

Initial Adaptation Communication to the United Nations Framework Convention on Climate Change

The Kingdom of Eswatini



© 2021 Copyright Government of Eswatini

The Kingdom of Eswatini
Initial Adaptation Communication to the United Nations
Framework Convention on Climate Change (UNFCCC)



Unless otherwise noted, copyright (and any other intellectual property rights, if any) in this publication is owned by the Government of Eswatini.

For bibliographic purposes, this publication may be cited as:

Government of Eswatini. (2021). Eswatini Initial Adaptation Communication to the United Nations Framework Agreement on Climate Change. Tfwala, S.S., Mabaso, S.D., and Groenewald, M. (Editors). Ministry of Tourism and Environmental Affairs, Mbabane, Eswatini.

Cover: Kingsley Holgate Foundation

Prepared with assistance from the NAP Global Network Secretariat and the International Institute for Sustainable Development (IISD), via the generous financial support of the United Kingdom's Foreign, Commonwealth, and Development Office.



This project is undertaken with the financial support of:
Ce projet a été réalisé avec l'appui financier de :

Secretariat hosted by:
Secrétariat hébergé par :

Canada



For more information, contact:

Ministry of Tourism and Environmental Affairs

PO Box 2652, Mbabane, H100

Eswatini

Telephone: (+268) 2404 9240 | Fax: (+268) 2404 9481

Website:

<http://www.gov.sz/index.php/ministries-departments/ministry-of-tourims-environments-a-communications>

Preamble

The Kingdom of Eswatini is pleased to submit her Initial Adaptation Communication (AdCom) to the United Nations Framework Convention on Climate Change. The AdCom was prepared in accordance with Article 7, paragraphs 10 and 11 of the Paris Agreement and the 2018 Katowice Climate Package that elaborated implementation guidance for the Paris Agreement, including guidance in relation to the AdCom. It provides information on the national circumstances including institutional arrangements; climate change impacts and risks; and adaptation measures and priorities proposed and already implemented. It further elaborates on barriers and challenges to planning and implementing climate change adaptation, and the support and implementation needed by the Kingdom to deliver on its adaptation priorities.

Executive Summary

The Kingdom of Eswatini is pleased to submit its First Adaptation Communication (AdCom) to the United Nations Framework Convention on Climate Change (UNFCCC). This Adaptation Communication was prepared in recognition of Article 7 of the Paris Agreement, Decision 9/CMA.1, and will inform the synthesis reports developed for the Global Stocktake (GST).

This AdCom provides information on national circumstances, including institutional arrangements; highlights climate risks, vulnerabilities, and impacts in Eswatini; and elaborates on ongoing and proposed adaptation measures and actions. The AdCom describes barriers and challenges to planning and implementing climate change adaptation, and the support needed by the Kingdom to deliver on its adaptation priorities.

Adaptation is the priority in Eswatini, a country that is experiencing the impacts of climate change including increased intensity and frequency of extreme weather events. Climate hazards faced by the country include droughts, floods, landslides, heatwaves, wildfires, invasive species, and epidemics. The government has established policies, strategies, and action plans to encourage adaptation action, including the National Climate Change Policy, 2016 and the National Climate Change Strategy and Action Plan, 2015-2020.

The AdCom provides a comprehensive overview of the actions taken by Eswatini to address the impacts of climate change, such as flood control, irrigation systems, climate-proofed infrastructure, and strengthening protected areas. Government departments, NGOs, farmers groups, and the private sector have helped to implement adaptation actions.

Five sectors for priority adaptation action were identified in the adaptation contribution in Eswatini's updated 2021 Nationally Determined Contribution (NDC): water, ecosystems and biodiversity, health, infrastructure, and agriculture. Moving forward to implement adaptation action in these priority sectors requires strengthening institutional and human resource capacities, establishing legal and policy frameworks, monitoring, and reporting on adaptation action, accessing climate finance, integrating indigenous and traditional knowledge systems, engaging the private sector, and establishing early warning systems. Eswatini's NAP process is assessing these needs and will set out a way forward in the country's National Adaptation Plan (NAP), which is expected to be completed in 2022.

Eswatini requires international funding and support to build the adaptive capacity and climate resilience of the Kingdom's vulnerable populations and communities. Meeting the country's adaptation goals is conditional upon receiving external support, including finance, technology development and transfer, and capacity building.

Contents

1. National Circumstances, Institutional Arrangements and Legal Frameworks	1
1.1 National Circumstances	1
1.1.1 Geography	1
1.1.2 Weather and Climate	1
1.1.3 Economy	1
1.2 Institutional Arrangements.....	1
1.3 Legal and Policy Frameworks.....	2
2. Eswatini Climate Change Impacts, Risks, Hazards, and Vulnerabilities	5
2.1 Climate Impacts	5
2.1.1 Water.....	5
2.1.2 Ecosystems and Biodiversity	5
2.1.3 Health	5
2.1.4 Infrastructure	6
2.1.5 Agriculture.....	6
2.2 Present and Future Risks	6
2.3 Climate Hazards	7
2.4 Vulnerabilities	8
3.0 National Adaptation Priorities and Synergies with Other Global Frameworks.....	9
3.1 Water	9
3.2 Ecosystems and Biodiversity.....	10
3.3 Health	11
3.4 Agriculture	11
4. Gender Responsiveness and Traditional, Indigenous, and Local Knowledge	12
5. Implementation of Adaptation Actions	13
6. Adaptation Implementation and Support Needs	16
Bibliography	20
Appendix	22

Abbreviations and Acronyms

AdCom	Adaptation Communication
GEF	Global Environment Facility
ESWADE	Eswatini Water and Agricultural Development Enterprise
MTEA	Ministry of Tourism and Environment Affairs
NBSAP	National Biodiversity Strategy and Action Plan
NCCC	National Climate Change Committee
NCCP	National Climate Change Policy
NDC	Nationally Determined Contribution
NGO	non-governmental organization
PA	protected area
SDG	Sustainable Development Goal
UNFCCC	United Nations Framework Convention on Climate Change

1. National Circumstances, Institutional Arrangements and Legal Frameworks

1.1 National Circumstances

1.1.1 Geography

The Kingdom of Eswatini is in the southeastern part of Africa with an area of 17,364 km², bordering South Africa (on the north, west, and south) and Mozambique to the east. Eswatini is divided into four administrative regions—Lubombo, Shiselweni, Manzini, and Hhohho—and six physiographic zones: Highveld, Upper Middleveld, Lower Middleveld, Western Lowveld, Eastern Lowveld, and Lubombo Range (Rommelzwaal & Van Waveren, 1994). The altitude ranges from 250 m above sea level in the Lowvelds to 1,400 m above sea level in the Highveld. The physiographic zones show the different climatic conditions, ranging from subhumid and temperate in the Highveld to semi-arid and warm in the Lowvelds.

1.1.2 Weather and Climate

The general climatic characterization of Eswatini is subtropical with wet, hot summers (October–March) and cold, dry winters (April–September). The peak of summer is January, with long-term average rainfall reaching 134.4 mm, while the lowest rainfall (about 20 mm) is usually recorded in July (Mlenga & Jordaan, 2019). The Highveld, in the western part of Eswatini, receives the most rainfall, ranging from 900 mm to 1,500 mm, while the Lowvelds receives the least rainfall with annual totals of less than 500 mm, making it the most vulnerable to drought. The Lubombo Range and Middleveld share the same characteristics, with rainfall in the range of 700 mm to 1,000 mm.

1.1.3 Economy

The country's economy can be viewed through three lenses: primary, secondary, and tertiary sectors. The primary sector consists of agriculture, forestry, mining, and quarrying activities. The secondary sector consists of manufacturing, construction, electricity, and water supply, and the tertiary sector covers services. The primary sector has been shrinking over the years, resulting from an overall decline in domestic production alongside an increase in agricultural imports. In addition, the country is highly dependent on climate-sensitive natural resources such as rainfed and subsistence agriculture, with an estimated 80% of farming relying on rainfed agriculture (Ministry of Tourism and Environmental Affairs [MTEA], 2016a). Consequently, the country remains highly vulnerable to the impacts of climate change and variability. The secondary sector also declined between 2013 and 2020. However, the tertiary sector is generally stable (Central Bank of Eswatini, 2020).

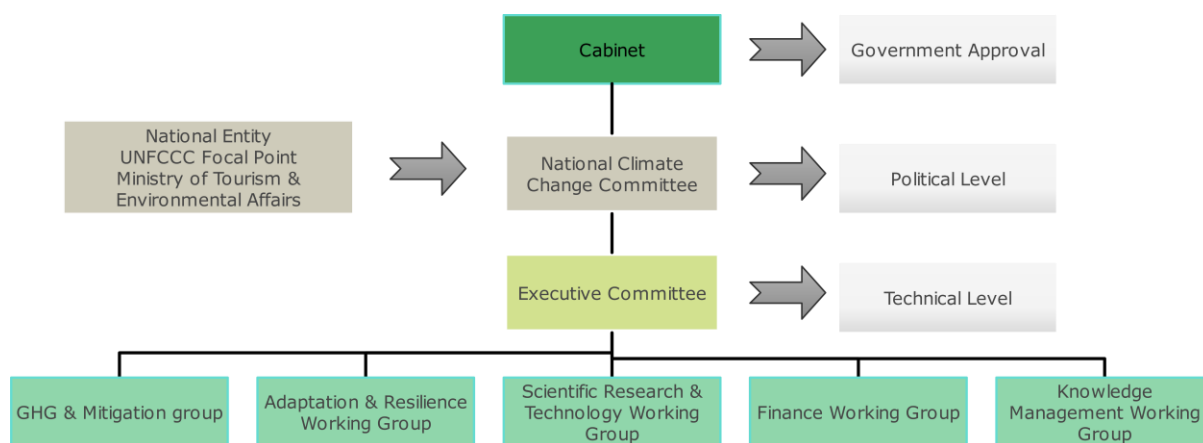
1.2 Institutional Arrangements

At the national level, several institutions are responsible for coordinating and implementing Eswatini's responses to climate change. The National Climate Change Committee (NCCC) was established as a multistakeholder group in 2010 by the MTEA through the country's cabinet (Mhlanga-Ndlovu & Mhlanga, 2019), with more than 30 members from different institutions. Its mandate is to coordinate the climate change affairs of Eswatini by ensuring that climate change is integrated into the broader

development agenda, and to guide development plans, programs, and projects in response to climate change.

The hierarchy of the NCCC places the cabinet as the highest authority (Figure 1); it receives updates from the NCCC, which is the political level that includes the United Nations Framework Convention on Climate Change focal point, who is currently housed in the MTEA, among other members. Under the NCCC is the Executive Committee, which oversees the five technical working groups: the Greenhouse Gas and Mitigation group, Adaptation and Resilience Working Group, Scientific Research and Technology Working Group, Finance Working Group, and Knowledge Management Working Group.

Figure 1. Eswatini national climate change coordination



Source: NCCC, 2015.

1.3 Legal and Policy Frameworks

Eswatini has developed several national and sector policies and regulatory frameworks to help address climate change. Key documents are provided in Table 1.

Table 1. Key documents to address climate change

Document	Brief description
National Climate Change Policy (NCCP; 2016)	Supports the development of a sustainable, climate-resilient, and inclusive low-carbon green growth economy.
National Climate Change Strategy and Action Plan (2015–2020)	Seeks to enhance the country's adaptive capacity to climate change to achieve sustainable development and contribute to a better quality of life for Eswatini.
Green Climate Fund Country Programme (2020)	Provides a background on climate change impacts in the country and highlights financial needs to drive climate action.
Technology Needs Assessment (2016–2018)	Prioritizes three economic sectors for mitigation: energy, waste, and land use and land-use change and forestry. Technologies identified for climate change mitigation were in line with national development priorities.
The National Development Strategy (2002)	Focuses on long-term development and provides guidelines for formulating development plans based on equitable allocation of resources.
Environmental Management Act (2002)	Provides for and promotes the enhancement, protection, and conservation of the environment and, where appropriate, the sustainable management of natural resources.
Swaziland National Biodiversity Strategic and Action Plan (2016)	Supports the improvement of the country's biodiversity by monitoring the reduction of threats and pressures, safeguarding ecosystems, encouraging sustainable utilization, and mainstreaming and integrating biodiversity into national plans and strategies to contribute to national development objectives.
Draft National Wetlands Policy (2020)	Promotes the conservation and sustainable and wise use of wetlands. It provides a framework for actions to improve legal, institutional, and organizational arrangements.
National Wetlands Strategic Action Plan (2021–2030)	Ensures that wetland resources are managed and used sustainably; that their functions are valued, conserved, and restored to sustain biodiversity; and that they provide ecosystem services for present and future generations of Eswatini.
Resilience Strategy and Action Plan (2017)	Makes the country safer, adaptive, and more resilient to all hazards for all generations. Against the history of regular, devastating, hazardous impacts on Eswatini, the strategy and action plan represent the nucleus of interventions aimed at reducing current and future exposure, vulnerability, damage, and losses.

Document	Brief description
Water Resources Master Plan (2016)	Encompasses sustainability by i) developing a strategy for financing integrated water resources management; ii) reviewing national development plans, policies, and strategies; and iii) recommending guidelines for integrating water-related issues into these instruments.
National Strategy & Action Plan for Plant Genetic Resources for Food and Agriculture (2019)	Serves as the blueprint for the management of the country's plant genetic resources for food and agriculture as a continuum of interventions to achieve clearly defined time- bound goals. Since the conservation and use of plant genetic resources for food and agriculture is a multisector endeavour, the activities and the responsible entities that form part of the strategy cut across several sectors, especially food and agriculture, environment, education, culture, science and technology, and commerce.
National Drought Plan (2020)	Recognizes that climate change has accelerated and intensified droughts and that this plan has linkages to the NCCP. It recognizes the need to strengthen local capacity in disaster risk reduction as well as climate adaptation and the need for climate-smart agriculture practices and technologies.
National Gender Policy (2019–2030)	Provides a framework for gender equality and equity in Eswatini. It outlines the country's vision for gender equality and is designed to provide guidance for stakeholders and institutions at all levels on how to advance gender equality and equity, and to mainstream gender across all sectors.

2. Eswatini Climate Change Impacts, Risks, Hazards, and Vulnerabilities

Eswatini's 2021 Nationally Determined Contribution (NDC) prioritized the following sectors: water, ecosystems and biodiversity, health, infrastructure, and agriculture. The climate change impacts, risks, and vulnerabilities are discussed below, in the context of the five prioritized sectors:

2.1 Climate Impacts

Eswatini's Third National Communication to the United Nations Framework Convention on Climate Change highlighted several impacts of climate change the country has already experienced, noting that the intensity and frequency of extreme weather events such as droughts and heat waves have increased over the past few years (MTEA, 2016b). In addition, according to the Global Climate Change Regional Climate Model, representative concentration pathway 4.5, mean temperature is projected to increase by 1.8°C to 2.0°C in the period 2040–2069, impacting the country's economy and society (Dlamini, 2021).

2.1.1 Water

There is growing evidence of the effects of climate change in the water sector of Eswatini. Historical trends show the annual average temperature has increased by 3°C between 1961 and 2020. The frequency of heat waves has increased in the last two decades, with more days exceeding 34°C. These changes have reduced stream flows in main river basins, increased the prevalence of waterborne diseases due to reductions in water quality, and increased the frequency of droughts and floods. For example, during the 2015–2016 El Niño, water sources and rainfall received declined by more than 50% (Government of Eswatini, 2016b). Drying of small streams and wetlands is gradually altering biodiversity and ecosystems. The vulnerability assessment in the water sector conducted in 2016 projected that the streamflow of rivers would decrease by 40% by 2050 due to climate change. The variability of rainfall and the proliferation of invasive alien species is accelerating the drying of these streams.

2.1.2 Ecosystems and Biodiversity

Climate change has contributed to biome shift, habitat loss, habitat fragmentation, species loss and extinction, reduction in dispersal patterns, species migration, increased wildfire incidents, encroachment, a decline in genetic resources, a growing list of threatened and vulnerable species, and a decline in indigenous forests. These climate impacts have subsequently affected ecosystem services, livelihoods, ecotourism opportunities, and traditional medicine availability.

2.1.3 Health

Scientific evidence shows an increase in vector-borne and waterborne diseases, which is attributed to poor hygiene and sanitation practices due to extreme weather events (flooding and water scarcity). Encroachment of vector-borne disease (malaria) has been evident in the Middleveld, and this encroachment has been more prevalent in the Lowveld. Climate-induced mental conditions (influenced by forced migration, displacement, and shifting sector dependency, in terms of agriculture) have been reported. Anecdotal evidence in Eswatini indicates increases in deaths due to

heat stress–related disease and extreme weather events (including lightning, flooding, snake bites, drowning, and heatstroke).

2.1.4 Infrastructure

Since 2001, the country has been hit seven times by drought (the most recent being the El Niño–induced drought in 2015–2016) and five times by extreme storm events, with the most recent (Tropical Cyclone Eloise) occurring in January 2021. The Rapid Assessment Report noted that Tropical Cyclone Eloise resulted in an estimated economic loss of about SZL 182 million, a result of extensive flooding that led to widespread damage to built infrastructure and utility networks, loss of lives and livelihoods, and environmental degradation (National Disaster Management Agency, 2021). In addition, the drainage systems of many cities, such as Mbabane, are increasingly failing to cope with heavy rainfall and flood episodes.

2.1.5 Agriculture

Evidence reveals that the country has experienced shifts in the planting season, as well as frequent and unfavourable incidences of food insecurity that were largely attributed to droughts and extended dry spells. Significant rainfall deficits or cessation at critical stages of crop growth have frequently led to a serious shortfall in crop production, especially maize, the staple crop in Eswatini (Mhlanga-Ndlovu & Nhamo, 2016). Wildfires, reduced rainfall with lengthy dry spells and increased evaporation, increased frequency and intensity of floods and storms, and increased temperatures will all negatively impact the agriculture sector of Eswatini, where about 75% of the population is rural and practices subsistence farming. Prospects for the livestock sector are mixed as the sector continues to be vulnerable to erratic weather conditions, with some areas even becoming semi-arid, and to be impacted by diseases brought by climate change. The 2015–2016 El Niño event led to a high livestock mortality rate of about 8% in Eswatini, at an estimated value of SZL 264 million (> USD 20 million; Government of Eswatini, 2016b; Tfwala et al., 2020).

2.2 Present and Future Risks

An updated climate change risk assessment of Eswatini was carried out in 2021 (Dlamini, 2021). This comprehensive analysis was developed through a rigorous process that applied models and was informed by multistakeholder engagement. Overall, risk varies considerably within the livelihood zones in Eswatini. Agriculture is at risk of multiple hazards, and parks and reserves are at risk of drought, fires, and floods. Urban and peri-urban areas are at risk of disease outbreaks, floods, and invasive species. Sugarcane areas are at risk of fire, drought, and disease impacts. Timber highlands face the risk of storms, invasive plants, floods, and fires. A summary of the risks is provided below.

1. Drought recurrence and severity in Eswatini has increased (Tfwala et al., 2020), and the frequency and intensity of droughts are projected to increase. Rural areas are the most susceptible to such risks.
2. Chuang et al. (2017) has shown that the incidence of waterborne diseases, specifically malaria, is increasing in Eswatini, especially in the Lubombo and Hhohho regions, and they attribute this increase to flooding associated with climate change. The Manzini and Shiselweni regions are also affected, particularly the populated and low-lying areas.
3. The frequency of high fire-danger days is projected to increase across Eswatini, with high fire risks projected in the Highveld, which is endowed with forest plantations and grasslands.

4. The high-flood-risk areas in the country are in the western high-rainfall areas near major rivers and waterways. The prevalence of floods is expected to increase due to additional factors such as declining land cover that is influenced by urbanization, and vegetation and land degradation. Other flood risk areas include low-lying areas in the Middleveld and Lowveld that are the recipients of inflows from the high-altitude areas.
5. Scientific evidence has shown a positive trend in maximum temperatures across the country, albeit with varying magnitudes of change. Rural areas with less vegetative cover are particularly at risk of heat waves.
6. Alien invasive species threaten to increase the risk of extinction of indigenous species. They alter the composition of indigenous populations; modify the phylogenetic and functional diversity of invaded communities and trophic networks; and alter ecosystem productivity, nutrient and contaminant cycling, hydrology, and disturbance regimes.
7. Although not yet scientifically proven, several parts of the country have substantial risk of storm damage from increased lightning frequency and higher windspeeds. The southwestern part of the country, as well as parts of the Middleveld and Lubombo plateau, are notable storm (lightning) hotspots.

2.3 Climate Hazards

Climate hazards identified in Eswatini include:

- 1 **Droughts:** Eswatini is most affected by droughts caused by low precipitation and increases in temperature. These extreme weather events threaten the country's water availability. According to the State of Environment (MTEA, 2020), 14% of the country's population of 180,000 people is potentially affected by drought and this number is projected to increase by 33% by 2050. An average of 15% of GDP (USD 0.5 billion) is potentially affected by droughts and this proportion is expected to rise to 41% of GDP by 2050.
- 2 **Floods:** Eswatini is already experiencing devastating urban floods, as evidenced by the recent (January 2021) Tropical Cyclone Eloise. This hazard is projected to increase in the future, especially in the Hhohho and Manzini regions. According to MTEA (2020a), an estimated 1,500 people in Eswatini are affected by floods each year.
- 3 **Heat waves:** These are expected to worsen under climate change, affecting the key sector, agriculture, as well as the health of elderly residents.
- 4 **Storms:** From 2001 to 2021, Eswatini was hit five times by varying storms (including windstorms, thunderstorms, hailstorms, lightning, and cyclones). One of the worst storms hit the country in 2005; it affected 100,000 people and destroyed dwellings and communal facilities.
- 5 **Wildfires:** Eswatini has seen a notable increase in wildfires, with fires being declared a national disaster in 2007–2008 and a national emergency in 2019. According to the National Disaster Management Agency, damages in 2019 were estimated at SZL 74 million with a total burnt area of about 36,163 hectares.
- 6 **Landslides:** Floods and storms have induced landslides, causing enormous danger to human life and property. Tropical Cyclone Eloise resulted in landslides in several locations of Eswatini, such as Manzana and Mpholonjeni in the country's western highlands.
- 7 **Invasive species:** Climate change and variability in the form of increasing temperatures have created favourable conditions for the rapid growth and survival of invasive alien plant species.

- 8 **Epidemics:** The high incidence of floods increases the occurrence of waterborne diseases such as cholera and malaria.

2.4 Vulnerabilities

The vulnerability profile in the country indicates that 60% of the population experiences medium to high vulnerability to climate-driven hazards (Dlamini, 2021). The vulnerability is driven by underlying socio-economic conditions, including poverty. The Shiselweni and Lubombo regions represent socio-economic vulnerability hotspots. The Hhohho and Manzini regions have moderate vulnerability. The urban areas, protected areas, private ranches, forests, and sugarcane plantations have notably lower vulnerability levels compared to other parts of the country as these areas are characterized by relatively high levels of employment and income.

Dependency on ecosystem services is another major vulnerability in the country. Eswatini's rural population particularly relies on the provisioning and regulating services of upstream ecosystems to protect soil quality and support access to water for domestic and agricultural use. Even though the maintenance of ecosystem services in Eswatini is a necessary aspect of support for both rural subsistence livelihoods and commercial-scale agricultural productivity, the increase in the deterioration of ecosystems in Eswatini has negatively affected the cultural, economic, and social practices of the population. These disturbances affect mostly the rural poor, especially households relying on subsistence farming to support their livelihoods.

3.0 National Adaptation Priorities and Synergies with Other Global Frameworks

The Kingdom of Eswatini, through its updated NDC, prioritized adaptation actions for five sectors: water, ecosystems and biodiversity, health, infrastructure, and agriculture. Their linkages to the Sustainable Development Goals (SDGs) and the Sendai Framework for Disaster Risk Reduction present an opportunity for alignment. Each sector can plan and implement the specific targets in a coordinated manner, which will increase efficiency while maximizing the use of resources.

3.1 Water

The priority adaptation measures for the water sector are outlined in Table 2.

Table 2. Water sector adaptation measures and their linkages to SDGs and Sendai Framework targets.

Adaptation measure	SDG goal	Sendai target
Construct water storage infrastructure	1,2,6,7,8,11,13	2
Improve water governance and compliance	2,6,10,12,13	2
Strengthen streamflow observation	6,8,12,13	2,3,7
Improve groundwater management	2,13	2
Improve water-use efficiency	2,13	2
Control invasive alien plant species in catchments	2,13	2
Construct sustainable portable water infrastructure in all basins	6,9,12,13	2
Develop and implement catchment management plans and strategies	2,6,11,13	1,2
Enhance risk assessment and management and improve early warning	6,11,13	2,7

Note: Refer to the appendix for an explanation of SDGs and Sendai Framework targets.

3.2 Ecosystems and Biodiversity

The adaptation measures for the ecosystems and biodiversity sector are outlined in Table 3.

Table 3. Ecosystems and biodiversity sector adaptation measures and their linkages to SDGs and Sendai Framework targets.

Adaptation measure	SDG goal	Sendai target
Conduct a re-evaluation of the country's protected area network and strengthen the expansion of the network	13,14,15	NA
Reduce pressures to biodiversity loss	13,14,15	NA
Develop land-use plans (that are divorced from land policy)	9,11,12,13	4,7
Strengthen implementation of the National Biodiversity Strategies and Action Plans (NBSAPs) and ensure that vulnerable ecosystems are addressed in national adaptation programs	8,13,15,16	NA
Prevent, control, and rehabilitate or restore degraded land	2,13,15	2
Effectively manage water resources' quantity and quality for ecosystems and biodiversity preservation (e.g., fish ponds)	2,13,14,15	NA
Conserve genetic resources (indigenous trees and land races)	12,13,15	1,2
Encourage restoration and protection of wetlands and sustainable use of their resources	13,14,15	1,2
Promote nature conservation and protected areas	13,15	2
Manage and control of invasive alien plant species	13,15	2
Promote research, innovation, and knowledge sharing (bamboo and moringa valorization strategy)	3,8,9,12,13,15	NA

Note: Refer to the appendix for an explanation of SDGs and Sendai Framework targets. NA = not applicable.

3.3 Health

The adaptation options for the health sector are outlined in Table 4.

Table 4. Health sector adaptation measures and their linkages to SDGs and Sendai Framework targets.

Adaptation measure	SDG goal	Sendai target
Develop and disseminate awareness-creation programs on climate change impacts	2,4,6,8,9,12,13,15	2,4
Promote waste management	3,6,11,12,13, 14,15	2
Address malnutrition to improve health	1,2,3,5,13	1,2
Build capacity for water, sanitation, and hygiene and health care staff on risk-informed programming	3,6,13	1,4
Integrate health and water, sanitation, and hygiene indicators into the existing early-warning systems	3,6,13	1,2,7

Note: Refer to the appendix for an explanation of SDGs and Sendai Framework targets.

3.4 Agriculture

The adaptation options for the agriculture sector are outlined in Table 5.

Table 5. Agriculture sector adaptation measures and their linkages to SDGs and Sendai Framework targets.

Adaptation measure	SDG goal	Sendai target
Strengthen resilience and coping capacity through integrated early-warning systems	1,2,3,5,8,13,16	1,2,3,4,7
Adopt climate-smart agriculture, aquaculture, and fisheries practices	1,2,3,5,6,8,10,13,15	2,3
Promote water harvesting: medium-size rainwater harvesting, sand dams, earth dams, and in-situ rainwater harvesting	1,2,3,5,6,8,9,10,13,15	1,2,3
Manage invasive alien plant species	1,2,3,8,11,13,15	2,3
Increase water-use efficiency	1,2,3,5,6,8,10,13,15	2,3
Manage and restore degraded land	1,2,3,5,6,13,15	2,3
Facilitate information management systems	1,2,3,8,10,13	2,3,7

Note: Refer to the appendix for an explanation of SDGs and Sendai Framework targets.

4. Gender Responsiveness and Traditional, Indigenous, and Local Knowledge

The National Development Strategy (Vision 2022) (Government of Eswatini, 1997) focuses on the quality of life, with critical dimensions including poverty eradication, employment creation, gender equity, social integration, and environmental protection. With the global community transitioning to the implementation phase of the post-2015 development agenda, it is imperative that gender equity and women's empowerment continue to influence, shape, and drive the collective climate and human development effort. Eswatini is recognising that there can be no genuine sustainable human development without gender equity. In response, different ministries, non-governmental organizations (NGOs), private sector, women's groups, youth groups, and individuals have taken collective actions to address the aforementioned issues as well as climate change. For example, a research unit on the conservation of indigenous foods and traditional medicine has been established at the University of Eswatini.

The people of Eswatini have remarkably close links with its ecosystems and biodiversity. According to the National Biodiversity Strategy and Action Plan (NBSAP II; Government of Eswatini, 2016a), more than 85% of the country's population relies on traditional medicine either entirely or in combination with modern medicine. In addition, several cultural practices and traditional dress materials depend directly on biodiversity and ecosystem provisions. The *Incwala* Ceremony, the annual Reed Dance and the National Hunt (*Butimba*) are all inextricably linked to the country's biodiversity and ecosystem provisions. Therefore, the NBSAP, National Development Strategy, and other relevant environmental policies are crucial in ensuring that the emphasis on conservation and sustainable use of natural resources is promoted and implemented at the national and community levels.

5. Implementation of Adaptation Actions

Since the country's first NDC in 2015, several key policies and plans have been developed, including the National Climate Change Strategy and Action Plan (2016–2020), NCCP (2016), National Development Plan (2019–2020 and 2021–2022), National Water Policy (2016), and NBSAP (2016).

In addition, the government, NGOs, and the private sector have adopted several adaptation measures. These adaptation initiatives are related to various agricultural and community irrigation projects, as well as biodiversity and conservation efforts, which are described below.

- The Strengthening the National Protected Areas System project, funded by the Global Environment Facility, has completed several projects including the establishment of a national knowledge and information management system to promote data sharing (Box 1). The project has expanded the protected areas (PAs) network and strengthened the functioning of PAs through improved conservation management and operational support for existing and new PAs, including both formal and informal PAs. In addition, the project has supported several wetland restoration initiatives that provide livelihoods to rural communities.

Box 1. Lubombo Biosphere Reserve

The Kingdom of Eswatini joined the Man and the Biosphere Network in 2019 with the inscription of its first site, Lubombo Biosphere Reserve, following the International Coordinating Council of United Nations Educational, Scientific and Cultural Organization (UNESCO) Man and the Biosphere Programme meeting in Paris in June 2019. The Lubombo Biosphere Reserve covers 294,020 hectares and lies in the Lubombo Mountain Range, which forms the eastern border of Eswatini with Mozambique and South Africa. Its ecosystems include forests, wetlands, and savannahs. Local flora species include a new *Barleria* species, as well as Lubombo Ironwoods, Lubombo Cycads, and the Jilobi forest. Twenty of the 88 mammal species in the area can only be found in the Lubombo region. Significant mammal species in the reserve include leopard, white rhino, Tsessebe, roan antelope, cape buffalo, and Suni. Numerous conservation and monitoring projects, as well as agriculture, animal husbandry, industry, tourism, commercial enterprises, and forestry, are already running in the reserve.

- Several interventions have been undertaken by the Eswatini Water and Agricultural Development Enterprise (ESWADE) to address the impacts of climate change. ESWADE has built the capacity of farmers on climate-smart agriculture practices, which have subsequently enhanced the adoption of sustainable agriculture (Box 2). The organization has further promoted land rehabilitation, ecosystem restoration, and the sustainable use of water through various interventions that engage communities. Several other projects have been initiated, including the Lower Usuthu Sustainable Land Management Project (whose objective is to decrease biodiversity loss), Komati Basin Water Authority, Komati Downstream Development Project, and Lower Usuthu Smallholder Irrigation Project.

Box 2. Eswatini Water and Agriculture Development Enterprise (ESWADE)

Through ESWADE, the Kingdom of Eswatini has facilitated the development of over 10,000 hectares with irrigation infrastructure to enhance farmers' resilience to climate change. A new phase is underway in the Lower Usuthu where over 5,000 hectares are being developed with irrigation infrastructure and are expected to be in full production by 2023. The country and the host communities for these projects have experienced significant transformation of their economies through direct earnings from the agriculture enterprises, and they also realized significant benefits from indirect positive externalities such as employment opportunities. ESWADE has also increased access to potable water and in the process has contributed toward SDG 6, "Ensure access to water and sanitation for all."

- The Department of Water Affairs has conducted the Nondvo dam feasibility study that will enhance food security and established a joint river-basin authority. The department will soon be installing eight near-real-time hydrometric stations and five groundwater monitoring systems, and installs approximately 50 boreholes annually.
- The country is in the process of developing a Renewable Energy and Independent Power Producers Policy that will enable it to fully realize its untapped renewable energy potential. In addition, key policies, such as the National Gender Policy (2019–2030), are being updated.
- Eswatini is also developing its National Adaptation Plan through the Climate Change Unit in the MTEA.
- According to Eswatini's Sixth National Report to the United Nations Convention on Biological Diversity (MTEA, 2020b), considerable progress has been made on the Aichi Biodiversity Targets. Among its achievements is the fact that the country has mainstreamed biodiversity into the key national development plans, poverty plans, and disaster management plans. Efforts to increase public awareness on the importance of biodiversity have been successful.
- In the health sector, the Malaria Programme has been successful in managing malaria as a climate-induced, vector-borne disease. There is a newly established unit for epidemiology and disease surveillance, which will assist in the integration of health and climate change issues. A significant stride in Eswatini was being the first country to introduce a malaria elimination scorecard to enhance tracking, accountability, and actions toward elimination of the disease.
- Funding through the European Union has built four packing houses in every region for farmers to store and pack their produce, thus reducing spoilage. It has also constructed irrigation canals and earth dams to address water stress for farmers and promoted climate-smart agriculture (Box 3).
- A shift from traditional thatch roofing to modern roofing has been taken up as an adaptation action to address lightning and wildfire hazards and to preserve the ecosystem.
- Climate-proofing of infrastructure includes the new bridge built in 2014–2015 at Siphofaneni, upgraded culverts after Tropical Cyclone Eloise, and improved drainage systems in the capital city, Mbabane.

- MTEA has taken initiatives to raise awareness on climate change with the civil sector, NGOs, and policy-makers. An example is the civil sector engagement initiative for environmental sustainability under the theme “Towards Environmental Sustainability: Unlocking climate finance opportunities for low carbon and climate-resilient investments through Civil Sector Organisations engagement.”

Box 3. Climate-Smart Market-Oriented Agriculture Project

Eswatini's National Agriculture Marketing Board has implemented the Climate-Smart Market-Oriented Agriculture Project that supports farmers with climate-smart agriculture techniques. The Climate-Smart Market-Oriented Agriculture Project is supporting farmers' irrigation schemes, such as Mavulandlela under Ntfonjeni Inkhundla in the Hhohho Region and Intamakuphila under Ngwempisi Inkhundla in the Manzini Region, to create jobs for several Emaswati, with an emphasis on opportunities for women and youth. These schemes, for example, are focused on producing baby vegetables for the export market but also encourage the growth of conventional vegetables during the off-season period. However, a lack of capacity has meant a slow adoption of climate-smart agriculture practices by farmers and not all are reaping the rewards of climate-smart agriculture and enjoying increased profits from their enterprises.

6. Adaptation Implementation and Support Needs

Eswatini faces many institutional, capacity, and technology constraints in addressing climate change adaptation challenges. The NCCP obliges the government to build the adaptive capacity and climate resilience of vulnerable populations and communities. An understanding of the barriers and gaps (Table 6) in the implementation of climate change adaptation enables the proper identification of support needed for adaptation action. Eswatini's NAP process is identifying actions to address these barriers and challenges and will set out a way forward in the country's National Adaptation Plan (NAP) document, which is expected to be completed in 2022.

Table 6. Barriers, measures, and support needed toward climate change adaptation in Eswatini.

Priority areas for adaptation	Barriers, constraints, and challenges	Measures needed to overcome barriers	Support needed	Target audience
<p>Institutional, technical, and human resource capacity</p>	<ul style="list-style-type: none"> → Low institutional, technical, and human capacity to implement climate change adaptation → Limited understanding and awareness of climate change impacts and adaptation approaches 	<ul style="list-style-type: none"> → Build capacity of national stakeholders on climate change adaptation → Strengthen institutional capacity (human resources, skills development, and data management), technical capacity (skills transfer, modelling for future water risks, baseline assessments, Post-Disaster Needs Assessments), capacity building (e.g., for climate-smart agriculture/conservation farming) → Build awareness and understanding of climate change among various stakeholders through education, training, and public awareness 	<ul style="list-style-type: none"> → Capacity building on climate change adaptation → Skills development on climate modelling and baseline assessment → Information materials on climate change (infographics, policy briefs, newsletters) 	<p>Line ministries, NGOs, private sector</p>
<p>Legal, policy, and institutional frameworks</p>	<ul style="list-style-type: none"> → Lack of an overarching legal framework for climate change → Fragmented policy development → Poor integration of climate change adaptation measures into the various sectoral policies and national development planning and budgeting 	<ul style="list-style-type: none"> → Integration of climate change adaptation measures into the various sectoral policies and national development planning and budgeting → Strengthening legal and institutional framework for effective coordination and implementation of climate change adaptation and 	<ul style="list-style-type: none"> → Programs to strengthen legal and institutional frameworks for climate change 	<p>Line ministries</p>

The Kingdom of Eswatini's Initial Adaptation Communication to the UNFCCC

Priority areas for adaptation	Barriers, constraints, and challenges	Measures needed to overcome barriers	Support needed	Target audience
		mitigation actions, programs, and initiatives → Review and update policy frameworks		
Monitoring, reporting, and verification for climate change adaptation	→ Inadequate data collection and data management systems → Lack of software, modelling skills, and telemetry systems for measurement, which impacts the predictions of models and early-warning systems → Monitoring and reporting systems for climate change reporting are fragmented	→ Improvement of data collection and data management systems → Monitoring systems → Capacity building → Climate modelling	→ Database management training → Software development → Climate modelling	Line ministries and research institutions
Climate finance	→ Limited capacity to access climate finance → Financial needs in Eswatini are not well documented → Low technical capacity to develop climate change adaptation proposals → Climate change has not been directly mainstreamed into the national budget; hence, funding is not sufficient to implement climate change-related projects such as	→ Provision of mechanisms for mobilizing and accessing support for technology development and transfer, capacity building, and financial resources from the international community and other sources → Integration of budgeting for climate change adaptation measures into the various sectoral policies and national development planning	→ Training to develop climate change proposals → Studies to assess the country's climate change adaptation financial needs	Line ministries, research institutions, NGOs

The Kingdom of Eswatini’s Initial Adaptation Communication to the UNFCCC

Priority areas for adaptation	Barriers, constraints, and challenges	Measures needed to overcome barriers	Support needed	Target audience
	investments in large water-storage infrastructure			
Indigenous and traditional knowledge systems	<ul style="list-style-type: none"> → Poor integration of traditional knowledge into climate change adaptation → Limited capacity on the integration 	<ul style="list-style-type: none"> → Development of traditional knowledge systems and conventional science in adaptation research and development 	<ul style="list-style-type: none"> → Programs to assess traditional knowledge systems and how to target them for climate change adaptation 	Research institutions, line ministries, NGOs, traditional custodians
Private sector engagement	<ul style="list-style-type: none"> → Limited private sector engagement 	<ul style="list-style-type: none"> → Promote private sector engagement and enhance private sector capacities in developing strategies and action plans for climate action 	<ul style="list-style-type: none"> → Technical assistance to develop a policy and strategy for private sector engagement 	Line ministries, private sector, NGOs
Early-warning systems	<ul style="list-style-type: none"> → Lack of technical capacity to develop early-warning systems → Early-warning systems are not integrated (i.e., operating in silos) → The country’s response capacity to early-warning systems is low 	<ul style="list-style-type: none"> → Enhance preparedness and emergency response to climate change, hazards, impacts, and disasters through a multi-hazard early-warning system → Early-warning systems and preparedness policies → Integrate climate change information into early-warning systems 	<ul style="list-style-type: none"> → Development of integrated multi-hazard early-warning systems → Development of early-warning systems and preparedness policies 	Line ministries and departments

Bibliography

- Central Bank of Eswatini. (2020). *Annual economic review report (2019/2020)*. Mbabane, Swaziland.
- Chuang, T.-W., Soble, A., Ntshalintshali, N., Mkhonta, N., Seyama, E., Mthethwa, S., . . . Kunene, S. (2017). Assessment of climate-driven variations in malaria incidence in Swaziland: Toward malaria elimination. *Malaria Journal*, 16(1), 232. doi:10.1186/s12936-017-1874-0
- Dlamini, W. M. (2021). *Climate risk mapping (Draft)*. Mbabane, Eswatini.
- Government of Eswatini. (1997). *National development strategy*. Mbabane, Eswatini.
- Government of Eswatini. (2016a). *National biodiversity strategy and action plan II*. Mbabane, Eswatini.
- Government of Eswatini. (2016b). *Swaziland drought assessment report: Rapid assessment 2015/16 season*. Mbabane, Eswatini.
- Mhlanga-Ndlovu, B. s. F. N., & Mhlanga, N. (2019). *Building capacity to advance national adaptation planning process in the Kingdom of Eswatini (Draft report)*. Mbabane, Eswatini.
- Mhlanga-Ndlovu, B. s. F. N., & Nhamo, G. (2016). Farmer perceptions of climate change impacts on Swaziland's sugar industry. *African Journal of Science, Technology, Innovation and Development*, 8(5-6), 429–438. doi:10.1080/20421338.2016.1219503
- Mlenga, D. H., & Jordaan, A. J. (2019). Monitoring droughts in Eswatini: A spatiotemporal variability analysis using the Standard Precipitation Index. *Journal of Disaster Risk Studies*, 11(1), 1996–1421.
- Ministry of Tourism and Environment Affairs. (2016a). *National climate change policy*. Mbabane, Eswatini.
- Ministry of Tourism and Environment Affairs. (2016b). *Third national communication to the United Nations Framework Convention on Climate Change*. Mbabane, Eswatini.
- Ministry of Tourism and Environment Affairs. (2020a). *State of environment*. Mbabane, Eswatini.
- Ministry of Tourism and Environment Affairs. (2020b). *Sixth National Report to the United Nations Convention on Biological Diversity*. Mbabane, Eswatini.
- National Climate Change Committee. (2015). *National Climate Change Committee terms of reference*. Mbabane, Eswatini.
- National Disaster Management Agency. (2021). *Cyclone Eloise rapid needs assessment report, Kingdom of Eswatini*. Mbabane, Eswatini.
- Remmelzwaal, A., & Van Waveren, E. J. (1994). *Agro-ecological analysis of Swaziland. Part A. Land Resources*. Mbabane, Eswatini.

Tfwala, C., Mengistu, A., Seyama, E., Mosia, M., van rensburg, L., Mvubu, B., . . . Dlamini, P. (2020). Nationwide temporal variability of droughts in the Kingdom of Eswatini: 1981–2018. *Heliyon*, 6. doi:10.1016/j.heliyon.2020.e05707.

United Nations. (2015). *The Sendai framework for disaster risk reduction 2015-2030*. New York, USA.

United Nations Economic and Social Commission for Asia and the Pacific (2017). *Regional roadmap for implementing the 2030 agenda for sustainable development in Asia and the Pacific*. Bangkok, Thailand.

Appendix

Figure A1. Sustainable Development Goals



Source: United Nations Economic and Social Commission for Asia and the Pacific (2017)

Figure A2. Sendai Framework targets

Target	Target explained
1	Substantially reducing global disaster mortality by 2030
2	Substantially reducing the number of affected people globally by 2030
3	Reducing direct disaster economic loss in relation to global gross domestic product by 2030
4	Substantially increase the number of countries with national and local disaster risk reduction strategies
5	Substantially reduce disaster damage to critical infrastructure and disruption of basic services, among them health and educational facilities
6	Substantially enhance international Cooperation to developing countries through adequate and sustainable support to complement their national actions for implementation of this framework by 2030
7	Substantially increase the availability of and access to multi-hazard early warning systems and disaster risk information and assessments to people

Source: Modified from United Nations, 2015

