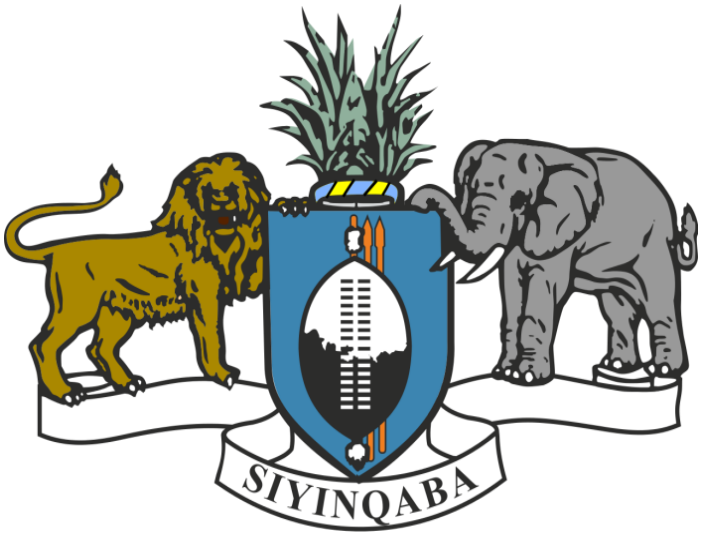


# Eswatini National Drought Plan

**The Kingdom of Eswatini**

**Ministry of Agriculture**

**August 2020**

# Contents

# List of acronyms and abbreviations

| | |
|---|---|
| CA | Conservation Agriculture |
| CANGO | Coalition Assembly of national NGO's |
| CASP | Comprehensive Agriculture Sector Policy |
| CBOs | Community Based Organizations |
| CCA | Climate Change Adaptation |
| CDP | Community Development Plan |
| CSA | Climate Smart Agriculture |
| CSO | Central Statistics Office |
| DLDD | Desertification, Land Degradation and Drought |
| DPMO | Deputy Prime Minister's Office |
| DRM | Disaster Risk Management |
| DRR | Disaster Risk Reduction |
| DWA | Department of Water Affairs |
| EEA | Eswatini Environment Authority |
| EMS | Eswatini Meteorological Services |
| EOC | Emergency Operation Centre |
| EPR | Emergency Preparedness and Response |
| ER | Early Recovery |
| ESWADE | Eswatini Water and Agricultural Development Enterprise |
| ESWC | Eswatini Water Services Corporation |
| EW | Early Warning |
| EWS | Early Warning System |
| FAO | Food and Agricultural Organization |
| GDP | Gross Domestic Product |
| GEF | Global Environment Fund |
| GoE | Government of Eswatini |
| IOHL | Institutes of Higher Learning |
| IPPC | Intergovernmental Panel on Climate Change |
| IWRM | Integrated Water Resources Management |
| KOBWA | Komati Basin Water Authority |
| LUSIP | Lower Usuthu Smallholder Irrigation Project |
| LUSLM | Lower Usuthu Sustainable Land Management |
| MDGs | Millennium Development Goals |
| MEPD | Ministry of Economic Planning and Development |
| MHCP | Multi Hazard Contingency Plan |
| MNRE | Ministry of Natural Resources and Energy |
| MoA | Ministry of Agriculture |
| MoET | Ministry of Education and Training |
| MoH | Ministry of Health |
| MTEA | Ministry of Tourism and Environmental Affairs |
| MTRD | Ministry of Tinkhundla and Regional Development |
| NAP | National Action Programme |

| | |
|---|---|
| NBSAP | National Biodiversity Strategy and Action Programme |
| NCCP | National Climate Change Policy |
| NDMA | National Disaster Management Agency |
| NDP | National Drought Plan |
| NDS | National Development Strategy |
| NDTF | National Drought Task Force |
| NEWU | National Early Warning Unit |
| NFP | National Focal Point |
| NGO | Non-Governmental Organization |
| NWA | National Water Authority |
| PNRI | Percentage of Normal Rainfall Index |
| RDRMC | Regional Disaster Risk Management Committee |
| SDGs | Sustainable Development Goals |
| SEAP | Swaziland Environmental Action Plan |
| SWALGA | Swaziland Association for Local Government Authorities |
| TNA | Technology Needs Assessment |
| TWRM | Trans-boundary Water Resources Management |
| ULA | Urban Local Authorities |
| UNCBD | United Nations Convention on Biological Diversity |
| UNCCD | United Nations Convention to Combat Desertification |
| UNCT | United Nations Country Team |
| UNESWA | University of Eswatini |
| UNFCCC | United Nations Framework Convention on Climate Change |
| UNISDR | United Nations Office for Disaster Risk Reduction |
| WASH | Water and Sanitation Hygiene |
| WFO | World Food Programme |

# Acknowledgements

The Eswatini National Drought Plan (NDP) was compiled under the Drought Initiative of the United Nations Convention to Combat Desertification (UNCCD). The authors acknowledge the Ministry of Agriculture for guidance during the preparation of the NDP, particularly the UNCCD National Focal Point, Mr. Bongani Masuku, the Senior Land Planning Officer Mr. Bongani Magongo and the Land Development Officer, Mr. Sipho Shiba. The Eswatini Water and Agricultural Development Enterprise is kindly appreciated for assistance with workshop logistics and funding the workshops. Valuable inputs were also provided by the National Disaster Management Agency (NDMA) and officials from various stakeholders. These include the Department of Water Affairs, Eswatini Meteorological Serves (EMS), University of Eswatini, Eswatini water Services Corporation and Eswatini Environment Authority. Civil Society Organizations also contributed through the participation of WaterAid, Eswatini Red Cross Society and others.

The UNCCD provided funding for the NDP development process and Mr. Hansol Park, the Programme Officer under the Drought Initiative offered valuable support and guidance throughout the formulation process. Previous national assessments of drought impacts from various national reports to the United Nations Rio Conventions provided valuable information for the NDP. The participants of the national workshop who convened to discuss the NDP are also very much appreciated for giving their personal time to provide their input and suggestions.

# Executive Summary

Drought is a prolonged dry period in the natural climate cycle that can occur anywhere in the world. Drought is a natural disaster of significant concern in Eswatini. Although Eswatini has a sub-tropical climate with rainfall ranging from 400 - 1,500 mm per year, a modest drop in normal rainfall can trigger water shortages. The recent droughts of 2015 to 2016 led to major losses in the agriculture, wildlife, and forestry sectors and affected human health in all the country's regions. Eswatini's drought vulnerability assessments indicates an increasing trend in the frequency of very hot days exceeding 36°C in the country, which may induce more frequent and intense droughts in future. It is therefore, critical that the Eswatini citizens be well prepared in the event of a drought.

Drought vulnerability in Eswatini is compounded by the poor economy and the subsistence nature of agriculture, whereby most of the farming is done on small scale basis and is often only sufficient to feed the farmer's immediate household. Preparing for drought and reducing the risk and mitigating the impacts of drought are paramount given the significant vulnerabilities in the country.

This National Drought Plan for Eswatini has several specific purposes. Firstly, it provides a compendium of the most up to date information on drought occurrence, impacts and risk in Eswatini. Secondly, it identifies a series of short-term immediate monitoring, communicating and response actions to address imminent drought impacts. Thirdly, it identifies longer-term actions that help prepare for future droughts by reducing drought risk. And finally, it provides a coordinated and consistent approach for government agencies, civil society, donors and the private sector actors to reduce the impacts of drought.

The Eswatini NDP is planned for 10 years (2020 – 2030) to be in line with the UNCCD Revised Strategy (2018 -2030) and it's supporting instruments such as the LDN Scientific and Conceptual Framework. The Eswatini NDP follows best-practice models for disaster management, including but not limited to, the Sendai Framework and the Theoretical National Drought Plan Framework. Its implementation relies on Eswatini's disaster risk reduction, which is set out in the National Disaster Management Act (2006), which establishes 9 clusters for disaster reduction, including the three clusters (food and agriculture, health and water and sanitation) which are most affected by drought. Under the NDP, clusters and various government ministries are given specific responsibilities of preparing, monitoring, communicating, responding to and recovering from drought.

The NDP envisions a drought resilient Eswatini by 2030 hence its lay-out is structured into goals, objectives and activities that have been developed around the three pillars for drought risk management. In addition, a fourth pillar is proposed which addresses cross cutting-issues. The NDP therefore has four (4) distinct yet mutually reinforcing pillars, namely:

- Implementing Drought Monitoring, Early Warning Systems and Impact Assessment.
- Assessment and Management of Drought Risk and Vulnerability.
- Implementing Measures to Limit Impacts of Drought and Better Respond to Drought.
- Addressing cross-cutting issues that lead to transformative changes in drought risk reduction.

The summary of NDP pillars, goals and objectives are shown in Box 1 below. The detailed actions are

outlined in appendix 1. The NDP encompasses a paradigm shift from a reactive emergency response emphasis to a proactive one of reducing the country's vulnerability and increasing drought resilience. Table 6 describes the triggers and responses that should be made during the various phases of a drought based on different levels of drought indicators (Standardized Precipitation Index and Percent Normal Rainfall Index).

Box 1: Summary of Eswatini NDP pillars, goals and objectives.

| Component / Key Pillar | Goals | Objectives |
|---|---|---|
| **Component 1 (*Key Pillar 1*):** Implementing Drought Monitoring, Early Warning Systems and Impact Assessment. | **Goal 1: Robust drought monitoring and early warning** | **Objective 1:** Strengthen Early Warning Systems |
| | | **Objective 2:** Disseminate reliable warning messages so that response to the risks are measured and timely |
| | | **Objective 3:** Undertake drought impact assessment |
| **Component 2 (*Key Pillar 2*):** Assessment and Management of Drought Risk and Vulnerability. | **Goal 2: Better assessment of drought risk and vulnerabilities** | **Objective 1:** Undertake drought impact assessment |
| **Component 3 (*Key Pillar 3):*** Implementing Measures to Limit Impacts of Drought and Better Respond to Drought. | **Goal3: Effective response during drought events** | **Objective 1 :** Respond to drought as it unfolds |
| | **Goal 4: Enhanced Drought Preparedness, Mitigation and Resilience** | **Objective 1:** Improve drought understanding |
| | | **Objective 2:** Reduce drought risk and vulnerability (Mitigation) |
| | | **Objective 3:** Support activities that increase resilience to drought |
| | | **Objective 4:** Improve water supply and demand management |
| | | **Objective 5:** Improve national food and nutrition security |
| | | **Objective 6:** Improve agricultural resilience to drought |
| | **Goal 5: Drought Risk Transfer and sharing** | **Objective 1:** Minimize losses due to drought |
| **Component 4 (*key Pillar 4* )** Addressing cross-cutting issues that lead to transformative changes in drought risk reduction | **Goal 6: Improve communication, awareness, capacity building, drought mainstreaming and resource mobilization.** | **Objective 1:** Improve drought communication and awareness |
| | | **Objective 2** Strengthen capacity to cope with drought |
| | | **Objective 3** Mainstream drought into ministerial and sectoral plans |
| | | **Objective 4** Mainstream gender into drought risk reduction |
| | | **Objective 5:** Mobilizing of adequate resources for drought preparedness, itoring and response |

# CHAPTER 1: BACKGROUND

## 1.1 Drought Overview

Drought can be defined as a prolonged dry period in the natural climate cycle that can occur anywhere in the world. Drought is a normal, recurring feature of climate and can occur in high and low rainfall areas (Wilhite, 2000). Drought is a protracted period of deficient precipitation resulting in extensive damage to crops, and a consequential loss of yield. Another way of defining drought would be to consider the decrease in precipitation (less rain) as the underlying cause of the drought, while soil moisture, runoff and socio-economic issues could be considered as first or second-order impacts. http://drought.unl.edu/Education/DroughtIn-depth/WhatisDrought.aspx, https://public.wmo.int/en/our-mandate/water/drought

Whichever definition is used, a drought represents a situation when reduced rainfall and diminished water supply affects all sectors and human activities that depend on water supply. Unlike other hazards such as floods, hurricanes and wildfires (which have a clear beginning and end), drought is a slow on-set hazard and its effects are not felt at once and can only be partially anticipated. Further, drought has unique characteristics that exacerbate other hazards (American Planning Association, 2019).

According to Wilhite and Glantz, 1985; Wilhite, 2000; and Crausbay *et al*. 2017, drought can be categorized into five main types, as follows:

**Meteorological drought**: occurs when there is a period of below average precipitation.

**Hydrological drought**: occurs when there are deficiencies in surface and subsurface water supplies. It is generally measured as streamflow, lake, reservoir, and groundwater levels.

**Agricultural drought**: occurs when there is an inadequate water supply to meet the needs of crops and other agricultural operations such as livestock.

**Socio-economic drought**: occurs when a drought impacts health, well-being, and quality of life, or when a drought starts to have an adverse economic impact in a country or region.

**Ecological drought**: occurs when deficiencies in surface water supplies create multiple distresses across ecosystems, impacting the flow of ecosystem services.

Quantifying the beginning and ending of drought is often very difficult hence, drought is typically known as a creeping phenomenon because of its slow onset, which makes it difficult for a community to know when they are entering or leaving a drought period and how long it will last - months or years. Drought conditions often remain unnoticed until water shortages become severe and impacts become evident as they progress over time.

## 1.2 Purpose and Scope of the National Drought Plan

The NDP assesses the institutional and legislative framework for DRR in Eswatini by identifying the role players and drought issues in all relevant Eswatini policies, plans and legislation related to drought. These include national instruments which relate to agriculture, land use planning, rural economic development, poverty reduction, water resource management and development, ecosystem and biodiversity conservation, health and built infrastructure.

Climate projections suggest that there will be persistent droughts over southern Africa, including Eswatini that are more intense than what has been experienced in the 20th century (Fourth National Climate Assessment 2018). The impacts of drought are many, but usually include damage to crops and reductions in crop yields, death of livestock and wildlife, increased fire hazard, reduced freshwater availability, and damage to wildlife and fish habitats.

The impacts of drought have many economic and social consequences including reduced income for the agriculture and broader economic sectors, higher food prices and unemployment. Drought planning, including preparedness and risk mitigation measures, will help reduce the impacts and enhance human well-being and security during and after drought. Therefore, preparing for drought and reducing the risk and mitigating the impacts of drought are paramount given the high incidence of land degradation and human poverty and malnutrition in Eswatini.

The NDP provides information on the challenges faced on drought management at the local and national level. It also draws attention to areas that require national collaboration to enhance consistent and coordinated national approaches by providing clarity around priorities, roles and responsibilities at all levels.

The NDP documents the risk of drought and outline a series of approaches and actions Eswatini can take to prepare for and increase resilience to drought. It brings together the key government agencies, communities, and NGO's and private sector organizations to take a proactive approach to drought management and develop appropriate response actions when drought occurs.

The NDP envisions improved mitigation of the adverse effects of drought in all areas of Eswatini resulting in increased drought resilience of the country's economic sectors, ecosystems and communities. It supports best-practice models for disaster management, including but not limited to, the Sendai Framework and the Theoretical National Drought Plan Framework (Crossman, 2017; UNCCD, 2018), which is operationalized via three priority pillars, namely:

a. Implementing Drought Monitoring, Early Warning Systems and Impact Assessment.
b. Assessment and Management of Drought Risk and Vulnerability.
c. Implementing Measures to Limit Impacts of Drought and Better Respond to Drought.

In addition the NDP, addresses cross-cutting issues that lead to transformative changes in drought risk reduction, including awareness raising, capacity building and mainstreaming specific drought issues that affect vulnerable groups such as women, youth and people leaving with disabilities.

The NDP actions are informed by previous assessments of risk and vulnerability in Eswatini. Continuous drought monitoring and forecasting is promoted so that the indicators are used to trigger drought management responses. There are three key indicators that are recommended for use in Eswatini to monitor and forecast drought onset, duration, conclusion, severity and impacts in the plan, namely Standard Precipitation Index (SPI), Land Surface Temperature (LST) and Normalized Difference Vegetation Index (NDVI).

The NDP is closely aligned to the Revised UNCCD Strategic Plan (2018-2030) and it's supporting instruments such as the LDN Conceptual Framework. It also supports other on-going national initiatives including poverty reduction programmes. Some of the proposed actions in the NDP, such as under Goal 4, are transformative in nature hence they can be attained in the long-term, while some are high-level actions which can be best pursued using a multi-sectoral approach. The timeframe for the NDP is therefore set at 10 years (2020 – 2030).

The NDMA will coordinate the implementation of actions outlined in the NDP, while the MoA will serve as the Secretariat. The Ministry of Agriculture will use the NDP to report to the UNCCD on drought management in Eswatini. The National Disaster Management Agency (NDMA) is the national institution that is mandated to coordinate disaster risk reduction (DRR) in Eswatiini.

## 1.3 Guiding Principles

The National Drought Plan shall be used to deliver a robust drought risk reduction process in Eswatini, guided by the following four principles.

1. Drought is a recurring phenomenon hence it is best managed by continuously monitoring, early warning, impact assessment and integrating results into drought response plans.
2. The assessment and management of drought risk and vulnerability is key to effective drought risk reduction, so that mostly affected groups are included in drought decision-making processes, plans and policies.
3. Eswatini needs to better prepare for drought by adopting measures that Limit the Impacts of Drought and help the country respond to drought better.
4. Drought is best managed by addressing several cross-cutting issues and mainstreaming drought into existing national programmes, sectoral policies and plans, including the National Disaster Management Agency programmes

# CHAPTER 2: THE IMPACT OF DROUGHT IN ESWATINI

## 2.1 Location and Bio-Physical Characteristics

The Kingdom of Eswatini is a landlocked and mountainous country, with a land area of 17,363 sq.km that is situated in the south eastern part of the African Continent, bounded by the Republic of South Africa on the north, west and south and by the Republic of Mozambique to the east (Manyatsi et. al. 2010). Eswatini's amazing variety of reliefs has four well-defined physiographic regions, extending longitudinally from north to south in roughly parallel belts. The land is classified into six physiographic zones. Highveld, Upper Middleveld, Lower Middleveld, Western Lowveld, Eastern Lowveld and Lubombo Range, (Sweet and Khumalo, 1994). Each of the physiographic regions has its own climate. In terms of altitude, Eswatini's highest summit point stands at 1 862 m above sea level, and the lowest point is at 152.4 m, with four ecosystems (aquatic, forest montane grassland and woodland-savannah mosaic represented in the steep gradient).

## 2.2 Climate

Eswatini has a sub-tropical climate with summer rains (with 75% in the period between October and March) and distinct seasons. It has 4 distinct ecological zones with different climatic conditions that range from temperate and sub-humid in the Highveld to semi-arid in the Lowveld. The country is influenced by air masses from different origins: equatorial convergence zone, sub-tropical eastern continental moist maritime, dry continental tropical and marine west Mediterranean (GOE, 1997).

Mean annual rainfall ranges from about 1 500 mm in the northern Highveld to 400 mm in the southern Lowveld. Precipitation varies considerably however from year to year, which leads to increases instances of flash flooding or drought. High recorded rainfall variation makes it difficult to identify trends with a high degree of certainty.

Drought is an inherent feature of the current semi-arid climate. Rainfall levels have consistently reduced over the last five years (since the 2011/12 season). The *El Niño* phenomenon has exacerbated the drought during the period, where the lowest rainfall levels over the five year period occurred during the 2015/16 season (Government of Eswatini, 2016b). The recorded and projected climate trends indicate that the Kingdom of Eswatini is particularly vulnerable to the effects of climate change. Measures to improve the functioning and wider disbursement of meteorological stations will assist the country to monitor and record climate related trends.

## 2.3 Social Context

Eswatini has a population of 1.3 million people of which 53% are women. The country is classified as a Lower Middle Income country with a per capita GDP of $3,500 and a GDP of $6.259 billion. Despite this classification, Eswatini still faces a number of serious development challenges which have been summarized in the United Nations Development Assistance Framework (2016-2020) as:

Slow economic growth; high levels of inequality and poverty; high unemployment rates especially amongst the youth; high incidence and prevalence of communicable (HIV and TB) and non-communicable diseases in the face of health system constraints; high maternal mortality; high levels of chronic malnutrition; increasing number of vulnerable households; limited research and technical capacity to generate timely and quality data to inform integration of risks and climate change adaptation and;

capacity constraints to effectively implement pro-poor development policies and slow uptake of development innovations at community level.

The poverty level is estimated at 63% with high income inequality. Unemployment stood at 47.1% for the overall population in 2013 with youth and women more adversely affected by unemployment. Rural households involved in subsistence farming activities are the poorest. Poverty is closely correlated to the extent of food security mainly due to unsustainable farming techniques, low rainfall and limited arable land. The poverty situation is worsened HIV/AIDS and the effects of climate change manifested in chronic droughts.

Eswatini's economy is predominantly agro-based with 77% of the population residing in rural areas and deriving their livelihoods from subsistence agriculture. The informal agricultural sector is largely responsible for the production of maize, legumes, sorghum and sweet potatoes. In addition, sugar cane and cotton are produced as cash crops in the informal sector. As the main producers of food crops, small and subsistence farmers operating in the informal sector are responsible for the production aspect of food security. The large scale operators under the Title Deed Land subsector cultivate almost exclusively, sugar cane, citrus and forests. Their involvement with food crops is limited.

## 2.4 Water Supply and Demand

Eswatini has been classified as a water scarce country where water supply comes from rainfall, surface water resources (rivers, dams, reservoirs) and groundwater. A variety of rivers traverse through Eswatini including Mlumati, Komati, Lusutfu, Ngwavuma and Mbuluzi Rivers, with an estimated 4.5km3/year of surface water, half of which originate in South Africa (GOE, 2014; Manyatsi and Brown, 2009). Water bodies make up only 4% of the land surface area, which is about 160 km2 of the total area of 17,364 km2. About 50% of the country is classified as dry sub-humid to moist semi-arid (see figures below).

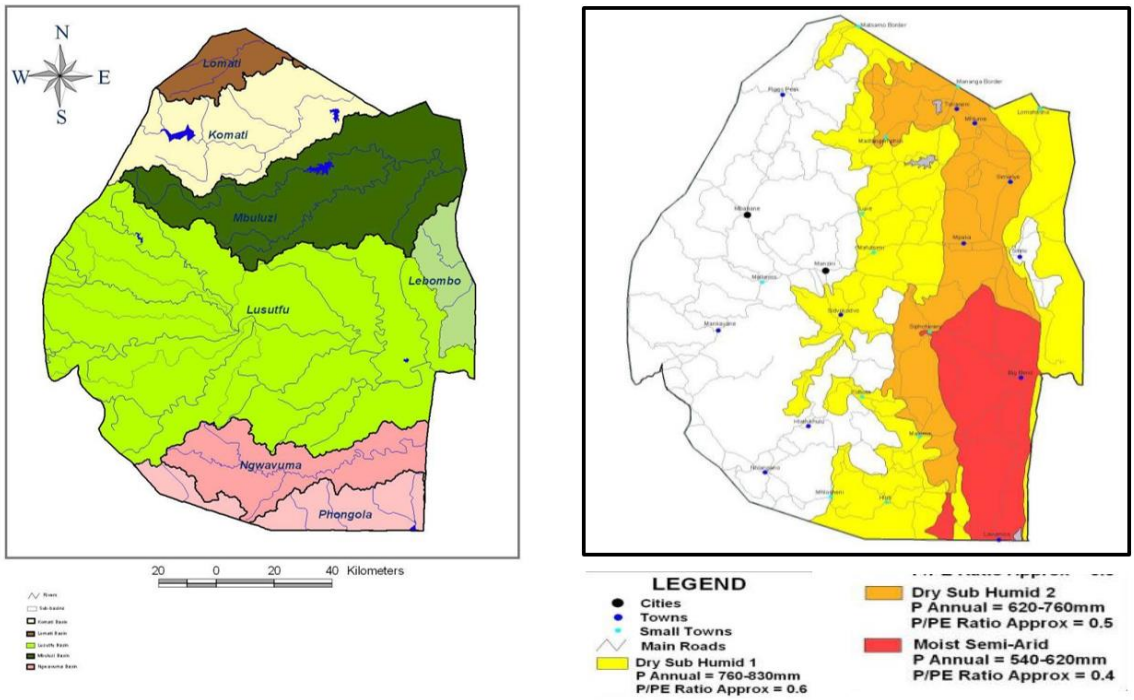


**Figure 1: The major river basins in Eswatini and zones classified by levels of aridity (Source: Matondo (undated))**

## 2.5 Climate Change and Drought

Droughts occur naturally, but climate change has generally accelerated the hydrological processes to make them set in quicker and become more intense, with many consequences (Mukherjee, Mishra & Trenberth, 2018). The impacts of climate change has been felt in many economic sectors of Eswatini including land, agriculture, water, forests and health, due to sharp reduction in crop yields in recent years, (Mhlanga-Ndlovu and Nhamo, 2017). Drought is an integral part of the actions that Eswatini needs in her proactive approach to climate change adaptation and disaster risk reduction. Thus the NDP needs to appreciate future projects on drought due to climate change predictions and prioritize accurate weather forecasting accurately to assist early planning for drought.

## 2.6 Historical Drought Occurrences

Drought is a natural climatic phenomenon that can potentially occur anywhere in the world. Eswatini is vulnerable to drought and other extreme natural and human induced hazards. Between 1980 and 2014, about ten drought events have been recorded with varying periods and intensity (see figure 2 below). Drought is a natural disaster of significant concern in Eswatini since prediction by the IPCC (2016) indicate that future drought events will be longer, more frequent and more intense in southern Africa, including Eswatini.

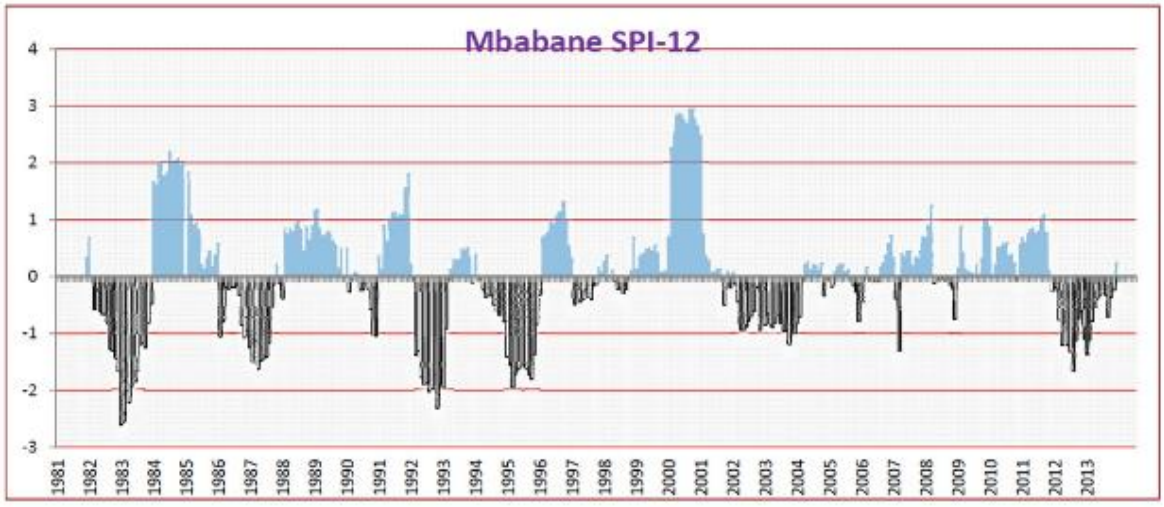


**Figure 2: Record of drought events in Eswatini from 1981 to 2013. (Source: NDMA)**

### 2.6.1 Environmental Impacts

Although Eswatini has a sub- tropical climate receiving up to 400 -1 500 mm of average annual rainfall*, El Nino* events have triggered extended periods of well below average rainfall leading to major water shortages and crop losses.

The impacts from drought in Eswatini include grass and forest fires, food shortages, reduced hydropower generation, loss of income and increased crime rates. The high incidence of poverty and malnutrition in Eswatini compounds the impacts of drought (https://public.wmo.int/en/our-mandate/water/drought). This makes drought risk alone to be capable of undermining the capacity of the country to make the capital investments and social expenditures necessary to develop sustainably. In Africa, it is estimated that drought accounts for more than 95 percent of the death toll caused by disasters and more than 80 percent of the number of people affected by disasters (UNCCD, 2019).

### 2.6.2 Social Impacts

Food security was also affected since drought is connected to climate change, mitigation and food security where the country's poorer communities are most at risk of global climate variations and global commodity price fluctuations. Drought exuberates the country's challenges to producing enough food to cover domestic requirements, contributing to the food insecurity of an estimated 20%-25% of the population (UNDP, 2012).

In 2015, an estimated 25% of Eswatini's population was severely food insecure, which is in contrast to the 2012 figure, which was 7% (FAO/WFP, 2015). While food insecurity can cause lasting damage to future generations and to the environment, it can also cause physical harm ranging from malnutrition to death. Over the past decade, drought has continued to put a heavy toll on the well-being of individuals and communities in the country. During the 2015/16 drought about 620 000 people received support either as in kind or cash transfers and over 80 000 cattle deaths were recorded (FAO, 2017). The total economic loss was about E3.843 billion (Equivalent to USD 308 million), representing a 7.01% of the country's GDP or 18.58% of government expenditure that year. Women, children and people in vulnerable situations were disproportionately affected.

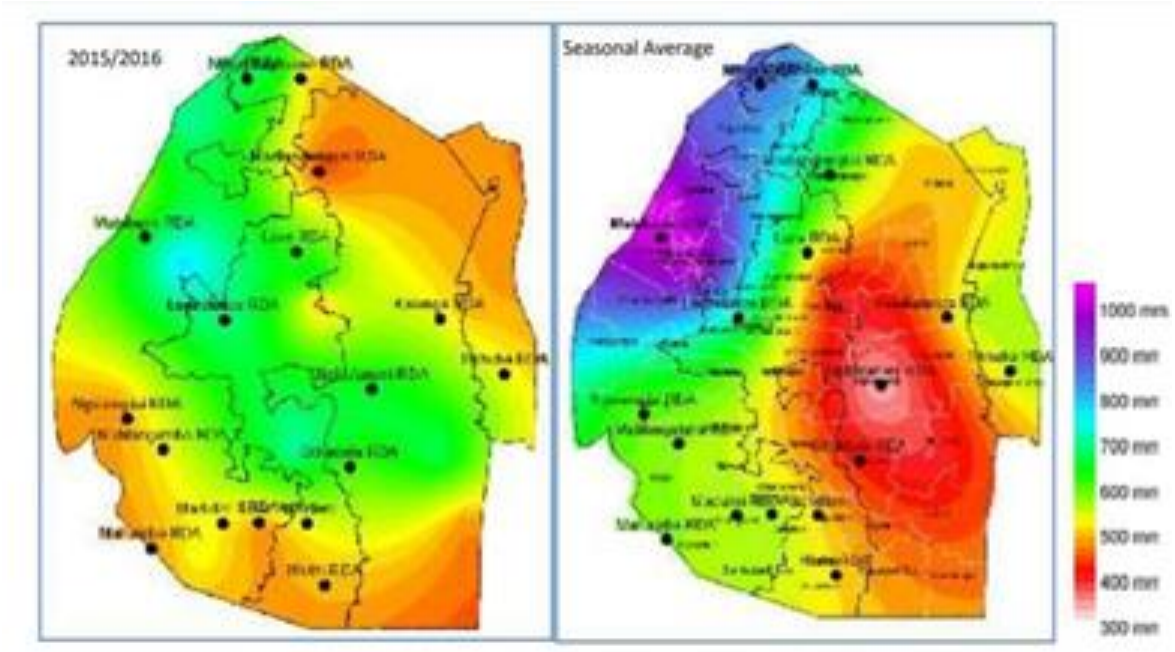


**Figure 3: Declining seasonal average temperatures and rainfall recorded in Eswatini during the *El Nino* drought of 2015/16. (Source: NDMA)**.

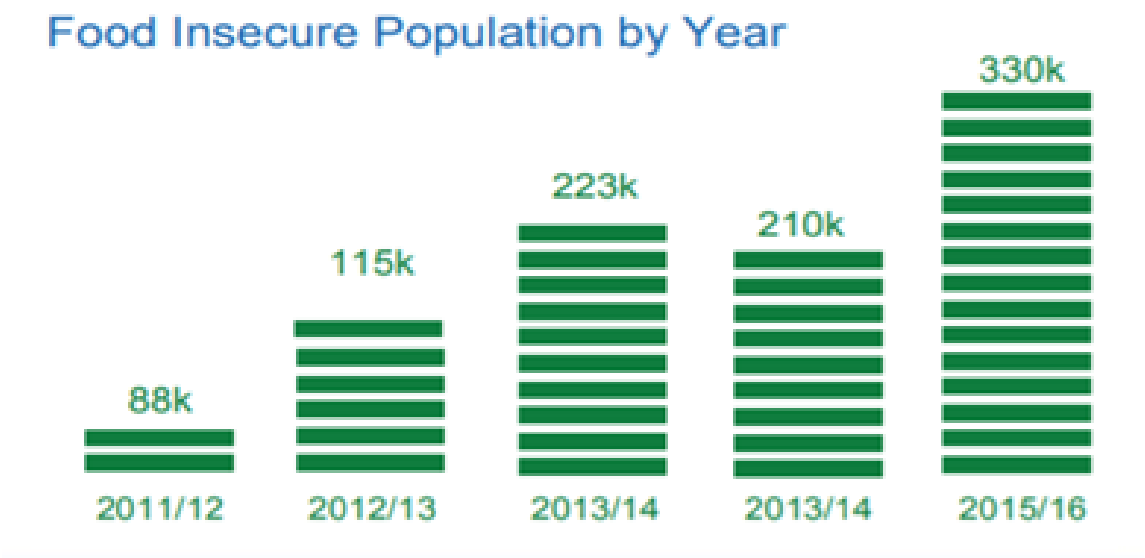


**Figure 4: The increasing number of people depending on food grants due to drought incidents in Eswatini (Source: WFP).**

## 2.7 Activities During Past Droughts

### 2.7.1 Food Distribution

The Government of Eswatini supported household food security during past droughts targeting vulnerable groups during food distribution. Under the vulnerable group food distribution programmes in the past, free food was distributed to specific groups during drought periods. These groups included individuals living in households with no source of income, including children aged five years and under, pregnant and lactating mothers, people over 60 years of age, mentally and physically handicapped persons, and persons certified as malnourished by hospital or clinic staff. In practice, there has sometimes been reluctance at the local level to distinguish between households with and without income, as required. Although programmes were financed from the Government and donors, delivery has been contracted out to NGOs.

Evaluation of the vulnerable group food distribution programme in Eswatini have revealed several major problems. First, the administrative and logistical difficulties of purchasing and distributing large amounts of food has meant that eligible households have not received food on time or in sufficient quantities, and that considerable funds have been spent on overheads at the expense of transfers. Second, the appropriateness and quality of some food items provided has been questioned. Third, over-registration has meant that the programme has been poorly targeted. This has arisen because efforts to distinguish between the poor and the non-poor households in some drought affected areas have been inadequate. Fourth, there has been concern that food has gone rotten or missing in transit. Fifth, there is a suspicion that food aid in general has a negative influence by creating dependency amongst beneficiaries, and by damaging private sector food retailers. In short, the Government and NGOs have faced challenges in delivering efficient food distribution programmes in time of drought.

### 2.7.2 Livestock, Crop and Water Relief Programmes

During past drought relief programmes, a central component has been support to livestock owners through a range of programmes. These have included fodder and lick subsidies, a marketing incentive scheme, support to transport cattle and lease grazing. In addition to the household food security programmes outlined above, communal-tenure crop farmers have been provided with subsidized agricultural inputs for the new planting season. In the past, water supply schemes were initiated in response to drought in order to meet emergency needs in a number of respects. This meant diversion of scarce resources to implement water supply schemes, initiated under drought relief programmes.

# CHAPTER 3: LEGISLATIVE AND INSTITUTIONAL FRAMEWORK

## 3.1 Related Policies, Legislation, Strategic Plans and Programmes

Eswatini has various existing plans and policies aimed to enhance water security, reduce risks associated with natural disasters, conserve natural resources, increase national wealth and increase the nation's resilience to climate change. All these instruments are directly relevant to national drought planning and risk reduction. It is important to identify within these plans and policies the parts that will help the country to directly or indirectly better prepare for and reduce the risk of drought. The key policies which are relevant to drought preparation and risk reduction include the following:

- The National Development Strategy (NDS) Vision 2022.
- The Poverty Reduction Strategic and Action Plan (2007-2015)
- The National Food and Nutrition Security Policy and Action Plan
- National Disaster Management Act (2006)
- National Disaster Risk Management Policy (2010)
- The Swaziland Disaster Resilience Strategy and Action Plan (2017)
- National Emergency Response, Mitigation and Adaptation Plan 2016-2022,
- The Swaziland Environment Action Plan (SEAP);
- Water Management Policies and Act
- Eswatini Multi-Hazard Contingency Plans
- Climate Change and Disaster Risk Reduction
- National Climate Change Policy (2016)
- National Biodiversity and Action Plan-2 (2018)
- National Agricultural Research Policy (2013)
- National Irrigation Policy (2005)
- Urban Government Act (1969)

### 3.1.1 National Development Strategy: Vision 2022

The National Development Strategy (NDS) – Vision 2022 is the overarching framework that guides all socio- economic interventions in Eswatini. It broadly focuses on improving the standard of living in the country, particularly as it relates to poverty eradication, employment creation, gender equality and environmental protection. While the NDS does not directly address drought, it is incorporated in the strategic areas related to physical infrastructure, agriculture, land and rural development, education and training, health and social welfare, and gender and disadvantaged groups. The Government of Eswatini (GoE) recognizes that drought mitigation is an integral component of realizing this vision. Drought mitigation is closely aligned with Eswatini's NDS since both promote poverty eradication; employment creation; gender equity; social integration and environmental protection.

#### 3.1.2 The National Disaster Management Act (2006)

The National Disaster Management Act of 2006 establishes the institutional framework for DRR. In line with the Eswatini Disaster Management Act, the Eswatini Disaster Risk Reduction National Action Plan (2008-2015) has the following five objectives, to:

- Create an effective and functional legal and institutional framework on DRR,
- Improve risk identification mechanisms in the country,
- Enhance information and knowledge management for disaster risk management,
- Improve national risk management applications for poverty and disaster risk reduction, and
- Establish / strengthen disaster preparedness and emergency response practices.

The drafting of the Eswatini national drought plan is guided by the existing disaster management policy and Act, hence it supports improved drought management through the use of the existing disaster management structures.

### 3.1.3 The National Emergency Response, Mitigation and Adaptation (2016- 2022).

This plan directly supports the NDP since it was developed in response to the devastating 2014-2016 El Nino induced drought. It is coordinated by the NDMA, and establishes the foundation for adaptation to drought. It utilizes a sectoral approach which ensures that each sector develops a plan and participates in its implementation. This creates a relevant platform for implementing the NDP.

### 3.1.4 National Disaster Management Plan

The NDMP is a multi-sectoral plan that acknowledges the risks arising from the impacts of hazards and disasters on various sectors which include water resource management, agriculture and land use planning, health and education. The development of Integrated Climate-Resilient Flood Management Strategies and the implementation of water management interventions in catchment and urban areas is key to the success of the NDMP.

### 3.1.5 The National Disaster Management Policy (2010)

This policy framework aims to change the approach to and the nature of Disaster Risk Management in Eswatini. Specifically, in recognition of the country's changing disaster profile, it sets down the requirements for the institutionalization of Disaster Risk Management in Eswatini on a cost effective, permanent and sustainable basis.

### 3.1.7 Swaziland Environmental Action Plan

The development of the Swaziland Environmental Action Plan (SEAP) was facilitated by the Eswatini Environment Authority (EEA) using a participatory approach which involved all sectors and different levels of the Eswatini community. Through the EEA, the importance of integrating environmental concerns into the national development planning process for the country is highlighted. The NDP aligns with the SEAP in that it will: i) assist policy and decision-makers and the general public in understanding drought impacts and their implications for natural resource and environmental management; and ii) enhance the technical and institutional capacity of Eswatini to integrate drought concerns into national planning and development. The SEAP has priorities in hydrology and water resources (fresh water), forestry and agriculture. The national plans for drought mitigation and adaptation are considered as priorities for the country, as well as vulnerability assessments for the identification of adaptation options.

### 3.1.8 National Climate Change Policy

The goal of the National Climate Change Policy (NCCP) is to support the development of a sustainable, climate-resilient and inclusive low-carbon green growth economy. In line with the objectives of the NCCP, the NDP will: i) promote and implement an integrated, climate-resilient catchment management approach; ii) enhance coordination of climate and drought risk response at the national and sub national levels; iv) disseminate information to improve awareness of drought risks to the public; and v) establish long-term drought mitigation plans and strategies.

### 3.1.9 National Climate Change Strategy and Action Plan

This plan is a roadmap to support greater integration of climate change and its associated impacts into Eswatini's national development. It contributes to drought resilience by seeking to: i) improve national capacity for climate change integration, adaptation and mitigation; ii) create an environment that will empower vulnerable communities to actively participate in uplifting their living standards; iii) strengthen partnerships among national structures and stakeholders ; and iv) create an enabling environment through technical assistance, workshops and meetings.

### 3.1.10 Nationally Determined Contributions

Eswatini's Nationally Determined Contributions (NDC's) highlights the steps for the country to reduce GHG emissions and to adapt to climate change. These contributions will assist the NDP by i) providing lessons learned for the development and implementation of a National Climate Change Adaptation Plan (NAP); ii) scaling up investments in restoring and maintaining ecological infrastructure; iii) establishing effective long term catchment management; and iv) developing systems to integrate water resource management across all sectors.

#### 3.1.11 Gender Policy (2009)

The Gender Policy in line with the constitution provides for gender equality. Several strategies have been put in place to support this policy since Eswatini is a signatory to a number of international conventions and agreements that have a bearing on gender equality and equity. These initiatives are aimed at addressing the inequitable access to education, reducing the skewed exposure of women to poverty due to their low participation in the formal employment sector, improving women's access to land and confronting gender-based violence, which is a major problem affecting mainly women and children. In addition, several pieces of legislation have been initiated or subjected to reviews in support of the above, including the Marriage Act; the Sexual Offenses and Domestic Violence Bill; and the draft Land Policy and the Deeds and Registry Act. The NDP is related to these initiatives since they indirectly reduce the vulnerability of women and children to drought impacts.

## 3.2 Relevant Regional and International Policy Framework

Eswatini has a number of existing plans and policies aimed to enhance water security, reduce risks associated with natural disasters, conserve natural resources, increase national wealth, and increase the nation's resilience to climate change – all of which are directly relevant to national drought planning and risk reduction. It is important to identify within these plans and policies the parts that will directly or indirectly better prepare for and reduce the risk of drought. The NDP is also aligned to two regional

initiatives, namely; the strategic framework called “Drought Resilience and Prepared Africa (DRAPA)” and the “Regional Inter-Agency Standing Committee for Southern Africa” (RIASCO) Action Plan. It is also linked to the Sendai Framework for Disaster Risk Reduction 2015-2030, which was adopted at the Third UN World Conference in Sendai, Japan on March 18, 2015 and the Windhoek Declaration (2016).

## 3.3 Drought Management in Eswatini

The Government of Eswatini has the ultimate mandate and responsibility to lead and coordinate all national disaster preparedness and response actions to prevent and mitigate the effects of disasters. Under the DPMO the NDMA is the Agency that coordinates Disaster Risk Reduction (DRR) and Disaster Risk Management (DRM) programmes. The NDMA thus assumes the role of Inter-Cluster coordinator of the National Multi-Hazard Contingency Plan. The relevant Government Sector Ministries/Departments have focal points who assist the NDMA in coordinating and managing all issues pertaining to DRM in line with the Disaster Management Act (2006) and Disaster Risk Management Policy (2010). Other stakeholders are described below: Other role players are presented in the table below:

**Table 1: Role player in Eswatini Drought Risk Reduction and Mitigation**

| ENTITY | ROLE |
|---|---|
| **Government of Eswatini** | The government of Eswatini has the ultimate mandate and responsibility to lead and coordinate all national disaster preparedness and response actions to prevent and mitigate the effects of disasters. Under DPMO the NDMA is the overall national coordinator of Disaster Risk Reduction (DRR) and Disaster Risk Management (DRM) programmes. |
| **The NDMA** | The NDMA coordinates the different DRR clusters in line with the Disaster Management Act (2006) and Disaster Risk Management Policy (2010). |
| **The National Committee on Multi-Hazard Contingency Planning (MHCP).** | Multi-sector involvement/engagement was undertaken through the Multi-Hazard Contingency Plan (MHCP). The MHCP is led, coordinated and managed through the NDMA Clusters |
| **Civil Society** | In the context of an expanded humanitarian country partnership, civil society organizations such as Red Cross, World Vision Eswatini, Nazarene Compassionate Ministries and Save the Children play a vital role in DRR coordination and implementation of DRR activities. |
| **The United Nations Country Team (UNCT)** | Under the guidance of the UNRC, the United Nations Country Team (UNCT) is responsible for effective and efficient implementation of Inter-Agency disaster risk management activities. It provides overall leadership to the cluster planning, response and recovery and for initiating dialogue with the Government and donors. The UN Agencies serve as the Core Lead Agencies and work closely with their relevant counterpart Lead |

| | |
|---|---|
| | Agencies in Government. |
| **The National Emergency Preparedness and Response Unit** | The National Emergency Preparedness and Response Unit Is responsible for providing leadership and coordination on health emergencies, providing emergency medical/ambulance service, shaping the health emergency research agenda, setting norms and standards, articulating evidence-based policy options for disaster risk management for health, monitoring disease outbreaks and assessing performance of health system during emergencies. |
| **The Multi-sector involvement / Engagement Committee** | Since 2013 a multi-sector involvement on DRM has been undertaken through the Multi-Hazard Contingency Plan (MHCP). This body is coordinated and managed through an Inter-Cluster/Sector arrangement with the relevant Government Agency serving as the Lead Agency and the United Nations or relevant NGO Agency as Core Lead Agency. |
| **The Eswatini Vulnerability Assessment Committee (VAC)** | This Body collects household level information to assess levels of chronic food insecurity, malnutrition, livelihoods and vulnerability in rural households in all regions of the country. It builds the capacity of core Swazi VAC members to undertake integrated food security and vulnerability analyses of household survey data. |
| **The Eswatini Meteorological Service (EMS)** | The Eswatini Meteorological Service issues seasonal forecast and sensitize farmers on the importance and the use of the forecast for planning. |
| **The Department of Water Affairs (DWA)** | The DWA monitors hydro-meteorological indicators and issues drought related information |
| **The National Early Warning Unit (NEWU)** | The NEWU conducts food supply assessment in conjunction with other stakeholders, provide advice on food supply policies, gather, analyze and disseminate information on food security issues, provide early warning information on the expected weather conditions and crop production in liaison with the Department of Meteorological Services. The unit further liaises with regional and international bodies on issues of food security that have a bearing on the local food security context. |

## 3.4 Challenges Facing Disaster Risk Management in Eswatini

The Disaster Management Act of 2006, and the Disaster Risk Management Policy (2010) are in place, however their implementation has not been optimal due to the factors described below. As a result of these limitations, drought response and management in Eswatini is generally reactive and in terms of crisis management; known to be untimely; poorly coordinated and disintegrated; poorly targeted and response often lacks a scientific basis.

### a. Coordination Complexities

The Act has complex management structures and thus coordination needs can grow exponentially, at the

risk of duplication. Most of the organs created by the act are not in place except for the NDMA. The National Action Plan (NAP) 2008-2015 was adopted by cabinet. However, due to NDMA institutional constraints, the NAP lacks a coherent systematic coordination and management in terms of its implementation. The national DRM policy (2010) was adopted, however it has not been operationalized since its adoption. The policy lacks a coherent strategy for its operationalization. Further, there is need to review and align the Disaster Management Act and Disaster Risk Management Policy with the aim of promoting efficacy in DRM interventions in the country at various institutional levels. There is weak mainstreaming of DRR into National Development plans, sector plans and budgets which translates into lack of ownership of DRR initiatives.

**b. Slow Rate of Decentralization of DRR**

The Disaster Management Act (2006) is designed along the premise of decentralization and delegation of powers, for effective and timely delivery of relief in disaster emergency situations. It calls for the establishment of regional disaster management committees.

The Act mandates all four Regional Administrators to establish a Regional Disaster Management Committee to be chaired by the Regional Secretary or a person appointed by that Regional Secretary, the composition of such committees are also defined in the Act. The functions of the Committee shall include: (i) reviewing Regional Disaster Management Policies and Plans and ensuring that they address the requirements for Disaster Management, including risk assessment, prevention, preparedness, rescue, evacuation, relief, recovery, rehabilitation and reconstruction measures at the regional level; (ii) making recommendations to the Minister, the Regional Administrator and the National Disaster Management; facilitating the implementation of Disaster Management Programmes and procedures at Regional, Inkhundla and Community level by the Agency and role players, etc. Three out of four Regional Disaster Management Committees have been established and trained on DRR issues, however, more work is still required to strengthen the capacity of Regional Disaster Management Committees to effectively execute their mandate.

Similarly, the Urban Government Act (1969) provides that, all urban local authorities should develop Integrated Development Plans (IDP) which constitutes components like disaster management and environmental sustainability plan. However, there is a need to strengthen the effectiveness of disaster management component from the IDPs.

However, the NDMA has not yet devolved at regional, urban and community levels, and thereby affecting its ability to coordinate DRR/M at these levels (UNDP, 2014). According to the National Multi-Hazard Planning (MHP) Progress Report (2013) there is weak Capacity of Urban Local Government Authorities to plan for and implement DRR agenda. Currently, there only three (out of thirteen) municipalities that have committed to the mainstreaming of DRR through development of contingency plans. There is a need to establish DRM structures at regional and local levels and strengthen local urban government capacity in disaster risk reduction, emergency preparedness and response as well as climate change adaptation and mitigation.

**c. Inadequate Capacity within Key DRR Institutions**

Key drought institutions such as the NDMA, NEWU an EMS have staff shortages and weak capacity to

provide effective leadership, coordination and management of DRR and management interventions in the country. Currently none of the urban areas meet the risk reduction preparedness benchmark standards, given their development services to the national socio-economic development.

Inadequate skilled and qualified personnel. Not all weather stations have officers deployed to run them. There are limited capacities in government technical units to produce and analyse data that would contribute to a proper risk assessment.

No continuous data sets from meteorological service. Since the stations are insufficiently manned, there are difficulties in having observations carried out over the weekends. There is also frequent breakdown of the functioning of weather stations and most of the time they are not fixed in time hence gaps are recorded in data sets series.

The country needs to address the challenges highlighted in the sections above by:

Closing these gaps and inconsistencies in the national institutional framework by reviewing and harmonizing the Act and the policy. This includes review of Disaster Management Act (2006) as well as development of action plans for operationalizing DRM Policy through a review of the Disaster Risk Reduction National Action Plan in order to take into consideration new emerging issues.

Establishment of DRM structures at regional and local levels and strengthen local urban government capacity in DRR, EPR as well as climate change adaptation and mitigation.

Establishment of a National Platform to strengthen DRR and Emergency Preparedness coordination mechanisms which would facilitate coordination across sectors. It would further facilitate the integration of DRR into national policies, sector plans, as well as into international or bilateral development aid policies and programs. Due consideration of the additional resources needed to provide secretariat support to the National Platform would be given in the process.

**d. Weak Early Warning Systems**

In addition, the early warning 'system' (EWS) limitedly focuses on one sector, agriculture, and does not adequately involve most functions of a EWS. Effort to improve transfer and facilitate exchange of relevant information within the country remains essential. The Eswatini Meteorological Department (MET), which is the main recipient and provider of hazard data to national counterparts, requires further capacity strengthening to input information, process and issue more timely warnings.

In addition, the system does not incorporate mechanisms for turning scientific/technical information on weather from the National Early Warning Unit (NEWU) into risk scenarios, for developing warning messages (such as evacuate in the face of potential floods/fires/hail storms) keyed to those scenarios, and, for transmitting those messages to communities at risk.

**e. Weak Communication and Collaboration**

The country also experiences weak communication and collaboration between producers, managers and users of EW information. The EWS is fragmented with little synergy and collaboration across sectors. There is an urgent need for effective communication and collaboration between producers of weather and

climate information and users in order to empower farmers, individuals and communities under threat from natural and other hazards to take effective and timely measures to protect lives, property and the environment from the effects of disasters. The improved communication would form a basis for nation-wide and regional initiatives against climate change-induced disasters.

**f. Lack of Comprehensive Drought Risk Assessment**

There is no up-to-date comprehensive disaster risk profile for the country, however individual institutions do conduct risk assessment *ad-hoc* in a non-coherent manner and is not comprehensive. The country needs to conduct proper risk assessments in all its four regions of in order to compile a comprehensive risk profile. This will serve as guidance to influence decision-making in terms of mainstreaming DRR into the development processes.

**g. Inadequate Mainstreaming of Gender in DRR**

Disaster risk is not gender-neutral. Studies have shown that women and girls are disproportionately impacted by disasters and other social issues such as HIV/AIDS in Eswatini. Most of the affected people during the 2015/16 drought were women due to socially-constructed gender roles that determine what norms and behaviours are acceptable for women and men, and girls and boys. In particular, women tend to take responsibility for home-based tasks and work harder to protect their agricultural assets in the case of drought and famine. A gender-sensitive approach would identify how disasters affect men, women, boys and girls differently and shape policy that addresses people's specific vulnerabilities, concerns and needs.

**h. Weak Protocols for Collecting and Managing DRR Information**

The country's protocols for collecting, management, use and storage of DRR information are weak due to the following:

**i. Poor dissemination and access to data and information:**

There is need for effective communication and collaboration between data and information producers and users in order to empower communities under threat from natural and other hazards to take effective and timely decision-making to protect lives, property and the environment from the effects of disasters. The National Early Warning Unit focuses on agriculture and food security which is a limitation on the type of hazards to be monitored.

**ii. Absence of a centralized database on previous disaster events and impacts:**

Historical information and previous disaster events are not yet stored in a centralized database managed by the NDMA. There is no aggregation or analysis done, and detailed maps do not exist. Baseline data on disaster incidents and vulnerability are not available to measure improvement.

**iii. Absence of systematic data collection and Information management for DRR:**

Data collection is considered as a challenge due to lack of tools, funding, staff and competencies. Therefore, most data collection is initiated as part of specific projects carried out by UN Agencies, NGOs or other International Organizations. Data collection is often halted once the projects end,

and in most cases it does not constitute a nation-wide effort.

**iv. Lack of continuous data sets:**

There are difficulties in having consistent observations carried out such as over the weekends due to resources constraints. There is also reported frequent breakdown of the functioning of weather stations and most of the time they are not fixed in time hence gaps are recorded in data sets series. The country needs to establish a solid national risk observatory, which would continuously collect and analyze data from relevant agencies, coordinate and/or disseminate early warnings, and serve as a communications hub. The National Risk Observatory would unify the disparate databases of various agencies.

**v. Lack of a Centralized Disaster Loss Register.**

There is need for a centralized database system that will capture and quantify all disaster incidences into financial values so as to establish trends, and compare the impact of the hazards over the years.

**j. Financing Constraints**

Eswatini Government is supporting DRR activities in the country through budget allocation to the NDMA and provision of resources during disasters for emergency response activities. The Annual budget for Disaster Response in Eswatini during the period 2009 to 2012 is inadequate and limited. As a result, activities for disaster preparedness have been limited.

There is no budget properly dedicated to DRR in line ministries and at Regional level. It was recognized that in part this was due to fiscal constraints faced by the government budget, as well as the need for stronger capacities in advocating for resources supported by clear rationale. The existing Emergency Fund under NDMA is used mainly to respond to emergencies and disasters when they occur.

## 3.5 Proposed Coordination of the National Drought Plan

The NDMA will coordinate the implementation of actions outlined in the NDP, while the MoA will serve as the Secretariat. The Ministry of Agriculture has responsibility to report to the UNCCD on drought management in Eswatini. The National Disaster Management Agency (NDMA) is the national institution that is mandated to coordinate disaster risk reduction (DRR) in Eswatini.

Since Eswatini already has a robust DRR/DRM coordination structure in place, it will not be necessary to create a separate Drought National Committee to oversee the implementation of the NDP. Instead, the existing institutional arrangements for handling drought under the National Disaster Risk Management Committee, which is chaired by the DPM, is best suited to fast trek the NDP. This committee includes representation from line Ministries and several non-governmental organizations, as a national policy making and coordinating body. It is supported by the Disaster Management Unit in the Office of the Deputy Prime Minister which acts as its Secretariat, and the Early Warning Unit which provides information on the status of food production and stocks in the country. It is proposed that the composition of current National Disaster Risk Management Committee (NDRMC) be reviewed to ensure adequate representation of drought practitioners, targeting Senior Officer from the following sectors:

- National Disaster Management Agency (NDMA)
- Deputy Prime Minister's Office (DPMO)
- DPMO /Department of Social Welfare
- Ministry of Tourism and Environmental Affairs/ Meteorological Department
- Ministry Public Works and Transport / Housing Department
- Ministry of Health- EPR Ministry of Agriculture
- Ministry of Information, Communications & Technology
- Ministry of Economic Planning and Development
- Ministry of Tinkhundla Administration and Development
- Ministry of Housing and Urban Development
- Ministry of Natural Resources and Energy (MNRE) / Department of Water
- Ministry of Natural Resources and Energy (MNRE) / Department of Energy
- Eswatini Environmental Authority
- World Food Programme (WFP)
- Food and Agricultural Organization of the United Nations
- United Nations Development Programme (UNDP)
- Coalition Assembly of Non-Governmental Organizations (CANGO)
- Business Eswatini
- Baphalali Eswatini Red Cross Society
- Eswatini Local Government Association

In addition, units that exist within the MoA (NEWU), MTEA (EMS), and MNRE (DWA) should be strengthened to ensure that the provisions of this NDP with regard to weather information, agriculture and water programmes are implemented.

Coordinating functions related to drought-recovery programmes and long-term drought mitigation programmes will be the responsibility of the NDMA, supported by Food Security Technical Committee under the FAO and WFP, as well as other national coordinating structures such as the National Focal Points for the UNFCCC, UNCCD and the UNCBD.

At the Regional and Tinkhundla levels, responsibility for drought emergency management currently resides with Regional Disaster Management Committees. These structure are well suited for local level drought coordination, however they need to be strengthened, in line with the Government's Decentralization Policy which calls for a strengthening of local involvement in development activities. As such, they are in a good position to deal with emergency management, recovery, and long term drought mitigation programmes in a holistic manner. During the disaster drought emergency phase, they are directed at a national level by the DPMO, and directly supported by the NDMA, while otherwise they will work in cooperation with other National bodies, including the Food Security and Nutrition Council, the National Land Use and Environment Authority, and the line Ministries. During non-emergency phases, government should continue supporting local structures in terms of capacity strengthening and preparedness to deal with future drought emergencies. The proposed organogram for implementing the Eswatini National Drought Plan is presented in section 9.1

# CHAPTER 4: DROUGHT MONITORING, FORECASTING & IMPACT ASSESSMENT

Eswatini needs to adopt a proactive approach to drought management and that requires monitoring drought using a consistent set of indicators to identify when drought is occurring, its extent, and when it is ending. Monitoring reduces the chance of surprises and gives time for planning and implementing drought mitigation strategies. Monitoring also provide continuous feedback to government decision makers to determine when and where to implement preparation and response actions.

Being able to forecast droughts allows for advance warnings that help sectors and organizations prepare for the adverse effects of drought. An impact assessment methodology is important for the Government of Eswatini to identify the sectors of the economy and society more likely to be adversely affected by drought.

Without an effective drought monitoring and early warning system to deliver timely information for early action, effective impact assessment procedures, pro-active risk management measures, preparedness plans aimed at increasing the coping capacity, and effective emergency response programmes directed at reducing the impacts of drought, the Eswatini will continue to respond to drought in a reactive, crisis management approach.

This chapter describes some of the tools and systems available to the Government of Eswatini for monitoring, forecasting and assessing impacts of drought

## 4.1 Drought Monitoring Indicators

Many indicators are available for monitoring the main types of drought - meteorological, agricultural, ecological, social and hydrological. The UNCCD Technical Guidelines to support its Drought Resilience, Adaptation and Management Policy (DRAMP) Framework (Crossman 2017) identifies ten indicators for meteorological drought, one indicator for hydrological drought and three indicators for agricultural drought. Data inputs required for these 14 indicators include a mix of rainfall, temperature, evapotranspiration, soil available water holding capacity and stream flow. The DRAMP Technical Guidelines also list nine remotely sensed indicators (mostly related to vegetation stress) and five modelled / composite indicators that use multiple data inputs. Choosing an indicator is determined by specific national circumstances, such as availability of spatio-temporal data, technical capacity and the nuances of the climatic, social, economic and environmental conditions.

Ideally a drought monitoring indicator would include spatial data on evapotranspiration and soil attributes to get a more complete picture of circumstances within agriculture in Eswatini. However, real time and/or regular collection of this information is expensive especially in a small developing country characterized by complex topography and a low GDP, like Eswatini. Rainfall-based indicators are a good basis for monitoring drought given that drought is an exceptional lack of water as compared to the expected normal (Carrão et al. 2016, Van Loon *et al.* 2016) and extended rainfall deficits cause agricultural, hydrological and/or socioeconomic disasters. Therefore rainfall indicators can be used as proxies for agricultural and hydrological drought (Vicente-Serrano *et al.* 2012).

There are only five meteorological stations geographically dispersed across Eswatini, which limits the country's ability to collect representative data to make accurate weather predictions. Within this limitation Eswatini needs to adopt a practical pragmatic approach in selecting indicators that can be used to monitor drought in future. Through a partnership that exists between the NDMA and University of Nebraska (USA), three common and accessible rainfall-based drought indicators have been selected for monitoring drought in Eswatini, due to ease of observance. It is envisaged that in future a fourth indicator (soil moisture) will be added to the drought monitor. The indicators are described below:

### 4.1.1 Standardised Precipitation Index (SPI)

Standardised Precipitation Index (SPI) is good indicator which expresses actual rainfall as a standardised departure from the long-term median rainfall. The values of SPI are expressed in standard deviations, with positive indicating greater than median rainfall and negative values indicating less than median rainfall. SPI can be applied over different timescales (1, 3, 6, 12, 24 and 48 months) and is normalised so it is applicable to different climates (Crossman 2017). The drought categories of SPI in the table below can be used as triggers for implementing various levels of planning and management actions. Drought starts when the SPI value is equal or below -1.0 and ends when the SPI value becomes positive (World Meteorological Organization 2012).

**Table 2: Probability of recurrence of drought event described by SPI. Source: World Meteorological Organization (2012).**

| SPI | Category | Number of times in 100 years | Severity of event |
|---|---|---|---|
| 0 to -0.99 | Mild dryness | 33 | 1 in 3 years |
| -1.0 to -1.49 | Moderate dryness | 10 | 1 in 10 years |
| -1.5 to -1.99 | Severe dryness | 5 | 1 in 20 years |
| -2.0 or less | Extreme dryness | 2.5 | 1 in 50 years |

### 4.1.2 Land Surface Temperature (LST)

Land Surface Temperature (LST) as a reliable proxy indicator of soil moisture and therefore agricultural drought (Son et al. 2012, Perez et al. 2016). Both the Normalized Difference Vegetation Index **(**NDVI) and the LST are computable from MODIS satellite sensor data which has been collecting daily observation data at 5.6km resolution across Eswatini since 2001.

### 4.1.3 Normalized Difference Vegetation Index (NDVI)

The Normalized Difference Vegetation Index (NDVI) is the ratio of red to near infra-red light and can identify whether vegetation is present and is stressed (Tucker 1979, Sellers 1985). Many studies have found that there is a strong negative correlation between temperature (e.g. Land Surface Temperature, LST) and NDVI during drought periods, and that a time series of LST/NDVI is a rapid indicator of drought at country and province level in tropical areas (McVicar and Bierwirth 2001).

### 4.1.4 The US Drought Monitor

The US Drought Monitor serves as a good example of how a combination of different indicators can be used to develop a drought monitor. It is a state of the art in composite indicators for drought monitoring known as the US Drought Monitor (USDM, Svoboda et al. 2002). The full USDM combines six indicators of drought (Palmer Drought Severity Index, soil moisture, daily stream flow, rainfall deciles, SPI and Vegetation Health Index) that describe the major types of drought (meteorological, agricultural, hydrological). The USDM uses weighted averages of the inputs to produce a weekly real-time assessment of current drought conditions in the USA. The drought categories used by the USDM (table below) are potential triggers for different levels of planning and drought management response. The thresholds of each indicator are a useful guide for identifying triggers under each indicator in the USD.

Table 3: The USDM drought categories, possible impacts and association with input indicators. Source: adapted from Svoboda et al. (2002)

| | | | Ranges | | | | |
|---|---|---|---|---|---|---|---|
| Category | Description | Possible Impacts | Palmer Drought Severity Index (PDSI) | CPC Soil Moisture Model (Percentiles) | USGS Weekly Streamflow (Percentiles) | Standardized Precipitation Index (SPI) | Objective Drought Indicator Blends (Percentiles) |
| D0 | Abnormally Dry | Going into drought:<br>▪ short-term dryness slowing planting, growth of crops or pastures<br>Coming out of drought:<br>▪ some lingering water deficits<br>▪ pastures or crops not fully recovered | -1.0 to -1.9 | 21 to 30 | 21 to 30 | -0.5 to -0.7 | 21 to 30 |
| D1 | Moderate Drought | ▪ Some damage to crops, pastures<br>▪ Streams, reservoirs, or wells low, some water shortages developing or imminent<br>▪ Voluntary water-use restrictions requested | -2.0 to -2.9 | 11 to 20 | 11 to 20 | -0.8 to -1.2 | 11 to 20 |
| D2 | Severe Drought | ▪ Crop or pasture losses likely<br>▪ Water shortages common<br>▪ Water restrictions imposed | -3.0 to -3.9 | 6 to 10 | 6 to 10 | -1.3 to -1.5 | 6 to 10 |
| D3 | Extreme Drought | ▪ Major crop/pasture losses<br>▪ Widespread water shortages or restrictions | -4.0 to -4.9 | 3 to 5 | 3 to 5 | -1.6 to -1.9 | 3 to 5 |
| D4 | Exceptional Drought | ▪ Exceptional and widespread crop/pasture losses<br>▪ Shortages of water in reservoirs, streams, and wells creating water emergencies | -5.0 or less | 0 to 2 | 0 to 2 | -2.0 or less | 0 to 2 |

## 4.2 Current Drought Monitoring in Eswatini

The Eswatini National Meteorological Services (EMS) under the Ministry of Tourism and Environmental

Affairs (MTEA) is the national meteorological Service in Eswatini, while the Department of Water Affairs (DWA), under the Ministry of Natural resources and Energy (MNRE) is the agency responsible for hydrological services. The EMS is mandated to provide weather, flood, climate and astronomical products and services to promote people's safety and well- being and contribute to national development.

The EMS runs a country-wide network of 20 meteorological stations which ensure the recording, transmission and processing of meteorological information, according to internal needs and the directives of the World Meteorological Organisation.

The information obtained from monitoring is used for various purposes. These include the development of meteorological and agro-meteorological forecasts, warnings on natural meteorological phenomena, for use in global and regional meteorological data exchange networks and climate change assessments. The main parameters being monitored are temperature, humidity, daily sunshine hours, atmospheric pressure, average daily wind speed, rainfall, lightning data and evaporation rates (TNA, 2016).

## 4.3 Development of the Eswatini Drought Monitor

With support from the World Bank and the European Union, Eswatini is currently developing a drought monitor in order to improve the country drought resilience, mitigate drought impacts and coordinate drought preparedness programmes and responses in an effective and efficient manner. Through this process Eswatini will improve collaboration among stakeholders on drought information, enhance monitoring systems and information delivery for preparedness and reduced drought impacts. It is envisaged that this will create a proactive approach drought mitigation and planning measures, risk management, public outreach and resource stewardship. Multiple users of the tool will be able to enhance their network and build the necessary capacity for a more substantive and sustained drought preparedness and resilience programme in the country.

The idea is to consolidate the indices and indicators into one comprehensive national drought map, through a consultative process and produce a combined drought monitor for Eswatini (CDI-E), to monitor the temporal and spatial extents of historic drought events. It is worth noting that the intention is to provide an assessment product [by trying to capture these characteristics, the drought's magnitude (duration + intensity), spatial extent, probability of occurrence and impact], not a forecast.

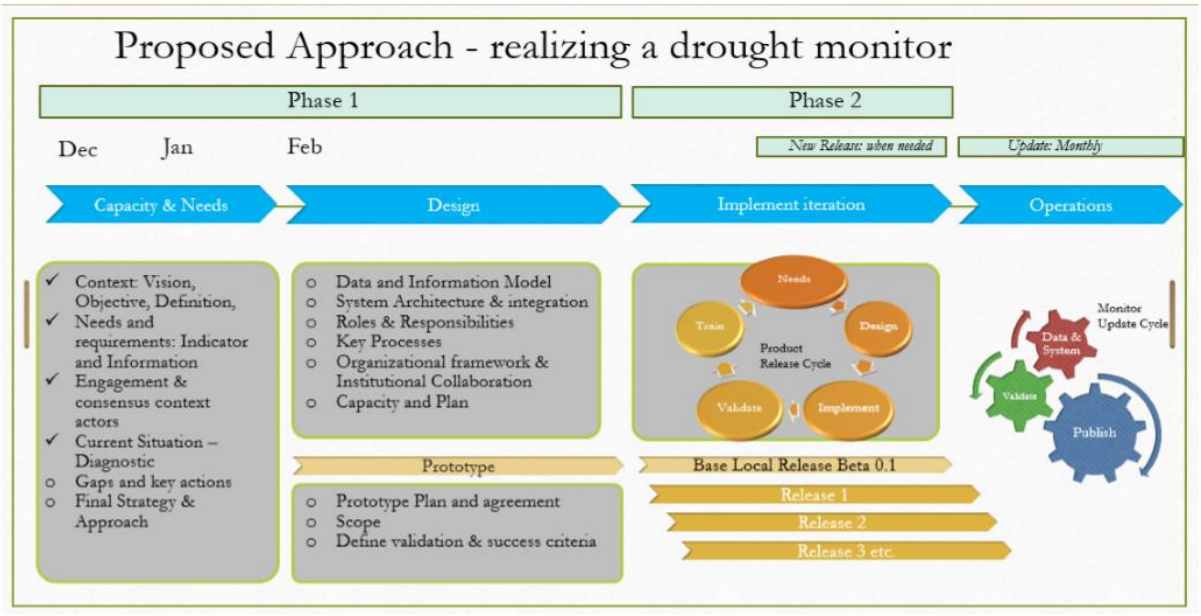


**Figure 5: The steps taken in developing a drought monitor for Eswatini (Source: NDMA)**

An example of the preliminary results of the CDI-E which was developed by combining the three satellite-based parameters (2001 to 2019) is shown in Figure 18 and 16 below:

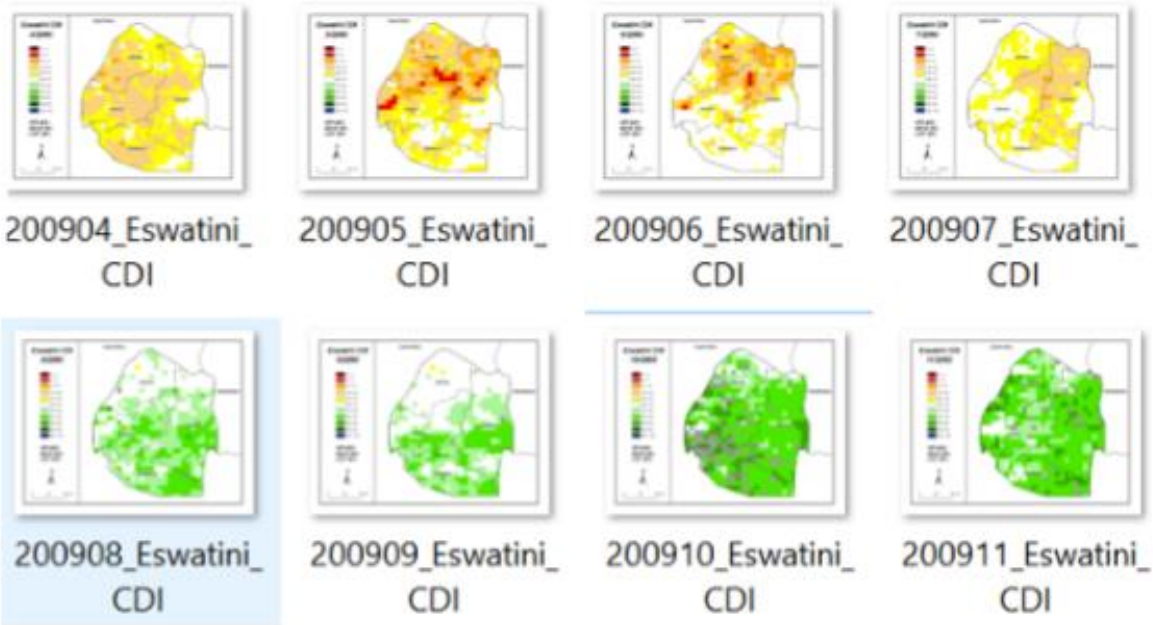


**Figure 6: CDI-E measurements taken using 2009 data (source: NDMA).**

The tool will assist the decision making process in a number of ways such as assessment of current conditions and current impacts using precipitation and other parameter to incorporate to other key

information and data. The indicators and CDI-E input data are objective parameters, which can be validated physically for decision making on onset of drought.

The CDI-E will assist in multi-hazard risk assessment for developing detailed country risk profiles and maps, and updating disaster management strategies and action plans based on identified risks. It can also assist in undertaking a drought preparedness Cost Benefits analysis and costs of inaction assessment.

It will also facilitate data integration through a team of experts, inputs from community based national volunteers for drought monitoring and national weather stations. Integrated data can be used in a number of ways such as supporting the development and implementing the drought monitor in order to prepare and update multi-sectoral drought preparedness and contingency plans; undertaking comprehensive risk transfer and finance strategy for the country and capacity building to support strategic management of water resources, drought and disaster risks, and climate change, including strategic partnerships with international institutions and expert.

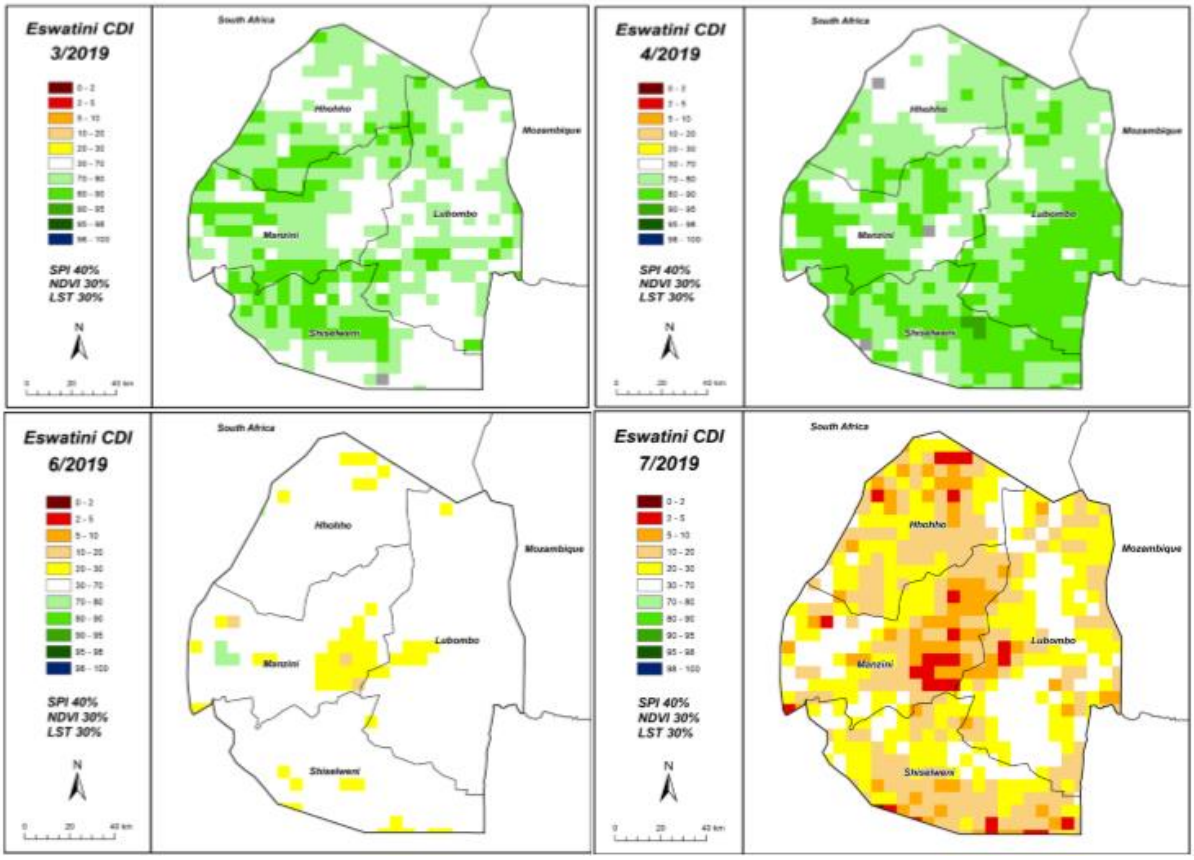


**Figure 7: CDI-E measurements taken using 2019 data ( Source: NDMA).**

## 4.4 Drought Impact Assessment

Drought can have many different effects on different sectors, hence impact assessments are required to

quantify the consequences of a drought on the different sectors of society and the economy. The potential impacts to the major sectors in Eswatini are listed in the Table 4 below. This sections summarizes the importance of each of these major sectors to the Eswatini economy and society, and how they have been impacted in the past by drought.

## 4.5 Drought Impact Reporting

Detecting drought impacts early can help to prevent the drought turning into a humanitarian crisis because drought response actions can be implemented swiftly before the situation deteriorates. Collection of anecdotal data on drought impacts provides an early and, when complemented with technical information such as drought indices and forecasting, can create a comprehensive understanding of losses caused by drought. Anecdotal information can include word of mouth, media reports, photographs, food and water market activity and citizen science. Some of the key information is available from women and youth.

**Table 4: Potential drought impacts for the major sectors in Eswatini. (Source: adapted from One World One Water (2017))**

| Agriculture and commerce | Water supply | Public health, environment and safety |
|---|---|---|
| • Loss from crop production<br>• Loss from livestock and dairy production<br>• Loss from fishery production<br>• Income loss for farmers<br>• Unemployment from drought-related production declines<br>• Loss to tourism industry<br>• Declines in food production<br>• Cost of water transport<br>• Reduced economic development<br>• Mental and physical stress<br>• Reduced quality of life and changes in lifestyle<br>• Population migration | • Groundwater depletion<br>• Reservoir draw down<br>• Water quality declines (increased salinity)<br>• Disruption of water supplies<br>• Increased surface water depletion<br>• Increased conflicts over water use<br>• Mental and physical stress<br>• Reduced quality of life and changes in lifestyle<br>• Depleted rainwater catchment and storage for residents without water service<br>• Increased costs for water hauling for residents without water service | • Mental and physical stress<br>• Health-related water shortage problems (water contamination, diminished sewage flows)<br>• Increased conflicts<br>• Increased wildfire risk and severity<br>• Disruption to cultural belief systems<br>• Loss of aesthetic values<br>• Reduction in recreational activities<br>• Reduced quality of life and changes in lifestyle<br>• Population migration<br>• Damage to biodiversity and ecosystem degradation<br>• Loss of wetlands<br>• Coral bleaching and marine habitat degradation |

# CHAPTER 5: DROUGHT RISK AND VULNERABILITY

The Kingdom of Eswatini is particularly vulnerable to drought as a developing country in which a significant portion of the population is reliant on subsistence farming for their daily sustenance and livelihoods. The ability to adapt to and cope with natural disasters, including drought, depends on economic resources, infrastructure, technology and social safety nets - many of which are typically lacking in Eswatini (TNC, 2016). Furthermore, the country is under pressure due to rapid urbanization and resource depletion, making it even more vulnerable to the additional challenges resulting from drought. Thus the Resilience Strategy and Adaptation Plan for Eswatini (2017) identifies poverty and food insecurity, HIV and AIDS, weakened governance, development-generated factors, and the fragile environment as the major sources of vulnerability to disaster risk, including drought.

Drought risk assessment is a core activity for establishing an effective drought monitoring and early warning system. A risk assessment provides important information for setting priorities and developing actions that prevent drought and mitigate drought impacts. The drought risk assessment can be used by authorities to target drought preparedness, mitigation and crises response actions to those communities and sectors most vulnerable to drought, and in locations where the impacts of drought are currently or forecast to be most severe. Outputs from a drought risk assessment should be incorporated into land use and rural development planning, health care systems, environmental and natural resource management approaches, supply chains and business models, and non- agricultural sectors.

Thus, understanding and assessing drought risk is essential, as some sectors, population groups or regions can be more vulnerable than others or vulnerable in different ways. Accordingly, the NDP has attempted to carry out risk assessments in a consistent and coordinated manner.

This chapter introduces the concepts of risk and vulnerability and compiles information for assessing risk and vulnerability to drought in Eswatini. Risk assessment outputs are provided from a global study completed by the European Commission's Joint Research Centre (Carrão et al. 2016). These are complemented by several studies completed by national organizations that have assessed components of risk in Eswatini.

## 5.1 Definitions

Drought risk and vulnerability assessments are inextricably linked, with the latter being a subset of the former. A drought risk assessment extends the vulnerability assessment by including information about the drought hazard independent of the sectors and communities potentially impacted by drought.

**Drought risk** can be calculated as:

Drought risk = Vulnerability (V) x Hazard (H)

Where vulnerability (V) is calculated as described below, and hazard (H) is the likelihood of drought

occurrence calculated using the indicators and indices developed for the drought monitoring and early warning system (see Chapter 5).

**Vulnerability** can be calculated as:

Vulnerability (V) = Exposure (E) + Sensitivity (S) – Adaptive Capacity (AC)

Where exposure (E) is the degree to which communities and ecosystems experience stress from drought (Adger 2004), sensitivity (S) is the degree to which communities and ecosystems are modified or affected by perturbations (Adger 2006), such as a change in climatic conditions brought about by the onset of drought, and adaptive capacity (AC) is the ability of communities and ecosystems to evolve in order to accommodate environmental hazards or policy change and to expand the range of variability with which it can cope (Adger 2006), including the ability to take advantage of opportunities, or to cope with the consequences (Füssel and Klein 2006).

Completing a drought risk and vulnerability assessment is important for several reasons (Crossman, 2017):

a. Identifying the communities and sectors that are at risk from a drought so that drought management plans, policies and risk mitigation measures can then be effectively designed, tailored and prioritized toward those at greatest risk. This is a pre-cursor to developing drought preparedness, monitoring, early warning response systems.
b. It is an important learning and knowledge gathering exercise that can improve the understanding of human and natural processes that add to drought vulnerability and community resilience. Providing important insights into community groups that may be marginalized such as women, children, the elderly and sick, the landless, and indigenous communities.

## 5.2 Drought Risk Mapping by the European Commission Joint Research Centre

A drought risk assessment was completed by the Joint Research Centre of the European Commission for the period 2000-2014. It uses a global-scale top-down data driven approach that is consistent and applicable to all regions in the world. Drought risk is calculated as the probability of harmful consequences or likelihood of losses resulting from interactions between drought hazard (i.e. the possible future occurrence of drought events), drought exposure (i.e. the total population, its livelihoods and assets in an area in which drought events may occur), and drought vulnerability (i.e. the propensity of exposed elements to suffer adverse effects when impacted by a drought event) (Carrão et al. 2016). Specifically, drought risk was calculated as:

**Drought risk** = Vulnerability x Hazard x Exposure

Each component of drought risk was calculated independently of each other and based on global- sale indicators of different spatial resolutions. Hazard was using historical sequences of monthly precipitation deficits for the period between 1901 and 2010. Exposure was computed at the sub-national level using high spatial resolution gridded indicators of population and livestock density, crop cover and baseline water stress. Vulnerability was derived from a combination of factors of social, economic and infrastructural indicators.

## 5.3 Assessing Drought Vulnerability

Vulnerability assessments undertaken by the VAC should be integrative and comprehensive and incorporate different dimensions (e.g. social, economic, physical, environmental, and institutional). An elegant framework for calculating vulnerability of a system (e.g. people, communities, sectors) to drought is presented in the figure below. Variables describing drought, such as spatial extent, probability of occurrence (from historic drought events), projected frequencies under climate change, and intensity are often used to estimate exposure. The NDP therefore establishes the framework for estimating sensitivity, variables describing the system of interest (e.g. agriculture), such as dependency on water resources, extent of land degradation, population densities, and diversification of income sources. For estimating adaptive capacity, variables describing the five capitals (natural, social, human, financial, manufactured).

The variables used to describe exposure, sensitivity and the adaptive capacity of the Eswatini's social, human, financial, manufactured and natural capital would ideally be spatially explicit and high resolution.

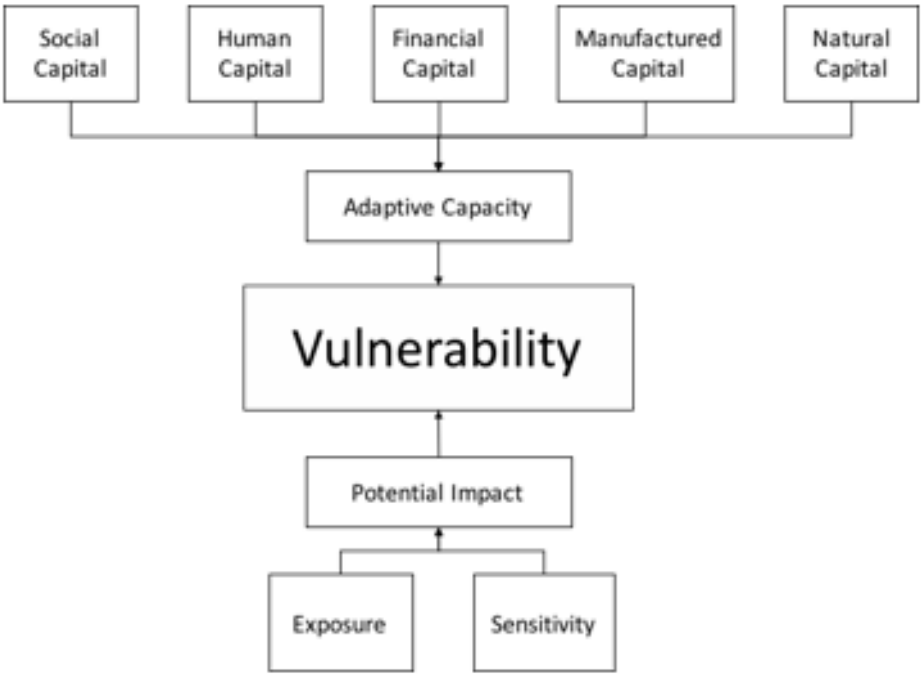


**Figure 8: The conceptual framework showing the multiple dimensions to be included for assessing vulnerability to drought. Modified from Gbetibouo et al. (2010)6.4 Data Collected for Drought Risk Assessment**

Eswatini is mainly affected by hydro meteorological hazards, and the monitoring of these hazards is the responsibility of established institution such as Eswatini Meteorological Service. The Eswatini Vulnerability Assessment Committee (VAC) collects household level information to assess levels of chronic food insecurity, malnutrition, livelihoods and drought vulnerability in rural households in all regions of the country. It undertakes integrated food security and vulnerability analyses of households. Currently Eswatini uses a multi-sector approach to conduct disaster risk assessments (including drought) and uses that information for planning. However, there is no standardized tool that is being used to conduct the assessments by the various sectors, hence the country is developing standardized tools for assessment at the onset of a disaster targeting the household and institutional level.

***The National Disaster Management Agency*:** Acts as the central repository for assessment tools and reports and handles all issues pertaining to disaster risk reduction from preparedness, response, mitigation and recovery. This institution plays a coordination role among the role players stated below:

***The Department of Meteorology:*** has the mandate: to collect weather and climate (meteorological) data, to issue forecasts, to provide advisory for monitoring meteorological systems, to ensure that observing standards are met, instruments are calibrated and Eswatini participates in the international community, etc. The department regularly issues early warning information regarding storms, lightning, heat waves, cold waves and other weather related hazards in a timely manner. The major limitation of the early warning information / forecast provided by the Meteorology department is that it does not indicate the frequency and the spatial distribution of the rain.

***Eswatini Vulnerability Assessment Committee (EVAC):*** located under the NDMA pursues the main objective of the EVAC , which is to collect household level information in order to assess levels of chronic food insecurity, malnutrition, livelihoods and vulnerability in rural households in the four regions of the country. Its objectives include: understanding distribution of various vulnerabilities around the country; understanding linkages between food security, vulnerability and malnutrition in the country, using the household survey as a baseline for developing a multi-agency, inter-sectoral monitoring system in the country. It also aims at building the capacity of core Swazi VAC members to undertake integrated food security and vulnerability analyses of household survey data.

***National Early Warning Unit (NEWU):*** which is under the Ministry of Agriculture, conduct food supply assessment in conjunction with other stakeholders, provide advice on food supply policies, gather, analyze and disseminate information on food security issues, provide early warning information on the expected weather conditions and crop production in liaison with the Department of Meteorological Services, liaise with regional and international bodies on issues of food security that have a bearing on the local food security context.

***Other institutions that the coordination office works with include***: the Surveyor Generals office, which provides maps and detailed locations, the Central Statistics Office, and Emergency Preparedness and Response Unit under the Ministry of Health. These departments deal with their risk assessment at the sector level.

# CHAPTER 6: DROUGHT COMMUNICATION AND RESPONSE ACTIONS

Effective communication of the onset of drought and the actions required to respond to drought across all stakeholders is essential for reducing impacts. This calls for clear protocols to be put in place about who is responsible for drought messages, where are they made, when are they are made (in response to different drought conditions), and how to respond in the event of a drought.

All stakeholders, whether they be government agencies, private sector or the general population in the Eswatini, have a responsibility to communicate and respond appropriately as a drought unfolds and conditions worsen. This chapter presents specific details and actions for communicating and responding to drought in Eswatini.

The drafting of the NDP occurred during the outbreak of the Corona Virus Pandemic which offered many valuable lessons about communication during a disaster in Eswatini.

## 6.1 Drought Communication Protocol

Information and communication are critical to ensuring that drought-affected people are at the centre of humanitarian action during drought. It is now recognized that information and communication are important forms of aid, in addition to traditional humanitarian aid such as food, water and shelter. Without information and communication, affected people cannot access services or make the best decisions for themselves and their communities. When people are given the opportunity to voice their opinions and provide feedback, this enhances their sense of well-being, helps them adapt to the challenges they face, and better enables them to take an active role in their own recovery.

Traditionally, drought communication has been a one-way process of alerting communities to evolving drought circumstances, providing advice on what they should do, and clarifying and coordinating the roles of each of the relevant government agencies as drought evolves. This is still very important to ensure coordination for effective response. Therefore, the communication protocol presented here is multi-dimensional, it presents actions for opening up effective lines of communication with communities during drought, and actions that the Government of Eswatini and communities take during and after drought. The actions for the Government for establishing two-way communication during the phases of drought are presented in the table below. The process of communicating actions as drought conditions evolve is presented in the remainder of this chapter and is linked to different levels of the key indicators used to monitor drought (see Chapter 4).

## 6.2 Declaration of Drought Conditions

Drought conditions in Eswatini are monitored by the NDMA, EMS and NEWU. The EMS in collaboration with WMO and partners in the SADC region provides three main products that can be used to monitor and forecast drought which all use the Percentage of Normal Rainfall Index (PNRI) at national scale

a) Monthly climate assessment and outlook - monthly summary of the temperature and rainfall for the past month and a forecast of temperature and rainfall for the next month, including the weather systems and ENSO conditions underpinning the assessment and outlook;

b) Season climate outlook - twice-yearly forecast of the temperature and rainfall for the coming two seasons (six months), including the weather systems and ENSO conditions underpinning the outlook;
c) Monthly drought and dry spell assessments - monthly summary of drought conditions for the previous month, issued during periods of drought.

EMS uses three categories of drought and dry spell, defined as:

*1. Drought:* Three consecutive months of way below normal rainfall (>60% reduction from average rainfall), or Five consecutive months of below normal rainfall (21-60% reduction from average rainfall)

*2. Dry spell:* Three consecutive months of below normal rainfall (21-60% reduction from average rainfall), or two consecutive months of way below normal rainfall (>60% reduction from average rainfall).

*3. Dry condition*: Two consecutive months of below normal rainfall (21-60% reduction from average rainfall).

NDMA recently adopted the Standardized Precipitation Index (SPI), Normalized Difference Vegetation Index (NDVI) and Land Surface Temperature (LST) anomaly for improved drought monitoring. The forum of data experts that will refine the CDI-E monitor is expected to harmonize the indices, as the CDI-E is finalized. The next section summaries monitoring, declaration and responses actions as the drought worsens and the values of the SPI indicator decreases beyond certain thresholds.

## 6.3 Communication and Coordination Guidelines and Response Actions

### 6.3.1 Communication during drought

Various communication channels and tools will be used to disseminate information about drought management in the country, which will include the following:

- *Print media:* Newspapers, magazines, newsletters, leaflets, brochures, pamphlets, road banners, roll-up banners, posters, bill boards;
- *Electronic media/broadcast:* Radio, television, documentary, interactive website, social media.
- *Direct stakeholder engagement:* Interactive engagements such as meetings, workshops,
- symposia, exhibits/displays, road shows, school clubs
- *Social marketing and advertising:* Newspapers, radio, TV.
- *Social Media Platforms: NDAM Website and accounts for* Facebook, WhatsApp, Twitter etc.

The approaches for communicating with different types of Emaswati audiences and their advantages and disadvantages are listed in the table below. It important to consider that Siswati translations, clear and simple communication protocols in any products distributed to people vulnerable to drought is vital.

**Table 5: Approaches for communicating with Emaswati and their advantages and disadvantages. Source: modified from Government of Malawi (2014).**

| Target audience | Communication approaches | Advantages | Disadvantages |
|---|---|---|---|
| **Rural communities** | Radios; mobile phones; posters; TV; leaflets; brochures; meetings; school clubs; national radio stations | Radio - reaches mass audience | Not everyone has access to radios |
| | | Mobile phones - fast | Mobile phones – not everyone has access and coverage; require electricity to charge |
| | | Posters – easy to distribute | Posters - prone to vandalism |
| **Urban communities** | Radios; mobile phones; posters; TV; leaflets; brochures; meetings; school & sport clubs; social media and advertising (newspapers; radio; TV) | Radio & TV – wide coverage | Radio & TV – requires electricity |
| | | Social media – wide coverage | Social media – requires data bundles and modern technologies which exclude older generations |
| **Whole of Government** | Newspapers; television; radios; workshops/ meetings; leaflets; brochures; policy briefs | Newspapers – easily accessed | The number of people relying on newspapers for news in Eswatini is declining |
| **International community; private sector; donors** | Newspapers; websites & social media; press conferences; meetings; reports; workshops | Social media – widespread among professional communities | Websites and social media requires data bundles, good connectivity and modern technologies which exclude older generations |

### 7.3.2 Coordination and Response

In response to a major drought, the Government of Eswatini, via the NDMA will lead various actions as the drought unfolds. The responses will be coordinated under a cluster model as shown in the Figure below:

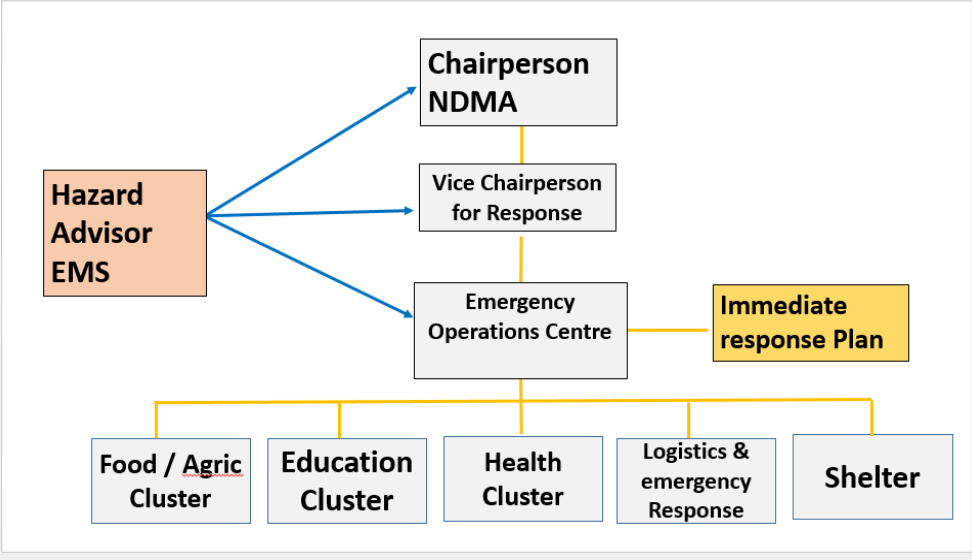


**Figure 9: Coordinated responses to drought under the Eswatini DRM Model based on clusters.**

There are many actions that should be implemented in Eswatini during a drought, and the different clusters will be responsible for different actions. The actions in responding to drought include:

**a. In general:**

- Rehabilitating irrigation networks to improve irrigation efficiency
- Massive information campaign – daily media briefings
- Water rationing
- Intensification of leak repair programs
- Water quality monitoring
- Cloud seeding operation
- Hydropower generation shall be kept to their respective minimum allowable generating capacities

**b. For agriculture:**

- Ensuring water availability in production areas through irrigation and cloud seeding. Climate risk factors should be incorporated into any new or expanded water supply projects;
- Shifting of planting calendars or early planting, especially in drought vulnerable areas;
- Planting early maturing crops that require less water and are more tolerant to drought.
- Focus on location-specific varieties in drought vulnerable areas;
- Emergency income assistance to compensate for farm/fishery income loss;
- Emergency food assistance;
- Promotion of alternative crops as replacement for major staples.
- Providing seeds, planting materials and fingerlings;
- Fertilizer support (organic/inorganic); and further irrigation development.

The response actions are linked to various levels of drought intensity as indicated by the SPI and other drought indicators, and they are summarized in table 6. During the early phases of the drought, a drought risk, impact and needs assessment should be completed to identify the different regions, areas and communities requiring aid. Water supply enhancing technologies and food aid should be distributed as early as possible and use a practical approach to avoid human suffering.

# CHAPTER 7: DROUGHT MITIGATION AND PREPAREDNESS

Being better prepared for the next drought requires actions to be put in place as soon as possible to reduce drought risk and potential impacts of future droughts. Preliminary interactions with key stakeholders has revealed the need to:

a) Include disaster risk reduction in national sectoral plans (mainstreaming drought).
b) Identify and engage stakeholders on disaster risk mitigation to minimize the impact of drought on communities.
c) Establishment of a national risk observatory in Eswatini which would continuously collect and analyse data from relevant agencies, coordinate and/or disseminate early warnings, and serve as a communications hub. The National Risk Observatory will unify the disparate databases of various agencies, improve dissemination and access of data and information to empower communities under threat from drought.
d) There is need for a centralized database system that will capture and quantify all disaster incidences into financial values so as to establish trends, and compare the impact of the hazards over the years.

There are many things that the Kingdom of Eswatini could do to mitigate risk and be better prepared, including development of new and alternative water sources, community education and outreach to encourage water conservation practices, and improved water resource monitoring and impact assessment.

This National Drought Action Plan (appendix 1) presents a number of options to monitor and enhance water supply, improve water quality and educate communities about the importance of water conservation. The actions available are presented in summary tabular format (Appendix 1) for ease of communication and reference.

**Table 6: Summary of response actions under different levels of drought (per the SPI and PNRI drought indicators), and by whom.**

| Phase | Indicators and Impacts | Response actions | Who leads | Other Agencies involved |
|---|---|---|---|---|
| Drought<br>Advisory | • D0 (Abnormally dry)<br>• PNRI (< 75% for 3 months)<br>• SPI (-0.5 to -0.7)<br>• Short-term dryness slowing planting, growth of crops or pastures<br>• Observed drops in reservoir, tank and groundwater levels | • Regular monitoring<br>• Enact the drought task force to monitor situation | NDMA | EMS |
| Drought watch/alert | • D1 (Moderate drought)<br>• PNRI (<70% for 3 months) SPI (-0.8 to -1.2)<br>• Some damage to crops, pastures<br>• Reservoirs, tanks and wells low, Some water shortages developing or imminent | • Close monitoring of conditions for persisting or rapidly worsening drought<br>• Activate risk assessment committee and assess risks and impacts/needs to all potentially affected communities across the major clusters impacted by drought (Food & Non-food; Health; Education; Logistics and Telecommunications; Shelter)<br>• Voluntary non-essential water-use restrictions applied<br>• Intensive communication and public information campaign – implement communication with communities plan as per Table 5 and implement communication mediums as per Table 5 | NDMA | EMS; MoET; MTRD, MoH; ENPS, Defence |
| Drought warning | • D2 (Severe drought) | • Mandatory and stringent water restrictions and water conservation measures | NDMA | EMS; MoE; MTRD,MH |

| | | | | |
|---|---|---|---|---|
| | • PNRI (< 65% for 6 months)<br>• SPI (-1.3 to -1.5)<br>• Crop or pasture losses likely, Reservoirs, tanks and wells continue to decline, Water shortages common; | • Drought task force and drought monitoring committee activated<br>• Potential drought emergency declared<br>• Distribution of RO units and hygiene kits to worst affected communities, especially schools | | UD; MoH; ENPS; Defense MoA |
| Drought emergency | • D3 (Extreme drought)<br>• PNRI (< 60% for 6 months)<br>• SPI (-1.6 to -1.9)<br>• Major crop/pasture losses<br>• Widespread water shortages or restrictions | • Mandatory water allocations and emergency supplies<br>• Maximum per capita daily water uses applied<br>• Prie Mnister declares national State of Emergency<br>• Activate Emergency Operations Centre (OpCen) | NDMA | EMS; MoE MTRD; MNUD, MoH; ENPS, Defense; MoA |
| | • D5 (Exceptional drought)<br>• NRI (< 65% for 12 months)<br>• SPI (-2.0 or less)<br>• Exceptional and widespread crop/pasture losses<br>• Shortages of water in reservoirs, tanks and wells threatening life | • Distribution of emergency food and water supplies<br>• Hospital disaster emergency operations implemented | NDMA | EMS; MoE MTRD; MNUD, MoH; ENPS, Defense; MoA |

# CHAPTER 8: THE ESWATINI NATIONAL DROUGHT ACTION PLAN

## 8.1 Guiding Principles

The National Drought Plan shall be used to deliver a robust drought risk reduction process in Eswatini, guided by the following four principles.

1. Drought is a recurring phenomenon hence it is best managed by mainstreaming it into existing national programmes, sectoral policies and plans, including the National Disaster Management Plans.
2. Eswatini should prepare better for drought, hence the impact of drought should be continuously assessed and integrated into drought response plans.
3. Drought is best managed by including affected groups of Eswatini society, giving priority to most vulnerable communities, the disable, women and youth and including them in drought decision-making processes, policy design and planning.
4. The human, institutional, organizational and technical capacities of Eswatini citizens needs to be enhanced for effective implementation of the drought action plan

## 8.2 Goals, Objectives and Activities of the National Drought Plan

The National Drought Plan for Eswatini has been developed based on the three pillars for drought risk management. Below is an elaboration of its Goals, Purpose, Objectives and Activities to be undertaken. Apart from a descriptive outlay in the foregoing sections, the plan has also been further elaborated in matrix format (Appendix 1).

### 8.2.1 Vision

Improved mitigation of the adverse effects of drought in all areas of Eswatini resulting in increased drought resilience of the country's economic sectors, ecosystems and communities.

### 8.2.2 Goals and Objectives

The NDP as four components, which have been adapted from the DRAMP Framework and supported by six goals and their corresponding objectives (see table below). Based on the drought cycle, the actions towards each objective (elaborated in appendix 1) are not mutually exclusive, since some of those that are aimed at managing and adapting to drought are also applicable to more than one pillar.

**Table 7: Summary of Eswatini NDP pillars, goals and objectives**.

| Component / Key Pillar | Goals | Objectives |
|---|---|---|
| **Component 1 (*Key Pillar 1*):** Implementing Drought Monitoring, Early Warning Systems and Impact Assessment. | **Goal 1: Robust drought monitoring and early warning** | **Objective 1:** Strengthen Early Warning Systems |
| | | **Objective 2:** Disseminate reliable warning messages so that response to the risks are measured and timely |
| | | **Objective 3:** Undertake drought impact assessment |
| **Component 2 (*Key Pillar 2*):** Assessment and Management of Drought Risk and Vulnerability. | **Goal 2: Better assessment of drought risk and vulnerabilities** | **Objective 1:** Undertake drought impact assessment |
| **Component 3 (*Key Pillar 3):*** Implementing Measures to Limit Impacts of Drought and Better Respond to Drought. | **Goal3: Effective response during drought events** | **Objective 1 :** Respond to drought as it unfolds |
| | **Goal 4: Enhanced Drought Preparedness, Mitigation and Resilience** | **Objective 1:** Improve drought understanding |
| | | **Objective 2:** Reduce drought risk and vulnerability (Mitigation) |
| | | **Objective 3:** Support activities that increase resilience to drought |
| | | **Objective 4:** Improve water supply and demand management |
| | | **Objective 5:** Improve national food and nutrition security |
| | | **Objective 6:** Improve agricultural resilience to drought |
| | **Goal 5: Drought Risk Transfer and sharing** | **Objective 1:** Minimize losses due to drought |
| **Component 4 (*Cross-Cutting Issues*)** Addressing cross-cutting issues that lead to transformative changes in drought risk reduction | **Goal 6: Improve communication, awareness, capacity building, mainstreaming drought and resource mobilization.** | **Objective 1:** Improve drought communication and awareness |
| | | **Objective 2** Strengthen capacity to cope with drought |
| | | **Objective 3** Mainstream drought into ministerial and sectoral plans |
| | | **Objective 4** Mainstream gender into drought risk reduction |
| | | **Objective 5:** Mobilizing of adequate resources for drought preparedness, monitoring and response |

# CHAPTER 9: IMPLEMENTATION ARRANGEMENTS

## 9.1 Mechanisms for Implementation

The NDMA will coordinate the implementation of actions outlined in the NDP, while the MoA will serve as the Secretariat. The Ministry of Agriculture will use the NDP to report to the UNCCD on drought management in Eswatini. The National Disaster Management Agency (NDMA) is the national institution that is mandated to coordinate disaster risk reduction (DRR) in Eswatiini.

The implementation of this drought plan will be done through the clusters that are established under the NDMA Act, which are used for coordinating and directing the implementation of disaster risk management programs in the country. Within the clusters that are established under the NDMA, relevant ministries and other members of the various clusters should implement interventions in their own sectors while the NDMA will be managing the resources mobilized for drought risk mitigation, response, and recovery actions.

The National Drought Plan is designed to be closely aligned with existing national programmes that are driven by various government ministries, so that it is sustainable. The NDP is based on the premise that there will be national collaboration to enhance consistent and coordinated national approaches around the identified priorities, roles and responsibilities. It brings together the key government agencies, communities, local urban government, NGO's and private sector organizations to take a proactive approach to drought management and develop appropriate response actions when drought occurs.

The agencies that are identified to play different roles in the NDP will seek to work with the National Disaster Management Agency and the Ministry of Agriculture and build the capacities of responsible entities and communities. This can be best achieved by following the guidelines of the RACI Approach, which tasks the lead institutions with the responsibility to clearly identify the role of stakeholders in the NDP based on their status (Responsible, Accountable, Consulted or Informed) and address them accordingly. The NDMA Act (2006) provides a good solid framework since the actions of the NDP can be coordinated through the nine clusters established under the Act, with priority actions directed to the clusters that are more vulnerable to drought such as food and agriculture, water and sanitation, forestry and environment etc.

Central to the NDP implementation, is the ability to generate and communicate quality weather information. It is also crucial to ensure that different institutions that generate drought monitoring information collaborate in their respective roles to give a more accurate analysis of drought circumstances in the country. It is therefore recommended that a data sharing forum is established and capacitated to support the NDP. Similarly, in a Technical Advisory Capacity, an ad hoc body of national experts is proposed to support the NDP (see figure 10 below).

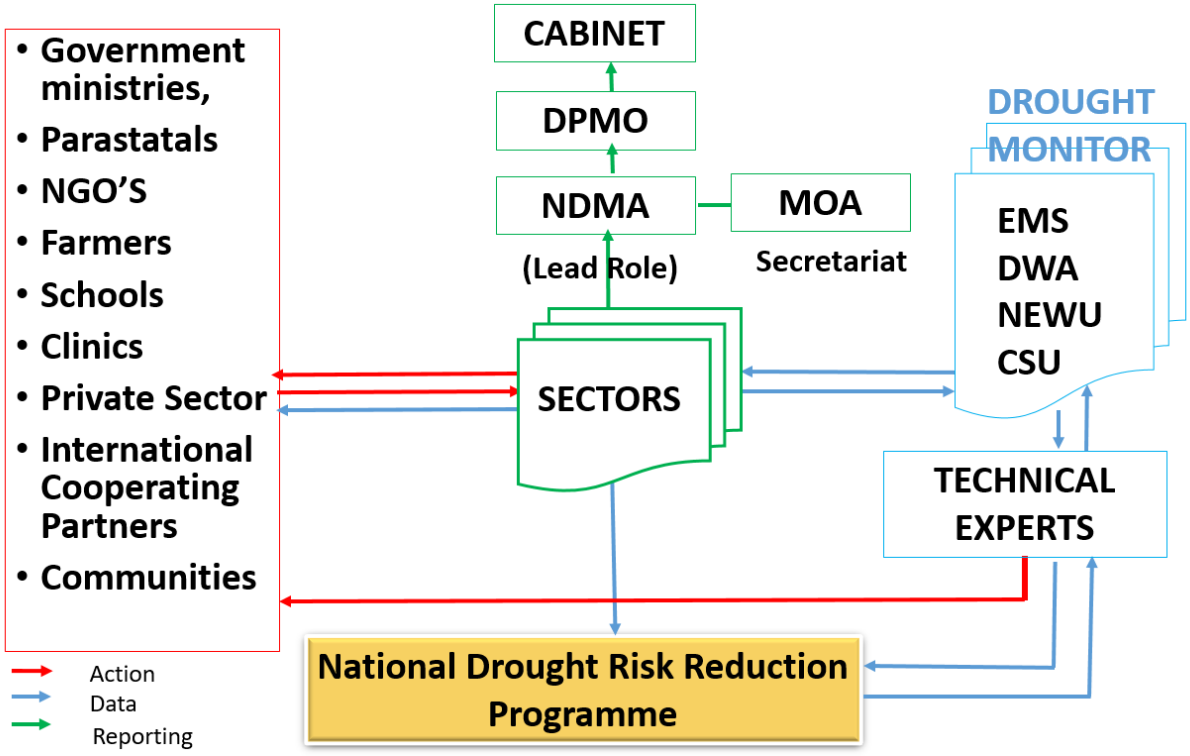


**Figure 10: Implementation structure for the Eswatini NDP (2020 – 2030).**

## 9.2 Monitoring and Reporting

Regular reporting on the status of implementation of the NDP is required in order to assess progress, gaps and challenges as well as to capture lessons learned so that interventions deliver meaningful results. This shall be done through annual reviews in accordance with the Government of Eswatini policies and procedures focusing on the activities and timeframes.

The Ministry of Economic Planning and Development is best placed to monitor progress on the NDP and report on its effectiveness together with cross-sectoral programmes that are anchored initiatives such as the Poverty Reduction Strategy. In submitting their periodic reports, the Ministry of Agriculture and the Office of the Deputy Prime Minister's Office, will include progress on the on-going activities outlined in the drought, as well as activities undertaken during emergency drought situations.

The NDP goals will be used as a basis for measuring progress on attainment of objectives and execution of activities. An evaluation system should be established through a consultative process with all stakeholders and sectors that have been involved in the planning and implementation of this drought plan. It is ideal that civil society is involved in the monitoring exercise. Activities to be monitored are those listed in Appendix 1. The NDMA should prepare and guide standardized data collection and analysis tools and approaches and produce and share periodic progress reports with all stakeholders. These progress reports should highlight successes and challenges in the implementation of the national drought plan and assist in reviewing and updating plan.

### 9.3 Future Updates and Revisions

Regular updating and revising the drought plan will ensure the following: (i) increased agricultural productivity and sustainability through sustainable agricultural practices; (ii) strengthened resilience of water resource management and supply; (iii) improved food security, nutrition and delivery of health services; and (iv) enhanced drought resilience and preparedness by strengthening the capacity of institutions and drought affected communities to reduce their risks and vulnerability.

# References


1. *Adger, W. N. (2006).* Vulnerability. Global Environmental Change 16:268-281.

2. *Adger, W.N., Agrawala, S., Mirza, M.M.Q., Conde, C., O'Brien, K., Pulhin, J., Pulwarty, R., Smit, B. and Takahashi, K. (2007).* Assessment of adaptation practices, options, constraints and capacity. Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, pp. 717–743. In M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson, Eds. Cambridge, UK, Cambridge University Press.

3. *American Planning Association (2019).* Falling Dominoes: A Planner's Guide to Drought and Cascading Impacts.

4. Manyatsi, A. M., Mhazo, N., and Masarirambi, M. T. 2010. Climate Variability and Change as Perceived by Rural Communities in Swaziland. Research Journal of Environmental and Earth Sciences, 2(3), 165-170.

5. *Mhlanga-Ndlovu, BFN & Nhamo, G. (2017)* An assessment of Swaziland sugarcane farmer associations' vulnerability to climate change, Journal of Integrative Environmental Sciences, 14:1, 39-57, https://doi.org/10.1080/1943815X.2017.1335329

6. *Brown, R. (2010).* Parliamentary Role and Relationship in Effectively Addressing Change Issues, Swaziland. Climate Journal of Agricultural Studies. Vol. 2, No. 1, 86-98.

7. *Carrão, H., G. Naumann, and P. Barbosa (2016).* Mapping Global Patterns of Drought Risk: An empirical framework based on sub-national estimates of hazard, exposure and vulnerability. Global Environmental Change 39:108-124.

8. *CDAC Network (2014).* Practice Brief: Communicating with Communities during the First Six Weeks of an Emergency Response.

9. Central Statistics Office. 2010a. Population Projection and Housing Census 2007-2030. Ministry of Agriculture and Cooperatives, Mbabane.

10. Central Statistics Office. 2010b. Population Projection Report: 2007-2030. Central Statistics Office, Eswatini.

11. Central Statistics Office. 2011. Poverty in a Decade of Slow Economic Growth: Swaziland in the 2000's. Central Statistics Office, Eswatini.

12. *GoE (2016)* National Climate Change Action Plan 2011-2028. Eswatini.

13. *Crausbay, S. D., A. R. Ramirez, S. L. Carter, M. S. Cross, K. R. Hall, D. J. Bathke, J. L. Betancourt, S. Colt, A. E. Cravens, M. S. Dalton, J. B. Dunham, L. E. Hay, M. J. Hayes, J. McEvoy, C. A. McNutt, M. A. Moritz, K. H. Nislow, N. Raheem, and T. Sanford (2017).* Defining Ecological Drought for the Twenty-First Century. Bulletin of the American Meteorological Society 98:2543-2550.

14. *Crossman, N. D. (2017).* Drought Resilience, Adaptation and Management Policy (DRAMP) Framework Technical Guidelines. UNCCD, Bonn.

15. *Fourth National Climate Assessment (2018).* Impacts, Risks, and Adaptation in the United States. Chapter 28. "Reducing Risks through Actions." Washington, D.C.: U.S. Global Change Research Program. Available at https://nca2018.globalchange.gov/chapter/28 .

16. *Füssel, H.-M., and R. J. T. Klein (2006).* Climate Change Vulnerability Assessments: An Evolution of Conceptual Thinking. Climatic Change 75:301-329.

17. *Gamedze, M. (2006).* Climate Change Vulnerability and Adaptation Assessments in Swaziland. Online publication Research Abstract available at http://unfccc.int/files/adaptation/adverse_effects_and_response_measures_art_48/application/pdf/200609_swaziland_iva_abstract.pdf Accessed 5 May 2020.

18. *Gbetibouo, G. A., C. Ringler, and R. Hassan (2010).* Vulnerability of the South African farming sector to climate change and variability: An indicator approach. Natural Resources Forum 34:175-187.

19. GoE (1997). Swaziland Environmental Action Plan. Ministry of Tourism, Environment and Communications, Mbabane.

20. *GoE (2014).* National Disaster Risk Management Communication Strategy (2014 –2018).

21. *GoE (2016).* Third National Communication to the United Nations Framework Convention on Climate Change.

22. *GoE (2015).* National Progress Report on the Implementation of the Hyogo Framework for Action (2013-2015). http://www.preventionweb.net/english/hyogo/progress/reports/

23. *GoE (2013).* Annual Vulnerability Assessment and Analysis Report. Mbabane, Government of Eswatini.

24. *GoE (2014).* Optimizing Groundwater Use within the Context of Integrated Water Resources Management (IWRM) Framework and General Water Sector Reforms.

25. *GoE (2014).* Vulnerability and Adaptation Assessment: Biodiversity and Ecosystems. Eswatini National Trust Commission, Ministry of Tourism and Environment Affairs, Mbabane.

26. *GoE, (2015).* The Aligned Eswatini National Action Plan to Combat Desertification, Land Degradation and Drought FY 2015-2025. Ministry of Agriculture, Mbabane.

27. *IFAD (2015).* Rural Poverty in the Kingdom of Swaziland. www.ruralpovertyportal.org/country/home/tags/swaziland . Accessed 27 March 2020.05.18

28. *IPCC. (2014).* Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. pp. 1132. In Field, C.B., V.R. Barros, D.J. Dokken, K.J. Mach, M.D. Mastrandrea, T.E. Bilir, M. Chatterjee, K.L. Ebi, Y.O. Estrada, R.C. Genova, B. Girma, E.S. Kissel, A.N. Levy, S. MacCracken, P.R. Mastrandrea, and L.L. White, Eds. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

29. *Manyatsi, A.M. and Mhazo, N. (2014)* A Comprehensive Scoping and Assessment Study of Climate Smart Agriculture (CSA) Policies in Swaziland (Draft). Commissioned by the Food, Agriculture and Natural Resources Policy Analysis Network (FANRPAN).

30. *Manyatsi, A.M. and Brown, R. (2009).* Integrated Water Resources Management Survey and Status Report: Swaziland, Global Water Partnership, Southern Africa.

31. *Oseni, T. O. and Masarirambi, M. T. (2011).* The Effects of Climate Change on Maize Production and Food Security in Swaziland. American Journal of Agriculture and Environmental Science, 11(3), 385-393.

32. Remmelzwaal, A and Vilakati J.D. (1994). Physiographic map of Swaziland. Ministry of Agriculture and Cooperatives, Mbabane.

33. Remmelzwaal R. (2006). Swaziland: Country Environment Profile. Report Prepared for the Joint-Venture of NIRAS PINSISI Consortium partners. AGROTEC S.p.A, June 2006.

34. *Sellers, P. J. (1985).* Canopy reflectance, photosynthesis and transpiration. International Journal of Remote Sensing 6:1335-1372.

35. Svoboda, M., D. LeComte, M. Hayes, R. Heim, K. Gleason, J. Angel, B. Rippey, R. Tinker, M. Palecki, D. Stooksbury, D. Miskus, and S. Stephens. 2002. The Drought Monitor. Bulletin of the American Meteorological Society 83:1181-1190.

36. Sweet and Khumalo, 1994 Sweet, R.J. and Khumalo S. 1994. Range Resources and Grazing Potentials in Swaziland. FAO Report, Ministry of Agriculture and Co-operatives, Mbabane.

37. *Tsegai, D., J. Liebe, and R. Ardakanian (2015*). Capacity Development to Support National Drought Management Policies: Synthesis. UNW-DPC, Bonn, Germany.

38. *UNISDR. (2015).* Sendai Framework for Disaster Risk Reduction 2015 - 2030.

39. Van Loon, A. F., T. Gleeson, J. Clark, A. I. J. M. Van Dijk, K. Stahl, J. Hannaford, G. Di Baldassarre, A. J. Teulng, L. M. Tallaksen, R. Uijlenhoet, D. M. Hannah, J. Sheffield, M. Svoboda, B. Verbeiren, T. Wagener, S. Rangecroft, N. Wanders, and H. A. J. Van Lanen. 2016. Drought in the Anthropocene.

Nature Geosci 9:89-91. Vicente-Serrano, S. M., S. Beguería, J. Lorenzo-Lacruz, J. J. Camarero, J. I. López-Moreno, C. Azorin- Molina, J. Revuelto, E. Morán-Tejeda, and A. Sanchez-Lorenzo (2012). Performance of Drought Indices for Ecological, Agricultural, and Hydrological Applications. Earth Interactions 16:1-27.

40. *Vicente-Serrano, S. M., S. Beguería, J. Lorenzo-Lacruz, J. J. Camarero, J. I. López-Moreno, C. Azorin-Molina, J. Revuelto, E. Morán-Tejeda, and A. Sanchez-Lorenzo (2012).* Performance of Drought Indices for Ecological, Agricultural, and Hydrological Applications. Earth Interactions 16:1-27.

41. *Wilhite, D. A. (2000).* Drought as a Natural Hazard: Concepts and Definitions. Pages 3-18 in D. A. Wilhite, editor. Drought: A Global Assessment, Vol. I. Routledge, London.

42. *Wilhite, D. A., and M. H. Glantz (1985).* Understanding: the Drought Phenomenon: The Role of Definitions. Water International 10:111-120. World Meteorological Organization. 2012. Standardized Precipitation Index User Guide. World Meteorological Organization, Geneva, Switzerland.

# Appendix 1: Eswatini National Drought Action Plan

| Goal / Objective | Actions | Who? | Assisted by? | By When? |
|---|---|---|---|---|
| **GOAL 1:** | **ROBUST DROUGHT MONITORING AND EARLY WARNING** | | | |
| **Objective 1:** *Develop early warning systems* | 1. Continue developing the Eswatini Drought Monitor in order to produce reliable seasonal forecasts and develop appropriate decision-support tools for impacted areas | **NDMA** | **EMS , NEWU , DWA** | **On-going** |
| | 2. Monitor key indicators and indices of precipitation, temperature, soil moisture, vegetation condition, stream flow, snowpack and ground water | **DWA** | **EMS NDMA** | **On-going** |
| | 3. Incorporate indigenous knowledge into scientific drought monitoring and forecasting | **NDMA** | **Communities IOHL NEWU, DWA** | **On-going** |
| **Objective 2:** *Disseminate reliable warning messages so that response to the risks is measured and timely* | 1. Support national weather forecasting institution to deliver continuous data sets on drought | **EMS** | **NEWU, DWA** | **On-going** |
| | 2. Harmonize datasets held by different agencies | **CSU** | **NEWU DWA** | **2022** |
| | 3. Establish clear data sharing protocols between key data institutions | **CSU** | **NEWU DWA** | **2021** |
| | 4. Use the Central Statistics Office as a national data repository of drought data | **CSU** | **NEWU DWA** | **2020** |
| | 5. Apply communications protocol to pass information to affected areas and sectors of society | **NDMA** | **EMS, NEWU, DWA** | **2021** |
| **Objective 3:** *Undertake drought impact assessment* | 6. Monitor and assess the impact / consequences of drought, especially the impacts to vulnerable sectors such as agriculture | **NDMA** | **MOA SECTORS** | **After drought events** |
| **GOAL 2:** | **BETTER ASSESSMENT OF DROUGHT RISK AND VULNERABILITIES** | | | |
| **Objective 1:** *Undertake* | 1. Monitor and assess the impact / consequences of drought, especially the impacts to vulnerable sectors such as heath and agriculture | **NDMA** | **MOA SECTORS** | **After drought** |

| | | | | |
|---|---|---|---|---|
| *drought impact assessment* | | | | **events** |
| | 2. Report on drought impacts | **NDMA** | **MOA SECTORS** | **After drought events** |
| **GOAL 3 :** | **EFFECTIVE RESPONSE DURING DROUGHT EVENTS** | | | |
| **Objective 1:** *Respond to drought as it unfolds* | 1. Implement drought response actions as drought unfolds( Table 6) | **NDMA** | **SECTORS** | **During a drought** |
| | 2. Adopt to the drought communication protocols as outlined in the NDP | **NDMA** | **MOA, MTEA, CSU** | **During a drought** |
| | 3. Implement communication protocols with communities (Table 5) | **NDMA** | **SECTORS** | **During a drought** |
| | 4. Use social media to receive real-time updates on community-level drought impacts | **EMS** | **NDMA, MICT SECTORS** | **On-going** |
| **GOAL 4:** | **ENHANCED DROUGHT PREPAREDNESS, MITIGATION AND RESILIENCE** | | | |
| **Objective 1:** ***I****mprove drought understanding* | 1. Implement and improve systematic damage assessments | **NDMA** | **Civil Society** | **Continuously** |
| | 2. Strengthen drought research | **NDMA** | **MOA, IOHL EWSC Civil Society** | **Continuously** |
| **Objective 2:** *Reduce drought risk and vulnerability (Mitigation*) | 1. Assess the physical, social, economic and environmental pressures on communities to identify who and what is at risk and why, before, during and shortly after drought | **NDMA** | **DWA** | **Continuously** |
| | 2. Undertake drought risk mapping by identifying drought impacts on vulnerable economic sectors, including food and agriculture (cropping and livestock), biodiversity and ecosystem, energy, tourism and health | **NDMA** | **DWA EMS EWSC** | **2022** |
| | 3. Assess conditions or situations that increase the resistance or susceptibility to drought and the coping capacity of communities affected by drought | **NDMA** | **MTEA EWSC MOA SECTORS** | **On-going** |

| | | | | |
|---|---|---|---|---|
| | 4. Assess the extent of potential damage or loss in the event of a drought | **NDMA** | **MTEA, MOA SECTORS** | **On-going** |
| | 5. Support individuals and communities in long term efforts aimed at the reduction of vulnerability to drought, the management of drought, and recovery from drought. | **NDMA** | **MTEA MOA SECTORS** | **On-going** |
| | 6. Strengthen the capacity of institutions and drought affected communities to reduce their risks and vulnerability (LT). | **NDMA** | **MNRE EWSC SECTORS, MTEA MOA** | **2022** |
| | 7. Develop and implement drought sector-wide response plans | **MEPD** | **GOVT LINE MINISTRIES** | **2025** |
| | 8. Coordinate drought responses and procedures | **NDMA** | **MOA Civil Society** | **After drought events** |
| | 9. Assist farmers in restoring agricultural systems after drought | **NDMA** | **NPGRC Civil Society Donors** | **After drought events** |
| | 10. Mainstream drought into national development initiatives aimed at promoting sustainable rural livelihoods | **MEPD** | **GOVT LINE MINISTRIES** | **2025** |
| | 11. Support national efforts to achieve country's Sustainable Development Goals, particularly SDG 14 in achieving a land degradation neutral status by 2030. | **MEPD** | **MOF, GOVT LINE MINISTRIES** | **2025** |
| | 12. Support national sustainable rangeland management practices | **MOA** | **Farmers** | **2030** |
| **Objective 3:** *Support activities that increase resilience to drought* | 1. Assist communities and local governments to draw up their own drought contingency plans (Resilience) | **NDMA** | **MTAD MHUB SECTORS** | **2025** |
| | 2. Mitigate future drought impacts by implementing response actions under different levels of drought (per the SPI and PNRI drought indicators in Table 6) | **NDMA** | **SECTORS** | **On-going** |
| | 3. Diversify income for both subsistence and commercial farmers, so as to reduce dependence on rain-fed agriculture | **MOA** | **MEPD MOF** | **2030** |

| | | | | |
|---|---|---|---|---|
| | 4. Support new activities like agroforestry, bee farming, conservation agriculture and small secondary industries. | **MOA** | **ESWADE Civil Society Donors** | **2022** |
| **Objective 4:** *Improve water supply and demand management* | 1. FastTrack implementation of integrated water resources management (IWRM) and cost recovery targets | **DWA** | **MNRE MHUD** | **2022** |
| | 2. Apply policies to ensure that the price of water and community management responsibility limits its consumption to sustainable levels | **DWA** | **MNRE EWSC MHUD** | **2022** |
| | 3. Apply water conservation measures and water awareness campaigns to increase the consumption efficiency and hence limit demand from primary sources | **DWA** | **MNRE EWSC MHUD** | **2022** |
| | 4. Promote water-saving technologies in irrigated sugarcane and other production systems | **DWA** | **MNRE EWSC MHUD** | **2022** |
| | 5. Introduce measures / incentives to promote efficient use of water | **DWA** | **MNRE EWSC MHUD** | **2022** |
| | 6. Scale up water harvesting activities from previous programmes such as LUSLIM / larger domestic rainwater tanks in remote areas | **MNRE** | **Civil Society Donors** | **2023** |
| | 7. Scale up the supply of small rainwater harvesting structures, water impounding structures, earth dams and farm reservoirs | **MNRE** | **MOA Civil Society Donors** | **2025** |
| | 8. Scale up climate smart agriculture and conservation agricultural activities | **MOA** | **Civil Society Donors** | **2025** |
| | 9. Rehabilitate existing small-scale irrigation systems for agricultural productivity and natural resources sustainability | **MOA** | **Civil Society Donors** | **2025** |
| | 10. Construct more boreholes in the Lowveld and Lubombo | **MNRE** | **Civil Society Donors** | **2025** |
| | 11. Community-based watershed management for sustainable water resources and livelihood development in critical watersheds of selected irrigation systems | **MNRE** | **MOA Civil Society Donors** | **2025** |
| **Objective 5:** Improve food and nutrition security | 1. Increase the resources available to poor households, in order to improve their access to food during drought periods | **MOA** | **MOH Civil Society Donors H, F& A Sectors** | **2030** |

| | | | | |
|---|---|---|---|---|
| | 2. Assist families to enable them to make the best use of available resources | **MOH** | **MOA<br>Civil Society Donors<br>H, F& A Sectors** | **2030** |
| | 3. Promote improved food storage and preservation methods, starting at the household level | **MOA** | **MOH MHUD<br>Civil Society Donors<br>H, F& A Sectors** | **2030** |
| | 4. Promote good nutritional practices, particularly for children and pregnant and lactating women, and improved health and sanitation practices. | **MOA** | **MOH MHUD<br>Civil Society Donors<br>H, F& A Sectors** | **2030** |
| | 5. Maintain efficient arrangements with food importers | **NMC** | **NAMBOARD** | **2021** |
| | 6. Intervene during periods of food shortages | **MOA** | **NDMA, Donors<br>Private Sector** | **On-going** |
| | 7. Distribute and encourage use of drought tolerant crops and high value crops | **NPGRC** | **MOA EXT.** | **2022** |
| **Objective 6:** *Improve agricultural resilience to drought* | 1. Upscale programmes that support livestock breeds being made available to farmers | **MOA** | **MOA Dept. Vet** | **2022** |
| | 2. Adopt climate smart technologies and practices | **MOA** | **Private Sector, DWA** | **2022** |
| | 3. Increase the range of drought mitigating technologies and practices. | **DARSS** | **Private Sector** | **2022** |
| | 4. Increase number of farms that produce and store hay | **MOA<br>Dept. Vet** | **MOA EXT.** | **2025** |
| | 5. Distribute and encourage use of drought tolerant crops | **NPGRC** | **MOA EXT.** | **2022** |
| | 6. Support shift to alternative cropping systems and calendars | **MOA<br>EXT.** | **DARSS** | **2022** |
| | 7. Increase the contribution of agricultural research and extension services to drought risk reduction | **DARSS** | **MOA EXT.** | **2022** |
| **GOAL 5:** | **DROUGHT RISK TRANSFER AND SHARING** | | | |

| | | | | |
|---|---|---|---|---|
| **Objective 1:** *Minimize losses due to drought* | 1. Establish drought risk insurance or fund | **MOF** | **MEPD Farmers Insurance Companies Private Sector** | **2030** |
| | 2. Investigate new and novel drought risk financing options | **MOF** | **MEPD Insurance Companies Farmers Private Sector** | **2030** |
| **GOAL 6:** | **IMPROVE COMMUNICATION, AWARENESS, CAPACITY BUILDING, DROUGHT MAINSTREAMING AND RESOURCE MOBILIZATION** | | | |
| **Objective 1** *Improve communication and awareness* | 1. Spearhead campaigns on drought related disease spread and prevention measures | **MOH** | **NDMA** | 2022 |
| | 2. Promotion of school gardening, urban gardens and backyard gardens to improve diet diversification and dissemination | **MoET** | **MOHUB MOH Civil Society** | 2023 |
| | 3. Disseminate knowledge of compost-making techniques and resilience techniques against drought (including water conservation techniques - drip irrigation - and traditional storage techniques) | **MOA** | **Civil Society** | 2023 |
| | 4. Increase water supply and create backup options for schools | **MoET MNRE** | **Civil Society** | 2022 |
| | 5. Adopt technologies for rapid communication | **MoET** | **MICT** | 2022 |
| | 6. Target women, schools for education campaigns and awareness raising | **MoET** | **Civil Society** | 2022 |
| | 7. Raise awareness on drought at different level using various mechanisms | **MOH** | **MNRE MHUD** | On-going |
| | 8. Capacity building among professionals for communication, data collection and early warning systems | **NDMA** | **LINE MINISTRIES, SECTORS** | On-going |
| | 9. Set-up national platform on DRR and emergency preparedness | **NDMA** | **MOA, MTEA , CSU** | **2021** |

| | | | | |
|---|---|---|---|---|
| **Objective 2** *Strengthen capacity to cope with drought* | 1. Capacitate the subsidiary bodies established under the NDMA Act, including the National Disaster Management Council and the Regional Disaster Coordination Committees on drought issues so that the National Drought Plan is fully implemented within the existing structures | **NDMA** | **GOVT LINE MINISTRIES SECTORS** | **On-going** |
| | 2. Establish an ad hoc body made up of a Technical Experts including the sectors of government and non-government organizations needs in order to contribute and harmonize data for drought monitoring. | **NDMA** | **MNRE , MOA MTEA, MHUD MTARD** | **2021** |
| | 3. Build drought databases and capacity in key data institutions | **NDMA** | **MOA MTEA CSU, Donors** | **2025** |
| | 4. Assess people's capacity to live with less water during a drought period and their willingness and capability to adapt | **NDMA** | **MHUD , MOA MTEA, MNRE MTARD** | **2022** |
| | 5. Strengthen the existing drought institutional framework | **NDMA** | **MOA** | **2025** |
| | 6. Train and involve local communities in drought decision-making processes, policy design and planning | **NDMA MOA** | **ESWADE Civil Society** | **2022** |
| | 7. Increase water supply to schools and provide education and activities on water saving, urban gardens, composting. | **MNRE** | **MoET MOF** | **2025** |
| **Objective 3** *Mainstream drought into ministerial and sectoral plans* | 1. Create an enabling policy and service environment to mainstream drought into project development plans | **MEPD** | **GOVT LINE MINISTRIES** | **2022** |
| | 2. Prioritize drought into sectoral plans | **MEPD** | **LINE MINISTRIES Civil Society** | **2022** |
| **Objective 4** *Mainstream gender into drought risk reduction* | 3. Integrate women's economic empowerment in NDP implementation activities in order to eradicate their extreme poverty. | **MEPD** | **LINE MINISTRIES CIVIL SOCIETY** | **2025** |
| | 4. Identify and break down gender-related barriers to speed up implementation of the Aligned UNCCD NAP to create quality income earning opportunities for rural women involved in implementation activities | **MEPD** | **GOVT LINE MINISTRIES Civil Society** | **2026** |

| | | | | |
|---|---|---|---|---|
| | 5. Develop strategic partnerships with women organizations to support implementation of the NDP | **DPMO** | **NDMA SECTORS Civil Society** | **2025** |
| | 6. Support land and water based gender-related initiatives and to promote gender equality and/or resource poor women's empowerment at community level | **MEPF** | **NDMA MOA MNRE, SECTORS Civil Society** | **2025** |
| **Objective 5:** *Mobilizing of adequate resources for drought preparedness, monitoring and response* | 7. Capitalization of the National Disaster Management Fund (DMF) | **NDMA** | **MOA Government and cooperating partners** | **2021** |
| | 8. Optimize available national, regional and international funding for drought preparedness, monitoring and response | **MEPD** | **NDMA, Government cooperating partners** | **2021** |
| | 9. Incorporate drought preparedness in all relevant capital projects | **MEPD** | **MOF, MOA , NDMA Government and cooperating partners** | **2021** |