

KINGDOM OF SWAZILAND



**MINISTRY OF TOURISM AND ENVIRONMENTAL
AFFAIRS**

***NATIONAL CLIMATE CHANGE STRATEGY AND
ACTION PLAN***

2015 - 2020

FOREWORD

EXECUTIVE SUMMARY

Climate change is threatening Swaziland's quest to achieve sustainable development and therefore the livelihoods and food security of the Swazi Nation. Climate change is already evident in a number of ways. Consistent warming trends and more frequent and intense extreme weather events (such as floods and droughts) have been observed across the country in recent decades. In line with these trends, climate change scenarios consistently project temperature increases across the southern Africa region, which will require the Swazi Nation to adapt to changing conditions. Much less certainty and agreement exists among models on rainfall variability, but extreme weather events are generally expected to increase in frequency and severity across the southern Africa region. Thus, the probability of climate-related disasters will rise with changes in precipitation patterns and temperature increase. For example, droughts are projected to be more intense and prolonged, while floods will be more frequent.

With changes in the global climate system likely to span into the next century, geography, high population density and immense poverty will continue to make Swaziland especially vulnerable. Human health, biodiversity, agricultural production, food security, water and energy will be imperilled, as natural disasters worsen and migration grows, intensifying stresses on the Swazi Nation. In this regard, therefore, Swaziland, like many countries in Africa, is a country where the global responsibility for addressing climate change should be particularly stressed. It is where one can clearly make a case for countries that have contributed relatively so little to the causes driving climate change stand to lose so much from its adverse effects.

To address the challenge posed by climate change, at the global level, the United Nations Framework Convention on Climate Change (UNFCCC) and its Kyoto Protocol were agreed upon as the international legal instruments for responding to climate change. One of the cardinal principles that underpin the Convention and its Kyoto Protocol is the Principle of Common but Differentiated responsibilities (CBDR), which sets out how developing and developed countries shall undertake their commitments under the Convention. The principle of CBDR obligates developed countries which are most responsible for the current build up of greenhouse gases in the atmosphere to take the lead in combating climate change and to assist developing countries, such as Swaziland, that are particularly vulnerable to the adverse effects of climate change in meeting costs of adaptation to those adverse effects of climate change. The support would entail provision of financial resources, technology development and transfer and capacity building. Thus, targeted climate change adaptation and mitigation actions supported by appropriate means of implementation in form of finance, technology development and transfer and capacity building will be necessary to build resilience of the Swazi Nation through implementation of this National Climate Change Strategy and Action Plan (NCCSAP).

Consistent with the country's Vision 2022 that incorporates environmental sustainability in her quest to achieve sustainable development and poverty eradication, the NCCSAP is intended to guide climate change efforts directed towards making the Swazi Nation

climate resilient. Resilience is used to describe the magnitude of a disturbance that a system can withstand without crossing a threshold into a new structure or dynamic. In human systems, resilience refers to the ability of communities to withstand and recover from stress, such as environmental change or socio-economic aspects, while for natural systems, it is a measure of how much disturbance, such as storms, fire or pollutants, an ecosystem can handle without shifting into a qualitatively different state. This implies that social systems have the additional ability to anticipate and plan according to perceived and real changes. Therefore, the ability of institutions and individuals to avoid potential damage and to take advantage of opportunities will be a critical factor in building resilience to climate change. In addition, building resilience to climate change requires simultaneously building resilience in human systems and in the inter-linked ecosystems on which they depend.

The NCCSAP identifies five strategic focus areas, namely:

- 1. Integration of climate change adaptive and mitigative measures into the various sectoral policies and national development planning and budgeting:** This is intended to ensure that in the long term, climate change-related measures are integrated into the national development planning and climate sensitive sectoral policies and resources are made available for their implementation. This will ensure that the country builds the requisite climate resilience in her quest to achieve sustainable development. In this regard, qualitative and quantitative scenarios will need to be developed at the national and sub-national levels. Combined with detailed economic analysis of adaptation and mitigation options, these multifaceted risk assessments and scenarios should serve as the basis for addressing climate change. Thus, without integration, climate change-related actions will simply add another layer of planning rather than the mainstreaming process.
- 2. Promotion of development of adaptation and mitigation actions that contribute to achievement of sustainable development, eradication of poverty and enhances adaptive capacity:** Several important adaptation measures (in such sectors as agriculture and food security, water resources, biodiversity and ecosystems, health and human settlements) and mitigation actions (industry, agriculture, energy, transport, waste management and forestry) should be implemented. Greater variability in weather and production outcomes will require enhanced attention to risk-sharing and risk-reducing actions.
- 3. Provision of mechanisms for mobilizing and accessing support for technology development and transfer, capacity building and financial resources from the international community and other sources:** Means of implementation (technology development and transfer, capacity building and finance) are critical in the Swazi Nation's quest to effectively implement adaptation and mitigation actions. In this regard, Swaziland will in put in place measures that will enhance the country's capacity to harness international and regional support in technology development and transfer, capacity building and finances. In addition,

the country will enhance its institutional and technical capacities to enable it to mobilize and utilize available financial resources.

- 4. Building awareness and understanding of climate change among various stakeholders through education, training and public awareness:** Knowledge and information on climate change is critical in informing the design of appropriate adaptation policies, planning and choice of strategies and reducing climate-related risks. This will call for a robust, adequate and high quality national climate data and information. Such climate information should be made available to policy makers and other stakeholders to enhance decision making. In this regard, education, training and public awareness are of critical importance in building an enlightened populace.
- 5. Strengthening legal and institutional framework for effective coordination and implementation of climate change adaptation and mitigation actions, programmes and initiatives:** Since climate permeates many sectors most of which are coordinated under different ministries and departments of Government, it is imperative that appropriate measures to put in place enabling policy, legislative and institutional arrangement that will enhance coordination of climate change issues. In addition, there is need to enhance regional and international cooperation as well as partnerships with different stakeholders, including multilateral organizations, regional institutions, private sector and civil society organizations.

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ACRONYMS AND ABBREVIATIONS

ACMS	Aid Coordination Management Section
AGN	African Group of Negotiators
AMCEN	African Ministerial Conference of the Environment
CBDR	Common but differentiated responsibilities
CCA	Climate Change Adaptation
CDM	Clean Development Mechanism
CERs	Certified emission reductions
CH ₄	Methane
CO ₂	Carbon dioxide
COMESA	Common Market for Eastern and Southern Africa
COP	Conference of the Parties
CRM	Climate risk management
CSOs	Civil Society Organisations
CTCN	Climate Technology Centre and Networks
DFID	UK's Department for International Development
DJF	December-January-February
DNA	Designated National Authority
DPM	Deputy Prime Minister
DRF	Disaster risk financing
DRR	Disaster risk reduction
DWA	Department of Water Affairs
E	Emalangeni
EAC	East African Community
EU	European Union
EWS	Early warning system
FAO	Food and Agricultural Organization of the United Nations
FSE&CC	Federation of Swaziland Employers and Chamber of Commerce
GCF	Global Climate Fund
GEF	Global Environment Facility
GHG	Greenhouse gases
GOS	Government of Swaziland
HFCs	Hydroflouorocarbons
IPCC	Intergovernmental Panel on Climate Change
IWRM	Integrated Water Resources Management
JJA	June-July-August
KDDP	Komati Downstream Development Project
LEDS	Low Emission Development Strategy
LPG	Liquefied Purified Gas
LULUC	Land use, land use change
LULUCF	Land use, land use change and forestry
LUSIP	Lower Usuthu Smallholder Irrigation Project
M&E	Monitoring and Evaluation
MAM	March-April-May
MDGs	Millennium Development Goals

MEPD	Ministry of Economic Planning and Development
MET	Meteorology Department
MICT	Ministry of Information, Communications and Technology
MNRE	Ministry of natural Resources and Energy
MOA	Ministry of Agriculture
MOF	Ministry of Finance
MOH	Ministry of Health
MOHUD	Ministry of Housing and Urban Development
MOJCA	Ministry of Justice and Constitutional Affairs
MOPWT	Ministry of Public Works and Transport
MTEA	Ministry of Environment and Tourism
Mtoe	Million tonnes oil equivalent
MTP	Medium term plan
N ₂ O	Nitrous oxide
NAMAs	National Appropriate Mitigation Actions
NAP	National Adaptation Plan
NCCSAP	National Climate Change Strategy and Action Plan
NDMA	National Disaster management Agency
NDS	National Development Strategy
NEF	National Environment Fund
NGO	Non governmental organisation
ODA	Official Development Assistance
OECD	Organisation for Economic Co-operation and Development
PES	Payment for ecosystem services
PPP	Public-private partnership
RECs	Regional economic communities
REDD+	Reduced emissions from deforestation and forest degradation-plus
RF	Rockefeller Foundation
SADC	Southern African Development Community
SADP	Swaziland Agricultural Development Project
SCARTA	Swaziland Commercial Amadoda Road Transport
SCCF	Special Climate Change Fund
SEA	Swaziland Environmental Authority
SEC	Swaziland Electricity Company
SERA	Swaziland Energy Regulating Authority
SIDP	Smallholder Irrigation Development Project
SIPA	Swaziland Investment Promotion Authority
SNC	Second National Communication
SNTC	Swaziland National Trust Commission
SON	September-October-November
SWAp	Sectorwide approach
SWASA	Swaziland Standards Authority
SWSC	Swaziland Water Services Corporation
TEC	Technology Executive Committee
TNA	Technology Needs Assessment
UN	United Nations

UNCBD	United Nations Convention on Biological Diversity
UNCHR	United Nations Commission for Refugees
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate change
UNIDO	United Nations Industrial Development Organization
UNISWA	University of Swaziland
WMO	World Meteorological Services of the United Nations

1.0 INTRODUCTION

1.1 *Background*

Climate change impacts are already being observed in Swaziland in the form of erratic rainfall and changing temperatures which have a direct influence on availability of water, agriculture production, energy sources and supplies and ecosystems. This undermines Swaziland's quest for sustainable development, eradication of poverty and achievement of the Development Goals (MDGs).

The Kingdom of Swaziland is a monarchy and land-locked country located in the south eastern part of Africa covering an area of 17,363 km². It is bounded by the Republic of South Africa on the north, west and south and by the Republic of Mozambique to the east. It is classified into six physiographic zones: Highveld, Upper Middleveld, Lower Middleveld, Western Lowveld, Eastern Lowveld and Lubombo Range (Sweet and Khumalo, 1994). The altitude ranges from 250 m above sea level in the Lowveld, to 1400 m above sea level in the Highveld. The Lowveld is predominantly gentle undulating plain as opposed to the Highveld that has steep slopes on steeply dissected escapement. The natural vegetation ranges from short sour grasslands with forest patches in the cooler and moist Highveld to Acacia savanna in the hotter and dry Eastern Lowveld.

The general climatic characterization of Swaziland is subtropical with wet hot summers (about 75% of the annual rainfall in the period from October to March) and cold dry winters (April-September). The physiographic zones show the different climatic conditions, ranging from sub-humid and temperate in the Highveld to semi-arid and warm in the Lowveld. Swaziland is highly vulnerable as it lies at the transition of major climatic zones, being influenced by air masses from different origin: equatorial convergence zone (summer rains), subtropical eastern continental moist maritime (onshore flow with occasional cyclones), dry continental tropical and marine west Mediterranean (winter rains, with rare snow). Mean annual rainfall ranges from about 1,500 mm in the northern Highveld to 500 mm in the southern Lowveld. Precipitation varies considerably from year to year, which either may lead to periods of flash flooding or drought. Mean annual temperature varies from 17°C in the Highveld to 22°C in the Lowveld.

The country is prone to a number of hydro-meteorological hazards, with drought being the most common and this is likely to be exacerbated by climate change. The most severe ones occurred in the years 1983, 1992, 2001, 2007 and 2008 (GOS-UNDP, 2008). About 40% of the population was faced with acute food and water shortages in 2007, when the drought caused the worst harvest in the country's recorded history (IRIN, 2007). The other hydro-meteorological hazards in recent years include incessant lightning during rainy seasons, cyclone Domonia in 1984, and torrential rains and floods in 2000 (Manyatsi, 2011).

Given that the country's economy is predominantly agricultural-based and with agriculture being the main source of income and livelihoods for the majority of the population who live in the rural areas, climate change is likely to have adverse effects. Furthermore, the National Census of 2007 indicated that the population of Swaziland is 1,018,449 of which over half was below 20 years old, implying that the population has the potential to grow at a much higher rate, and the demand for resources would likely outstrip the current supply (GOS-MEPD, 2007).

According to the World Bank, in 2010 about 63% of the population lived below the national poverty line (World Bank, 2012). Poverty and high unemployment are some of the major factors accountable for the vulnerability and limited adaptive capacity of Swaziland. It is also the poor who first bear the brunt of climate change impacts and at the same time have little or no capacity to withstand or adapt to climate change. Thus, climate change will worsen the situation of the poor.

It is against this background that the Government of Swaziland has taken deliberate steps aimed at putting in place a National Climate Change Policy and a Strategy and Action Plan that will guide all efforts directed towards addressing the challenges posed by climate change. The National Climate Change Strategy and Action Plan (NCCSAP) aims at implementing the Policy and its scope is to provide a:

- (a) Strategic outlook which deals with the situational analysis at the global, regional and national levels;
- (b) Vision, Objectives and Guiding Principles of the Strategy;
- (c) Strategic areas of focus, including:
 - (i) Low carbon development
 - (ii) adaptation and climate risk management,
 - (iii) mitigation,
 - (iv) research and technology development and transfer,
 - (v) capacity building,
 - (vi) finance,
 - (vii) knowledge management and dissemination,
 - (viii) education, training and public awareness,
 - (ix) coordination, cooperation and partnerships;
- (d) Implementation Action Plan;
- (e) Monitoring, evaluation and reporting framework.

1.2 The Strategy Formulation Process

In developing this National Climate Change Strategy and Action Plan (NCCSAP), the Ministry of Tourism and Environmental Affairs pursued a consultative approach that entailed to achieve the following:

- (a) identify key climate change challenges and opportunities;
- (b) define national climate change vision, objectives and guiding principles that would enhance achievement of sustainable development through implementation of adaptation and mitigation actions;
- (c) place stewardship of the NCCSAP in the public domain so as to enhance sharing of responsibility by government, private sector, civil society, local communities and other stakeholders;
- (d) build a common understanding on climate change issues among stakeholders with a view to establishing public confidence in the formulation and implementation of the NCCSAP;
- (e) establish synergies and areas of complementarity with relevant sectoral policies and institutions on climate change issues; and
- (f) identify relevant regional and international instruments that enhance regional integration in addressing climate change.

The process was guided by a Multi-Sectoral Stakeholder Team comprising of representatives from different ministries, civil society organizations (CSOs), media and private sector. The following consultative activities were undertaken:

- (a) Technical experts working sessions comprising of experts from public and non public sectors;
- (b) Regional stakeholder meetings countrywide during which oral submissions were made by various stakeholders;
- (c) National stakeholder workshops; and
- (d) Consultative sessions with government departments, civil society organizations and private sector actors.

2.0 STRATEGIC OUTLOOK

2.1 *Global context*

Climate change is considered one of the most serious threats to the sustainability of the world's environment, society and the global economy. Human activities are changing the global climate, with unpredictable and potentially profound consequences for global weather patterns, ecosystems and human health. Since the beginning of the industrial revolution in the early 19th century, human activities begun to interfere with homeostatic processes, releasing carbon dioxide and other greenhouse gases into the atmosphere more quickly than they can be absorbed by natural sinks, primarily the oceans and forests. The result is that concentrations of these gases are increasing in the atmosphere. As a result, an ever greater proportion of the sun's energy is being trapped within the atmosphere, and the planet is heating up.

To address the challenge posed by climate change, at the global level, the United Nations Framework Convention on Climate Change (UNFCCC) and its Kyoto Protocol were agreed upon as the international legal instruments for responding to climate change. The ultimate objective of the Convention and any related legal instruments (such as protocols and decisions) that the Conference of the Parties (COPs) may adopt is to achieve, in accordance with the relevant provisions of the Convention, stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. Such a level should be achieved within a time frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner.

One of the cardinal principles that underpin the Convention is the Principle of Common but Differentiated Responsibilities, (CBDR), which sets out how developing and developed countries shall undertake their commitments under the Convention. The principle of CBDR obligates developed countries which are most responsible for the current build up of greenhouse gases in the atmosphere to take the lead in combating climate change and to assist developing countries, such as Swaziland, that are particularly vulnerable to the adverse effects of climate change in meeting costs of adaptation to those adverse effects of climate change. The support would entail provision of financial resources, technology development and transfer and capacity building. In this regard, therefore, the Government of Swaziland expects that the international community will provide the necessary means of implementation to enhance the implementation of this Strategy and Action Plan.

2.2 *Regional context*

Within the African Union framework, there are eight regional economic communities (RECs), including the Southern African Development Community (SADC) and Common Market for East and Southern Africa (COMESA), which are the continental economic building blocks. The RECs share common vision and a firm and shared conviction, both individually and collectively, that aim to put Africa on a path of sustainable development. Due to the close relationship between sustainable growth and climate change, it has become necessary to ensure that regional initiatives find a balance that integrates climate change and enhances the attainment of Development Goals (MDGs).

Swaziland is a Party to the SADC Treaty. The treaty aims, among others, at promoting sustainable and equitable economic growth and socio-economic development that will ensure poverty eradication and support the socially disadvantaged through regional integration. Climate change poses a number of risks to SADC goals for regional economic growth and socio-economic development as the region is highly susceptible to the adverse effects of climate change. For example, increased frequency and magnitude of floods, cyclones, and droughts may damage infrastructure, adversely affect agricultural production, disrupt livelihoods, and cause loss of life.

As adaptation to climate change involves many factors of progress in southern Africa, SADC has developed and is implementing several regional initiatives in response to global initiatives on climate change. Integration of climate change in other developmental sectors, such as water and agriculture, is also a priority of SADC leading to the development of the SADC Climate Change Adaptation Strategy. In addition, SADC has put in place other regional tools that may also help in addressing climate change. These include the SADC Protocol on Shared Watercourse Systems, the SADC Forestry Protocol and the SADC REDD+ Strategy.

Swaziland is also a member of COMESA which has developed a comprehensive approach and program initiative to address climate change. The programme aims at addressing the impacts of climate change in the eastern and southern Africa region through successful adaptation and mitigation actions that also build economic and social resilience for present and future generations. The COMESA Secretariat is working jointly with SADC and the East African Community (EAC) in facilitating the implementation of a Tripartite Programme on Climate Change.

2.3 National context

Evidence of climate change can be better computed from temperature and rainfall observations. An analysis of observed climatological data (temperature and rainfall) from the Swaziland Meteorological Services for the 40 year period from 1961 to 2000 indicated some climatic changes over this period. Seasonal analysis of the four annual seasons (December-January-February (DJF), March-April-May (MAM), June-July-August (JJA) and September-October-November (SON)) indicates clearly that in most parts of the country, significant increases in both mean minimum and mean maximum temperatures are evident except for minimum temperature at Bulembu during JJA and for maximum temperatures at Nhlangano and Mananga during DJF. This is a robust indication of global warming and future projections indicate that such trends will worsen in the future.

Similar increases were also noted in the number of both coldest nights and hottest days with annual minimum and maximum temperatures increasing. Spatially extensive and statistically significant increases in the duration of the longest (90th percentile) heat waves were also noted, with the largest increases occurring during JJA and SON at Mhlume and Ubombo in the Lowveld zone. In general the frequency of cold nights (and frost where it occurs) has decreased whilst the frequency of hot nights has increased. Highest increases in the number of hot nights occurred at Mbabane, where the frequency increased by 27% between 1961 and 2004 during JJA season.

With regard to rainfall, the analysis found that there are statistically significant increases in the rainfall intensity indices at specific locations and for specific periods especially for the DJF period indicating increases in the season's rainfall intensity. An analysis of the trends in average dry spell length and the median wet spell length indicated that there were more DJF days with rain in the later part of the 40 years. On seasonal rainfall boundaries (start and end of rainy season), significant changes were noted after 1980 indicating that rains have been delayed in the later part of the study period. On the other hand, rainfall cessation was found to have been occurring earlier over most of the country except southeast (Lowveld) and in the northwest (Highveld). It was also found that the rainfall season has been decreasing in length over central regions (most significantly at Matsapha) and increasing in the southeast and northwest parts of the country.

Climate change induced impacts have already manifested themselves in key socio-economic sectors in Swaziland and the country has an obligation to address the challenges posed by such impacts which add an extra economic burden to the country's fragile economy. The country is simultaneously faced with other serious challenges like the heavy disease burden, high poverty rate, food insecurity and low economic growth. The Second National Communication to the UNFCCC highlighted observed and potential impacts of climate change in key socio-economic sectors in the country. Swaziland is likely to be most seriously affected if issues on adaptive capacity and resource availability are not addressed

In response to climate change, Swaziland has made efforts to put in place policies and interventions that aim to reduce the impacts of climate change and build resilience. Such interventions include the National Malaria Control Programme that is implemented by the Ministry of Health, promotion of use of efficient and energy saving woodstoves that is implemented by the Ministry of Natural Resources and Energy and the integrated water resources management strategies and initiatives such as the Komati Downstream Development Project (KDDP), the Lower Usuthu Smaller Irrigation Project (LUSIP), the Smallholder Irrigation Development Project (SIDP), the Swaziland Agricultural Development Project (SADP) and the Dam Construction and Irrigation Development Programme (IDP).

3.0 GOAL, STRATEGIC OBJECTIVES AND GUIDING PRINCIPLES

3.1 Goal

To enhance adaptive capacity of the country to climate change in order to achieve sustainable development and contribute to a better quality of life for the Swazi Nation.

3.2 Strategic Objectives

3.2.1 Overall Strategic Objective

To provide a systematic approach to deal with climate change through adaptation and mitigation in a manner that contributes to achievement of sustainable development and eradication of poverty.

3.2.2 Strategic Objectives

The strategic objectives are to:

- (a) Integrate climate change adaptive and mitigation measures into the various sectoral policies and national development planning and budgeting.
- (b) Promote development and implementation of adaptation and mitigation actions that contribute to achievement of sustainable development, eradication of poverty and enhancement of adaptive capacity.
- (c) Provide mechanisms for mobilizing and accessing support for capacity building, transfer of technology and financial resources from the international community and other sources.

- (d) Build awareness and understanding of climate change among various stakeholders through education, training and public awareness.
- (e) Strengthen the legal and institutional framework for effective coordination and implementation of climate change adaptation and mitigation actions, programmes and initiatives.

3.3 Guiding Principles

The following guiding principles will underpin this Strategy:

- (a) **Sustainable development:** Any climate adaptation and mitigation actions implemented must aim to contribute to the achievement of sustainable development, eradication of poverty and enhancing the adaptive capacity.
- (b) **Access to information:** Each individual must have due access to information, held by the public authorities on the environment, to be able to participate in decision making processes.
- (c) **Public Participation:** A coordinated and participatory approach to climate change adaptation and mitigation actions should be enhanced to ensure that the relevant government agencies, private sector, civil society and communities are involved in planning, decision making and implementation processes taking into account youth, gender and vulnerable groups.
- (d) **The Principle of Subsidiarity:** Empower local communities to make climate change related decisions at the lowest levels.
- (e) **The Precautionary Principle:** Lack of full scientific certainty should not be used as a reason for postponing cost-effective measures to prevent damage and loss due to climate change.
- (f) **Capacity Building:** Community involvement, participation and collaboration with stakeholders should be continually encouraged to enhance building of local capacity.
- (g) **International Cooperation:** Every effort shall be made to enhance Swaziland's participation at the regional and global fora. The country shall also make efforts to promote south-south, north-south and triangular cooperation.
- (h) **Cross-Sectoral/Intersectoral Cooperation:** The strategy recognises the need to ensure that the cross-cutting nature and inter-dependencies of climate change adaptation and mitigation actions are taken into consideration in implementation by different sectors.

4.0 STRATEGIC AREAS OF FOCUS

4.1 *Strategic Objective 1: To integrate climate change adaptation and mitigation measures into the various sectoral policies and national development planning and budgeting.*

4.1.1 *Low Carbon Development*

Climate change, green growth and poverty are related. Climate change will have severe negative impacts that will exacerbate poverty and hinder development; but development will reduce poverty and increase the country's adaptive capacity. At the same time, development if carried on in a high carbon fashion will lead to increased carbon emissions that will eventually cause climate change and so exacerbate the ill effects of poverty.

The concept of low carbon development, also known as low-emission development strategies (LEDS) which was crystallized at the sixteenth Conference of the Parties (COP16) held in 2010 in Cancun, Mexico is used to describe forward looking national economic development plans or strategies that encompass low emission and/or climate resilient economic growth. This is premised on the recognition that LEDS are indispensable to sustainable development and that incentives are required to support the development of such strategies. Though not clearly implied by the terminology, LEDS are understood to also include provisions to reduce vulnerability to climate change impacts. The LEDS take a development-first approach which rethinks development planning and proposes structural solutions with lower emission trajectories. LEDS, therefore, focuses on addressing and integrating climate change with development objectives.

The need to integrate climate change and development may be traced to the fourth assessment report of the IPCC as there is a scientific consensus that to limit the rise in global average surface temperature to 2°C, which climate scientists believe marks the limit of safety, beyond which climate change becomes catastrophic and irreversible, then global carbon emissions must peak around the year 2020, followed by dramatic declines in global emissions of 2% per year. Furthermore, the Stern Review confirmed that not only is the cost of action far smaller than the cost of inaction, but that even the most aggressive action on climate change would have an almost imperceptible impact on the projected 150% growth in the global economy by 2050. In this regard, therefore, the LEDS provide a unique opportunity for Swaziland to take advantage of low-carbon green growth in advancing its long-term development prospects.

The proposed strategic actions are:

	Actions	Sub-actions
1.	Mainstream climate change into the national development, strategies and budgetary planning processes.	<ul style="list-style-type: none"> • <i>Ensure that climate change is integrated into the country's economic blueprint – Vision 2022, the NDS, the Poverty Reduction Strategy and its medium term plan.</i>
2.	Promote low carbon investments in key sectors.	<ul style="list-style-type: none"> • <i>Identify opportunities to support low carbon and climate resilient growth and promote investments.</i> • <i>Promote development of diversified portfolio of renewable energy and application of energy efficiency measures.</i> • <i>Enhance use of public transport and vehicle fleet efficiency.</i> • <i>Identify and provide incentives that encourage the private sector to finance low carbon investments.</i> • <i>Promote development and transfer of technologies that enhance reduction of GHG emissions in industries, agriculture, forestry and waste management.</i>
3.	Develop and implement a low carbon development strategy and a project pipeline	<ul style="list-style-type: none"> • <i>Identify sectoral flagship programmes and projects that promote the reduction of GHGs.</i> • <i>Prioritize the flagship programmes and project.</i> • <i>Analyse barriers hindering their implementation</i> • <i>Develop a low carbon development pathway</i> • <i>Develop a pipeline of priority needs for project development.</i>

4.2 ***Strategic Objective 2: To promote development and implementation of adaptation and mitigation actions that contribute to achievement of sustainable development, eradication of poverty and enhances adaptive capacity.***

4.2.1 Adaptation and climate risk management

4.2.1.1 **Adaptation**

Considering the relatively higher vulnerability of Swaziland and her people, adaptation strategies are needed to strengthen their resilience to the impacts of climate change. International support for adaptation is essential for reasons of fairness, poverty reduction and historical responsibility.

4.2.1.1.1 *Agriculture and Food Security*

Climate change is projected to have a wide range of impacts on various aspects of the agriculture sector. Overall, it is suggested that climate change will significantly undermine crop production in the region, posing a serious threat to food security, even after adaptation and productivity improvements have been accounted for. Effective adaptation in this sector will be of crucial importance. Yet, the Food and Agriculture Organization of the United Nations (FAO) estimates that food production needs to increase by 70% by 2050 to meet growing population demands, thus, it will be increasingly challenging to sustain progress towards the MDGs in the face of climate change. Indeed climate change is threatening food production systems and therefore the livelihoods and food security of thousands of Swazi people who depend on agriculture.

Agriculture is a sector most vulnerable to climate change due to its high dependence on climate and weather and because people involved in agriculture lack adaptive capacity. Current evidence (IPCC, 2001, 2007, 2013) suggests that countries like Swaziland are expected to be more vulnerable to warming because additional warming will affect, among other things, their already dwindling water resources and negatively affect their agricultural sector. The problem is expected to worsen since farmers depend most heavily on rain-fed agriculture. Indeed, consistent warming trends and more frequent and intense extreme weather events such as droughts, cyclones and floods have been observed across southern Africa in recent decades.

There is a general feeling among the Swazis that there had been some change in the climate. The temperature has increased and the amount of rainfall has declined and its timing altered. Because of these changes, Swaziland has been experiencing a decline in maize production thus making the country highly dependent on food imports. This is confirmed by agronomic studies which show that yields could fall quite dramatically in the absence of intervening adaptation measures. Furthermore, the current farming technology is basic, and the income is low, suggesting that farmers will have few

options to adapt. In addition, public infrastructure such as irrigation systems, long term weather forecasts and agricultural research and extension are inadequate to secure appropriate adaptation.

Adaptation to climate change in Swaziland, where the projected scenarios are less water and higher temperatures, means first, more efficient use of water, and second, a change in farming practices (both crops and livestock). Even without climate change, there are serious concerns about agriculture in Swaziland because of water supply and water variability. In addition, changes in the mean temperature and rainfall, and the increased variability of rainfall, have resulted in prolonged length of dry seasons and increased severity of periodic droughts that reduces water and fodder available for livestock.

Climate change will also affect pests and diseases in the same way it affects infectious disease agents. The range of many insects will expand or change, and new combinations of pests and diseases may emerge as natural ecosystems respond to altered temperature and precipitation. Increase in the frequency or severity of extreme weather events, including droughts, heat waves, windstorms, or floods, could also disrupt the predator-prey relationships that normally keep pest populations in check. The effect of climate on pests may add to the effect of other factors such as the overuse of pesticides and the loss of biodiversity that already contribute to pest and disease outbreaks.

The proposed strategic actions are:

	Actions	Sub-actions
1.	Mainstream climate change in agricultural policy, strategy, programmes and initiatives	<ul style="list-style-type: none"> • <i>Review the agricultural policy, strategy, programmes and initiatives with a view to integrating climate change issues.</i>
2.	Enhance adoption of sustainable land management practices	<ul style="list-style-type: none"> • <i>Promote adoption of sustainable land management practices such as changes in agricultural practices, participatory adaptive management practices, soil management, seed management, fertilizer use, crop rotation, agroforestry, integrated pest management system (IPMS), changing planting and harvesting times and post-harvesting management.</i> • <i>Promote rainwater harvesting for crop and livestock production to increase the buffer and adaptive capacity of smallholder farmers to deal with climate change.</i> • <i>Improve irrigation techniques and agricultural water management for more efficient water use.</i> • <i>Promote agricultural diversification to</i>

		<p><i>enhance climate resilience.</i></p> <ul style="list-style-type: none"> • <i>Promote appropriate indigenous knowledge agricultural practices.</i>
3.	Enhance agricultural research and technology development and innovation	<ul style="list-style-type: none"> • <i>Develop national knowledge base on climate change impacts and adaptation strategies using an agroecological zone and farming systems approach, taking into account information such as crop yield responses to climate, water availability for rain-fed and irrigated crops, and livelihood strategies in rural areas.</i> • <i>Promote use of or develop drought-and/or heat tolerant crops, water conserving crop varieties and livestock breeds.</i> • <i>Invest in post harvest and value addition processing and storage technologies.</i>
4.	Strengthen agricultural extension service	<ul style="list-style-type: none"> • <i>Improve agricultural advisory services and information systems.</i> • <i>Strengthen weather forecast information sharing for farmers and establish a dedicated agricultural forecasting system.</i> • <i>Promote use of indigenous knowledge and local coping strategies as a baseline and starting point of adaptation</i>
5.	Promote risk management and insurance	<ul style="list-style-type: none"> • <i>Identify and develop indicators for climate risks, including thresholds and acceptable coping ranges at the sector and project levels, which are critical to improving climate risk management and planning.</i> • <i>Integrate disaster preparedness by providing accurate and timely climate information and early warning systems.</i> • <i>Enhance application of climate risk management tools, such as crop and livestock weather-based insurance.</i>

4.2.1.1.2 Water Resources

Water, like other natural resources, has both commercial and environmental value not readily determined by or reflected in market prices. Access to water is a basic necessity for all Swazi people, both for direct consumption and as an integral part of hydro-power generation, agricultural production and industrial use. Yet, southern Africa is generally regarded as a water scarce region, a problem that is likely to be aggravated by climate change. Thus, balancing competing uses over scarce water supplies remains one of the major challenges for Swaziland.

The vulnerability and adaptation assessment of the water sector in Swaziland undertaken in 2012 showed that flash floods occur more frequently in the present than in the past and mean annual flows appear to be lower in the present than in the past. Due to such changes, the country faces water stresses during dry seasons which inhibit agricultural production and threaten food security. Such stresses will increase with predicted potential negative impacts of climate change in the country.

International law has long addressed issues relating to transboundary or shared water resources. Swaziland is really in a very unique position as the main rivers that traverse the country are shared with South Africa and Mozambique. This has necessitated the three countries to sign bilateral and trilateral agreements on shared water resources. It is inevitable that these shared water resources can give rise to significant bilateral or multilateral disputes, particularly in a time of scarcity. Yet, Swaziland must meet her water needs.

The proposed strategic actions are:

	Actions	Sub-actions
1.	Mainstream climate change into sectoral water policy, programmes, plans and initiatives.	<ul style="list-style-type: none"> • <i>Review water sector policy, strategy, programmes, plans and initiatives with a view to integrating climate change.</i>
2.	Enhance holistic management of water resources through effective implementation of Integrated Water Resources Management (IWRM) approaches.	<ul style="list-style-type: none"> • <i>Protect and rehabilitate water catchment areas and wetlands.</i> • <i>Promote groundwater recharge and rainwater harvesting.</i> • <i>Facilitate and promote water recycling and reuse.</i> • <i>Enhance provision of reliable piped water and sanitation.</i> • <i>Enhance harnessing of water for hydro-power generation, agriculture, industrial, basic human needs and other uses.</i> • <i>Develop and apply water saving technologies and management methods.</i>
3.	Enhance risk management and early warning	<ul style="list-style-type: none"> • <i>Undertake water resources assessment, including continuing determination of resource availability and quality, and water demand trends.</i> • <i>Develop and implement an early warning system.</i> • <i>Develop and implement flood risk reduction strategies and drought monitoring systems.</i>
4	Enhance rain water harvesting	<ul style="list-style-type: none"> • <i>Construct large scale reservoirs</i> • <i>Properly manage existing dams</i>

	<ul style="list-style-type: none"> • <i>Promote household level water harvesting techniques</i>
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4.2.1.1.3 Biodiversity and Ecosystems

Healthy ecosystems are vital to the implementation of both adaptation and mitigation strategies. Well-functioning ecosystems, with high natural biodiversity, are able to sequester more carbon than degraded natural systems and human structures. Furthermore, healthy ecosystems continue to provide ecosystem services that help people to adapt to the adverse effects of climate change and exhibit high resilience to other problems. Yet, according to IPCC Fourth Assessment Report (2007), any increase in global average temperature above the range of 1.5 . 2.5°C is likely to result in significant alterations in the structure, function and geographical ranges of ecosystems.

Biodiversity is defined very broadly in the United Nations Convention on Biological Diversity (UNCBD) as: *“the variability among living organisms from all sources including inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems.”* Thus, ecosystem services provide both the conditions and processes that sustain life.

Swaziland pride herself with a diverse terrain from the high altitude mountainous Highveld to the low lying Lowveld. Such a diverse terrain is accompanied by diverse biodiversity ranging from thousands of flora and fauna species. There are several nature reserves in the country which are also tourist attractions and these include: Malolotja National Park, Hlane National Park, Mkhaya Nature Reserve, Mlilwane Nature Reserve and other smaller reserves. Such reserves play a major role in preserving endangered species in the country such as black rhino, loan & sable antelope, tsessebe, white rhino, elephant and other locally endangered species.

The country together with neighbouring South Africa and Mozambique have plants and vertebrate species that are regarded as endemic to the area which cannot be found anywhere else in the world except for these area which lies in the three countries. These plant species are: *Encephalartos lebomboensis*, *Encephalartos aplanatus*, *Encephalartos sentocisus*, *Encephalartos umbeluziensis*, *Euphorbia keithii*, *Celtis mildbraedii* and *Aloe keithii* and the vertebrate species are: *Platysaurus lebomboensis*, *Leptotyphlops telloi* and *Cordylus warren*. According to information in the SNC all these species will be severely impacted or even driven to local extinction as result of the effects of climate change. Those that are most vulnerable to extinction are with small populations, slow rates of dispersal, restrictive elevation, climate requirements, and/or whose habitat is limited or occurs in patches.

Perhaps the greatest long-term danger from climate change will be the disruption of natural ecosystems, which provide an array of services that ultimately support human health. Biotic systems . whether in forests, Highvelds, Lowvelds, aquatic environments or elsewhere . provide food, materials and medicines; store and release fresh water; absorb and detoxify wastes; and satisfy human needs for recreation and wilderness. These systems will likely undergo major reorganization as global temperatures rise and rainfall patterns change more rapidly than they have in the past 10,000 years. Fragmentation and disturbance of ecosystems and of landscapes will have profound effects on the services provided, since these impacts shift the balance of the kinds of species present . from large, long-lived species to small, short-lived ones. These shifts are likely to lead to loss of biodiversity besides reducing the capacity of the systems to store nutrients, sequester carbon and provide pest protection among other functions.

One of the most significant threats to biodiversity is the emergence into an ecosystem of species that do not belong there . alien invasive species. Recent studies show that alien invasive species have rapidly grown in the country covering all the four regions. The government is doing everything possible to control the spread of these alien invasive species.

The proposed strategic actions are:

	Actions	Sub-actions
1.	Promote ecosystem-based approach to biodiversity conservation	<ul style="list-style-type: none"> • <i>Identify priority areas for conservation, restoration and adaptive management. Create protected areas and biodiversity corridors to enhance interconnectedness of protected areas.</i> • <i>Capacity building for inventorying and monitoring, including operational monitoring capability for remote sensing and use of geographic information systems through technology transfer.</i> • <i>Enhance systematic removal and control of the alien invasive species.</i> • <i>Implement ecosystem-based management and payment for environmental services (PES).</i> • <i>Put in place a mechanism for species and ecosystems monitoring.</i> • <i>Develop and maintain seed banks.</i>
2.	Enhance biodiversity knowledge management.	<ul style="list-style-type: none"> • <i>Develop and promote standards and guidelines for data collection and management and information dissemination.</i>
3	Increase area under conservation	<ul style="list-style-type: none"> • <i>Promote both in-situ and ex-situ conservation</i>

	<ul style="list-style-type: none"> • <i>Promote community conservation sites</i>
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4.2.1.1.4 Health

Climate change influences many of the key determinants of health: temperature extremes and violent weather events; the geographical range of disease organisms and vectors, the quantity of air, food and water and the stability of the ecosystems on which the people depend on. IPCC (2001) indicates that many vector, food and water-borne diseases are sensitive to changes in climatic conditions. For example, results of predictive models have shown that under different climate change scenarios, there would be a net increase in the geographical range of potential transmission of malaria and dengue fever (Tonnang et al., 2010).

In Swaziland, there are already reported incidences of epidemic malaria in the country. Mosquitoes are quite sensitive to changes in temperature and rainfall and are among the first organisms to extend their range when environmental conditions become favourable. Higher temperatures could influence the incidence of diseases such as malaria, dengue fever, yellow fever and several types of encephalitis. Cold temperatures are often the limiting factor in mosquito survival, so any increase in minimum winter temperatures would likely extend mosquito ranges into higher altitudes where they do not survive now.

Although temperature most determines the potential range of various vector, food and water-borne diseases, precipitation principally governs the availability of breeding sites. Thus, the combination of temperature and rainfall changes . modified by many other factors such as land use changes, human population densities and whether exposed populations have any built-in disease immunity . will determine how the patterns of these vector, food and water-borne diseases.

The proposed adaptation strategic actions are:

	Actions	Sub-actions
1.	Establish preventive measures and surveillance systems	<ul style="list-style-type: none"> • <i>Build capacity of communities to take measures to improve the environmental conditions in and around their homes.</i> • <i>Improve surface water management and destroy breeding sites of water-related vectors.</i> • <i>Promote use of mosquito nets.</i> • <i>Promote domestic water treatment.</i> • <i>Create awareness to educate the public about the importance of hygiene, proper waste disposal and removal of breeding sites for mosquitoes and other insect vectors.</i>

2.	Develop and implement preparedness and response measures	<ul style="list-style-type: none"> • <i>Improve disease surveillance systems.</i> • <i>Improve preparedness and emergency response.</i> • <i>Develop and implement an early warning system.</i>
3.	Develop green hospital designs	<ul style="list-style-type: none"> • <i>Promote use of eco-friendly material in building hospitals</i> • <i>Promote off-grid renewable energy in hospitals</i> • <i>Improve hospital and hazardous waste management practices</i>

4.2.1.1.5 Human settlement

Increasing human populations, coupled with changing land tenure systems, have led to unplanned and unserviced settlements making them more vulnerable to adverse effects of climate change. Human settlement requires some form of planning whose main goal is to improve the quality of life and the general welfare of the community concerned. This can only be achieved through both development and conservation. Land use planning is one of the means applied to achieving this goal as it provides a system through which communities can address their development problems. The system would also be the first line of action for addressing many local and regional environmental problems. When properly undertaken it incorporates environmental considerations and integrated environmental management.

The proposed strategic actions are:

	Action	Sub-actions
1.	Regulate land use	<ul style="list-style-type: none"> • <i>Develop and implement land use plans and regulations that take into account climate related risks.</i> • <i>Strengthen and expand building design standards and codes to cover all areas taking into account climate-related risks.</i> • <i>Improve settlements of communities living in climate change risk prone areas.</i> • <i>Relocate settlements from climate change high risk prone areas.</i>

4.2.1.1.6 Energy

An energy mix of comprising of modern energy sources such as electricity, liquefied petroleum gas (LPG) and renewable energy are crucial for growth of the Swazi

economy as well as improving the quality of life. Improving access to modern energy calls for the move towards cleaner and more efficient energy. Currently, kerosene and biomass are extensively used in rural households in Swaziland, mainly for cooking and heating purposes. Over the years however, there has been a growing demand for electricity to which Government has responded through the implementation of the Rural Electrification Programme.

Energy sources and systems are affected by climate change, either directly or indirectly. Swaziland's local generation capacity is mainly from hydropower and biomass. Both these sources of energy are heavily reliant on precipitation. Dams and rivers are also affected by soil erosion and siltation. In addition to power generated within the country, Swaziland imports coal based electricity from South Africa, which has since imposed an Environmental Levy, thus making electricity unaffordable, especially to the poor. This is likely to become worse with the imminent introduction of carbon tax in South Africa. It is, therefore, necessary that Swaziland improves her energy security by diversifying energy sources with focus on harnessing the potential opportunities to produce energy from in-country renewables.

The proposed strategic actions are:

	Actions	Sub-actions
1.	Enhance conservation of ecosystems which support energy production and use.	<ul style="list-style-type: none"> • <i>Invest in the protection of ecosystems that support existing and planned energy production.</i> • <i>Improve watershed management to regulate the hydrologic cycle and reduce sediment loads, thereby maintaining hydropower production levels.</i>
2.	Enhance access and use of clean energy sources and technologies	<ul style="list-style-type: none"> • <i>Deploy energy efficient technologies</i> • <i>Promote local production and use of energy efficient stoves.</i> • <i>Promote establishment of woodlots.</i> • <i>Upscale Rural Electrification Programme to reach the majority of the people living in the rural areas.</i> • <i>Introduce smart subsidies and enhance financing the uptake of renewable energy and energy efficient technologies.</i> • <i>Build local capacity to evaluate and respond to energy needs from a climate change perspective.</i>

4.2.1.1.7 Natural hazards and preparedness

The number of global natural disasters per year has been rising dramatically on all continents since 1980. Some of the implications of climate change for natural hazards are obvious: climate change alters the frequency and intensity of some natural hazards, worsening some and lessening others, thus complicating hazard planning standards.

Natural hazards pose a significant threat to the attainment of both national development goals. Over the past 20 years, natural disasters have been on the increase in Swaziland. For example, between 1984 and 2008 several natural disasters, including floods, droughts, storms and wildfires were experienced in Swaziland. It is evident that two thirds of all disasters are hydrometeorological events.

Profile of hazard events in the recent years

Hazard	Year	Population Affected
Hydro meteorological Hazards		
Drought	2001	347 000
	July 2007	410 000
	July 2008*	287 634
	2009	256283
	2010	170000
	2011	88 511
Strong winds/ Windstorms	28 Jan 1984	632 500
	23 Jan 2005	1 150
	1 Aug 2006	6 535
	March 2010	1000
	2011*	+/-200 families
Hailstorms, thunder & lightning	Jan 2000	No data available
	2011*	+/-200 families
Floods	Jan 2008	272 000
Epidemiological Hazards		
*Foot & mouth	Jan 1992	2228
	Jan 1996	None
A/H1N1	2009	95
Avian influenza	2009	None
Cholera	2009	20
MDR and XDR TB	2009	<ul style="list-style-type: none"> • TB incidence rate 1198 per 100,000 population • TB mortality rate 317 per 100,000
Man-made Hazards		
Wildfires	27 Jul 2007	1500
	8 Oct 2008	1230

Source: Adapted from GOS-DPMO (2012, pp.10)

Disasters disproportionately affect the poor and vulnerable and can set back the achievement of development goals such as the MDGs. Investments in disaster resilience can reduce direct and indirect disaster losses dramatically, contributing to sustained economic growth, the achievement of poverty reduction and other MDGs, and enhanced natural resources management. Actions to strengthen resilience also need to be implemented within an integrated disaster risk management (DRM) framework, combining climate change adaptation (CCA), disaster risk reduction (DRR), disaster preparedness, post-disaster relief, early recovery, reconstruction, and disaster risk

financing (DRF) goals under a single framework and pursuing them through joint initiatives.

The proposed strategic actions are:

	Actions	Sub-actions
1.	Strengthen the national capacity to prepare and respond to disasters.	<ul style="list-style-type: none"> • <i>Strengthen the legislative and regulatory frameworks and fiscal incentives to enhance building of resilience.</i> • <i>Integrate disaster risk reduction in sector plans, project life cycle and investment screening, design and appraisal procedures.</i> • <i>Strengthen national resilience capacity, coordination and capabilities.</i> • <i>Establish mechanisms for climate change related risks and vulnerability assessments.</i>
2.	Strengthen the existing disaster response mechanisms to make them more effective.	<ul style="list-style-type: none"> • <i>Strengthen institutional arrangement for disaster risk management.</i> • <i>Strengthen early warning system (EWS) and effective disaster preparedness and response.</i> • <i>Strengthen disaster risk awareness and information support on disaster risk management.</i> • <i>Enhance disaster preparedness and management at all levels.</i>

4.2.1.1.8 *Climate change induced migration and conflicts*

The Office of the UN High Commissioner for Refugees estimates that by 2050, adverse effects associated with global climate change will result in the displacement of between 50 and 200 million people (UNCHR 2009). Seasonal migration remains an important source of income in normal circumstances and in times of scarcity like drought. People migrate to earn income when the livelihood conditions in their home areas are not conducive, pushing them to look for alternative places and activities to earn income.

Still, if conditions in the receiving areas cease to be conducive to migrants, then the smallholders would rather remain at home because they feel more secure in their home area than in the receiving areas. This suggests that adverse climate conditions is just one of the many factors that push people to migrate and that the conditions in the receiving areas must also be conducive before people decide to move to those areas. Another implication is that if conditions and employment opportunities are increased in the rural areas that migration can be reduced. Through migration, the migrants earn off-

farm incomes which they are likely to invest in agricultural activities. Thus, earning income outside the farm contributes to maintaining on-farm food security and production, especially in the aftermath of droughts and floods.

Another important aspect is the issue of gender. Since it is mostly men that migrate or have multi-local livelihoods, wives are left at home to cater for themselves and the elderly and children. This means that women must take on additional work but their spheres of influence in decision-making does not increase. This can adversely affect the effectiveness of adaptations, for example, as decisions to sell livestock in times of scarcity like drought must be delayed until the house hold head sends a message of his decision. Thus interventions in rural areas must be gender-sensitive in order to also improve the livelihood conditions of women.

Both scarcity and abundance of environmental resources can exacerbate existing tensions and contribute to conflict between families and communities. A combination of environmental change, resources capture and population growth decreases the per capita availability of natural resources, particularly the poorest that depend on these natural resources for survival. The resulting social effects . migration and intensified competition over resources could lead to conflicts. For example, conflict and tensions can erupt in respect of distribution, access and quality of water resources.

The proposed strategic actions are:

	Action	Sub-actions
1.	Develop and implement a risk management strategy to protect citizens from climate change induced migration.	<ul style="list-style-type: none"> • <i>Expand the understanding and recognition of potential migration issues through better analysis, better data and better predictions.</i> • <i>Prepare to prevent and control resource-based conflicts as a result of climate change induced migration.</i> • <i>Enhance the capacity of local institutions to address climate change induced migration related conflicts through cooperative conflict resolution and management approaches taking into account gender.</i> • <i>Facilitate, where appropriate, the return of disaster-affected populations to homes and ensure adequate reconstruction efforts.</i>

4.2.1.2 **Climate Risk Management**

Climate change increases disaster risk in a number of ways. It changes the magnitude and frequency of extreme events and it also changes average climatic conditions and climate variability, thus affecting underlying risk factors and it generates new threats which might never have been experienced or dealt with in the region. Consequently, if

climate change adaptation interventions are to be efficient and effective, they must build on and expand existing DRR efforts and if DRR approaches are to be sustainable they must account for the impact of climate change.

It is acknowledged that both climate change and DRR recognize that the poor are disproportionately affected by hazards. This is due to lack of access to the means by which they can improve their resilience, whether in economic, social, physical or environmental terms. For both adaptation and DRR, poverty reduction and sustainable natural resource management are essential components of reducing vulnerability to hazards and climate change. Building resilience is a basis for both DRR and climate change adaptation. Traditional knowledge on such matters is an important starting point for developing adaptation and DRR strategies.

The proposed strategic actions are:

	Actions	Sub-actions
1.	Mainstream disaster risk reduction into national planning processes	<ul style="list-style-type: none"> • <i>Incorporate disaster risk reduction into national planning processes.</i>
2.	Enhance early warning systems	<ul style="list-style-type: none"> • <i>Identify, assess and monitor disaster risks and enhance early warning systems.</i> • <i>Strengthen disaster preparedness and management capacities for effective response at all levels taking into account traditional/indigenous knowledge.</i> • <i>Promote risk-sensitive land use planning.</i>

4.2.1.3 **Mitigation**

Mitigation and adaptation are both essential aspects of dealing with climate change, but adaptation becomes costlier and less effective as the magnitude of climate change grows. Consequently, when mitigation objectives are affordably achieved, adaptation requirements are reduced and the ultimate is less stress. Whereas Article 4 of the Convention sets out mitigation of climate change as a global responsibility for both developing and developed countries, this is to be achieved in developing country such as Swaziland with support from developed countries in form of capacity building, transfer of technology and finance. According to Swaziland's Second National Communication of 2012 the sectors that are responsible for GHGs, include (1) Industries - 45.8% (mostly HFCs), (2) Waste - 33.7%, (3) Agriculture - 8.2%, (4) Energy - 6.7%, and (5) Land use change - 5.6% and they are projected to double by the 2030.

There is need for overall national interventions targeting all the sectors and to establish the necessary MRV framework to enhance mitigation actions in the country.

	Actions	Sub-actions
1.	Mainstream low carbon development options into national planning processes	<ul style="list-style-type: none"> • <i>Identify entry points in the different sectors for low carbon</i> • <i>Develop sectoral mechanisms for data collection</i> • <i>Promote the preparation of sectoral inventories</i> • <i>es</i>

4.2.1.3.1 Industry

At global level, emissions from industries account for about 23% of the total GHG emissions. In Swaziland according to the Second National Communication, industries are the highest GHG emitters, accounting for about 45.8% of the national GHG emissions. These are largely agro-processing industries, producing sugar, ethanol, cotton, timber products, beef and canned fruit, production of soft drinks concentrates beverages, textiles, and other manufacturing. The types of GHGs emitted from the Swaziland industrial sector can be classified into three categories: (1) energy-related carbon dioxide emissions, (2) carbon dioxide emissions from non-energy uses of fossil fuels and non fossil fuels, and (3) non carbon dioxide GHGs, particularly HFCs. There continues to be a large demand for capital investment in improved technology to upgrade industrial facilities. Such efficient and cleaner technologies will reduce energy demand and emissions while also phasing out undesired HFCs. This will go a long way in attainment of sustainable development, which seeks to strike a balance of attainment of economic benefits, without compromising social issues such employment while also protecting the environment through implementation of cleaner production processes.

The proposed strategic actions are:

	Actions	Sub-actions
1.	Provide incentives to encourage investment in cleaner technologies	<ul style="list-style-type: none"> • <i>Identify low carbon technologies for adoption.</i> • <i>Promote phasing out of HFCs through appropriate technology transfer and diffusion.</i> • <i>Develop legal and economic instruments that promote low carbon production.</i>
2.	Develop and implement comprehensive corporate climate change strategy	<ul style="list-style-type: none"> • <i>Enhance the adoption and use of cleaner production practices and technologies.</i> • <i>Encourage industries to incorporate climate change issues into their operations and reporting.</i> • <i>Establish a GHG inventory and reporting systems to help understand the sources and magnitudes of GHG emissions from</i>

	<p><i>industries and other sources.</i></p> <ul style="list-style-type: none"> • <i>Undertake voluntary energy audits and establish environmental quality management systems.</i> • <i>Enhance energy efficiency, materials efficiency and recycling to reduce GHG emissions.</i> • <i>Promote diversification of energy sources and fuel switching technologies.</i>
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4.2.1.3.2 Waste Management

Waste accounted for about 34% of the GHG emissions for Swaziland in 2000 (GOS-SNC, 2012). Swaziland, like other countries in southern Africa, is experiencing a burgeoning population growth and rapid urbanization has led to a disproportionate escalation in the rate of waste generation. Since unprecedented demands are being placed on available resources and the environment, a comprehensive waste management strategy is necessary.

The waste management process takes place within a complex milieu of ever-changing economic, social, political and biotic factors, all of which have to be taken into account in the development of any waste management strategy. This calls for a holistic approach to waste management where waste is dealt with in an environmentally responsible way from its generation to its ultimate disposal.

The proposed strategic actions are:

	Action	Sub-actions
1.	Develop and implement a Comprehensive Waste Management and Pollution Control Strategy	<ul style="list-style-type: none"> • <i>Review and revise the National Solid Waste Management Strategy, to include some aspects of climate change</i> • <i>Revise and update the Environmental management Act of 2002</i> • <i>Establish a waste database which will provide accurate figures on quantities and types of wastes generated by various sectors of Swazi society.</i> • <i>Promote the establishment of industries that use recyclable materials to create a market base for recyclers.</i> • <i>Introduce and strengthen waste minimization strategies.</i> • <i>Raise awareness on waste minimization initiative.</i> • <i>Promote a variety of waste disposal</i>

		<p><i>options, including incineration, recycling, physico-chemical treatment, biological treatment (bioremediation) and well managed landfills.</i></p> <ul style="list-style-type: none"> • <i>Ensure the proper handling, treatment and disposal of solid and liquid waste in both rural and urban areas.</i> • <i>Promote harnessing of biogas from wastes through transfer of technology of biogas digesters.</i>
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4.2.1.3.3 *Agriculture*

Agriculture is one of the major contributors to climate change. According to the IPCC Fourth Assessment Report (2007), agriculture, which consists of cropland, pasture and livestock production accounts for about 13 percent of total anthropogenic GHG emissions. Emissions from this sector are primarily methane (CH₄) and nitrous oxide (N₂O), making the agriculture sector the largest producer of non-CO₂ emissions (60% of the world total in 2000).

In Swaziland, sources of emissions from agriculture are in the following sub-sectors: cultivation of agricultural soils, livestock and manure management, rice production and the burning of agricultural residues and clearing of savanna. Emissions from agriculture are expected to rise in the future because of increased food demand for the growing and more prosperous Swazi nation that is able to afford more varied diets with higher shares of meat and dairy products. Such a shift will also lead to increased pressure on forests for agricultural expansion leading to deforestation.

Farmers in Swaziland have the potential to reduce the quantity of emissions from the agriculture sector through the efficient management of carbon and nitrogen flows and such other measures that reduce the amount of emissions (abatement) or enhance the absorption of GHGs (sequestration). Such practices may include: (1) carbon sequestration into soils, through adoption of sustainable agricultural practices and grazing land management, (2) on-farm emission reductions through improved management practices, including livestock and manure management, fertilizer management and improved water use and management, and (3) emission displacements from the transport sector through biofuel production. However, the overall benefits will need to be weighed against potential impacts on yield.

The proposed strategic actions are:

	Action	Sub-actions
1.	Promote sustainable agricultural practices	<ul style="list-style-type: none"> • <i>Promote adoption of sustainable agricultural practices and technologies that enhance efficiency and productivity while reducing GHG emissions.</i> • <i>Enhance efficient fertilizer application.</i> • <i>Promote manure management practices.</i> • <i>Promote use of biotechnology to reduce methane emissions.</i> • <i>Promote harnessing of biogas from agricultural residues.</i>

4.2.1.3.4 Energy

Globally the energy sector is faced with the challenge of meeting energy demands, at affordable prices and appropriate quality, while having to reduce environmental degradation in energy production and use. Swaziland is no exception to this challenge. As populations and economies grow, the global demand for energy continues to rise, placing an ever-increasing burden on natural resources and the environment. For about three decades, world primary energy demand grew by 2.1 per cent annually, rising from 5566 million tonnes oil equivalent (Mtoe) in 1971 to 11204 Mtoe in 2004. Although, over two-thirds of this increase come from developing countries, primary energy use per capita in OECD countries was still 10 times higher than in sub saharan Africa.

Global increases in carbon dioxide emissions are primarily due to fossil fuel use (IPCC 2007), which are combusted to meet approximately 82% of the world's energy demand. However, traditional biomass (firewood and charcoal) remains an important energy source in developing countries like Swaziland, where rural majority rely on it for heating and cooking. Swaziland's main source of electricity is from hydropower. Potential exists for the use of clean and renewable energy sources such as solar, wind and geothermal for power generation purposes, to meet the local energy demand.

The proposed strategic actions are:

	Actions	Sub-actions
1.	Put in place enabling environment for investment in low carbon and carbon neutral energy infrastructure and technologies	<ul style="list-style-type: none"> • Improve investment in low carbon and carbon neutral energy infrastructure and technologies. • Create an enabling environment for generation and utilisation of clean and renewable energy, such as solar, wind, biowaste and geothermal. • Ensure conducting of a strategic environmental assessment for renewable

		<p>energy programmes.</p> <ul style="list-style-type: none"> • Enforce and incentivize the adoption of clean and efficient technologies and practices in energy production and use. • Explore and provide viable sources of capital funding for large investments in renewable energy programmes.
2.	Enhance national capacity in energy planning and monitoring	<ul style="list-style-type: none"> • Build capacity for energy planning and monitoring to minimize GHG emissions.

4.2.1.3.5 Land use, land use change

Changes in land use date to prehistory and are the direct and indirect consequence of human actions. Land use, land use change plays a major role in climate change at global, regional and local scales. At the global scale, LULUC is responsible for releasing greenhouse gases to the atmosphere, thereby contributing to global warming. LULUC can increase the release of carbon dioxide to the atmosphere by disturbance of terrestrial soils and vegetation, and the major driver of this change is deforestation and this can be aggravated by agriculture. Changes in land use can also be a major source of other greenhouse gases such as methane and nitrous oxide.

Terrestrial carbon can be maintained by changing land use to reduce GHG emissions. It can be created by changing land management practices or by changing existing land uses to those which sequester more atmospheric greenhouse gas as carbon. However, changing the way terrestrial carbon is managed at scale requires new thinking, incentive systems and policy approaches that enhance adaptive capacity of the people. It requires the transition to a new era of low carbon economy, a holistic approach to land use (landscape approach) across the country. At the global scale, the Kyoto Protocol offers an example of international efforts to reduce climate change caused by GHG emissions from land. It offers incentives, such as carbon credits that encourage land use practices which promote the storage of carbon on land, including the planting of trees, perennial crops and other sustainable land management practices.

The proposed strategic actions are:

	Action	Sub-actions
1.	Enhance land use planning	<ul style="list-style-type: none"> • <i>Enhance land use planning and sustainable land management practices.</i> • <i>Build capacity on assessment, estimating and monitoring land use, land use change drivers and their impacts.</i> • <i>Promote greenhouse gas accounting for the land use sector and promote enhancement of carbon stocks.</i>

4.2.1.3.6 Transport

While transportation is crucial to Swaziland's economy and personal lives of her people, the transport sector is also a source of GHG emissions. The carbon dioxide emissions from the transport sector accounts about 23% of the total global GHG emissions. In Swaziland, the number of vehicles has increased significantly in the last decade, these accounts for the increase in GHG emissions from the transport sector. Aviation activities contribute the least towards Swaziland's transport emissions. Transportation systems are also vulnerable to climate change in that precipitation and storm activity may have adverse impacts on infrastructure design, operations and maintenance.

The proposed strategic actions are:

	Actions	Sub-actions
1.	Promote low emission transport systems	<ul style="list-style-type: none"> • <i>Institute mechanisms for climate change informed urban transport planning to facilitate efficient and low GHG emissions.</i> • <i>Establish an effective vehicle inspection to ensure compliance with vehicle emission standards and update standards.</i> • <i>Promote use of biofuels without compromising food security and biodiversity.</i> • <i>Improve design, construction and alignment of transport infrastructure.</i>

4.2.1.3.7 Forestry

According to the Second National Communication to the UNFCCC, land use, land use change and forestry accounted to about 5.6% of the greenhouse gas emissions. Yet, forests play a crucial role in regulating the global climate, while also being a vital natural resource. Forests help prevent climate change by acting as sinks that absorb carbon dioxide, but at the same time deforestation and land use change are responsible for more than 20% of global carbon dioxide emissions . the second largest source after the burning of fossil fuels, and more than the combined emissions from all forms of transport.

According to FAO, an assessment of the state of the world's forests indicates that the total forested area continues to decline significantly. Deforestation appears to be prevalent in developing countries especially in Africa. Despite growing awareness and increasing investments in environmental protection, pressures on Swaziland's forests continue to increase rapidly. For example, the total land area under forests in Swaziland declined over the period 1990 to 2000 by 1.2%. This loss was partially offset by reforestation efforts, new forest plantations and the gradual regrowth and expansion of

forested areas. The leading causes of deforestation are the extension of subsistence farming and government/community backed conversion of forests to other land uses. Poverty, joblessness and general quest for land for human settlement force many people to invade the forests. More than 90% of rural households in Swaziland depend on woodfuel, including fuelwood and charcoal, for their energy requirements. The sustainability of this high dependence is questionable.

At international level under the UNFCCC, Parties have put in place a framework for reducing emissions from deforestation and forest degradation commonly known as the REDD+. REDD+ focuses on developing policies and financial incentives to curb emissions from forests and it covers three critical elements: (1) reducing emissions from deforestation, (2) conservation and sustainable management of forests, and (3) enhancement of forest carbon stocks. Currently, developing countries are working to put in place policies and measures that would help curb emissions from forests and governments and other actors are trying different approaches through pilot activities for REDD+. Nonetheless it is increasingly becoming evident that the goal REDD+ programmes can only be achieved if the drivers of deforestation are addressed. Many of which are outside the forest sector.

The proposed strategic actions are:

	Actions	Sub-actions
1.	Strengthen national forest management and enforcement	<ul style="list-style-type: none"> • <i>Strengthen national plans and programmes for forest management, inventory and monitoring.</i> • <i>Enhance investments in agroforestry.</i> • <i>Promote afforestation and reforestation.</i> • <i>Strengthen forest law enforcement, governance and trade, including increasing capacity of communities to manage and utilize forests sustainably.</i>
2.	Develop and implement a National REDD+ Strategy	<ul style="list-style-type: none"> • <i>Develop a national REDD+ Strategy.</i> • <i>Promote development and implementation of REDD+ programmes, and forestation and afforestation programmes.</i> • <i>Develop national reference levels and national carbon map.</i> • <i>Build technical capacity (learning by doing) to create expert teams with the experience to develop well-designed projects with rigorous national and sub-national carbon accounting frameworks.</i>

4.2.1.3.8 Building and Housing

The building sector is also an important player in reducing greenhouse gas emissions. Sustainable buildings are essential for a green economy and the country needs to invest on such buildings to ensure that the country's infrastructure is compatible with international standards.

	Actions	Sub-actions
1.	Establish and implement a Green Building and Housing Code	<ul style="list-style-type: none">• <i>Review building standards to incorporate greenhouse gas emissions.</i>• <i>Undertake a national zoning exercise to mark “no construction zones”</i>• <i>Design and implement energy efficiency measures at commercial and household levels.</i>• <i>Promote sustainable energy options at household level.</i>

4.3 Strategic Objective 3: To provide mechanisms for mobilizing and accessing support for technology development and transfer, capacity building and financial resources from the international community and other sources.

4.3.1 Research and technology development and transfer

Science, technology and traditional knowledge are important resources for responding to climate change. Research and technology development and transfer are crucial for adaptation, in response to changes brought about by climate change. An example of such change is changes in the length of growing seasons, increased droughts and periodic floods and increased temperature (heat) as well as as new pests and diseases. To adapt to these changes, investment in research and transfer of technology will be critical. Various types of research, some of which is climate change related, has been carried out in the country. However these research findings are not utilised to inform policy or implementation of initiatives. Furthermore, improved technologies that address climate change adaptation and mitigation already exist, yet Swaziland may not be in a position to access them without international support. A Technology Needs Assessment (TNA) was conducted, as part of the development of the Second National Communication to UNFCCC.

Swaziland like many developing countries stand to derive many benefits from technologies developed elsewhere, yet accessing these technologies and managing their risks remains a challenge. To address this challenge, at the international level, in 2010 at the sixteenth Conference of the Parties (COP16) established a Technology Executive Committee (TEC) and a Climate Technology Centre and Network (CTCN) now located at the United Nations Environment Programme (UNEP) in Nairobi, Kenya under the consortium that includes the UN Industrial Development Organization (UNIDO) and eleven other international research and development organizations.

The Centre will work to facilitate adoption of technology to enable developing countries, such as Swaziland, reduce GHG emissions and improve resilience to changing weather patterns, soil erosion and other impacts of climate change. In particular, the Centre will: (1) foster public-private partnerships; (2) promote innovation; (3) catalyse the use of technology road maps or action plans; (4) mobilise national, regional and international technology centres and network; and (5) facilitate joint research and development activities. The CTCN will work to reduce these risks and barriers and support efforts to implement adaptation and mitigation actions that can reduce GHG emissions and contribute to achievement of sustainable development goals.

Swaziland needs to put in place mechanisms that will allow her national institutions involved in research and development to engage with CTCN for the benefit of the country. Thus through nationally designated authority (DNA), Swaziland will be able to call on the services of the Centre and its wider network for technical support and advice as well as capacity building.

The proposed strategic actions are:

	Action	Sub-actions
1.	Enhance climate change research and development	<ul style="list-style-type: none"> • <i>Enhance research and development of appropriate technologies that will build climate resilience and reduce GHG emissions.</i> • <i>Establish a climate change technology innovation centre that will be a hub of technology development, transfer and diffusion.</i> • <i>Promote the implementation of appropriate research findings, innovations and technologies.</i> • <i>Establish dialogues that will provide a platform where new research findings, innovations and technologies are discussed to promote knowledge sharing and dissemination.</i>

4.3.2 Capacity building

To effectively implement climate change adaptation and mitigation actions, enhanced efforts in capacity building will be necessary. The strengthening of many institutions and organizations and the development of personnel skills and expertise will be required. This can be achieved through increased education, training and access to relevant information, tools and technologies.

Understanding of the impacts of climate change in Swaziland is still not well understood and would require special attention. In the government, public and private domains, climate change issues are rarely fully recognized. A substantial advancement of human and institutional capacity must be achieved to manage and implement adequate climate change solutions across sectors. In some cases, an additional strengthening of the appropriate policy and legal frameworks is necessary. In order to make capacity building efforts as effective as possible, periodic needs assessments will be necessary. Also, securing long term financial support and evaluating the progress of capacity building efforts with standardized criteria is vital.

The proposed strategic actions are:

	Action	Sub-actions
1.	Develop and implement a Comprehensive Capacity Building Programme	<ul style="list-style-type: none"> • <i>Undertake capacity needs assessment.</i> • <i>Prepare a costed Comprehensive Capacity Building Programme and mobilize resources for its implementation.</i> • <i>Build capacity of institutions on climate-related data management and dissemination.</i> • <i>Build capacity on the local, regional and national levels for design, implementation and monitoring the impacts of adaptation and mitigation actions.</i> • <i>Strengthen capacity in numerical weather prediction and modelling.</i>

4.3.3 Finance

Funding adaptation and mitigation to climate change in developing countries such as Swaziland is mainly through two sets of mechanisms. The official development assistance (ODA), which focuses on activities to reduce poverty and the dedicated multilateral climate finance. The Global Environment Facility (GEF) is designated to operate the financial mechanisms for the Rio Conventions and more recently the Green Climate Fund (GCF) was established.

The GEF has mechanisms that support such adaptation and mitigation actions include:

- (a) The GEF Trust Fund which finances the incremental costs of producing global environmental benefits
- (b) The Special Climate Change Fund (SCCF) finances and supports activities complementary to those funded by the GEF Trust Fund.
- (c) The Adaptation Fund established under the Kyoto Protocol which receives 2% of the Certified Emission Reductions (CERs) issued for projects of the Clean Development Mechanism (CDM) and funds from other sources. The Adaptation Fund finances concrete adaptation projects in developing countries such as Swaziland.

The GCF to which much of the \$100 billion (2020 target) mobilized from a wide variety of sources will be channeled is intended to consolidated climate finance at the international level. Decision4/CP.18 requests the Board of the GCF to balance the allocation of the resources of the GCF between adaptation and mitigation activities. The effect of this decision is that a country like Swaziland will need to position herself to access financial resources from the GCF.

Whereas the Government of Swaziland in the past years has been able to access financial resources from GEF and the Adaptation Fund through multilateral agencies such as the United Nations Development Programme (UNDP) and the United Nations Environment Programme (UNEP), a need has arisen for the Government of Swaziland to reorganize her activities in a manner that will enable her to mobilize and access climate finance from different sources. This is important if the country is to implement effectively the strategies contained in this Strategy and Action Plan.

The Government has established a full-fledged section in the Ministry of Economic Planning and Development known as the Aid Coordination Management Section (ACMS) whose main function is to mobilize resources to support development activities. Whereas the Section coordinates resource mobilization, implementation of the funded programmes and projects is done by the respective line ministries and departments.

The Environmental Act establishes the National Environment Fund (NEF) whose main function, *inter alia*, is to mobilize financial resources to support implementation of environmental and related projects and initiatives across the country. The NEF provides an opportunity in the interim and with the necessary adjustments to mobilize climate finance from different sources. However, the ideal situation is to establish a full-fledged National Climate Fund.

The proposed strategies are:

	Actions	Sub-actions
1.	Legal and institutional strengthening	<ul style="list-style-type: none"> • <i>Establish a semi-autonomous agency and build the requisite technical capacity to enable it undertake the mobilization of climate finance to support development and implementation of adaptation and mitigation actions.</i> • <i>Develop legal and institutional framework for the establishment of the National Climate Finance Agency that meet the international requirements of receiving, controlling and disbursing climate finance.</i> • <i>Strengthen the institutional and technical capacity of the Climate Finance Agency to enable it meet the international fiduciary requirements.</i>
2.	Enhance resource mobilization	<ul style="list-style-type: none"> • <i>Strive to adequately fund adaptation strategies and actions through predictable, stable funding sources, including through the national budget.</i> • <i>Design new, creative funding opportunities to support adaptation and mitigation</i>

		<p><i>actions, including public-private partnerships (PPP) with the private sector.</i></p> <ul style="list-style-type: none"> • <i>Develop investment framework and eligibility criteria to access climate finance from either the National Environment Fund or the proposed National Climate Fund.</i>
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4.4 Strategic Objective 4: To build awareness and understanding of climate change among various stakeholders through education, training and public awareness.

4.4.1 Knowledge management and dissemination

Knowledge and information on climate change is critical in informing the design of appropriate adaptation policies, planning and choice of strategies and reducing climate related risks. This however is dependent on the adequacy and quality of climate data and information. For example, with information on impending drought or storms, farmers can adapt their strategies accordingly. In this way climate monitoring and Early Warning Systems (EWS) can contribute to better responses to climate change.

Climate services which entail climate data collection, monitoring, prediction and dissemination of climate information is critical in establishing an effective EWS. Thus, a climate-based EWS would constitute assessment of risk, technical warning service, communication needs and the preparedness of those at risk. In this regard, therefore, an effective EWS would provide information on impending climate hazards early enough to enable actors to take action to prevent injury and loss of life as well as to reduce socio-economic impacts.

Some of the major challenges to monitoring and forecasting weather and climate are as shown in the Box below. Although climate monitoring and predictions has substantially improved in Swaziland in the past decade, there is still more room for improvement. Generally climate data from the region is often limited, in both quantity and quality. This is as a result of low investment in equipment and trained personnel. According to the World Meteorological Organization of the United Nations (WMO), the density of meteorological stations in

Challenges to climate monitoring and prediction for informing policy and national planning

- Lack of historical data limiting the use of climate data.
- Coarse spatial and temporal resolution of the forecasts.
- Sparse distribution of stations.
- Lack of calibration for point rainfall estimates to enable real time monitoring.
- Limited resources for special equipment and computers for climate monitoring.
- Low number of staff.
- Timely availability of climate products and services from global climate centres.
- Inadequate knowledge of the public about climate hazards, climate variability and climate change
- Inadequate communication facilities.

Africa is estimated to be 8 times lower than the minimum recommended, causing a gap in global climate data. The uneven distribution of stations especially in the rural remote areas where climate information is needed most increases this deficit. As a result, missing climate data, which cannot be easily interpolated, are common. Often satellite data is used to compensate for missing data but the limited technological development restricts the use of this data.

Of importance to agriculture is also the dissemination of seasonal climate outlooks (seasonal climate predictions or seasonal-averaged weather predictions) that provide indication of rainfall 3 to 6 months in advance and short term weather forecasts of impending climatic hazards. Forecasts contain some degree of uncertainty that need to be communicated. For example, farmers need to know that when Swaziland Meteorological Department forecasts early or late rains that the rains might turn out to be not so early or late in the farmer's judgments. The periodicity of forecasts needs to be adapted to the periods when climate information is critical, for example, during sowing, dry spells and critical periods in crop growth. To improve weather forecasts and their dissemination to farmers, the MET and scientists must understand the cultural context of the target audiences, communicate in a language that farmers understand and remind farmers that the forecasts are probabilities so that farmers respond to the weather forecasts bearing these limitations in mind.

The proposed strategic actions are:

	Actions	Sub-actions
1.	Strengthen Institutional and technical capacity	<ul style="list-style-type: none"> • <i>Undertake institutional and technical strengths and needs assessment in particular, national focal point and DNA, government ministries and departments, private sector organizations and civil society organizations with a view to developing a capacity development plan of action.</i> • <i>Improve the capacity of inventory preparation and downscaling of climate models for national and local application.</i> • <i>Prepare a roster of professional experts and inventory of institutions dealing with climate change and climate research in different thematic areas and their respective capacities.</i>
2.	Establish a framework for climate change knowledge management and dissemination under the Department of climate change.	<ul style="list-style-type: none"> • <i>Establish a national climate change data base.</i> • <i>Increase and improve access to climate information.</i> • <i>Facilitate packaging and dissemination of climate information to different</i>

		<p><i>stakeholders and target groups.</i></p> <ul style="list-style-type: none"> • <i>Engage in national round tables and dialogues that foster common understanding and action on climate change issues.</i> • <i>Engage and train the media on scientific research findings in a language understood by the local society.</i>
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4.4.2 Education, training and public awareness

Access to information and education is a basic human right, and an important aspect of human wellbeing. Training at different levels is necessary to ensure that various adaptation and mitigation interventions are well understood. In addition, public awareness is critical in mobilizing concerted efforts by the citizenry to addressing climate change issues.

The proposed strategic actions are:

	Actions	Sub-actions
1.	Mainstream climate change in the national curricula	<ul style="list-style-type: none"> • <i>Review the curricula with a view to integrating climate change issues.</i>
2.	Enhance training	<ul style="list-style-type: none"> • <i>Conduct training for practitioners with regard to mitigation and vulnerability and risk assessments.</i>
3.	Enhance public awareness	<ul style="list-style-type: none"> • <i>Strengthen public awareness within local communities (schools, universities, media, etc) on the importance of climate change mitigation and adaptation solutions and their role in reducing other human stressors.</i> • <i>Disseminate information on climate change issues within relevant government institutions, and other public and private stakeholders.</i> • <i>Promote public participation in climate change related decision making processes.</i>

4.5 ***Strategic Objective 5: To strengthen the legal and institutional framework for effective coordination and implementation of climate change adaptation and mitigation actions, programmes and initiatives.***

4.5.1 Coordination

Climate change permeates many sectors most of which are coordinated under different ministries and departments of Government. To give effect to this Strategy, it is imperative that a framework be established that would enable effective coordination of different players and actors in a manner that does not interfere with their legal, jurisdictional and administrative mandates.

4.5.1.1 Legal Framework

Currently, Swaziland does not have a National Climate Change Policy and a specific legislation on climate change. However, there are a plethora of sectoral policies and legislation that have a bearing on climate change. These include those dealing with environment, water, wildlife conservation, energy, agriculture and food security, forests and health among others. It would appear necessary that the first deliberate step at national level in addressing climate change in a comprehensive manner is threefold: (1) formulate and adopt a comprehensive national climate change policy; (2) develop and enact comprehensive national climate change legislation; and (3) review sectoral policies and legislation with a view to integrating climate change issues.

The proposed strategies are:

	Actions	Sub-actions
1.	<i>Develop and enact a comprehensive National Climate Change legislation.</i>	<ul style="list-style-type: none"> • <i>Review sectoral legislation that have a bearing on climate change with a view to making recommendations on how they could be amended to incorporate climate change.</i> • <i>Formulate a comprehensive National Climate Change legislation.</i>

4.5.1.2 Institutional Arrangement

Climate change in Swaziland is hosted at the Meteorological Department (MET) under the Ministry of Tourism and Environmental Affairs (MTEA). In this regard, therefore, the national focal point and designated national authority (DNA) for the clean development mechanism (CDM) is the MET Department. The MET Department has and continues to execute this function with increasing challenges due to the fact that climate change permeates many sectors some of which are in completely different ministries thus limiting the coordination and influence of the department.

This arrangement worked very well before when there was low understanding of the impacts of climate change to the economy and the people. Now, with increased awareness of climate change issues and its impacts on the various sectors, it is becoming more apparent that climate change needs to be coordinated in a manner that recognizes its cross-sectoral nature. Furthermore, in the recent years, climate change has assumed political centre stage as the African Union Summit established a coordinating committee of the Heads of State and Government since 2009. For example, the fifteenth Conference of the Parties (COP15) held in Copenhagen, Denmark in 2009 was attended by the Heads of State and Government. This calls for a paradigm shift in the manner that climate change issues are coordinated in Swaziland.

The proposed strategic actions are:

	Action	Sub-actions
1.	Establish a climate change department under the Ministry of Tourism and Environmental affairs.	<ul style="list-style-type: none"> • <i>Establish Climate Change Department (which will also be the National Focal Point, DA, DNA, negotiations) in the Ministry of Tourism and Environmental Affairs to coordinate and synergize with ministries and departments.</i> • <i>Strengthen the capacity of the Ministry responsible for environment to enable it coordinate effectively climate change at the ministerial level, the African Ministerial Conference on the Environment (AMCEN) and other related fora.</i>
	Operationalise and strengthen the capacity of the Department	<ul style="list-style-type: none"> • <i>Establish a national greenhouse gas unit under the Department</i> • <i>Establish a knowledge management information and capacity unit</i> • <i>Staff the Department and build the capacity of the staff to perform their duties.</i>

4.5.2 Cooperation

The United Nations Framework Convention on Climate Change (UNFCCC), which entered into force in 1994, provides a platform and an overall framework for governments to concertedly tackle the challenge posed by climate change. The Kyoto Protocol constitutes first step under the Convention to set GHG emission reduction targets. In the Kyoto Protocol's first commitment period from 2008-2012, 37 industrialized countries were bound by explicit emission reduction targets. The second commitment period was renewed at the seventeenth Conference of the Parties (COP17) held in Durban, South Africa in 2011 and parties decided on an 8-year second commitment period which started on January 1st 2013, during the eighteenth Conference of the Parties (COP18) held in Doha, Qatar in 2012. Countries that are taking further commitments under the Kyoto Protocol agreed to review their emission reduction commitments at the latest by 2014, with a view to increasing their respective levels of ambition. At COP18, Parties also, agreed on a timetable for the 2015 global climate change agreement and increasing ambition before 2020.

In light of the foregoing, it is imperative that Swaziland as a Party to the Convention and its Kyoto Protocol has and must continue to play its role in the climate change multilateral processes. At the time of developing this Strategy, Swaziland was the current chair of the African Group of Negotiators (AGN), a position it assumed in Durban for a period of two years ending December 2013. By virtue of being the AGN Chair, Swaziland has assumed responsibility to provide leadership and negotiate on behalf of Africa.

The proposed strategic actions are:

	Actions	Sub-actions
1.	Strengthen participation in multilateral climate change processes.	<ul style="list-style-type: none"> • <i>Effectively prepare and coordinate participation in the multilateral climate change negotiations and regional climate change initiatives and programmes.</i> • <i>Continue to play a participatory role in the regional groupings such as the African Group of Negotiators (AGN) so as to ensure that the interests and aspirations of the Swazi Nation are incorporated in the overall group position.</i>
2.	Enhance regional integration in dealing with climate change issues and other processes	<ul style="list-style-type: none"> • <i>Participate in the design and implementation of regional climate changes processes, programmes and initiatives by the SADC, COMESA among others.</i>

4.5.3 Partnerships

The private sector can and should play a critical role in addressing climate change adaptation and mitigation actions. The sector is well placed through direct investments and partnerships to support specific adaptation and mitigation actions.

The proposed strategic actions are:

	Action	Sub-actions
1.	Enhance partnerships on climate change issues	<ul style="list-style-type: none"> • <i>Encourage round table meetings with civil society, public and private sectors to enhance dialogue, participation and partnerships.</i> • <i>Enhance public-private partnerships in addressing climate change issues.</i> • <i>Promote South-South and South-North partnerships in areas of common interest.</i>

4.5.4 Linkages with other sectors

Climate change permeates every sector of the economy. Consequently, an agreed framework between sectors and across sectors on the coordination and integration of climate change considerations at all levels will assist in clarifying the roles and responsibilities.

The proposed strategic actions are proposed are:

	Action	Sub-actions
1.	Enhance linkages with climate related sectors	<ul style="list-style-type: none"> • <i>Establish an inter-ministerial committee on climate change to ensure cross- and inter-sectoral coordination and policy integration of climate change issues into sectoral policies, programmes and plans.</i> • <i>Encourage appropriate use of the sector-wide approach (SWAp) as a tool for coordinating integration of climate change issues into the national development and sectoral planning and decision making.</i> • <i>Put in place an effective mechanism that will ensure constant communication among agencies that share jurisdictions and responsibilities on matters relating to climate change.</i>

IMPLEMENTATION ACTION PLAN

Strategic Priority Focus Area	Sector	Action	Sub-actions	Performance indicators	Target					Lead institutions	Costs E
					Yr1	Yr2	Yr3	Yr4	Yr5		
<i>Strategic Objective 1: To integrate climate change adaptive and mitigation measures into the various sectoral policies and national development planning and budgeting.</i>											
Low Carbon Development	National development planning	Mainstream climate change issues in the national development and sectoral planning processes and budget.	<i>Review the country's economic blueprint – Vision 2022, the NDS and its medium term plan and integrate climate change issues.</i>	Sectorial climate change milestones						Ministry of Economic Planning and Development	0.5 million
		Promote low carbon investments in key sectors.	<i>Identify opportunities to support low carbon and climate resilient growth and promote investments.</i>	List of identified opportunities and their expected impacts						All stakeholders, Climate Change Department to take the lead	0.2 million
			<i>Promote development of diversified portfolio of renewable energy and application of energy efficiency measures.</i>	Number of new energy efficiency measures in use, number of new renewable energy types in use.						Department of Energy, Ministry of Natural Resources and Energy	0.2 million
			<i>Enhance use of public transport and vehicle fleet efficiency.</i>	Number of pool vehicles						Transport Department, ministry of Public Works and Transport and transport operators (SCARTA)	0.3 million
			<i>Identify and provide incentives that encourage the private sector to finance low carbon investments.</i>	Incentives promoted and enforced						Business community (FSE & CC) and Climate Change Department.	0.3 million

Strategic Priority Focus Area	Sector	Action	Sub-actions	Performance indicators	Target					Lead institutions	Costs E
					Yr1	Yr2	Yr3	Yr4	Yr5		
			<i>Promote development and transfer of technologies that enhance reduction of GHG emissions in different sectors.</i>	Sectorial mitigation actions (NAMAs) and technologies for implementing the identified actions						All stakeholders, Climate Change Department.	0.5 million
<i>Strategic Objective 2: To promote development and implementation of adaptation and mitigation actions that contributes to achievement of sustainable development, eradication of poverty and enhances adaptive capacity.</i>											
Adaptation	Agriculture and food security	Mainstream climate change in agricultural policy, strategy, programmes and initiatives	<i>Review the agricultural policy, strategy, programmes and initiatives with a view to integrating climate change issues.</i>	Climate change integrated to the agricultural policy						Ministry of Agriculture	0.5 million
		Enhance adoption of sustainable land management practices	<i>Promote adoption of sustainable land management practices</i>	Number of communities practising sustainable land management						Land use Planning in the Ministry of Agriculture	10 million
			<i>Promote rainwater harvesting for crop and livestock production.</i>	Number of established rainwater harvesting structures						Ministry of Agriculture and Department of Water Affairs	15 million
			<i>Improve irrigation techniques and agricultural water management.</i>	Number of improved irrigation schemes or areas						Ministry of Agriculture	60 million

Strategic Priority Focus Area	Sector	Action	Sub-actions	Performance indicators	Target					Lead institutions	Costs E
					Yr1	Yr2	Yr3	Yr4	Yr5		
			<i>Promote agricultural diversification to enhance climate resilience.</i>	Diverse agricultural practises and systems						Ministry of Agriculture	10 million
			<i>Promote appropriate indigenous knowledge agricultural practices.</i>	Indigenous knowledge well promoted and practised						Ministry of Agriculture	2 million
		Enhance agricultural research and technology development and innovation	<i>Promote use of or develop drought- and/or heat tolerant crops, water conserving crop varieties and livestock breeds.</i>	New drought and heat tolerant crop varieties and livestock breeds						Malkerns Research Station, University of Swaziland: Luyengo Campus	20 million
			<i>Invest in post harvest and value addition processing and storage technologies.</i>	- Number of farmers trained in post harvesting and value addition - number of value addition centres established						Ministry of agriculture	15 million
		Strengthen agricultural extension service	<i>Improve agricultural advisory services and information systems.</i>	- Well-equipped and well-staffed agricultural advisory and information systems - number of tailored advisory products						Agricultural and extension service department in the ministry of agriculture	4 million
			<i>Strengthen weather forecast information sharing for farmers.</i>	- institutional arrangements for agro-meteorology strengthened						Swaziland Meteorological Services	1.8 million

Strategic Priority Focus Area	Sector	Action	Sub-actions	Performance indicators	Target					Lead institutions	Costs E
					Yr1	Yr2	Yr3	Yr4	Yr5		
				<ul style="list-style-type: none"> - training of meteorological staff and extension officers - periodical tailored products disseminated to farmers - farmers involved in data collection 							
			<i>Promote use of indigenous knowledge and local coping strategies as a baseline and starting point of adaptation</i>	<ul style="list-style-type: none"> - assessments for local coping mechanisms completed - database for area specific coping mechanisms - duplication of effective and efficient coping mechanisms to other relevant communities 						Climate Change Department	0.5 million
		Promote risk management and insurance	<i>Integrate of disaster preparedness by providing accurate and timely climate information and early warning systems.</i>	<ul style="list-style-type: none"> - Disaster risk management committee strengthened - disaster hotspots mapped - community early warning systems established - early warning communication strategies 						National Disaster Management Agency	1.5 million

Strategic Priority Focus Area	Sector	Action	Sub-actions	Performance indicators	Target					Lead institutions	Costs E
					Yr1	Yr2	Yr3	Yr4	Yr5		
				developed							
			<i>Enhance application of climate risk management tools, such as crop and livestock weather-based insurance.</i>	- Inclusive assessments on risk transfer tools completed. - relevant tools identified and promoted						Ministry of Agriculture	0.5 million
Adaptation	Water Resources	Mainstream climate change into sectoral water policy, programmes, plans and initiatives	<i>Review water sector policy, strategy, programmes, plans and initiatives with a view to integrating climate change.</i>	Number of water sector policy, strategies and programmes reviewed						DWA, MEPD, all sectors	0.5 million
		Enhance holistic management of water resources through effective implementation of Integrated Water Resources Management (IWRM) approaches.	<i>Protect and rehabilitate water catchment areas and wetlands.</i>	Number of water catchments protected						MOA, MTEA, DWA, NGOs	1.5 million
			<i>Promote groundwater recharge and rainwater harvesting</i>	Number of groundwater and rainwater harvesting schemes						MTEA, DWA, MOA	3 million
			<i>Facilitate and promote water recycling and reuse</i>	Percentage of population recycling and reusing water						MTEA, SEA, SWSC	4 million
			<i>Enhance provision of reliable piped water and sanitation</i>	Proportion of population with access to piped potable water and sanitation						MNRE, DWA, SWSC	15 million
			<i>Enhance harnessing of water for hydro-power generation, agriculture, industrial, basic human needs and other uses</i>	Amount of energy generated						MNRE, SERA, SEC	2 million

Strategic Priority Focus Area	Sector	Action	Sub-actions	Performance indicators	Target					Lead institutions	Costs E
					Yr1	Yr2	Yr3	Yr4	Yr5		
			<i>Develop and apply water saving technologies and management methods</i>	Amount of water saved						Climate Change Department and DWA	2 million
		Enhance risk management and early warning	<i>Undertake water resources assessment, including continuing determination of resource availability and quality, and water demand trends.</i>	Water resources assessment report						Climate Change Department and DWA	1 million
			<i>Develop and implement an early warning system</i>	Early warning system in place						Climate Change Department and DWA	1 million
			<i>Develop and implement flood risk reduction strategies and drought monitoring systems</i>	Number of flood risk reduction strategies in place and implemented						Climate Change Department, National Disaster Management Agency and DWA	2 million
Adaptation	Biodiversity and Ecosystems	Promote ecosystem-based approach to biodiversity conservation	<i>Identify priority areas for conservation, restoration and adaptive management. Create protected areas and biodiversity corridors to enhance interconnectedness of protected areas</i>	Size of area identified and protected						Climate Change Department, SNTC	2 million
			<i>Capacity building for inventorying and monitoring, including operational monitoring capability for remote sensing and use of geographic information systems through technology transfer</i>	Number of persons trained in carrying inventory and monitoring						Climate change Department and other stakeholders	1 million
			<i>Enhance systematic removal and control of the alien invasive</i>	Area cleared of alien invasive plant species						Climate Change Department, MOA, MTEA	60 million

Strategic Priority Focus Area	Sector	Action	Sub-actions	Performance indicators	Target					Lead institutions	Costs E
					Yr1	Yr2	Yr3	Yr4	Yr5		
			<i>species</i>								
			<i>Implement ecosystem-based management and payment for environmental services (PES).</i>	Number of organisations implementing PES						MTEA, SNTC	2 million
			<i>Put in place a mechanism for species and ecosystems monitoring</i>	A mechanism for species and ecosystem monitoring put in place						MTEA	1 million
			<i>Develop and maintain seed banks</i>	Seed bank developed and maintained						MTEA, MOA	2 million
		Enhance biodiversity knowledge management.	<i>Develop and promote standards and guidelines for data collection and management and information dissemination.</i>	Standards and guidelines for data collection in place						MTEA	0.5 million
Adaptation	Health	Establish preventive measures and surveillance systems	<i>Build capacity of communities to take measures to improve the environmental conditions in and around their homes</i>	Number of communities trained						MOH	2 million
			<i>Improve surface water management and destroy breeding sites of water-related vectors</i>	Number of water surfaces with improved management						MOH, DWA	3 million
			<i>Promote use of mosquito nets</i>	Number of persons using mosquito nets						MOH	4 million
			<i>Promote domestic water treatment</i>	Number of households treating domestic water						MOH, DWA	5 million
			<i>Create awareness to educate the public</i>	Number of persons						MOH	0.5 million

Strategic Priority Focus Area	Sector	Action	Sub-actions	Performance indicators	Target					Lead institutions	Costs E
					Yr1	Yr2	Yr3	Yr4	Yr5		
			<i>about the importance of hygiene, proper waste disposal and removal of breeding sites for mosquitoes and other insect vectors</i>	educated about importance of hygiene							
		Develop and implement preparedness and response measures	<i>Improve disease surveillance systems</i>	Number of persons trained in disease surveillance						MOH	0.5 million
			<i>Improve preparedness and emergency response.</i>	Time taken to respond to emergency						MOH, NDMA	0.4 million
			<i>Develop and implement an early warning system</i>	Early warning system in place						NDMA	1 million
Adaptation	Human Settlement	Regulate land use	<i>Develop and implement land use plans and regulations that take into account climate related risks.</i>	Number of land use plans developed and implemented						MOA, MNRE	1 million
			<i>Strengthen and expand building design standards and codes to cover all areas taking into account climate-related risks</i>	Number of building designs standards and codes strengthened						MOHUD	1 million
			<i>Improve settlements of communities living in climate change risk prone areas</i>	Number of communities with improved settlements						MOHUD, MOA	5 million
			<i>Relocate settlements from climate change high risk prone areas</i>	Number of settlements relocated						MOHUD, Tinkhundla, MOA	10 million
Adaptation	Energy	Enhance conservation of ecosystems which support energy production and use.	<i>Invest in the protection of ecosystems that support existing and planned energy production</i>	- No. of afforestation initiatives - Initiatives implemented to protect and conserve water						MNRE – Energy and Water SEA SNTC MTEA – Forestry	30 million

Strategic Priority Focus Area	Sector	Action	Sub-actions	Performance indicators	Target					Lead institutions	Costs E
					Yr1	Yr2	Yr3	Yr4	Yr5		
				resources							
		Enhance access and use of clean energy sources and technologies	<i>Promote local production and use of energy efficient stoves</i>	No. of efficient woodstoves being used						MNRE – Energy MOA – Home Economics	20 million
			<i>Promote establishment of woodlots</i>	No of household and community based woodlots established						MTEA – Forestry	15 million
			<i>Upscale Rural Electrification Programme to reach the majority of the people living in the rural areas</i>	- no of rural households with modern energy access						MNRE – Energy SEC	50 million
			<i>Introduce smart subsidies and enhance financing the uptake of renewable energy and energy efficient technologies</i>	Increased sales and use of renewable energy technologies in all demand sectors						Ministry of Finance MNRE	3 million
			<i>Build local capacity to evaluate and respond to energy needs from a climate change perspective.</i>	No of stakeholders trained in energy and climate change planning and monitoring						Climate Department Change MNRE MOPWT UNISWA	0.5 million
Adaptation	Natural hazards and preparedness	Strengthen the national capacity to prepare and respond to disasters.	<i>Strengthen the legislative and regulatory frameworks and fiscal incentives to enhance building of resilience</i>	Legislation strengthened						NDMA	0.5 million
			<i>Integrate disaster risk reduction in sector plans, project life cycle and investment screening, design and appraisal procedures</i>	Number of projects that integrate disaster risk management						NDMA,MEPD	0.5 million

Strategic Priority Focus Area	Sector	Action	Sub-actions	Performance indicators	Target					Lead institutions	Costs E
					Yr1	Yr2	Yr3	Yr4	Yr5		
		Strengthen the existing disaster response mechanisms to make them more effective	<i>Strengthen national resilience capacity, coordination and capabilities</i>	Number of staff trained						NDMA	0.8 million
			<i>Establish mechanisms for climate change related risks and vulnerability assessments</i>	Mechanism for climate change related risks in place						Climate Change Department, NDMA	0.5 million
			<i>Strengthen institutional arrangement for disaster and risk management</i>	Institutional arrangement in place and strengthened						NDMA	0.5 million
			<i>Strengthen early warning system (EWS) and effective disaster preparedness and response</i>	Early warning system in place						NDMA	0.5 million
			<i>Strengthen disaster risk awareness and information support on disaster risk management</i>	Number of personnel trained						NDMA	0.8 million
			<i>Enhance disaster preparedness and management at all levels.</i>	Number of organisations strengthened						NDMA, other sectors	0.8 million
Adaptation	Climate induced migration and conflicts	Develop and implement a risk management strategy to protect citizens from climate change induced migration	<i>Expand the understanding and recognition of potential migration issues through better analysis, better data and better predictions.</i>	- analysis and assessment of current and potential migration causes undertaken - data collected on status of causes - projections made on future changes in the causes of					Ministry of Housing and Urban Development, Ministry of Tinkhundla	1.5 million	

Strategic Priority Focus Area	Sector	Action	Sub-actions	Performance indicators	Target					Lead institutions	Costs E
					Yr1	Yr2	Yr3	Yr4	Yr5		
				migration due to climate change							
			<i>Prepare to prevent and control resource-based conflicts as a result of climate change induced migration</i>	- resource-based conflict resolution plan developed						Ministry of Home Affairs, Ministry of Tinkhundla	0.5 million
			<i>Enhance the capacity of local institutions to address climate change induced migration related conflicts through cooperative conflict resolution and management approaches taking into account gender.</i>	- Local authorities capacitated on conflict and migration due to climate change. - women priorities on approaches to address conflict and migration						Ministry of Tinkhundla	0.5 million
			<i>Facilitate where appropriate, the return of disaster-affected populations to homes and ensure adequate reconstruction efforts</i>	- disaster affected areas are rehabilitated and reclaimed where possible - initial landowners return to rehabilitated or reclaimed land						National Disaster Management Agency	2 million
Climate Risk Management	Climate Risk Management	Mainstream disaster risk reduction into national planning processes	<i>Incorporate disaster risk reduction into national planning processes</i>	Number of national plans with mainstreamed disaster reduction						MEPD	0.5 million
		Enhance early warning systems	<i>Identify, assess and monitor disaster risks and enhance early warning systems</i>	Early warning system in place						NDMA	0.2 million

Strategic Priority Focus Area	Sector	Action	Sub-actions	Performance indicators	Target					Lead institutions	Costs E
					Yr1	Yr2	Yr3	Yr4	Yr5		
			<i>Strengthen disaster preparedness and management capacities for effective response at all levels taking into account traditional / indigenous knowledge</i>	Disaster preparedness strengthened						NDMA, other sectors	0.5 million
			<i>Promote risk-sensitive land use planning</i>	Number of risk sensitive land use plans in place						NDMA, MHUD	0.5 million
Mitigation	Industry	Provide incentives to encourage investment in cleaner technologies	<i>Identify low carbon technologies for adoption.</i>	Assessment conducted on key industries with potential for switching to low carbon technologies. Champions identified for low carbon technology adoption						Climate Change Unit Ministry of Commerce Industry and Trade Industry	2 million
			<i>Promote phasing out of HFCs through appropriate technology transfer and diffusion.</i>	No of HFC conversion programmes implemented Level of HFCs recorded						SEA Industry	1 million
		Develop and implement comprehensive corporate climate change strategy	<i>Enhance the adoption and use of cleaner production practices and technologies.</i>	Industry specific cleaner production policies in place						Climate Change Department MCIT	1 million
			<i>Encourage industries to incorporate climate change issues into their operations and reporting.</i>	No of industry driven climate change programmes						Climate Change Department Industry	1 million

Strategic Priority Focus Area	Sector	Action	Sub-actions	Performance indicators	Target					Lead institutions	Costs E
					Yr1	Yr2	Yr3	Yr4	Yr5		
			<i>Establish a GHG inventory and reporting system to help understand the sources and magnitudes of GHG emissions from industries and other sources.</i>	Industry GHG measuring and reporting system in place						Climate Department Change Industry	1.5 million
			<i>Undertake voluntary energy audits and to establish environmental quality management systems.</i>	No. of certified energy auditors No. of energy audits conducted						MNRE SWASA	0.5 million
			<i>Enhance energy efficiency, materials efficiency and recycling to reduce GHG emissions.</i>	Reduced energy demand, Reduced waste, Reduced emissions						MNRE SEA	1.5 million
			<i>Promote diversification of renewable energy sources and fuel switching technologies</i>	Reduced imports of coal and HFO, Increased number of renewable based independent power producers						MNRE MCT Industry	2 million
Mitigation	Waste Management	Develop and implement a Comprehensive Waste Management and Pollution Control Strategy	<i>Formulate a National Policy on Waste Management and Pollution Control</i>	National Policy in place						MTEA	0.8 million
			<i>Develop and enact a National Legislation on Waste Management and Pollution Control</i>	National legislation in place						MTEA	0.6 million
		<i>Establish a waste database which will provide accurate figures</i>	Water database established						SEA	1 million	

Strategic Priority Focus Area	Sector	Action	Sub-actions	Performance indicators	Target					Lead institutions	Costs E
					Yr1	Yr2	Yr3	Yr4	Yr5		
			<i>on quantities and types of wastes generated by various sectors of Swazi society</i>								
			<i>Promote the establishment of industries that use recyclable materials to create a market base for recyclers</i>	Number of industries that use recyclable material					MEPD	2 million	
			<i>Introduce and strengthen waste minimization strategies</i>	Number of waste management strategies introduced and strengthened					SEA	2 million	
			<i>Raise awareness on waste minimization initiative</i>	Number of persons aware of waste management initiatives					SEA, MTEA	1 million	
			<i>Promote a variety of waste disposal options, including incineration, recycling, physico-chemical treatment, biological treatment (bioremediation) and landfills</i>	Number of different waste disposal options being used					MTEA, SEA	2 million	
			<i>Ensure the proper handling, treatment and disposal of solid and liquid waste in both rural and urban areas</i>	Amount of waste that is handled properly					MTEA, MHUD	1 million	
			<i>Promote harnessing of biogas from wastes through transfer of technology of biogas digesters</i>	Amount of biogas harnessed from wastes					MNRE, MTEA	20 million	
Mitigation	Agriculture	Promote sustainable	<i>Promote adoption of</i>	No. Of farmers					MOA	5 million	

Strategic Priority Focus Area	Sector	Action	Sub-actions	Performance indicators	Target					Lead institutions	Costs E
					Yr1	Yr2	Yr3	Yr4	Yr5		
		agricultural practices	<i>sustainable agricultural practices and technologies that enhance efficiency and productivity while reducing GHG emissions</i>	using reduced GHG emissions technologies							
			<i>Enhance efficient fertilizer application</i>	No. Of farmers using organic fertilizers						MOA; Malkerns Research Station; UNISWA	5 million
			<i>Promote manure management practices.</i>	Improved manure disposal practices						MOA, SEA	4 million
			<i>Promote use of biotechnology to reduce methane emissions</i>	programmes conducted on biotechnologies for reduction of methane production techniques and						MOA, UNISWA, SEA	2 million
			<i>Promote harnessing of biogas from agricultural residues</i>	No of farmers producing biogas from manure						MNRE SERA	10 million
Mitigation	Energy	Put in place enabling environment for investment in low carbon and carbon neutral energy infrastructure and technologies	<i>Improve investment in low carbon and carbon neutral energy infrastructure and technologies.</i>	Improve investment in low carbon and carbon neutral energy infrastructure and technologies.						MNRE SERA	1 million
			<i>Create an enabling environment for generation and utilisation of clean and renewable energy, such as solar, wind, biowaste and geothermal.</i>	Feed in tariffs in place Independent power producer policy adopted						MNRE SERA	0.5 million
			<i>Ensure conducting of a</i>	Strategic						SEA	2 million

Strategic Priority Focus Area	Sector	Action	Sub-actions	Performance indicators	Target					Lead institutions	Costs E
					Yr1	Yr2	Yr3	Yr4	Yr5		
			<i>strategic environmental assessment for renewable energy programmes.</i>	Environment Assessment conducted for renewable energy						MNRE	
			<i>Enforce and incentivize the adoption of clean and efficient technologies and practices in energy production and use.</i>	Renewable energy policy developed REFIT finalised and adopted						MNRE SERA	2 million
			<i>Explore and provide viable sources of capital funding for large investments in renewable energy programmes.</i>	Increased funding, in particular climate finance, towards energy infrastructure						MNRE MOF Climate Change Unit	1 million
			Enhance national capacity in energy planning and monitoring	<i>Build capacity for energy planning and monitoring to minimize GHG emissions.</i>	Climate change responsive energy capital projects						MNRE MOPWT MEPD
Mitigation	Land use, land use change	Enhance land use planning	<i>Enhance land use planning and sustainable land management practices</i>	Number of projects with enhanced land use planning and land management practices						MEPD, MOA	1 million
			<i>Build capacity on assessment, estimating and monitoring land use, land use change drivers and their impacts</i>	Number of persons trained						MOA	1.5 million
Mitigation	Transport	Promote low emission transport systems	<i>Institute mechanisms for climate change informed urban transport planning to facilitate efficient and low GHG emissions.</i>	Reduced emissions from the transport sector Reduced congestion						Ministry of Housing and Urban Development Local Municipalities MOPWT	2 million

Strategic Priority Focus Area	Sector	Action	Sub-actions	Performance indicators	Target					Lead institutions	Costs E
					Yr1	Yr2	Yr3	Yr4	Yr5		
			<i>Establish an effective vehicle inspection to ensure compliance with vehicle emission standards</i>	Vehicle testing programme implemented						MOPWT SWASA SEA	5 million
			<i>Promote use of biofuels without compromising food security and biodiversity</i>	Mandated ethanol blending						MNRE	5 million
Mitigation	Forestry	Strengthen national forest management and enforcement	<i>Strengthen national plans and programmes for forest management, inventory and monitoring</i>	Forest management programmes in place and implemented						MTEA, Forestry department	2 million
			<i>Enhance investments in agroforestry</i>	No. Of famers practicing agroforestry						MTEA, Forestry department, MOA	5 million
			<i>Promote afforestation and reforestation</i>	Reduced deforestation						MTEA, Forestry department, SEA	20 million
			<i>Strengthen forest law enforcement, governance and trade, including increasing capacity of communities to manage and utilize forests sustainably</i>	Forest laws developed and implemented							0.8 million
		Develop and implement a National REDD+ Strategy	<i>Develop a national REDD+ Strategy</i>	REDD+ strategy developed						MTEA, Forestry department	2 million
			<i>Promote development and implementation of REDD+ programmes, and reforestation and reforestation programmes</i>	REDD+, reforestation and re-afforestation Programmes developed and implemented						MTEA, Forestry department	50 million
			<i>Develop national reference levels and national carbon map</i>	National levels developed						MTEA, Forestry department	1.5 million
			<i>Build technical capacity (learning by doing) to create expert</i>	Expert roster developed and technicians						MTEA, Forestry department, UNISWA	1.5 million

Strategic Priority Focus Area	Sector	Action	Sub-actions	Performance indicators	Target					Lead institutions	Costs E
					Yr1	Yr2	Yr3	Yr4	Yr5		
			<i>teams with the experience to develop well-designed projects with rigorous national and sub-national carbon accounting frameworks</i>	trained.							
<i>Strategic Objective 3: To provide mechanisms for mobilizing and accessing support for technology development and transfer, capacity building and financial resources from the international community and other sources</i>											
Research and technology development and transfer	Cross cutting	Enhance climate change research and development	<i>Enhance research and development of appropriate technologies that will build climate resilience and reduce GHG emissions.</i>	Ongoing and published climate change research and development in local research institutions						Local universities MICT	5 million
			<i>Establish a climate change technology innovation centre that will be a hub of technology development, transfer and diffusion.</i>	climate change technology innovation centre established and operational						MCIT Climate Change Department	30 million
			<i>Promote the implementation of appropriate research findings, innovations and technologies.</i>	No. of local research based initiatives implemented						Local universities Climate Change Department	10 million
			<i>Establish dialogues that will provide a platform where new research findings, innovations and technologies are discussed to promote knowledge sharing and dissemination</i>	Research and technology dialogues conducted						Climate Change Department Local universities Key stakeholders	2 million
Capacity building	Cross cutting	Develop and implement a comprehensive	<i>Undertake capacity needs assessment</i>	Final draft of the capacity needs						All stakeholders, Climate Change Department	0.5 million

Strategic Priority Focus Area	Sector	Action	Sub-actions	Performance indicators	Target					Lead institutions	Costs E
					Yr1	Yr2	Yr3	Yr4	Yr5		
		capacity building programme		assessment report							
			<i>Prepare a costed Comprehensive Capacity building Programme and mobilise resources for its implementation</i>	Comprehensive Capacity Building Programme developed - resources for implementation solicited						Climate Change Department, Ministry of Finance, Aid Coordination and Management Section	0.8 million
			<i>Build capacity of institutions on climate-related data management and dissemination</i>	- number of officers in different institutions trained on climate-related data management and dissemination						Climate Change Department	1 million
			<i>Build capacity on the local, regional and national levels for design, implementation and monitoring the impacts of adaptation and mitigation actions</i>	- number of local, regional and national authorities trained on design, implementation and monitoring impacts of adaptation and mitigation actions.						Ministry of Tinkhundla	2 million
			<i>Strengthen capacity in numerical weather prediction and modelling.</i>	Number of officers trained on numerical weather prediction and modelling						Department of Meteorology	2 million
Finance	Cross cutting	Legal and institutional	<i>Empower the Aid Coordination</i>	ACMS empowered						MOF	1.5 million

Strategic Priority Focus Area	Sector	Action	Sub-actions	Performance indicators	Target					Lead institutions	Costs E
					Yr1	Yr2	Yr3	Yr4	Yr5		
		strengthening	<i>Management Section (ACMS) to build the requisite technical capacity to enable it coordinate mobilization of climate finance to support development and implementation of adaptation and mitigation actions.</i>								
			<i>Develop legal and institutional framework for the establishment of the National Climate Fund that meet the international requirements of receiving, controlling and disbursing climate finance.</i>	Legal and institutional framework for establishment of National Climate change Fund developed						MOF, MOJCA	1 million
		Enhance resource mobilization	<i>Strengthen the institutional and technical capacity of the National Environment Fund to enable it meet the international fiduciary requirements</i>	Number of trained personnel in National Environment Fund						MOF	3 million
			<i>Strive to adequately fund adaptation strategies and actions through predictable, stable funding sources, including through the national budget.</i>	Amount of funds available for adaptation strategies and actions						MOF	2 million
			<i>Design new, creative funding opportunities to support adaptation and mitigation actions, including public-private partnerships</i>	Creative Funding opportunities developed						MOF	1 million

Strategic Priority Focus Area	Sector	Action	Sub-actions	Performance indicators	Target					Lead institutions	Costs E	
					Yr1	Yr2	Yr3	Yr4	Yr5			
			<i>(PPP) with the private sector</i>									
			<i>Develop investment framework and eligibility criteria to access climate finance from either the National Environment Fund or the proposed National Climate Fund</i>	Investment framework developed						MOF, MEDP, SIPA	1 million	
Strategic Objective 4: To build awareness and understanding of climate change among various stakeholders through education, training and public awareness.												
Knowledge management and dissemination	Cross-cutting	Strengthen institutional and technical capacity	<i>Undertake institutional and technical needs assessments in particular the national focal point and DNA, government ministries and departments, private sector organisations and civil society organizations with a view of developing a capacity development plan</i>	Needs assessment report and capacity development plan						Climate Department Change	0.5 million	
			<i>Improve capacity on inventory preparation, data analysis downscaling climate models for national and local application</i>	Number of official trained in climate modelling and inventory preparation						Climate Department and other stakeholders	Change	2 million
			<i>Prepare a roster of professional experts and inventory of institutions dealing with climate change and climate research in different thematic areas and their respective capacities.</i>	Roster of experts and database of institutions						Climate Department	Change	0.3 million

Strategic Priority Focus Area	Sector	Action	Sub-actions	Performance indicators	Target					Lead institutions	Costs E
					Yr1	Yr2	Yr3	Yr4	Yr5		
		Establish a framework for climate change knowledge management and dissemination	<i>Establish a national climate change data base</i>	Managed climate change database						Climate Change Department	0.4 million
			<i>Increase and improve access to climate information.</i>	Number of new information products and number of people accessing the products						Climate Change Unit	0.3 million
			<i>Facilitate packaging and dissemination of climate information to different stakeholders and target groups</i>	Identified target groups, number of packages						Climate Change Department	1 million
			<i>Engage and train the media on scientific research findings in a language understood by the local society</i>	Number of media personnel trained						Climate Change OUnit	0.5 million
Education training and public awareness	cross-cutting	Mainstream climate change in the national curricula	<i>Review the curricula with a view to intergrading climate change issues</i>	Climate change mainstreamed in the curricula at all levels						Ministry of Education, Universties	2 million
			<i>Conduct training for practioners with regard to mitigation and vulnerability and risk assessments</i>	Number of trained individuals						Climate Change Department	1 million
			<i>Strengthen public awareness within local communities (schools, universities, media, etc.) on the importance of climate change mitigation and adaptation solutions and their role in reducing other human stressors.</i>	Number of local institutions visited and number of participants						Climate Change Department	1 million

Strategic Priority Focus Area	Sector	Action	Sub-actions	Performance indicators	Target					Lead institutions	Costs E
					Yr1	Yr2	Yr3	Yr4	Yr5		
			<i>Disseminate information on climate change issues within relevant government institutions, and other public and private stakeholders.</i>	Number of workshops and information sources disseminated						Climate Change Unit/Department	3 million
			<i>Promote public participation in climate change related decision making processes</i>	Number of members of the public participating in decision making						Climate Change Department	2 million
<i>Strategic Objective 5: To strengthen the legal and institutional framework for effective coordination and implementation of climate change adaptation and mitigation actions, programmes and initiatives.</i>											
Legal Framework	Cross-cutting	Formulate and adopt a comprehensive National Climate Change Policy	<i>Review sectoral policies that have a bearing on climate change with a view to making recommendations on how they could be amended to incorporate climate change</i>	National Climate Change Policy adopted						MTEA, MOJCA, Cabinet, Parliament	1 million
		Develop and enact a comprehensive National Climate Change legislation	<i>Review sectoral legislation that have a bearing on climate change with a view to making recommendations on how they could be amended to incorporate climate change</i>	Sectoral legislation that have a bearing to climate change reviewed						MTEA, , MOJCA, Cabinet, Parliament	1 million
		Formulate a comprehensive National Climate Change legislation	<i>Formulate a comprehensive National Climate Change legislation</i>	Climate Change Act enacted						MTEA, DPM's Office, MOJCA, Cabinet, Parliament	1 million
Institutional Arrangements	Cross-cutting	Strengthening Climate change	<i>Establish Climate Change Department</i>	Fully established and						MTEA, Cabinet,	30 million

Strategic Priority Focus Area	Sector	Action	Sub-actions	Performance indicators	Target					Lead institutions	Costs E
					Yr1	Yr2	Yr3	Yr4	Yr5		
		institutions	<i>(which will also be the National Focal Point, DA, DNA, negotiations) in the Ministry of Tourism and Environmental Affairs to coordinate and synergize with ministries and departments</i>	operational Climate change Unit							
			<i>Strengthen the capacity of the Ministry responsible for environment to enable it coordinate effectively climate change at the ministerial level, the African Ministerial Conference on the Environment (AMCEN) and other related fora</i>	Effective coordination of Climate Change						MTEA	4 million
Cooperation	Cross-cutting	Strengthen participation in multilateral climate change processes.	<i>Effectively prepare and coordinate participation in the multilateral climate change negotiations and regional climate change initiatives and programmes</i>	- Increase in delegation attending annual climate talks (Bonn session and the COP) - representation of the country in all multilateral meetings - number of positions held by the country in multilateral climate change committees or bodies.						Climate change Department, Ministry of Foreign Affairs	3 million

Strategic Priority Focus Area	Sector	Action	Sub-actions	Performance indicators	Target					Lead institutions	Costs E
					Yr1	Yr2	Yr3	Yr4	Yr5		
			<i>Continue to play a participatory role in regional groupings such as the Africa Group of Negotiators (AGN) so as to ensure that the interests and aspirations of the Swazi nation are incorporated in the overall group position</i>	- number of Swazi lead coordinators for the AGN and G77 and China						Climate Change Department, Ministry of Foreign Affairs	3 million
		Enhance regional integration in dealing with climate change issues and other processes	<i>Participate in the design and implementation of regional climate change processes, programmes and initiatives by SADC, COMESA, etc</i>	- number of regional initiatives implemented in the country						Climate Change Department and other implementing stakeholders	3 million
Partnerships	Cross-cutting	Enhance partnerships on climate change	<i>Encourage round table meetings with civil society, public and private sectors to enhance dialogue, participation and partnerships.</i>	Number of round table meetings held						Climate Change Department, Business Community, industry, financial institutions	1 million
			<i>Enhance public-private partnerships in addressing climate change issues</i>	Number of public-private partnerships						Climate Change Department, Business Community, industry, financial institutions	1 million
			<i>Promote South-South and South-North partnerships in areas of common interest.</i>	Number of south-South and South-North Partnerships						Ministry of Foreign Affairs, Climate Change Department	1 million
Linkage with other sectors	Cross-cutting	Enhance linkages with climate related sectors	<i>Establish an inter-ministerial committee on climate change to ensure cross- and inter-sectoral coordination and policy integration of climate change issues into sectoral policies,</i>	An inter-ministerial committee established						Climate Change Department	3 million

Strategic Priority Focus Area	Sector	Action	Sub-actions	Performance indicators	Target					Lead institutions	Costs E
					Yr1	Yr2	Yr3	Yr4	Yr5		
			<i>programmes and plans.</i>								
			<i>Encourage appropriate use of the sector-wide approach (SWAp) as a tool for coordinating integration of climate change issues into the national development and sectoral planning and decision making.</i>	Number of organisations using SWAp						Climate Department Change	1.5 million
			<i>Put in place an effective mechanism that will ensure constant communication among agencies that share jurisdictions and responsibilities on matters relating to climate change</i>	Mechanism put in place						Climate Department Change	0.5 million
TOTAL COST											707.1 million

6.0 MONITORING, EVALUATION AND REPORTING

6.1 Monitoring and Evaluation

Monitoring and Evaluation (M&E) will be an important aspect of this Strategy. The Strategy will use the results based framework as the principal M&E planning and implementation tool. There will be annual report summarizing main activities and results as set out in Table 1. The Ministry responsible for climate change will cause a mid-term review of the Strategy to be undertaken in 2016 with a view to establish the extent to which it is being implemented. The recommendations from the Review will be integrated into the implementation of the remaining period of this Strategy and the succeeding Strategy.

Summary of the milestones of this Strategy

Action	Baseline	Performance indicator	Target	Responsibility
Strategic Objective 1: Integration of Climate Change into National Development Planning Processes and Budget				
<i>Establishment of an Inter-Ministerial Committee</i>	<i>No committee</i>	<i>Committee in place</i>	<i>June 2014</i>	<i>Office of the Deputy Prime Minister</i>
<i>Mainstream climate change issues into the medium term plan (MTP)</i>	<i>Limited integration of climate change issues in the MTP</i>	<i>MTP incorporating climate change</i>	<i>December 2014</i>	<i>Ministries of Economic Planning and Finance</i>
Strategic Objective 2: Priority adaptation and mitigation actions				
Develop and implement a risk management strategy to protect citizens from climate change induced migration	No risk management strategy	Risk management strategy in place	December 2015	NDMA, Ministry of Housing and Urban Development, Ministry of Tinkhundla
Promote low carbon investments in key sectors.	Limited and uncoordinated low carbon investments activities	Well-coordinated and well marketed opportunities for low carbon investment	December 2014	All sectors
Enhance conservation of	Climate change	Number of afforestation	December 2015	MNRE Energy and

ecosystems which support energy production and use	adaptation in water sector	initiatives - Initiatives implemented to protect and conserve water resources		DWA SEA SNTC MTEA Forestry
Enhance access and use of clean energy sources and technologies	Limited uptake and use of renewable energy technology	Number of household with access to renewable energy	December 2018	MOA . Home Economics MNRE . Energy MOA . Home Economics MTEA . Forestry MNRE . Energy SEC
Promote low emission transport systems	No air pollution regulations in place No biofuels strategy and action plan in place and implemented	Reduced emissions from the transport sector	December 2018	MOHUD Local Municipalities MOPWT SWASA MNRE Climate Change Unit MTEA
Strategic Objective 3: Technology development and transfer, capacity building and finance				
Develop and implement a Comprehensive Capacity building Programme	No comprehensive capacity building programme	Comprehensive Capacity Building Programme implemented	June 2016	MNRE
Enhance climate change research and development	Limited researches being on climate change	Ongoing and published climate change research and	December 2018	MICT, Climate

	technology	development in local research institutions climate change technology innovation centre established and operational Number of local research based initiatives implemented		Change Unit
Strategic Objective 4: Education, training and awareness				
Strengthen institutional and technical capacity	No technical need assessments, limited capacity in climate modelling and no roster of professional experts for inventories	Need assessment report, capacity development plan Trained climate modellers, Roster of professional experts on inventories	December 2017	Climate Change Unit
Establish a framework for climate change knowledge management and dissemination	No framework	operational framework for knowledge management	December 2017	Climate Change Unit
Mainstream climate change into national curricula	minimal coverage of climate change in national curricula	climate change part of national curricula at all levels	December 2020	Ministry of Education, universities
Enhance training	no training for practioners	number of vulnerability and mitigation assessment trainings and	By June 2016	Climate Change Unit

		number of participants		
Enhance public awareness	minimal public awareness activities	Number of communities aware of climate change	By June 2016	Climate Change Unit
Strategic Objective 5: Legal and Institutional Framework				
Formulate the National Climate Change Policy	Tendering stage	National Climate Change Policy in place	March 2014	MTEA
Strengthen participation in multilateral climate change processes	small delegation to international processes, country is Chair of the Africa Group of Negotiators	larger delegations covering all relevant sectors	December 2018	Climate Change Unit, Ministry of Foreign Affairs
Enhance regional integration in dealing with climate change issues and other processes	limited implementation of regional initiatives	Full implementation of regional initiatives	December 2018	Climate Change Unit, Ministry of Foreign Affairs
Enhance partnerships on climate change	No partnerships on climate change issues	Number of round table meetings, public-private partnership, South-South and North-South partnerships on climate change issues	December 2016	Private sector, ACMS,

6.2 Reporting

6.2.1 Biennial Update Report and National Communications to the UNFCCC Secretariat

Pursuant to that the sixteenth Conference of the Parties, through its decision 1/CP.16, paragraph 60(c), in which it was decided that developing country Parties, consistent with their capabilities and the level of support provided for reporting, should submit

biennial update reports containing updates of national greenhouse gas inventories, including a national inventory report and information on mitigation actions, needs and support received, Swaziland is expected to submit its First Biennial Update Report by December 2014 and the subsequent ones every two years, either as a summary of parts of their national communication in the year when national communication is submitted or as a stand-alone update report. The national communication shall be submitted every four years.

6.2.2 Sectoral Annual Reports

Every sector shall be responsible for the implementation of this national strategy is expected to develop and implement a sectoral action plan that details further mechanisms and actions that it intends to take with a view to implementing the national strategy. The sectoral action plan shall describe adequately its activities, outputs and outcomes and demonstrate how these feed each other to achieve the overall objective of the national strategy.

6.2.3 National Reports

Every two years the Office of the Deputy Prime Minister shall prepare a national report on the state of implementation of the National Climate Change Strategy and Action Plan detailing achievements made, challenges, emerging opportunities and support received in respect of technology development and transfer, capacity building and finance.

6.3 Mid-term review

A mid-term review will be done at the end of the second year of implementation of the programme. The review will be done to determine the progress of implementation and identify constraints and best practices. The review will be used to identify aspects of the strategy that may need to be revised.

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GLOSSARY OF TERMS

Abatement refers to Actions resulting in reductions to the degree or intensity of greenhouse gas emissions. It is also referred to as mitigation.

Adaptation refers to adjustments in natural or human systems, intended to reduce vulnerability to actual or anticipated climate change and variability or exploit beneficial opportunities.

Adaptive capacity refers to the ability of a system to adjust to climate change, variability and extremes to moderate potential damages, to take advantage of opportunities or to cope with the consequences.

Adverse effects / impacts refer to the potential negative effects of human-induced climate change as well as the impacts resulting from implementation of response measures. Such effects or impacts include changes in precipitation, storms and other weather patterns.

Anthropogenic emissions refer to emissions of greenhouse gases associated with human activities. These include burning of fossil fuels for energy, deforestation and land-use changes.

Atmosphere refers to the envelope of gases surrounding the earth and bound to it by the earth's gravitational attraction.

Biomass refers to the total dry organic matter or stored energy content of living organisms. Biomass can be used for fuel directly by burning (e.g. Wood) or indirectly by fermentation or extraction of combustibles.

Capacity building refers to a process of constructive interaction between developed and developing countries to help developing countries build the necessary capability and skills needed to achieve environmentally sound forms of economic development.

Carbon dioxide (CO₂) means a naturally occurring gas produced by natural processes such as respiration; decay of vegetation or forest fires and as a by-product of human activities. It is the principal anthropogenic greenhouse gas that affects the Earth's temperature and is also the reference gas against which other greenhouse gases are indexed.

Carbon sinks refers to natural or man-made systems that absorb carbon-dioxide from the atmosphere and store them. Trees, plants and the ocean all absorb carbon dioxide hence are carbon sinks.

Carbon tax means a tax placed on carbon emissions with the tax rate based on the fuel's carbon content.

Clean Development Mechanism (CDM) refers to a flexible mechanism established under the Kyoto Protocol that allows a country with an emission-reduction or emission-limitation commitment under the Kyoto Protocol (Annex B Party) to implement an emission-reduction project in developing countries. Such projects can earn saleable certified emission reduction (CER) credits, each equivalent to one tonne of CO₂, which can be counted towards meeting Kyoto targets.

Climate means the average and statistics of variations of weather in a geographical region. The averaging period is typically several decades.

Climate resilient development refers to development activities that will deliver benefits under all potential future climate scenarios and can cope with uncertainties over future conditions. It differs from business-as-usual development in actively considering and addressing potential existing and future climate risks.

Climate variability means the departure of climate from long term average values or changing characteristics of extremes, for example, extended rainfall deficits which cause droughts, or the prevalence of a greater than average rainfall depth occurring over a season.

Deforestation means the removal of forest stands by cutting and burning to provide land for agricultural purposes, residential or industrial building sites, roads, etc, or by harvesting trees for building materials or fuel.

Designated National Authority (DNA) refers to an office, ministry or other official entity appointed by a Party to the Kyoto Protocol to review and give national approval to projects proposed under the Clean Development Mechanism.

Ecosystem means the interacting system of a biological community and its non-living environmental surroundings.

Global warming refers to the observed increase in global average surface temperature which is often poorly used as a synonym for climate change.

Green Climate Fund refers to the designated operating entity of the financial mechanism of the Convention.

Greenhouse gases refer to gases in the earth's atmosphere that absorbs and re-emit infra-red radiation. These gases occur through both natural and human-influenced processes.

Hydroflouorocarbons (HFCs) refers the greenhouse gases used for refrigeration and air conditioning, and known as super greenhouse gases because the combined effect of their soaring use and high global warming potential.

Integrated water resources management (IWRM) refers to a process which promotes the coordinated development and management of water, land and related resources in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems.

Intergovernmental Panel on Climate Change (IPCC) refers to the Intergovernmental scientific panel responsible for the preparation of assessments, reports, and guidelines on: the science of climate change and its potential environmental, social and economic impacts; technological developments; possible national and international responses to climate change; and other cross-cutting issues.

Maladaptation refers to an action or process that increases vulnerability to climate change-related hazards. Maladaptive actions and processes often include planned development policies and measures that lead to increased vulnerability in the medium to long term, for example, constructing new houses on a flood plain.

Methane (CH₄) refers to a colourless, odourless gas that occurs abundantly in nature as the chief constituent of natural gas, as a product of the anaerobic bacterial decomposition of vegetable matter under water and decomposition of sludge by anaerobic bacteria. It is a relatively potent greenhouse gas.

Mitigation refers to implementing actions that reduce greenhouse gas emissions and that enhance the capture and storage of greenhouse gasses.

Party refers to a State or regional economic integration group that agrees to be bound by a treaty and for which the treaty has entered into force.

Reforestation refers to the act or process of re-establishing a forest on land that had been deforested in the last 50 years.

Renewables refers to energy sources that are constantly renewed by natural processes. These include non-carbon technologies such as solar energy, hydropower, geothermal, marine and wind as well as technologies based on biomass.

Resilience means the ability of a social or ecological system to resist, absorb, accommodate and recover from the effects of a (climate) hazard in a timely and efficient manner, while retaining the same basic structure and ways of functioning. It reflects the amount of change a system can undergo, the degree to which it can reorganize and the extent to which it can build capacity to learn and adapt.

Risk assessment, risk is often defined as the combined probability and severity of an event occurring. A risk assessment seeks to quantify the level of risk either quantitatively, such as in monetary terms, or qualitatively, such as, high, medium, low.

Scenario refers to a coherent, internally consistent and plausible and often simplified, description of how the future may develop. It is not a forecast; rather, each scenario is

one alternative of how the future could unfold. A projection may serve to inform a scenario but scenarios often require additional information from other sources, sometimes combined with narrative storyline. A set of scenarios is often adopted to reflect, as well as possible, the range of uncertainty in projections.

Sensitivity refers to the degree to which a system is affected, either adversely or beneficially, by climate related stimuli. The effect may be direct or indirect. A sensitivity analysis typically involves gaining an understanding of how varying climate to different extents affects human or biophysical systems.

Sinks refers to a process or activity that removes a greenhouse gas or a precursor from the atmosphere.

Stabilization refers to the achievement of stabilization of atmospheric concentrations of one or more greenhouse gases.

Sustainable development means development that meets the needs of the present without compromising the ability of future generations to meet their own needs. The term describes development with an equitable balance between environmental, social and economic objectives.

Technology transfer refers to a process of constructive interaction with local, national and international partners to select and apply appropriate technology systems to achieve economic development. It includes both ~~hard~~ and ~~soft~~ technologies.

Vulnerability refers to the degree to which a system is susceptible to, or unable to cope with, adverse effects of climate change, including climate variability and extremes. Vulnerability is a function of the character, magnitude, and rate of climate change and variability to which a system is exposed, its sensitivity and its adaptive capacity. Thus, vulnerability assessment in the context of climate change refers to an analysis of the characteristics of a system (social vulnerability for example) that make it susceptible to negative (or positive) impacts due to climate change or variability.