re-emit infrared radiation. Examples include CO_2, CH_4, N_2O, HFCs, PFCs and SF_6. In the future, according to the new IPCC guidelines, to apply from 2015 onwards, NF3 will also be considered as a GHG.

Informal settlements/slums: the peripheral areas of cities in which inhabitants live in housing that is substandard in terms of both the construction materials used and the state of preservation. These areas are also characterized by an almost total absence of ventilation; a lack of streets and, consequently, systems for water supply and sewerage; insufficient lighting; lack of clean water, sanitation and drainage ditches, which results in the accumulation of water in rainy periods, leading to increased exposure to infectious and water-borne diseases.

Low-carbon development: any intervention that promotes development and increases prosperity without compromising the environment. In other words, it involves the decoupling of increases in GHG emissions from economic development. This approach redefines the paradigm of development, and enhances resilience through innovative solutions.

Mitigation: any anthropogenic intervention that can reduce or control/prevent GHG emissions as well as increase the sink capacity for removing GHG from the atmosphere.

Resilience: degree of change that a particular system can accommodate without altering its initial state. It is the capacity of the system, community or society to resist, absorb, accommodate and recover – from exposure to climate extremes or the effects of a threat or disaster – in a timely and efficient way, through the preservation and restoration of its essential basic structures and functions.

Sink: any process, activity or mechanism that removes GHGs from the atmosphere.

Sustainable development: commonly defined as development that satisfies current needs without compromising the welfare of future generations.

Technology transfer: a wide range of processes that include the movement of knowledge, experience and equipment for the purposes of climate change adaptation and mitigation among different parties, such as the government, the private sector, financial, educational and research institutions and NGOs.

Preface

Dr.ª Alcinda António de Abreu

Climate change is one of the biggest challenges faced by present generations and could threaten the survival of our planet if there is no consensus on the future climate change regime which aims to keep the global average temperature increase below 2° C. Its adverse effects on ecosystems, infrastructure, welfare and human health are already being felt throughout the world. The situation is particularly harsh for African developing countries, like Mozambique, which are already facing problems of poverty, food insecurity, access to water and other climate-dependent natural resources, sanitation, and access to financial and technological resources. Even though these countries have but marginally contributed to the problem of global warming (given their low emission of greenhouse gases), they have now to pay a heavy toll to be able to adapt to different climate regimes.

In Mozambique, the adverse effects of climate change are today painfully visible, in spite of the on-going efforts to implement some immediate measures to minimize these impacts on the ground. However, there was an urgent need to develop more effective long-term responses that would enable the country to build its resilience to the significant changes ahead. It was in response to this call that the Council of Ministers approved the National Climate Change Adaptation and Mitigation Strategy.

The National Climate Change Adaptation and Mitigation Strategy (ENAMMC) now published, represents a turning point in Mozambique's response to the challenges of climate change, indicating a clear set the strategic actions to be implemented so that Mozambique is able to ensure a more prosperous, resilient and sustainable future. We counted, in its preparation, with the efforts of many - government institutions, private sector, academia, civil society and development partners - who combined their knowledge, experiences and perspectives to outline and prioritize mechanisms and actions which, once implemented, will result in the creation of adaptive capacity and climate resilience in the different ecosystems, communities and sectors of the national economy, resulting also in emissions reduction. The measures included in the Strategy were also designed to respond to two other key priorities for the country - poverty reduction and environmental sustainability.

Now we start a new chapter - that of implementing the guidance set out in this Strategy. Its success will only be achieved with the participation of all of us. Only with a combined effort we can, in 2025, have a greener and climate resilient Mozambique, with a vibrant green economy in all social and economic sectors.

For a Beautiful, Green and Prosperous Mozambique!

The Minister

Dr. Alcinda Antonio de Abreu

Executive summary

This document presents the Government of Mozambique's National Climate Change Adaptation and Mitigation Strategy (NCCAMS) covering the period 2013-2025. It includes the strategic and priority guidelines for adoption and implementation, along with an action plan for 2013-2014. Climate Change (CC) – any change in climate that is directly or indirectly related to human activity altering the composition of the atmosphere, additional to the natural climate variability observed during comparable time periods – is a determining factor for development processes, and is recognized as a major risk to the achievement of the agreed goals, mainly for the world's least-developed countries (LDCs). The effects of CC can be observed through the increased frequency and intensity of extreme climatic events such as droughts, floods, tropical cyclones, changes in the temperature and precipitation patterns, and in other phenomena, such as rising sea levels, saltwater intrusion and the spread of the forest wildfires. Many of these events are already occurring in Mozambique and, during the last decade, have caused the loss of thousands of human lives and the destruction of public and private infrastructure, including schools, hospitals, access routes, houses and tourist facilities. These losses negatively impact the growth of the country's gross domestic product (GDP), and the achievement of the Government's national objectives for poverty reduction and wealth creation, including those assumed at the international level, such as the Millennium Development Goals (MDG).

Given that CC can no longer be avoided, and that projections indicate that its impacts in Mozambique will increase in both frequency and intensity, the NCCAMS has been prepared. This Strategy identifies the key areas and actions to diminish the severity of the impacts through adaptation measures and the reduction of climate risks, and to create benefits through mitigation and low-carbon development opportunities.

The NCCAMS has five chapters:

1. Introduction and the Strategy's rationale.
2. The methodology used for the document's preparation.
3. Information on the current state of knowledge on vulnerability, the impacts of CC, existing opportunities, and the status of plans to mainstream CC in national development policies.
4. The fundamental component of the Strategy, including the vision, mission, principles, general and specific objectives, and strategic actions grouped in two main pillars: (i) adaptation and reduction of the climate risk, and (ii) mitigation and low-carbon development. The NCCAMS is also supported by a set of cross-sectoral issues, including a number of actions which support the implementation of the pillars.
5. Implementation mechanisms for the NCCAMS, including coordination, monitoring and evaluation (M&E), and financing.

This Strategy is based on the United Nations Framework Convention on Climate Change (UNFCCC) and in the Hyogo Framework for Action on disaster risk reduction. It is supported by the basic principles of such international treaties; national policies on gender, social equity and CC; and sectoral policies and strategies that aim to promote peaceful and climate-change-resilient development, energy efficiency and the sustainable use of natural resources.

This document has been prepared in 2012 by the Inter Institutional Group on Climate Change (GIIMC), representing a number of sectoral ministries, the private sector and civil society, under the coordination of the Ministry for the Coordination of the Environmental Affairs (MICOA). The process consisted of: (i) a review of the legal and institutional framework on CC, as well as of the sectoral development policies and strategies, including integrated development policies and programmes; (ii) review of technical information on the impact of CC and GHG emissions, including National Communications, inventories of GHG emissions and removals, and projections for climate scenarios and associated sectoral impacts; (iii) consultations with representatives of different sectors from

ministries, the private sector, civil society, academics and the public in general through provincial and regional seminars and targeted consultations. This document was presented, discussed and revised at a joint session of the Technical Councils of the National Council for the Sustainable Development (CT-CONDES) and the Technical Council for the Disasters Management (CTGC), and in the Advisory Councils of the Ministry of Public Works and Housing (MOPH), the Ministry of Planning and Development (MPD), the Ministry of Mineral Resources (MIREM) and the Ministry of Agriculture (MINAG), as well as in Provincial Government sessions.

NCCAMS's general objective is to "establish the action guidelines to create resilience through climate risk reduction in communities and the national economy, and promoting low-carbon development and the green economy through its integration in the sectoral and local planning process". The specific objectives are: (i) that Mozambique becomes resilient to the impacts of CC, reducing climate risks to people and property to a minimum, and restoring and ensuring the rational use and the protection of natural and physical capital; (ii) identify and make use of opportunities to reduce GHG emissions that simultaneously contribute to the sustainable use of natural resources and access to financial and technological resources at affordable prices, and reduce pollution and environmental degradation, promoting low-carbon development; and (iii) build institutional and human capacity, as well as explore opportunities to access technological and financial resources, for the implementation of the NCCAMS.

The Strategy defines adaptation and climate risk reduction as a national priority, while recognizing the need to make use of the opportunities that the country has, without compromising development, to reduce the impacts of CC through a set of mitigation and low-carbon development actions.

In addition, there is a need to adjust the policies and institutions, to build the capacity to implement the Strategy at all levels, to generate knowledge and to spread it among the society aiming at a scientific and technically informed decision making, a series of cross sectoral strategic actions is considered, on which implementation of the present Strategy will subside.

The strategic actions are grouped under the two main pillars and cross-sectoral issues:

1. Adaptation and climate risk reduction

- strengthen early warning systems
- increase capacity to prepare responses to climate risks
- increase capacity to manage water resources
- increase access and capacity to capture, store, treat and distribute water
- increase the resilience of agriculture and livestock
- increase the resilience of fisheries
- guarantee adequate levels of food security and nutrition
- increase the adaptive capacity of vulnerable people
- reduce people's vulnerability to CC-related vector-borne diseases
- promote mechanisms for the planting of trees, and establish forests for local use
- develop resilience mechanisms for urban areas and other settlements
- suit the development of tourist zones and coastal zones to reduce the impacts of CC

2. Mitigation and low-carbon development

- improve access to renewable energy
- increase energy efficiency

- guarantee the development of regulations dealing with emissions from the extractive industries
- promote low-carbon urbanization
- control emissions from industrial processes, including solid waste and wastewater
- develop low-carbon agricultural practices
- reduce deforestation and the occurrence of wildfires
- plan and manage biodiversity and coastal ecosystems
- manage and set a price for waste

3. Cross-sectoral issues

- align the current legal framework with the NCCAMS
- align the current institutional framework with the NCCAMS
- develop research on CC
- strengthen institutions' systematic data collection on inputs to GHG inventories and National Communications
- develop the level of knowledge and capacity to act on CC
- promote the transfer and adoption of clean and CC-resilient technologies

To facilitate the implementation of this cross-sectoral Strategy including the participation of actors from the community to the national level, it was decided that:

- the coordination of implementation is run by the Climate Change Unit (CCU) that will be created in the CONDES Secretariat, and will be responsible for the strategic orientation, cross-sectoral coordination and M&E;
- the implementation of the actions in this Strategy will be performed in an integrated and coordinated way by actors from the public and private sectors, civil society and community-based organizations (CBOs), according to the plan of action;
- the coordination of finance will be undertaken by the National Environment Fund (FUNAB), and the necessary funds will arise from the state budget (OE) and Multilateral Environmental Agreements (MEA), bilateral accords and other resources mobilized by the private sector and civil society, while the possibility of creating a CC-related common fund and gathering funds through social corporations and individuals will be evaluated;
- CC knowledge will be managed by the Centre for the Management of the CC Knowledge (CGCMC), which will be created in the Academy of Sciences of Mozambique, within the Ministry of Science and Technology (MCT), having as its basis the existing institutions, with thematic groups managed by their corresponding public entities, which constitute a CC Network. The CGCMC will be a repository for studies, and will have a role in coordinating and disseminating research, and providing training to meet needs identified by all relevant stakeholders – particularly by the GIIMC in partnership with the CCU – and will function through a CC Network composed of thematic groups that will identify existing knowledge, and coordinate research-based knowledge generation. The thematic areas that constitute the Network will be coordinated by the sectoral ministries, which are mandated to deal with such issues through their respective research institutions. The Network will coordinate a network of research institutions, higher-education organizations, other entities that systematically collect climate and sectoral-activity data, and other organizations identified as holding or producing relevant data or information. Besides this function, the CGCMC shall elaborate communication plans aiming to spread the acquired knowledge and information in order to promote an informed Mozambican society able to make decisions about the challenges, risks and opportunities posed by CC.

An action plan covering 2013–2014 was prepared to ensure the implementation of the first phase of the Strategy. Its main focus will be piloting, at the community level, integrated adaptation and climate risk reduction actions (possibly including low-carbon development), and institutional reform and capacity building at all levels, including the establishment of the CCU and the CGCMC. The estimated cost for this phase is about USD 142.0 million, disaggregated to USD 63.9 million in 2013 and USD 78.1 million in 2014. By the end of this period, an evaluation will consider the lessons learned and will be the basis for the development of a plan of action for 2015–2019 that, after its own evaluation, will lead to a plan covering 2020–2025.

INTRODUCTION

1. Introduction

Climate Change (CC) – caused by human activities such as land-use change, agriculture, waste treatment, and industrial processes including burning fossil fuels – is one of the main problems threatening humanity as a whole and development in particular, as it results in the degradation of essential ecosystems and the destruction of natural resources, which are the basis of the economy. Scientific data demonstrate that CC results from anthropogenic GHG emissions, mainly carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O), and that recently observed atmospheric concentrations represent historic maxima.

Mozambique is particularly vulnerable to CC due to its location in the zone of inter-tropical convergence, downstream of shared watersheds; its long shoreline and the existence of extensive lowlands below sea level. The country's vulnerability is also increased by its low adaptive capacity, poverty, limited investment in modern technology, and weaknesses in its infrastructure and social services, especially those related to health and sanitation. In Mozambique, the effects of CC can be seen in changes in temperature and precipitation patterns, sea-level rises and the increase in the frequency and intensity of extreme climatic events, such as droughts, floods and tropical cyclones, which affect different regions of the country every year. These events result in the loss of human lives, crops, livestock and wildlife; the destruction of social and economic infrastructure; increased dependency on international support; food price increases; harm to human health and the environment; and the destruction of ecosystems. CC represents a major barrier to the Government and its partners' efforts to fight poverty and achieve the MDGs.

Even if global GHG emissions were stopped today, it is already acknowledged that a minimum rise in temperature of about 2ºC in 2100 relative to the average of 1960-1989 is inevitable. Climate scenarios developed for Mozambique's First National Communication (FNC) indicated that, by 2075, average air temperatures may rise between 1.8ºC and 3.2ºC; precipitation may decrease by 2–9%; solar radiation may increase by 2– 3%; and evapotranspiration may increase by 9– 13%. These results were later confirmed by INGC in 2009.[2]

Mozambique, as an LDC, has increased vulnerability to CC due to lower adaptive capacity, greater dependence of its population and economy on natural resources, as well as increased exposure to climate risk associated with its geographical location. Despite the uncertainty of the climate scenarios and the impossibility to determine the exact impacts with the current level of knowledge, adaptation is already a pressing issue.

Mozambique, as a Party to the UNFCCC since 1995, has committed to develop actions to mitigate GHG emissions, as well as to adapt its development policies to respond to the impacts of CC; promote cooperation in the scientific, technological, technical and socio-economic research fields; conduct systematic observation; provide education and training; and increase public awareness, including among NGOs, promoting wide participation in the CC response. Mozambique also ratified the Hyogo Framework for Action (2005-2015), which guides the main actions leading to disaster risks reduction, including those related to climate hazards. To fulfil the commitments in the UNFCCC, Mozambique has both internal resources from the OE and external resources, such as the Convention's own financial mechanism to support countries in meeting their adaptation and mitigation costs.

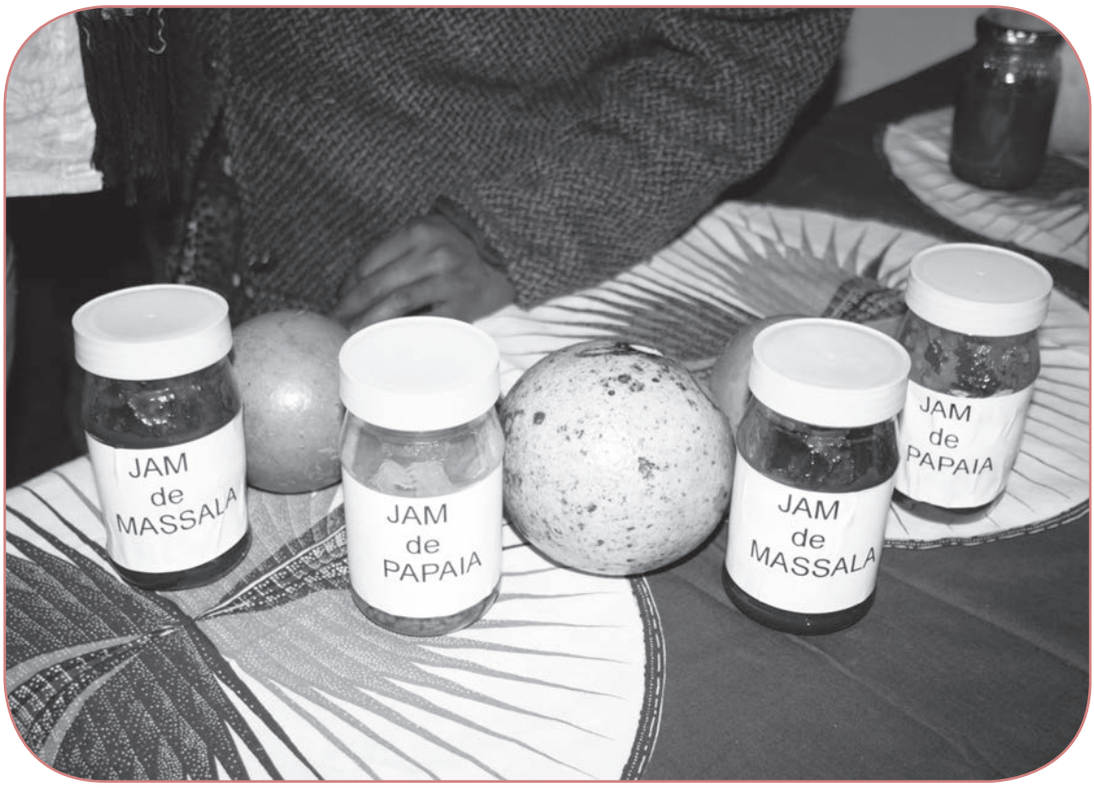
Due to poor coordination between sectors and limited capacity for mainstreaming CC in planning and budgeting documents, the widespread recognition of CC as an important issue among public, private and civil society actors has not resulted in effective adaptation and mitigation activities – instead, independent, sporadic and ineffective actions have been observed. This is despite the existence of a programme aiming at promoting the inclusion of mitigation and adaptation policies and strategies in the environmental sections of central- and district-level Social and Economic Plans (PES and PESOD, respectively[3]).

2 - INGC (2009): Estudo sobre o impacto das alterações climáticas no risco de calamidades em Moçambique. Relatório Síntese. Segunda Versão.

3 - PESOD will include CC from 2014 onwards.

It is now urgent to coordinate responses, ensuring that CC planning processes are integrated at all levels – spatially (at local, community, district, province and national levels) and sectoral. The NCCAMS has been designed to integrate the different initiatives, strengthening institutions and highlighting CC as a factor that may undermine social and economic development, in order to counter the trend through increased resilience and the promotion of a low-carbon development. In 2011, Mozambique drafted its Second National Communication (SCN), an important tool for assessing CC-related performance.

The purpose of this Strategy is to establish guidelines for action to increase resilience in communities and the national economy, which includes the reduction of climatic risks, and promoting low-carbon development and the green economy through the integration of adaptation and mitigation in sectoral and local planning.



METHODOLOGY

2. Methodology

The GIIMC – which was originally constituted by MICOA to prepare the FNC representing different sectoral ministries, the private sector and the civil society – initiated the drafting of the NCCAMS in February 2012. The group held preparatory seminars, and sought to ensure the incorporation of sectoral viewpoints through representatives. Visits were made to various ministries, as well as institutions representing the private sector and civil society, in order to gather information about sectoral strategies and evaluate their priorities and potential to implement CC adaptation and mitigation actions. A literature review of the impacts of CC and Mozambique's vulnerability was performed, with particular reference to INGC Phase II, the SCN, and the Report to the Rio +20 Conference. Part of this review included sectoral strategies, identifying guidelines that would lead to greater resilience or low-carbon development. It also suggested entry points for integrating CC considerations at the sectoral level, such as was the case with the National Development Strategy (ENDe) (in preparation). A first NCCAMS proposal was prepared and subsequently discussed in the GIIMC, the Advisory Councils of MICOA, MINAG, MIREM, MOPH, MPD and MAE, presented and discussed in provincial and regional seminars, and in CTGC, CT-CONDES and CONDES. This process was iterative and inclusive, and the document has also been made available online[4] for public and ministerial consultation, until the production of this final version.

4 - www.convambientais.gov.mz

CONTEXT

3. Context

3.1 Socio-economic environment

With average annual economic growth of about 8.0% recorded from 1996 to 2007, it is projected that less than 44.0% of Mozambique's population will live below the poverty line by 2015, down from 69.4% between 1996 and 1997. This meets the relevant MDG. Despite the country's economy being based on agriculture, new sectors such as mining, energy, transport and communications, tourism and financial activities have been arising, which will allow the emergence of more diverse and resilient economy in the medium to long term, which will be better able to face stressful international situations.

Table 1 – Economic indicators' trend

Indicators/Years	2011	2025*	2035*
Inflation: annual average	10.4%	5.1%	5.2%
State revenues/GDP	21.3%	26.9%	30.9%
Global balance after donations/GDP	-6.6%	-1.0%	-1.1%
Investment/GDP	13.1%	23.0%	24.0%
Exports/PIB	22.2%	28.5%	31.0%
Agriculture GDP/GDP	24.0%	20.8%	18.0%
Industry GDP/GDP	13.0%	15.0%	22.0%

* projections

Source: INE, 2012

The draft ENDE identifies priority sectors as agriculture, industry (manufacturing and mining), transport and communications, tourism and energy, aiming at maintaining an annual economic growth of 8.0–11.0%, and an increased GDP per capita from the current USD 500 to USD 5,000 by 2035. These objectives will not be achieved without taking into account the impacts of CC in various economic, social and environmental systems.

Demographic studies show that the Mozambican population will grow from 20 million in 2007 to about 24.5 million in 2015, and an estimated 31–33 million by 2030. Some 70% of the population lives in rural areas and is dependent on subsistence agriculture and the use of natural resources. 60% of the population lives in coastal areas, and this percentage is expected to rise, since economic growth and major cities are concentrated along the coastline. It is estimated that the population living in urban areas will increase from the current 30% to about 60%, increasing in absolute terms, from about 8 million in 2007 to 19 million in 2030. This means that, by 2030, the number of people living in cities in Mozambique will be almost equal to the entire country's population in 2007. This demographic development with the concentration of population in cities and in the coastal zone clearly shows the importance of early adaptation and mitigation measures in order to reduce the vulnerability of people and infrastructure. The increase in urban population imposes additional challenges to take into account in the process of planning and building settlements, due to the specific requirements of urbanity, such as the availability of drinking water and sanitation, waste management, infrastructure and the protection of fragile ecosystems. However, one must also take into account that the populations of remote rural areas are often the most vulnerable to CC. Combined planning, financing, monitoring and control of adaptation measures to minimize the adverse impacts of CC are crucial, as is identifying and exploiting opportunities for low-carbon development, integrating the use of renewable energy sources and increased energy efficiency.

3.2 Climate change impacts, vulnerability and opportunities

3.2.1 Past and present impacts

Overall, the occurrence of extreme weather events results in the loss of lives and property, damage to ecosystems and a greater likelihood of vector-borne diseases. Diseases also result from the deterioration of environmental conditions (contamination of water and soil, stagnant water and hydric stress to ecosystems, among others). There are also more incremental impacts.

The records of extreme events for the period between 1956 and 2007 indicate that the occurrences that led to the highest number of deaths and affected people were the droughts that lasted more than one year. However, considering events lasting less than a year, the floods of 2000 appear to be the event that caused the highest number of casualties, with 699 dead and 4.5 million affected. Despite the increase in the frequency and intensity of extreme weather events, there has been a reduction in the loss of human lives. This improvement is due to several actions adopted by the Government, particularly the resettlement of populations living in areas prone to flooding, as well as the operationalization of early warning systems for floods and cyclones that have promptly informed communities.

CC may result in the destruction of infrastructure such as bridges, roads, schools, hospitals, power grids, residences, crops and animals. Some of the infrastructure is destroyed because it does not meet national legislation on spatial planning, or due to a lack of risk zoning in areas prone to floods and cyclones. No less important is the environmental situation in riverine and coastal areas prone to floods and cyclones, where vegetation is being removed, which damages coastal and marine ecosystems and enhances erosion and other forms of damage.

Additionally, the variation of temperature and precipitation patterns and rising sea levels result in environmental degradation, loss of ecosystems and biodiversity, erosion and saltwater intrusion, thereby endangering communities' livelihoods and sources of income. Moreover, environmental degradation and the loss of biodiversity and ecosystems may affect tourism, mining, forestry, fisheries and agriculture, among other important socioeconomic sectors. However, few studies and monitoring activities have been conducted to assess the impact of CC and other environmental pressures.

3.2.2 Future impacts

INGC's (2009) projections anticipate that CC in Mozambique will be observed mainly through:

- **temperature patterns:**
    - in the atmosphere – with an average increase of 1.5–3.0ºC reached at some point between 2046 and 2065, and the observation of more hot and fewer cold days, and an increase in minimum and maximum temperatures; and
    - in the oceans – with subsequent sea-level rises, changes in the distribution and availability of fish stocks and effects on marine ecosystems (such as coral reefs).
- **precipitation patterns:**
    - with erratic rainfall in terms of start and end time, load (intense precipitation events in a short time) and extension of the rainy season, drought, and distorted understandings of the 'official' and 'real' start of the agricultural season, which in some regions may result in a drop in potential revenue of up to 25%; and
    - further reductions in potential agricultural income of up to 20% for the main crops that form the basis of food security and are essential for improving per capita yield of Mozambican households.

- **increases in the frequency and intensity of weather extremes, such as:**
    - o extraordinary floods in specific prone locations that can be classified as 'risk zones';
    - o cyclones and strong winds; and
    - o prolonged droughts.
- **sea-level rises – including 15 cm, 30 cm and 45 cm resulting from thermal expansion, and a further 15 cm, 110 cm and 415 cm resulting from the melting of continental icecaps, by 2030, 2060 and 2100, respectively, resulting in:**
    - o new areas facing increased risks due to the emergence of other adverse natural phenomena, such as the erosion and submergence of coastal areas, saltwater intrusion and desertification;
    - o a reduction in arable land in green belts and flood plains; and
    - o it should be noted that many principal coastal urban centres, including Maputo, Beira and Quelimane, are already in a critically vulnerable situation due to CC threats to human lives, property and infrastructure.

Table 2 summarizes the current and anticipated intensity of CC impacts in Mozambique for various sectors and activities.

Table 2 – CC impacts per sector/activity

Sector/Activity	CC Impact						
	Atmospheric temperature patterns	Rain patterns	Drought	Floods	Tropical cyclones	Sea-level rise	Sea water temperature rise
Water resources	•••	•••	•••	•••	•••	••	•
Infrastructure		•		•••	•••	••	
Agriculture	••	•••	•••	•••	•••	•	
Food security	••	•••	•••	•••	•••	•	
Forestry	••	•••	•••	••	•••	•	
Industry		•	•••	•••	•••	•	
Energy		•	••	•	••		
Health	••	•	••	••	••	•	•
Tourism	••	•	••	••	•••	•	•
Transport	••	•		•••	•••	••	
Biodiversity and conservation areas	••	•••	•••	•••	•••	•	••
Coastal zones	•	•	•	•••	•••	•••	••
Human settlements	••	••	•••	•••	•••	•••	•
Fisheries		•	•	•	••	••	•••

Key: ••• High; •• Moderate; • Low (or unknown)

The impacts and vulnerabilities identified in the NAPA, FNC, SNC, IPCC (regional) and the INGC (national and local) were verified in consultation with various stakeholders, including representatives of the private sector and civil society, and at sectoral, central, provincial and regional levels. These

are mainly related to response actions related to water resources management, which should be improved to meet the changing availability of water in terms of quantity, quality and seasonality; the alteration of periods of extreme rainfall and drought; the timing and duration of rainy seasons;[5] and the integration of parameters related to the protection of lives and infrastructures in planning processes. Given the exposure of Mozambique to extreme events, such as those associated with tropical cyclones, this component also includes risk prevention and management mechanisms associated with climate events. The vulnerability factors generated by changes in precipitation and temperature increases are:

- a reduction in the availability of water with the necessary quality for various uses – including human and animal consumption, forestry, agriculture, energy production and industry – due to reduced rainfall, decreased recharge of aquifers, increased evapotranspiration, saltwater intrusion and an increased risk of wildfires due to lower atmospheric relative humidity;
- greater risk of loss of life, crops, forests and natural heritage, soil erosion and damage to infrastructure associated with floods and inundation by rising seas, storm surge water and extreme precipitation events such as floods;
- less biomass available for energy generation;
- change in the distribution and abundance of fish stocks and marine biodiversity due to the warming and acidification of water and, ultimately, the bleaching and death of corals;
- increased mortality and morbidity by human-borne diseases associated with climatic variables and higher malnutrition, with greater effects on vulnerable groups; and
- the reduction of soil fertility through erosion, deforestation, burning and saltwater intrusion.

3.2.3 Vulnerability

Despite significant developments, Mozambique is considered the fifth most vulnerable country in the world, according to the Climate Change Vulnerability Index[6] due to two key factors::

- **risk exposure:**
  - Mozambique is exposed in the east, with 2,700 km of coastline along the Indian Ocean, which is an active region for tropical cyclones;
  - It lies downstream from nine shared river basins; and
  - there is a sharp drop in altitude from the interior to the coast, which gives high speed to superficial runoff and river flow, causing flash floods in a short time when there are high levels of precipitation upstream of shared river basins.
- **low socio-economic development, characterized by:**
  - high illiteracy rates (32% in men and 68% among women);
  - large population living in poverty, at 54.1% in 2003 (down from 69.4% in 1997);
  - weak socio-economic infrastructure networks, such as roads, dams and dykes (to colect and store water during the rainy season to be used in shortage periods), and silos where crops can be kept and later consumed or sold;

5 - This change can also be associated to occurrence of cyclones, but the reaction measures are the same.
6 - http://maplecroft.com/about/news/ccvi.html

- low purchasing power of small-scale household farmers dependent on rain-fed agriculture; and
- poor access routes.

Once the main vulnerability factors had been identified and verified in the exhaustive inclusive consultation with various stakeholders, response priority actions were identified, as the need for adaptation is already pressing:

- CC cannot be completely avoided – an increase of 1–3ºC in average global temperature was already considered inevitable;
- preventive and early adaptation is more effective and less costly than reactive adaptation and emergency responses;
- the impacts of CC, as well as extreme events, may be felt more quickly and more severely than predicted by current scenarios;
- immediate benefits can be obtained from better adaptation to climate variability and extreme events and by excluding policies and practices that can result in maladaptation, by avoiding the implementation of measures that prevent or reduce the effectiveness of future adaptive options; and
- CC represents opportunities and threats – future benefits can accrue from CC and these opportunities can be identified and enhanced through adaptation measures.

Emphasis should be put on stakeholders' roles – from the public and private sectors, CBOs, NGOs and development partners – as they are also a fundamental driving force for the effective implementation of NCCAMS. Despite many projects having already been planned and being implemented at various levels (community, regional or national; by the state or private agents alone, bilaterally or multilaterally), it is recognized that greater coordination is needed to ensure that the management of scarce – human, financial and natural – resources enables an effective, efficient and coordinated response to the enormous threats posed by CC. One of the objectives of the NCCAMS is to ensure that CC is incorporated into planning activities and the measures implemented by various sectors; some ministries have already identified the threats posed by CC (e.g. MINAG, SETSAN, DNA and ANE). It is important to remember the role of the private sector and civil society, and the country's development priorities, as defined by ENDe and the Action Plan for Poverty Reduction (PARP).

Therefore, the national priority is adaptation and climate risk reduction. Through this pillar of the NCCAMS, the Government of Mozambique reiterates its commitment to the UNFCCC, acknowledging the impact of CC on Mozambican society and national development, and the importance of building resilience, and restoring and ensuring the rational use and protection of natural and physical capital.

3.3 Opportunities

Poverty reduction is the main objective of development in Mozambique, which has clear connections with opportunities for adaptation and the reduction of climate hazards. The UNFCCC defined lines of funding to support adaptation to CC. The NCCAMS presents opportunities to:

- exploit synergies and complementarities with processes that promote the efficient use of existing resources for sustainable development, improving coordination between different sectors and actors;
- prioritize interventions in adaptation and mitigation as well as in areas of support, such as:
  - the systematization of observations and collection of data relevant to research, in order to produce information that helps with decisions related to the implementation of appropriate measures; and

- capacity-building through training, education and awareness-raising at all levels, and in involvement with international processes, including submitting information to the UNFCCC in response to multiple requests.

The early integration of climate risks in planning instruments leads to the prevention of damage and reduces future costs, and its inclusion in business plans can represent a competitive advantage in the market. However, there are also opportunities related to low-carbon development. In many cases there may be synergies between adaptation and mitigation measures that will improve the resilience of Mozambique.

Mozambique's GHG emissions are low in both absolute and relative terms, but the energy and carbon intensity of its GDP and industry are relatively high. This reveals inefficiencies and, therefore, opportunities for improvement, which can be achieved with the support of policies, measures, projects and programmes for CC mitigation.

Low-carbon development and a larger green economy cannot be achieved in Mozambique if key sectors of the economy do not identify and implement, in a coordinated way, specific measures and actions that maximise the potential for mitigation. In this context, NCCAMS should contribute positively to the process of developing and implementing a strategy of Mozambique towards the green economy.

Mitigation measures with multiple benefits shall be prioritized and will allow:

- the exploration and more sustainable use of Mozambican energy resources (including coal and natural gas);
- the promotion of access to, and the efficient use of, energy and natural resources (including raw materials and water);
- the use of more renewable energy sources by the public and private sectors, producing electricity for the national grid and stand-alone systems;
- the promotion of poverty alleviation and equitable social development;
- accelerated rural development;
- guaranteed basic social services and infrastructure; and
- the integration of CC mitigation and adaptation in decision-making and planning.

Mitigation and low-carbon development can be achieved through policies and measures, and using tools and methodologies for measuring and reducing GHG emissions. The success of mitigation actions depends on prior training at various levels, which will allow government staff to build robust sectoral inventories in line with the IPCC guidelines.

The existence of international funding opportunities for mitigation was explored by Mozambique, but like many other African countries, early efforts have shown few results so far. However, there are already additional financing mechanisms, as well as tools and methodologies for measuring reduced emissions (with special emphasis on project-level actions, although these are also available for programmatic and sectoral actions), that are more suitable to the needs and circumstances of countries like Mozambique.

The integration of NCCAMS's mitigation and low-carbon development pillar is an opportunity for Mozambique to engage in global efforts to reduce GHG emissions by setting voluntary national priorities to promote a low-carbon economy that makes use of an ability to mobilize financial and technological resources at affordable costs.

The system of observation and data collection in Mozambique is insufficient, and therefore research is still limited and does little to identify appropriate measures for decision-making, education and public awareness. Weak technical and institutional capacity contributes to the poor

exploitation of opportunities provided by the UNFCCC, with emphasis on access to financial and technological resources, including for capacity building.

3.4 Current status of the integration of climate change into developmental instruments

Mozambique's development policies aim to reduce poverty through actions relating to basic health care, food security and nutrition, water and sanitation, access to clean and renewable energy, among others. The implementation of these policies, despite indicating progress at various levels, has faced challenges posed by extreme weather events. The combined effect of the 2000 cyclone and floods, for example, resulted in the displacement of more than 500,000 people and massive destruction of infrastructure estimated to have cost USD 600 million[7], reducing GDP growth from 8.0% in 1999 to 1.5% in the following year. The same is recognized in the Basic Social Security Strategy, which indicates exposure to natural shocks and CC as a major cause of poverty.

Mozambique has some sectoral instruments that are already aligned with the need to reduce vulnerability to CC and promote low-carbon development, including the PARP; the Strategic Plan for the Agricultural Development (PEDSA); the Strategy for Basic Social Action; the Tourism Strategy; the National Water Resources Strategy; the Master Plan for Disaster Management; the Policy for Disaster Management; the Strategy for the Intervention in Informal Settlements in Mozambique and respective Action Plan; the Strategy for Gender, Environment and Climate Change; the Energy Strategy; the current draft of the ENDe and the Strategy for Reducing Emissions Resulting from Deforestation and Forest Degradation (REDD+). These instruments explicitly recognize that extreme weather events are one of the greatest threats to development and good performance in their respective sectors (see Annex – Integration of CC in the Main Sectoral Instruments). Additionally PES already includes a CC programme (which will be reflected in PESOD from 2014). Mitigation is beginning to be recognized as an opportunity, with references to it in the Energy Strategy (carbon tax and promoting the use of indigenous energy resources for clean and renewable energy), the Biofuels Policy and in strategies in preparation such as ENDe and REDD+.

Private sector agents are still not very aware of the risks of exposure to climate variations and phenomena, and did not immediately identify the need for adaptation and resilience creation in their activities. However, the private sector has its own resources and typically has greater adaptive capacity. Private sector actors are used to maintaining competitiveness in the market, which means that, like other sectors, when exposed to climate risks, they will realize that tackling vulnerabilities will integrate a competitive advantage into their operations.

CC should be mainstreamed in socioeconomic development plans, not as a cross-cutting issue, but as a development issue that is part of all sustainable development agendas set by the Government, NGOs and the private sector. The 2000 floods and other climate risks have clearly demonstrated that there is a need to include CC considerations in the development agenda of all sectors, because its impacts affect them all.

Thus, the aim of this Strategy is to establish guidelines for action to build resilience to CC in communities and the national economy and to promote low-carbon development through its integration in the national sectoral and local-planning process.

7 - http://edmc1.dwaf.gov.za/library/limpopo/index.htm

N. C. C. A. M. S.

National Climate Change Adaptation and Mitigation Strategy

4. National Climate Change Adaptation and Mitigation Strategy

Vision  **Mission**  **Principles**

4.1 Vision

A prosperous and CC-resilient Mozambique, with a green economy in all social and economic sectors.

4.2 Mission

Reduce CC vulnerability and improve the wellbeing of Mozambicans through the implementation of concrete measures for adaptation and climate risk reduction, mitigation and low-carbon development, aiming at sustainable development, with the active participation of all stakeholders in the social, environmental and economic sectors.

4.3 Principles

NCCAMS in based on the guiding principles of the UNFCCC and the Hyogo Platform for Action, adding:

- Proactive/Preventive nature – demonstrate leadership and a pioneering spirit rather than a reactive attitude;
- Social equity – recognize and respect human rights and the fact that all citizens, regardless of their social status, should lead specific actions for mitigation and adaptation to CC, noting the cultural diversity that characterizes the Mozambican society;
- Equality – respecting the rights of men and women in all spheres of political, social, economic and cultural life, irrespective of colour, race, ethnic origin or place of birth, religion, level of education, socioeconomic status, occupation, political belief and party affiliation;
- Gender parity – respect the principle of equality between men and women, to ensure the representation of women in CC decision-making bodies and management;
- Sustainability – design CC interventions that are economically, financially, environmentally, socially and culturally sustainable;
- Transparency and participation – provide information exchange, accountability and adequate responses among different actors related to CC, to implement the Strategy through a broad, inclusive and participatory process.

4.4 General objective

Establish the action guidelines to create resilience, including through climate risk reduction, in the communities and the national economy promoting a low-carbon development and a green economy, through its integration in the sectoral and local planning process.

4.5 Strategic objectives

The strategic objectives are:

1. that Mozambique becomes resilient to the impacts of CC, reducing to a minimum the climate risks to people and property, restoring and ensuring the rational use and the protection of the natural and physical capitals;

2. identify and make use of the opportunities to reduce GHG emissions that simultaneously contribute to the sustainable use of the natural and the access to financial and technological resources at affordable prices and the reduction of the pollution and the environmental degradation promoting a low-carbon development; and

3. build the institutional and human capacity as well as explore opportunities to access to technological and financial resources to implement the NCCAMS.

4.6 Pillars and priority actions

In the operationalization of the strategic objectives two pillars emerge as structuring guidelines for action, namely (1) adaptation and climate risk management and (2) mitigation and low-carbon development. Also shown is a set of key cross cutting actions that include (i) institutional and legal reform, (ii) research and systematic observation and (iii) capacity building and technology transfer. The strategy sets adaptation and reduction of climate risk as national priority and simultaneously recognizes the need to seize the opportunities that the country has, without prejudice of the development actions, to reduce the impacts of CC through a set actions for mitigation and low-carbon development.

In this section NCCAMS seeks to identify opportunities, provide options and respectively indicate how these can be combined with the necessary cross cutting elements that touch both adaptation and climate risk management and mitigation and low-carbon development, while integrating capacity building and technology transfer, research and systematic observation and the legal and institutional reform necessary to operationa-lize the NCCAMS through an action plan. This first and the subsequent action plans will be implemented taking into account the principles of equality, parity and social equity.

Apart from actions that fit into each of the pillars, it is also important to test integrated actions designed to respond to the objectives that:

- **In the short term (2013-2015):**
  - increase local resilience, fighting poverty and identifying opportunities for adaptation and low-carbon development at community level, to be included in district planning.

- **In the medium term (2015-2019):**
  - o increase regional resilience, reduce poverty and identify opportunities to adapt and encourage low-carbon development at the provincial level, to be included in planning at the provincial level.
- **in the long term (2020-2025):**
  - o increase national resilience, reduce poverty and identify opportunities to adapt and encourage low-carbon development at the national level, to be included in planning at this level.

Accordingly, a CC-integrated programme is included in the first plan of action (see Annex – Action Plan for the Period 2013-2014).

4.6.1 Adaptation and climate risk management

Responding to the key vulnerability factors[8] identified above, the Government of Mozambique reiterates the priority of adaptation and climate risk reduction, acknowledging the impact of CC on Mozambican society and national development; the importance of building resilience and restoring and ensuring the rational use and protection of natural and physical capital, as well as the importance of fulfilling its commitments under the UNFCCC.

Eight strategic areas for intervention, along with corresponding recommendations for strategic action, are identified:

1. reducing climate risk
2. water resources
3. agriculture, fisheries and food security and nutrition (SAN)
4. social protection
5. health
6. biodiversity
7. forests and
8. infrastructure.

4.6.1.1 Reducing climate risk

4.6.1.1.1 Strengthen early warning systems

Here two sets of actions are noted – one especially designed to protect people and property against extreme events such as tropical storms, floods and droughts, and the spread of fires, and another dedicated to the agricultural sector and its productivity. The lack of an effective national early warning system has contributed to the negative impact of CC, particularly in remote rural communities where there is a lack of climate information and infrastructure for sharing information about extreme events (e.g., weather stations and community radio). Therefore, funds should be mobilized for the establishment of infrastructure to share climate information among the Government and partners (private sector, NGOs, civil society, donors, and others).

It is recognized that strengthening institutional preparedness for imminent extreme climatic events and capacity to conduct relief operations during and after shocks are particularly important. Thus, proposed actions include:

8 - Note that the vulnerability factors associated with limited knowledge or finance – along with requirements for research, systematic observation, regulations and institutional frameworks – are discussed under cross-cutting issues (Section 4.6.3).

- providing adequate and timely weather information tailored to each user – including the development of a wildfires warning system, and identifying the most effective ways to reach multiple audiences with the most appropriate tools and instruments in relevant languages;
- increasing the scale of the warning system, and reaching the district level, through contributions from sectoral institutions to improve early warning systems, particularly for agriculture, water and health;
- timely distribution of information to key users and local communities.

4.6.1.1.2 Strengthen capacity to prepare for and respond to climate risks

The capacity to prepare for and respond to climate risks can be strengthened through the following actions:

- improving the preparation for imminent climate disasters, including the relocation and protection of people and property, and the supply of resources and equipment;
- strengthening the role of the INGC in coordinating operations, evacuation, relief, reconstruction and support for victims of climate disasters;
- strengthening the coordinating role of the INGC and its partners to reduce vulnerability to drought in arid and semi-arid zones;
- strengthening the role of the Multiple Uses Resource Centres (CERUM) in supporting local communities efforts to make more efficient use of natural resources and map vulnerable areas;
- ensuring the establishment and training of Local Committees for Disaster Risk Management.

4.6.1.2 Water resources

To ensure the availability of water in the necessary quantity and quality, water management infrastructure – natural dykes, dams, canals, small hydropower plants, community dams, rainwater harvest systems and drainage and water transfer systems – will need to be constructed or rehabilitated. This infrastructure must accommodate floodplains, which may expand due to extreme precipitation, and the management of trans-boundary river basins. Local knowledge must be used and integrated, for example, in water purification.

In addition to developing storage capacity and flood control, measures to increase efficiency should also be integrated into water management. This includes considering capacity to harvest and distribute rainwater, and sanitation within the context of the whole water cycle – from collection to treatment – in order to ensure that the quality of water at all stages does not compromise those using it. Wastewater, along with the solid waste management, is crucial to protecting public health, the environment and the quality of ecosystems.

Most of the water management priorities can be fulfilled through the construction and rehabilitation of infrastructure, as listed below.

4.6.1.2.1 Increase capacity to manage water resources

This priority can be achieved through the following actions:

- strengthening capacity to manage shared water resources;
- create capacity to regulate and accommodate flood peaks (through dams and dykes) and/

or diversions (by evaluating the sustainability of the water transfer among different watersheds);

- improve knowledge about the quality and quantity of groundwater resources.

4.6.1.2.2 Increase access to, and capacity to collect, store, treat and distribute water

This priority requires:

- implementing practices that allow the refilling of aquifers;
- improving rainwater drainage, and rural and urban sanitation systems;
- increase per capita storage capacity at all levels (domestic, community, urban, national) to guarantee supply to all people and economic sectors;
- using excavated and underground reservoirs to store rainwater, mainly in the Southern region;
- exploring technologies for providing fresh water (e.g. desalination);
- building easy-to-maintain agro-hydraulic infrastructure along major surface water courses and mini-dams to irrigate and provide drinking fountains for the animals;
- preventing the contamination of water in times of drought and flood;
- promoting efficient and low consumption systems to distribute water in cities.

4.6.1.3 Agriculture, fisheries, food security and nutrition

Agricultural interventions should be tailored for each agro-climatic zone and their predicted vulnerabilities. In the Southern region, where less but more erratic precipitation is expected, the emphasis should be on water resource management; in the North, where greater precipitation is projected, actions may be directed towards better crop selection, favouring increased productivity.

It is worth noting the importance of the resilience of infrastructure itself, for protecting crops from droughts, floods and extreme events, and groundwater use. Across the country, conservation of agricultural land, as well as the promotion of resilient crops, is crucial.

The strategic actions identified for the agricultural sector are listed below.

4.6.1.3.1 Increase the resilience of agriculture and livestock

This requires:

- diversifying and introducing crops that are more resistant to climate variation;
- improving agricultural productivity by making available technologies and inputs suitable for the changed climate;
- controlling pests and diseases during cultivation and storage;
- strengthening agro-ecological zoning and land-use planning develop national programmes and action plans for soil protection and nutrition (conservation);
- improving livestock nutrition through pastures management and foraging production;
- improving control of livestock diseases and the detection of epidemics;
- improving and broadening technical assistance to producers.

4.6.1.3.2 Increase the resilience of fisheries

This requires:

- promoting aquaculture as a way to tackle a decrease in fish stocks and increased demand;
- regenerating mangroves and implementing protective measures for algae and sea grass, corals and other zones use by fish for spawning and feeding;
- improving the quality of information availability and skills for small-scale fisheries;
- reinforcing control and management measures for fisheries by ensuring access to clean technologies for the renewal and maintenance of stocks.

4.6.1.3.3 Assure adequate food security and nutrition

This requires:

- improving the mechanisms for the distribution, transport and commercialization of food products;
- improving the availability of food and access to it;
- creating community-based food processing and conservation industries;
- promoting agro-processing;
- developing nutritional education programmes and mechanisms to manage food surpluses;
- researching and promoting the use of local species of foods consumed in communities.

4.6.1.4 Social protection

It is expected that the aforementioned CC effects will have more severe consequences for vulnerable people, including women and children, and elderly, disabled, chronically ill and displaced people. According to the Ministry of Woman and Social Action (MMAS),[9] CC contributes to the impoverishment and an increased vulnerability of the population in general, put particularly for those already most vulnerable, and results in greater population displacement, migration and orphaned children.

In this context, social protection can play a key role in increasing the resilience of the most vulnerable to the adverse impacts of CC. The National Strategy for Basic Social Security recognizes that temporary cash-transfer programmes in areas suffering from natural disasters can contribute to reducing vulnerability to climate shocks. One example of a temporary cash-transfer programme is the Basic Social Protection Programme Production pilot scheme for public works that has provided labour-intensive work since the second half of 2012. Besides the monetary transfer that benefits the recipients, the result of the public works can promote CC resilience through the construction of dams, irrigation canals, among others.

Strategic actions for social protection are listed below.

4.6.1.4.1 Increase vulnerable people's adaptive capacity

This requires:

- developing and implementing innovative community-based adaptation approaches;
- strengthening the existing CC-related social protection systems to contribute to the resilience of vulnerable people;

9 - MMAS (2010): Estratégia nacional de segurança social básica 2010-2014.

- strengthening the capacity, orientation and emphasis of basic social protection programmes to increase the resilience of vulnerable people;
- strengthening linkages between social protection systems and those related to natural disasters, including early warning systems.

Direct risks to health posed by CC include problems with physical security, the potential exacerbation of the spread of diseases (such as malaria and cholera), and changes in patterns of respiratory and occupational diseases.

4.6.1.5.1 Reduce vulnerability to CC-exacerbated vector borne diseases

This requires:

- strengthening capacity to prevent and control the spread of disease, including mapping of vector distribution and spatial mobility;
- promoting clean technologies and creating spaces, such as recreational forest areas and buffer zones in cities;
- conducting a baseline study on the diseases that are potentiated by CC
- establishing surveillance systems and control measures for specific diseases exacerbated by CC

4.6.1.6 Biodiversity

Mozambique's Conservation Policy has the overall objective of "developing and consolidating a national system of conservation of biological resources and their aquatic and terrestrial biodiversity contributing to the sustenance of life, economic growth and poverty eradication". Similarly, the Policy and Strategy for the Development of Forestry and Wildlife recognizes social, ecological and economic foundations as the pillars for harmonious development of the sector.

With respect to conservation, the actions listed below have been identified as priorities. Guarantee biodiversity protection

This requires:

- developing programmes and actions for CC-adaptive conservation;
- identifying and implementing adaptation actions to ensure the protection of threatened species;
- establishing trans-boundary conservation areas to maintain ecosystem functions and allow wildlife migration;
- applying management practices that increase the adaptive capacity of ecosystems, and maximize the utilization of habitats and biodiversity conservation;
- reclassifying and resizing conservation areas, and identifying risk areas of biodiversity loss.

4.6.1.6.1 Forestry

The impacts of CC on forests are not well known. However, 70% of the Mozambican population lives in rural areas, and are directly dependent on forestry resources. When managed sustainably, these bring positive impacts to rural communities by increasing their ability to adapt to climate change. In 2009, the presidential initiative "One pupil one tree, one community leader one new

forest" was launched in Mozambique. This initiative has been promoted as a national campaign of tree planting and natural forest regeneration. It has been implemented with the direct collaboration of MICOA, MINAG, MINED as well as the private sector.

Mozambique is in the process of REDD+ preparedness and readiness, as listed in the Cancun agreements (paragraph 70 of Decision 1/CP.16), which should be promoted for poverty alleviation and food security, as well as its benefits for biodiversity, ecosystems, and linkages between adaptation and mitigation. The strategic actions proposed for forest include those listed below.

4.6.1.7.1 Promote tree-planting and the establishment of local forestry use mechanisms

Increasing forests' adaptive capacity requires:

- developing programmes for the planting of trees with multiple uses and economic value, in order to meet the needs of local communities;
- enhancing local initiatives, fighting deforestation and preventing fires and their spread;
- exploring agrosilvopastoralist systems to facilitate livelihoods and diversify income sources;
- promoting community programmes to manage forest resources.

4.6.1.8 Infrastructure, urban areas, other settlements, and tourist and coastal zones

According to the Medium-Term Fiscal Framework (2012-2014) (CFMP), most of the investments made in Mozambique will be for the construction and maintenance of infrastructure – roads, bridges, viaducts, conduits, water supply, water treatment or drainage facilities, dykes and electricity networks among others. Therefore, considerations of how to make these resilient to the impacts of CC are vital to ensure that investments are not jeopardized and to avoid setbacks in national development efforts. The integration of CC into the process of urban planning allows cities to develop their ability to effectively adapt to current and future climate impacts, and also to experiment and innovate with urban planning policies. Many considerable investments in housing and infrastructure are occurring in many cities in Mozambique (for example, Maputo, Matola, Nacala, Beira and Tete), with long-term implications. Therefore, it is important to ensure that such investments are not at risk, by creating opportunities and mechanisms to make them more resilient to CC in all its phases of implementation: planning, execution and operation. A resilient city is able to adapt to the impacts of CC and other natural disasters, greatly reducing the magnitude and severity of their economic and social consequences. Therefore, the preparation, development and integration of CC aspects into land-use management instruments is important.

The strategic actions listed below are proposed for infrastructure, including in coastal and tourist areas, that may be vulnerable.

4.6.1.8.1 Develop resilience mechanisms for urban areas and other settlements

This includes:

- developing climatically robust instruments for land-use planning and strengthening their implementation;
- mapping vulnerable and at-risk infrastructure, depending on expected climatic phenomena (e.g. floods, cyclones, sea level rise);
- updating building codes for transport, telecommunications, energy distribution, and water infrastructure and buildings, in order to make them climate resilient;

- ensuring that investments, particularly public, in risky areas are CC-proof;
- promoting the design and implementation of insurance mechanisms for climate risks to existing infrastructure.

4.6.1.8.2 Adjust the development of tourist and coastal zones

The protection of vulnerable infrastructure in these areas requires:

- assessing the main climate risks to and areas of touristic interest;
- advising operators about appropriate building codes;
- promoting best practice among operators and tourists, making use of public-private partnerships to build the resilience of the sector and the conservation of ecosystems;
- conserving coastal areas and improving protection practices;
- promoting climate insurance for tourist activities and infrastructure.

4.6.2. Mitigation and low-carbon development

Mozambique, despite its low GHG emissions, recognizes the potential for mitigation and low-carbon development in certain areas, which provide the opportunity to promote sustainable development and to access additional sources of funding for related initiatives. NCCAMS should not constrain development or mitigation activities if they represent the best option for development. The guidelines and strategic actions proposed in this pillar should be developed in close coordination with existing and under-development projects, policies and strategic documents in Mozambique, such as the Strategy of Energy, the Policy for the Development of New and Renewable Energies and the Biofuels' Strategy, the SNC and the proposed ENDe and REDD+ Strategies. The guidelines and actions for mitigation strategies are organized into four strategic areas identified as entry points within the current context of Mozambique, namely: (1) energy, (2) industrial processes, (3) agriculture, forestry and other land uses and (4) waste. In addition, management programmes associated with Voluntary Carbon and other certification procedures should be promoted, and may be implemented by various public or private operators.

4.6.2.1 Energy

The mitigation strategies related to the use, production and transmission of energy are presented below.

4.6.2.1.1 Improve access to renewable energy

This requires:

- promoting the electrification of rural communities using renewable energy;
- promoting the use of renewable energy sources (biogas, biomass, solar, wind, thermal, wave and geothermal);
- promoting the expansion of the national energy network, or the creation of micro-power distribution networks;
- promoting and disseminating techniques and technologies for the production and sustainable use of biomass energy;
- evaluating mitigation mechanisms in infrastructure for the production and transmission of electricity.

4.6.2.1.2 Increase energy efficiency

This requires:

- ensuring the availability of and access to low-carbon fossil fuels;
- promoting initiatives for switching from high-carbon and non-renewable fuels to low-carbon alternatives and renewable energy in production and transmission processes;
- ensuring the implementation of regulatory instruments, programmes and projects for low-carbon transport, as well as producing of biodiesel for vehicle fleets that generate new sources of income and economic diversification in rural areas;
- promoting the use of 'clean coal' technologies in power stations (including the use of co-generation, where applicable);
- reducing emissions associated with power plants.

4.6.2.1.3 Ensuring that emissions from the extractive industry comply with regulatory standards

This requires:

- recovering methane from mining and hydrocarbon processing;
- assessing possibilities for carbon capture and storage.

4.6.2.1.4 Promote low-carbon urbanization

This requires:

- developing and implementing policies and measures to improve energy efficiency and promote the use of renewable energy in the construction of urban infrastructure, such as buildings and roads etc.;
- developing projects and programmes for the micro-generation of energy in commercial and residential buildings;
- encouraging the use of solar thermal systems in large commercial, industrial, public and residential buildings;
- encouraging the replacement of incandescent bulbs with energy-efficient bulbs;
- promoting gas for domestic and industrial use, and as an alternative for public and private transport;
- promoting energy-efficient practices and the use of equipment utilizing renewable energy and decentralized energy production, through building codes and production standards.

4.6.2.2 Industrial processes and the use of other products

4.6.2.2.1 Control industrial emissions, including associated waste and sewage

This requires:

- developing enforcement policies and measures, and regulating industrial activity to monitor compliance with national legislation and international conventions;
- encouraging investors to evaluate the potential GHG emissions from projects;
- promoting micro-generation projects and programmes in the energy industry.

4.6.2.3 Agriculture, forestry and other land uses

4.6.2.3.1 Develop low-carbon agricultural practices

This requires:

- encouraging agricultural conservation;
- promoting agricultural practices that reduce GHG emissions, in particular when harvesting sugar cane;
- using high-efficiency water-pumping systems for crop irrigation;
- recovering methane from agricultural activities in intensive farming systems, particularly rice paddies;
- promoting the collection and bio-digestion of animal and plant waste to increase the availability of methane for power generation.

4.6.2.3.2 Reduce deforestation and wildfires

This requires:

- exploiting forests in a sustainable manner, to maximize their potential for carbon capture and sequestration;
- promoting mechanisms leading to the natural regeneration of forests;
- creating mechanisms to prevent the spread of fires.

4.6.2.3.3 Plan and manage the biodiversity of coastal ecosystems

This requires:

- Developing sustainable management, regeneration and protection programmes for the mangroves, algae and seaweeds associated with potential carbon capture and storage ('blue carbon').

4.6.2.4 Waste

4.6.2.4.1 Manage and value waste

This requires:

- promoting the reduction, reuse and recycling of waste;
- encouraging the establishment of landfills allowing the recovery and subsequent use of methane;
- promoting the generation of energy from waste using anaerobic digestion, thermal and/or mechanical processes.

4.6.3 Cross-cutting issues

4.6.3.1 Institutional and legal reform

During consultations and other interactions with various stakeholders, institutional documents

and legal frameworks were often cited as a barrier to the effective implementation of policies, strategies and measures, aggravated by the fact that CC and its vulnerabilities and opportunities affect various sectors and societal activities, the environment and the economy.

Despite the institutions coordinating CC-related work being established, they still have limited capacity to carry out their activities, particularly because it is a relatively new and complex issue. For instance, CONDES and FUNAB, whose statutes were recently adjusted, still need to operationalize their new functions and coordinate CC-related fundraising and financial management. The implementation of CC adaptation and mitigation actions by different sectors will also require the adjustment of regulations. The poor implementation of existing laws and regulations in different sectors should be halted, in order to avoid jeopardizing the implementation of the NCCAMS.

To meet these needs, priority actions were identified as below.

4.6.3.1.1 Adjust the legal framework in line with the NCCAMS

This requires:

- identifying gaps, and needed adjustments, in legal instruments in order to mainstream CC;
- equipping sectors with instruments (strategies, policies, regulations and standards) to ensure the integration monitoring, detecting and responding to the challenges of CC;
- strengthening institutional frameworks at the district level, to encourage greater interaction between communities and district authorities;
- promoting the integration of CC in local committees, and encouraging the convergence of existing themes on issues such as land, water and forestry.

4.6.3.1.2 Adjust the existing institutional framework in line with the NCCAMS

This requires:

- finalizing the process of updating the statutes of CONDES to include other actors;10
- enabling CT-CONDES to meet the demands of CC inter-sectoral coordination through the establishment and operationalization of the coordinating CCU in the CONDES Secretariat;
- creating GIIMC statutes to make it a formal entity;
- enhancing, enabling and empowering institutions for the monitoring and enforcement of laws and regulations;
- interacting proactively with state institutions, the Government, civil society groups, CBOs, academics and media organizations.
- building capacity to design, analyse and monitor policies defining the National System for CC11 measurement, reporting and verification (MRV).

4.6.3.2 Research and systematic observation

The lack of data with appropriate frequency and scale represents a significant barrier to determining the real impacts of CC – including those beyond climatic variables. This is an impediment to determining appropriate responses in both the short and, in particular, the long term.

10 - The new proposal of the CONDES statutes, evaluated by CT-CONDES, integrates the following stakeholders: MAE, MINEC, MCT, MISAU, MMAS, INE, and three representatives from the academy, private sector and civil society.

11 - A transparent framework for data collection and treatment, information management, and mitigation and adaptation planning (including monitoring and evaluation), within the scope of NCCAMS and in line with international agreements. This should include an integrated database of CC information shared by all relevant institutions.

Among other limitations, it is worth noting the poor coordination between institutions engaged in the systematic collection of climate data; the dispersed and inaccessible data collection network and its high maintenance costs; the lack of standardization; the irregularity and low quality of climate data; and incipient research programmes with minimal financing. Priority actions for research and systematic observation include those listed below. These are based on the Strategy for Science, Technology and Innovation of Mozambique (approved by the government of Mozambique), which includes CC as one of its research priorities.

4.6.3.2.1 Develop climate change research

Concerning research and development, it is important to:

- accelerate the creation of the Centre for Knowledge Management (CGCMC), which is to produce, manage and disseminate information about CC;
- create a 'CC Network' of multi-sectoral research teams;
- design the National MRV System to monitor and gather data on the effects of CC, including the effects of adaptation measures and GHG activity data, emissions and other parameters;
- use the results of studies for the design of public policies for improving people's well-being;
- establish a peer review system for CC research;
- create systems for generating and sharing knowledge among and between the government, academia, the private sector and civil society;
- adapt and enhance (academic and other) research institutions to deal with the environment in the context of CC;
- promote regional and international exchange.
- Strengthen institutions that collect data for GHG inventories and National Communications

The strengthening of these entities requires:

- distributing responsibilities to the ad-hoc reporting group, and disseminating their reports (according to the National System);
- expanding and maintaining the CC network, and setting standards for meteorological, hydrological, hydrometric, and agrometeorological data;
- creating an integrated information-management system between INAM, DNA, IIAM, and INAHINA;
- strengthening the mechanisms for standardizing equipment and databases;
- strengthening institutions that perform systematic data observation, gathering and processing in order to feed GHG Inventories and National Communications.

4.6.3.3 Capacity building and technology transfer

The limited knowledge, financial resources and technology for CC response – at central and local level, and in communities and among the private sector – was often mentioned as a barrier to mounting an effective response to its impacts and opportunities. Thus, the objective of the NCCAMS is to develop capacity to mobilize financial and technological resources, and manage and implement appropriate responses to CC: building resilience and adaptation, and pursuing a low-carbon future through participation at all levels, training and technology transfer.

Capacity needs assessments (CNAs) previously made in respect to training and technology need to be updated, in order to develop action plans that respond to current needs.

Proposed strategies for capacity building and technology transfer are listed below.

4.6.3.3.1 Develop and enhance CC knowledge and the capacity to intervene

This requires:

- updating the CNAs, and adjusting and implement corresponding action plans;
- strengthening the Designated National Authority (DNA) for CDM Projects and Programmes, and enabling it to identify opportunities in all sectors and to improve the country's negotiating capacity at international fora;
- developing and integrating CC content in formal and informal education programmes;
- increasing general public awareness, and disseminating information on CC – including the NCCAMS, policies and international agreements;
- building integrated planning and budgeting capacity (PESOE, PESOD, PES) to include elements related to CC mitigation and adaptation;
- building capacity in FUNAB to guide the design and development of projects and programmes to include access to international funds (e.g. GEF, the Adaptation Fund, FCPF, the Least Developed Countries Fund, the Special CC Fund, the Green Climate Fund, Fast Start, and Climate Investment Funds);
- strengthening FUNAB's capacity for financial management and auditing, in its capacity as the CC Coordinating Agency for Financing;
- building the CCU's capacity for integrated management and monitoring of NCCAMS and its projects and/or programmes for adaptation and mitigation, including reporting on implemented projects and programmes.

4.6.3.3.2 Promote technology transfer and the adoption of clean and CC-resilient technologies

This requires:

- developing and conducting a technology needs assessment (TNA) and implementing a subsequent action plan;12
- using the CDM and similar instruments as catalysts for promoting technology transfer for CC mitigation, addressing the needs and technological limitations.

12 - Mozambique will be a piloting a TNA with the UNEP.

IMPLEMENTATION MECHANISMS

5. Implementation mechanisms

Given the cross-sectoral nature of CC, numerous sectors are implementing measures to meet its challenges at all levels (from local to national), in the short, medium and long term. Thus, there is a need for effective coordination to ensure the maximisation of synergies and the closing of gaps between sectoral responses, enabling effective communication and flow of information to meet the various needs (Table 5 in the annex presents the summary of activity areas for the main sectors). It is important to note that, in addition to coordination, there is a need to facilitate the management of resources and adequately monitor and evaluate progress over time.

Given the challenges for implementing the objectives in this Strategy, five elements have been selected as priorities, namely:

1. coordination
2. implementation
3. M&E
4. knowledge management and
5. financing (see Figure 1 for a diagrammatic explanation).

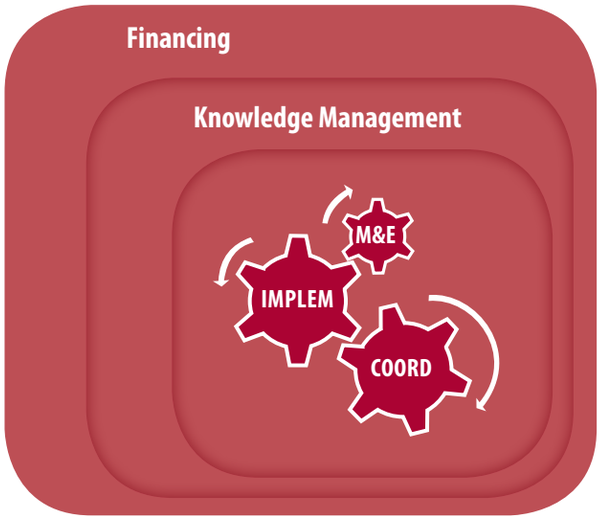


Figure 1 – Implementation Mechanisms`

Based on existing agreements,[13] MICOA is the institution responsible for coordinating CC-related activities; FUNAB is to perform the duties of the 'Agency for the Coordination of Financing'; and the CCU undertakes M&E. Recognizing the urgency of full operation of these entities, significant training is required; the transition to this mechanism of implementation will be incremental, with full function planned for end-2014.

The NCCAMS implementation mechanisms and the institutional arrangements (Figure 2) are described below.

13 - Article 11(j) of Ministerial Diploma 265/2009, from December 16, indicates that one of the functions of the Department of Natural Resources Conservation (included in the National Directorate for Environmental Management, DNGA) is to "ensure the technical support to implement the UN Biodiversity Convention and the UNFCCC".

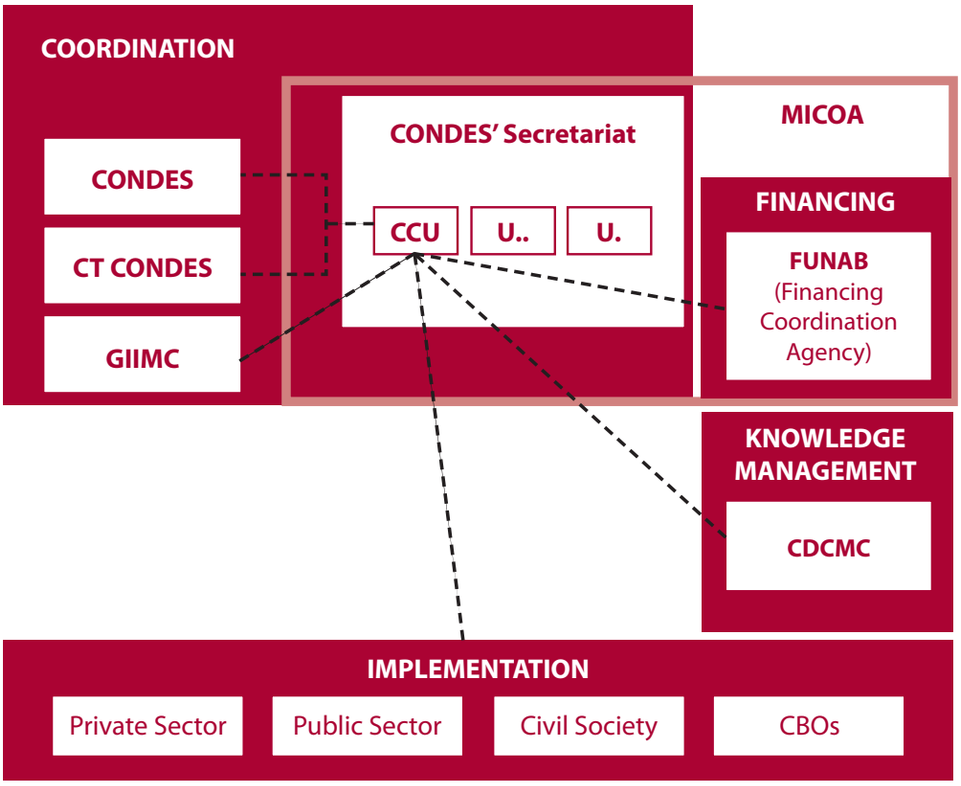


Figure 2 – Institutional arrangements associated with the NCCAMS implementation mechanisms.

5.1 Coordination

MICOA is responsible for CC coordination, in light of its responsibility for coordinating the implementation of Agenda 21, and its role as the UNFCCC focal point. Within MICOA, there is a set of supporting entities with mandates related to CC, in particular FUNAB (see 5.5 Financing) and DNA are responsible for CDM projects. MICOA is also responsible for assisting CONDES and its Secretariat (which deals with the political coordination of sustainable development), and CT-CONDES (which technically advises CONDES).

Under the NCCAMS, the CCU is established within the CONDES's Secretariat. This unit is technically advised by GIIMC and the CGCMC (see 5.4 Knowledge Management). The CCU is responsible for coordinating and facilitating inter-institutional connections on CC, preparing annual programmes and work plans, monitoring the implementation of NCCAMS, and giving technical advice on projects and programmes financed by CC funds and the MEA.

Since CC is a relatively new, complex and cross-sectoral issue, CT-CONDES should meet at least twice a year with the CTGC, the National Council for Food security and Nutrition (SAN) and other relevant stakeholders, to submit, present and discuss activity reports, and define annual plans of action, based on contributions from FUNAB, GIIMC and CGCMC, which will be approved by CONDES.

5.2 Implementation

The implementation of NCCAMS will be carried out by a number of actors, including those from the private and public sectors, civil society and CBOs, and cooperation partners. Under the NCCAMS, three cross-sectoral action plans will be prepared according to the Government planning cycles (2013-2014, 2015-2019, 2020-2024). In the year 2025, a review of the NCCAMS will be

conducted. The NCCAMS's action plans are defined on the basis of the needs identified by GIIMC and the CGCMC. Table 3 summarizes possible areas for intervention by different actors, although is not exhaustive.

Table 3 – Potential actions that can be implemented by different actors

ENTITY/SECTOR	POTENTIAL ACTIONS
Government (central ministries, provinces, districts)	Definition of policies, regulations and technical standards in line with CC Facilitate the integration and harmonization of public and private sector, civil society and CBO plans Design and implement CC projects, including adaptation and climate risk reduction, mitigation and low-carbon development, and cross-cutting issues Promote the coordinated implementation of activities to reduce the impacts of CC by incorporating it into PES and PESOD
Private sector	Implement adaptation and mitigation actions/projects Mobilize funds for the implementation of CC projects Support the Government in the implementation of activities regarding cross-cutting issues (e.g. social security) Provide technical support on the design and implementation of sectoral CC policies and measures, in cooperation/coordination with the Government Eventual participation in the creation of the internal/national mechanism for financing CC best practices, including incentives for clean industry (less pollution) and fines/taxes for polluters ('polluter pays' principle) Be a model by integrating CC risks into business plans, and to create greater resilience and security for investments Take a leading role in introducing/disseminating sectoral best practices Promote social responsibility and Voluntary Carbon management Monitor and report industrial GHG emissions
Civil society	Implement CC adaptation and mitigation activities at the community level Empower local communities in relation to CC adaptation and mitigation issues Mobilize funds for the implementation of CC projects Monitor the implementation of the NCCAMS, as independent observers
Media	Disseminate information on good practices for reducing vulnerability Translate CC materials into the vernacular, for a lay audience Transmit information from early warning system to stakeholders at all levels
CBOs	Transmit local knowledge on observed weather phenomena and mechanisms for adapting to extreme weather events Facilitate the interaction between scientific and local knowledge about CC Support and cooperate in the implementation of CC programmes and projects Propose and support the implementation of CC-specific adaptation measures for the typical impacts felt in each community
Academia and National Institutes	Develop and include CC in education curricula (formal and informal) and in capacity building Develop programmes of research and systematic observation, including the standardization of methods and data quality Systematize and document scientific, technical and local CC knowledge

5.3 Monitoring and evaluation

The CCU is responsible for monitoring the implementation of the NCCAMS. It shall ensure the systematic collection, documentation, archiving and management of information to be used for M&E and other relevant exercises related to CC, in constant collaboration with various sectors, civil society, the private sector, provincial governments, and with direct inputs from FUNAB, the CGCMC and the INE. The CCU will also promote the integration of CC indicators into the system of national statistics at INE, which should be considered an information management priority. Under the NCCAMS, the National System of MRV will be created within the CCU. This will establish a clear framework for the roles and responsibilities for data collection and processing, information management, the planning of mitigation and adaptation (including M&E), and responses to international commitments, with an integrated CC database that will run in all institutions to share information.

The framework for the NCCAMS's M&E will take into account its strategic objectives and pillars, and information already collected by various institutions. Figure 3 illustrates some of the entities that may contribute such information.

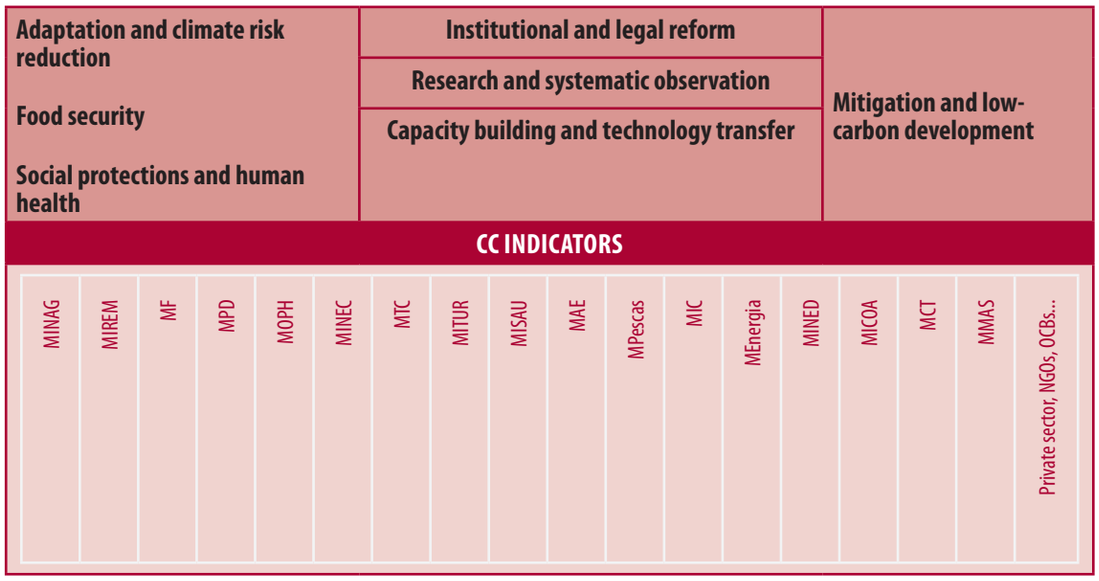


Figure 3 – Example of the entities that can contribute to the NCCMAS's M&E.

As one of the objectives is the mainstreaming of CC across sectors and within district, provincial and national planning duties, work will continue to define how PESOD and PES can monitor the Strategy's implementation and success. Under the current framework, PES balance reports include the updated indicator "cumulative number of sectors/institutions and provinces whose planning process integrates measures to reduce risk from natural disasters and to mitigate and adapt to CC". However, not all initiatives are captured by the PES; for example, those from the private sector, NGOs and even some cooperation partners are not included. Efforts must be made to establish a monitoring system that ensures that the country does not only monitor the actions of change, but also evaluates the contribution of adaptation and mitigation activities to efforts to reduce poverty in the medium term, and to promote sustainable development in the medium and long term.

To address the lack of basic information, and of sectoral and national indicators that capture such initiatives, Mozambique assumes that the National System for CC monitoring has to be designed from the beginning of NCCAMS, through three phases aligned to the beginning of each planning tool and after a five-year evaluation of the previous instrument:

- Phase 1 (2013-2014): basic indicator and monitoring system to be designed and applied to the first action plan

- Phase 2 (2015-2019): improvement of the monitoring system in 2019
- Phase 3 (2020-2025) application of the system to revise the NCCAMS.

Monitoring will be conducted at a frequency to be determined, and reporting will take place every six months. The first review is expected in 2014, when the system will be tested and assessed for any needed adjustments. Subsequent review exercises will take place in 2020 and 2025, the latter leading to the review of NCCAMS.

Matrices with specific indicators will guide the integration of all stakeholders in the planning process. At the Government level, these actions will be integrated into PES and PESOD and respective annual budgets.

5.4 Knowledge management

The Centre for the Management of CC Knowledge (CGCMC) is to be created and hosted within the Academy of Sciences of Mozambique, in MCT, relying on existing entities, and containing thematic groups to be managed by the corresponding public authorities. These will gather the knowledge dispersed across institutions, in order to serve as the repository, generator and transmitter of knowledge. The Centre will work through the Network of Climate Change, which is composed at this stage of ten thematic areas, namely: (i) coastal zones, fisheries and tourism, (ii) climate modelling, (iii) communities and local knowledge, (iv) water resources, (v) biodiversity and ecosystems, (vi) human health, (vii) food security and nutrition, (viii) agriculture and forests, (ix) cities, and (x) economics and finance.

The thematic research areas will be coordinated by their respective ministries, and will integrate specialized institutions, particularly the network of research institutions, higher education institutions and organizations that perform the systematic collection of climate or sectoral data. In addition to this function, the CGCMC should develop communication plans to disseminate the knowledge and information compiled, with a view to promoting an informed Mozambican society with the ability to make decisions to meet the challenges, risks and opportunities posed by CC. Figure 4 illustrates the relationship between the Centre and the different elements of the network.

The CGCMC will undertake:

- collecting, producing and disseminating knowledge and technologies for Mozambique to meet the challenges posed by CC;
- compiling data and information necessary to support the Mozambican diplomacy in international CC negotiations ;
- identifying, promoting and/or carrying out studies on the impacts of global and regional CC in Mozambique, focusing on the country's vulnerability;
- identifying, prioritizing and promoting the study of alternatives for CC adaptation and low-carbon development for Mozambique's social, economic and natural spheres;
- analysing and identifying opportunities for the mitigation of anthropogenic emissions and the enhancement of sink capacity, which could contribute to the country's sustainable development through improving access to financial and technological resources;
- participating in the preparation of national reports that Mozambique must periodically submit to the Conference of the Parties;
- contributing to the formulation and monitoring of CC policies and strategies in Mozambique;
- meeting research needs related to specific problems for communities' development;
- creating CC training, awareness and education content;

- capitalizing on the experience and knowledge of CC gained through organizing national and international events.

Knowledge-creation and capacity-building needs should be determined annually based on input from implementing agents identifying barriers and gaps. These are to be communicated to the GIIMC, and further reported to the CCU. Those needs that are considered priorities will form the basis for the CGCMC's annual activities plans. The CCU may also refer to the CGCMC for scientific and technical advice.

Figure 4 – Structure of the CC Network

5.5 Financing

Achieving an appropriate level of climate resilience and ensuring low-carbon development will require the Government, development partners, and private sector and civil society actors to make an additional effort to mobilize and allocate resources so that the priority interventions defined in this Strategy can be implemented on schedule. Thus, the mobilization of resources will be the main challenge Mozambique will face and it is expected to ensure the access to appropriate additional funding for the implementation of the Strategy. An effective response to the challenge of achieving this requires (i) strengthening national capacity to integrate CC in bilateral and multilateral development finance negotiations; (ii) strengthening the national body responsible for leadership and coordination of access to the various international CC financing mechanisms; (iii) evaluating the financing mechanisms available for CC adaptation, including local funds from donations, contributions, corporate social responsibility and individual contributions; and (iv) assessing the possibility of creating a CC common fund.

At present, there are several entities that finance and implement activities related to CC; it is planned that coordination will ensure that the volume of financing will be monitored alongside projects and programmes themselves. Therefore, it is expected that all funds raised by all entities will be communicated to FUNAB, which will assume the role of 'Financing Coordination Agency', for registration in its information system. This will facilitate the CCU's centralization, management and sharing of information.

The resources mobilized by FUNAB to sectors, programmes and projects will be allocated according to standards, norms and regulations in the country, and take into account the nature and modalities of each type of funding and the nature of the implementing institution receiving funds. It will be up to FUNAB, in coordination with the CCU and GIIMC, to ensure that available financial resources are allocated to the activities contributing to the implementation of the national priorities outlined in this Strategy.

Therefore, FUNAB will:

- coordinate, with the CCU and other relevant institutions, the design of CC fundraising projects;
- identify funding sources to be communicated, in coordination with the GIIMC, to potential candidates;
- monitor, evaluate and audit the finances of CC projects and programmes, in the context of NCCAMS's implementation and its M&E system;
- collect and keep track of the database of projects and programmes managed by FUNAB and other institutions (i.e. cooperation partners, NGOs and other actors);
- prepare and submit reports on its annual activities to the CCU.

Annexes