

Exploring Financing Options for Water-Related Climate Change Adaptation Technologies in Eswatini: A Brief Overview

Facilitating Wide-Scale Adoption of Water Technologies for a Climate-Resilient Eswatini



Introduction

Climate change is already having severe consequences to Eswatini's economy. Such has had several adverse impacts on the water sector, including: changes in precipitation patterns, increased frequency and intensity of incidences of droughts, floods and lightning, changes in the timing and magnitude of river flows, and rising temperatures. For instance, in the 2015/2016 the country experienced one of its most severe and prolonged droughts in over 35 years. This drought had a significant impact on the country's water sector and have highlighted the need for adaptation measures to address the challenges of climate change. Evaluations conducted within the nation post the 2015/16 drought revealed that it struggled significantly to cope with one of the lengthiest dry spells in its history. Approximately 410,000 individuals required various levels of humanitarian aid, including provisions like food, agricultural resources, water and sanitation, healthcare, and nutritional support, as well as assistance for early recovery of livelihoods. The country's rivers and dams reached historic low levels, leading to widespread water rationing across the country, food shortages, as well as livestock deaths.

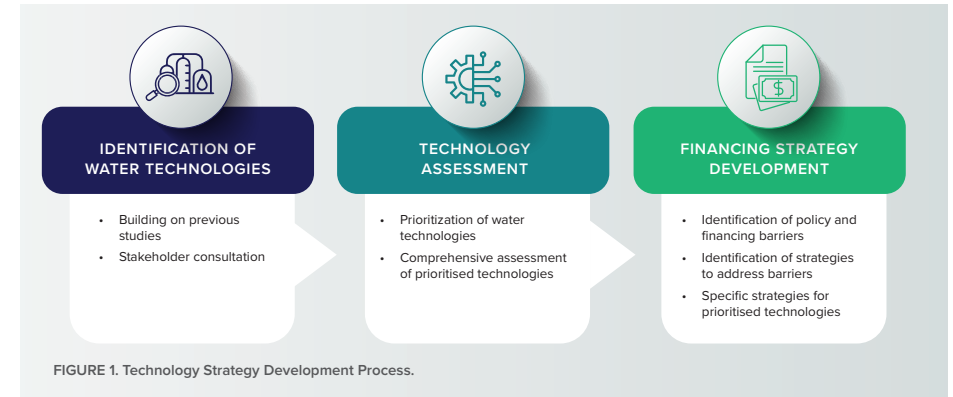
The experiences of Eswatini on climate change impacts particularly that of droughts underscore the urgent need for effective water management strategies, climate adaptation measures, and sustainable development practices to mitigate the impacts of climate change and safeguard water resources for future generations. The adoption of effective water related adaptation technologies provides a baseline for building collective resilience in the water sector. The country conducted a climate change Technology Needs Assessment (TNA) in 2016, which included and identified several water-related climate technologies that could be used to adapt to the impacts of climate change. These technologies include improving water storage and management infrastructure, promoting water-efficient practices in agriculture and industry,

implementing drought-resistant crop varieties, and enhancing water governance and planning processes.


Building to this work, the Eswatini Government through the Ministry of Tourism and Environmental Affairs (MTEA) and Ministry of Natural Resources and Energy (MNRE) with funding and technical assistance from the Green Climate Fund (GCF) and Global Water Partnership (GWP), respectively, commissioned a study to reprioritise water related climate technologies and identify some of the existing and potential barriers and gaps hindering the adoption and diffusion of these technologies. The study recognised gender equity as one of the selection criteria for water-related adaptation technologies. This is important because the design, dissemination, adoption, operation and maintenance of water technologies need to ensure that gender equality and social inclusion aspects are not ignored. Further to the reprioritisation of water technologies, a financing framework and roadmap to implement this framework was developed to ensure the diffusion and ultimate adoption of these technologies by the wider stakeholders and communities. By taking these steps, Eswatini can build a more resilient water sector and safeguard its water security in the face of climate change. This brief explores 16 promising water-related climate technologies tailored to Eswatini's needs, offering insights into adoption opportunities and the current market landscape.


1.2 Financing Water Technologies Development Process


The process for developing the financing framework for prioritised water-related climate technologies builds on previous studies conducted in Eswatini involving three main steps (Figure 1):



Key Messages


 Promotion of water conservation and efficiency measures, including public awareness campaigns is critical to ensure a wide scale adoption of water-saving technologies particularly for water sensitive sectors like agriculture and energy.


 Financial sector institutions are critical actors who need to be engaged to provide tailored finance and financial products to finance the various stages of the technology innovation chain and encourage the adoption and use of priority water technologies.

 Domestic resources can mobilize a more immediate, nationally driven response to climate change, and when aligned with external funding sources, can gain a much greater impact. This can be achieved through the government taking a leadership role and ensuring an increased budgetary allocation towards the water sector to support the application

of these technologies and the required capacity-building and awareness initiatives to easily attract the private sector to consider adopting and financing these technologies.

 Collaborations with regional and international partners is essential to access technical expertise and financial support to develop locally suited technologies and ensure the financing of early-stage technology innovation processes.

 Enforce regulations and legislation enacted to support technology uptake, including supporting the payment of water charges, tariffs, and levies.

 Considering the different water challenges, needs and priorities of both women and men is crucial in making decisions concerning appropriate, affordable and acceptable technologies for their different contexts.

1.3 Technology Innovation Chain

The process of developing and deploying new technologies follows the technology innovation chain consisting of four primary stages: Research and Development (R&D), Demonstration, Deployment,

and Diffusion. An evolving mix of policy and support instruments is needed to help technologies progress down this chain, including regulations and codes, fiscal incentives, Public Finance Mechanisms, market mechanisms and information dissemination. Figure 2 below shows some of these innovation stages

including the barriers and interventions associated with each of the innovation chain stages. Technology-based innovation can come either from technology-push inventions which are initially researched and developed and later adopted by the market that become useful for new needs or from market pull interventions where market needs lead to the

discovery of innovative technology to help meet the needs of the market. For Eswatini, it is important to understand that some water technologies may arrive at any stage in the innovation chain having undergone stages like research and development in other countries.

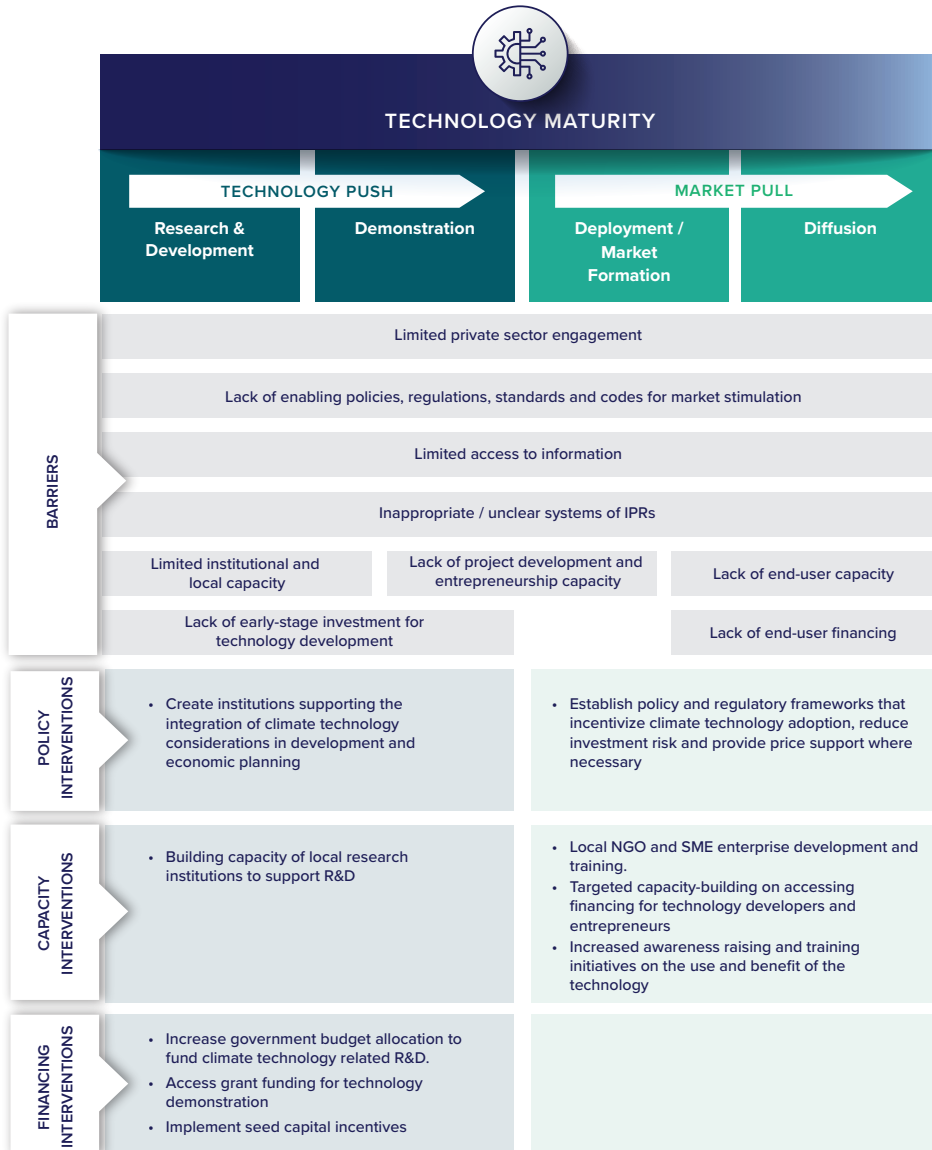


FIGURE 2: Barriers and proposed interventions along the Technology Innovation Chain

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Financing approaches to advance Eswatini's water technologies




Despite the referenced importance at both the global and national levels, water-related climate technologies have generally lacked the required finances to be adequately developed and adopted by developing countries like Eswatini. Historically the water sector has been financed by the public sector and this alone will not be sufficient to achieve the adoption of innovative solutions to enhance the resilience of the water sector. Due to the limited availability and the competing demands on public budgets, it is becoming increasingly important to mobilize non-traditional forms of capital to the water sector. Whatever limited public financing is available, should be primarily used to leverage private capital flows into the sector for

increased adoption of technologies. This is built on the premise that the private sector has the potential to fund water adaptation technologies; however, it requires a sound enabling framework to be created by the government.

Table 1 outlines financing strategies for prioritized water technologies in Eswatini. It elaborates on each technology and uses the Technology Innovation Chain framework to identify activities needed for each technology (e.g., research, deployment), potential financing sources (public, private) and institutions that could support financing these technologies.



TABLE 1: Financing strategies/pathways for the Eswatini prioritized water technologies

Financing Instruments	Description	Financing Instrument	Relevant support institutions responsible for sourcing identified finance
<p>1. Flood and drought risk assessment and mapping</p> 	<p>This tool evaluates how likely and how severe droughts might be in a specific region. It considers historical climate data like rainfall patterns, along with current information on soil moisture and vegetation health. By identifying areas prone to drought, this mapping helps develop water management strategies like conservation measures or promoting drought-resistant crops.</p> <p>Flood Risk Mapping combines information about flood hazards with data on the vulnerability of people, infrastructure, and the environment. It considers factors like population density, land use, and how well-built infrastructure is to withstand floods. By identifying high-risk areas, flood risk mapping helps with land-use planning, preparing for emergencies, and managing floodplains.</p>	<p>ODA, Philanthropies and Development Partners Grant funding for research (promote partnerships with other academic institutions in the north and south) for:</p> <ul style="list-style-type: none"> • Data and information collection • Research on open data platforms • Modelling • Development of technology transfer strategy <p>Government budgets</p> <ul style="list-style-type: none"> • Enhancing Institutional arrangements • Intellectual property rights • Piloting technologies • Strengthening institutional coordination • Establishment of communication structures <p>Private sector funding</p> <ul style="list-style-type: none"> • Acquiring or filing intellectual property rights • Early-stage venture capital funds for demonstration and patent rights • Financing technology companies via debt or equity • Corporate Social Responsibility from large technology solution providers <p>Multilateral Climate Fund</p> <ul style="list-style-type: none"> • Building institutional capacity on the use of technology • Education and awareness-raising • Establishment of communication structures • Piloting technologies 	<ul style="list-style-type: none"> • University of Eswatini • WaterNet • CTCN • International Cooperating Partners (JICA, EU Horizon Grants, GIZ, ADA) • UN Agencies (CTCN, UNDP) <hr/> <ul style="list-style-type: none"> • Ministry of Finance • Eswatini Environmental Fund • IDCE • Municipal Councils • Eswatini Agriculture Development Fund • River Basin Authorities • National Disaster Management Agency • Ministry of Natural Resources and Energy • National Disaster Management Agency <hr/> <ul style="list-style-type: none"> • Tech firms (Google, Microsoft) • VC Firms (Acuity Ventures, Vantage Capital, Convergence Partners, Seedstar Africa) • Insurance companies <hr/> <ul style="list-style-type: none"> • GEF • GCF • Adaptation Fund
<p>2. Central Data Storage Facility</p> 	<p>This refers to a centralized location where data related to water resources, such as water quality, water levels, and rainfall, is collected, stored, and managed. This allows for efficient data analysis and decision-making for water management.</p>	<p>ODA, Philanthropies and Development Partners Grant funding for:</p> <ul style="list-style-type: none"> • Researching available technologies for central data storage • Development of technology transfer strategy <p>Multilateral and Development Finance Institutions Loans and equity</p> <ul style="list-style-type: none"> • Feasibility studies • Technology transfer <p>Government budgets</p> <ul style="list-style-type: none"> • Enhancing Institutional arrangements • Piloting technologies • Establishing a policy framework for central data storage sharing • Capacity building <p>Private sector funding for:</p> <ul style="list-style-type: none"> • Public-private partnership for deployment and diffusion of technology • Financing technology companies via debt or equity 	<ul style="list-style-type: none"> • University of Eswatini • International Cooperating Partners (JICA, EU Horizon Grants, GIZ, ADA) • UN Agencies (CTCN, UNDP) <hr/> <ul style="list-style-type: none"> • AfDB • DBSA • Taiwan Development Assistance <hr/> <ul style="list-style-type: none"> • Ministry of Information Communication and Technology • Department of Water Affairs • Royal Science Technology Park • Eswatini Communications Commissions • Ministry of Economic Planning and Development (MEPD) <hr/> <ul style="list-style-type: none"> • Google • Amazon Web Services • Microsoft • Huawei
<p>3. Optimisation of reservoir operations</p> 	<p>This involves managing the release and storage of water in reservoirs to meet various demands, such as irrigation, domestic water supply, hydropower generation, and environmental flow requirements. During periods of heavy rainfall, water can be released from the reservoir at a controlled rate, which helps prevent sudden and excessive increases in downstream river flow. In addition, reservoirs can be managed to maintain lower water levels during periods of heavy precipitation. By keeping the reservoir at a lower level when significant rainfall is expected, there is more room to store incoming runoff, which reduces the risk of overflow and flooding.</p>	<p>ODA, Philanthropies and Development Partners Grant funding for research (promote partnerships with other academic institutions in the north and south) for:</p> <ul style="list-style-type: none"> • Data and information collection • Research on open data platforms • Modelling • Development of technology transfer strategy • Capacity building <p>Government budgets for</p> <ul style="list-style-type: none"> • Enhancing Institutional arrangements • Intellectual property rights • Piloting technologies 	<ul style="list-style-type: none"> • University of Eswatini • WaterNet • International Cooperating Partners (JICA, EU Horizon Grants, GIZ, ADA) • UN Agencies (CTCN, UNDP) <hr/> <ul style="list-style-type: none"> • Department of Water Affairs • KOBWA • River Basin Authorities • Eswatini Water Services Cooperation • Eswatini Electricity Company




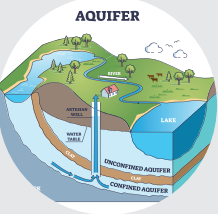







Financing Instruments	Description	Financing Instrument	Relevant support institutions responsible for sourcing identified finance
4. Water-saving toilets 	<p>These are also known as low-flow toilets and are designed to use less water per flush compared to traditional toilets. They incorporate technologies like dual-flush mechanisms or reduced water volume to conserve water without compromising functionality.</p>	<p>Bilateral ODA, Development Partners, and Philanthropies Grant funding for:</p> <ul style="list-style-type: none"> • Research and analysis of water-saving technologies in the market • Piloting water-saving technologies • Capacity building of SMME's • Awareness raising on water-saving toilet benefits <p>Government Budgets Funding for:</p> <ul style="list-style-type: none"> • Development of national standards and regulations for water-saving technologies • Development of tax incentives on water-saving toilets <p>Private Sector Funding for:</p> <ul style="list-style-type: none"> • Development of climate technology investment eco-systems • Financing technology companies via debt or equity 	<ul style="list-style-type: none"> • Bill and Melinda Gates Foundation • WaterAid • UNICEF • World Vision • Youth SMME grants • Environmental grants <hr/> <ul style="list-style-type: none"> • Ministry of Health – Environment and Health Department • Department of Water Affairs – WASH unit • National WASH Forum Partners • Eswatini Water Services Cooperation <hr/> <ul style="list-style-type: none"> • Sanitech • CemForce • Enviroloo
5. National and community disaster management plans 	<p>They outline strategies and actions to prepare for, respond to, and recover from disasters. These plans consider the specific risks and vulnerabilities of a region and involve collaboration among various stakeholders, including government agencies, emergency services, community organizations, and the public. Disaster management plans ensure a coordinated and effective response to disasters, reducing the impacts on human lives, infrastructure, and the environment.</p>	<p>Bilateral ODA, Development Partners, and Philanthropies Grant funding and technical assistance for:</p> <ul style="list-style-type: none"> • Stakeholder engagement • Assessment of existing policies and plans • Capacity building/training • Development of disaster management plans • Establishment of communication and information dissemination system <p>Government Budgets for</p> <ul style="list-style-type: none"> • Stakeholder consultations • Development of required policies and framework • Establishment of aid agreements • Awareness raising <p>Multilateral Climate Funds and DFIs</p> <ul style="list-style-type: none"> • Technical assistance to develop Plans • Capacity needs assessment 	<ul style="list-style-type: none"> • UNDP • IFRC • CTCN <hr/> <ul style="list-style-type: none"> • National Disaster Management Agency • Department of Meteorology • Ministry of Natural Resources and Energy • Ministry of Tinkhundla Administration and Development • Eswatini National Trust Commission • Municipal Councils <hr/> <ul style="list-style-type: none"> • Adaption Fund • Global Environment Facility (GEF) • Global Climate Change Alliance • Green Climate Fund (GCF) • Least Developed Countries Fund
6. Wetland restoration 	<p>Involves the rehabilitation or creation of wetland ecosystems that have been degraded or lost due to human activities. Wetlands provide valuable ecosystem services, including water filtration, flood control, and habitat for various species. Restoring wetlands helps improve water quality and biodiversity.</p>	<p>ODA, Philanthropies and Development Partners Grant funding for research grants (promote partnerships with other academic institutions in the north and south) for:</p> <ul style="list-style-type: none"> • Mapping and identification of hotspots • Technical support for policy revisions on wetland management in Eswatini • Demonstration projects at selected sites • Developing technical expertise in wetland restoration <p>Government Budgets for</p> <ul style="list-style-type: none"> • Strengthening enforcement and institutional arrangements • Awareness raising • Post-implementation monitoring and maintenance • Capacity development • Stakeholder engagement <p>Private Sector</p> <ul style="list-style-type: none"> • Public-private partnership wetland restorations for privately owned wetlands • Corporate Social Responsibility funds for demonstration, mapping, and monitoring 	<ul style="list-style-type: none"> • TNC • UN Agencies (CTCN, FAO, UNDP) • University of Eswatini <hr/> <ul style="list-style-type: none"> • Eswatini Environmental Authority • Department of Water Affairs • Eswatini National Trust Commission • Ministry of Agriculture • Eswatini Water and Agricultural Enterprise (ESWADE) <hr/> <ul style="list-style-type: none"> • Royal Eswatini Sugar • Illovo Sugar • CONCO • Eswatini Breweries • Embiveni Meat Industries • Montigny Investments

FIGURE 2: Barriers and proposed interventions along the Technology Innovation Chain

Financing Instruments	Description	Financing Instrument	Relevant support institutions responsible for sourcing identified finance
<p>7. Hydro-geological studies to inform optimal groundwater usage</p> 	<p>This involves analysing the characteristics of groundwater systems, such as aquifer properties, recharge rates, and groundwater flow patterns. These studies provide valuable information for managing and optimizing groundwater resources. By understanding the hydrogeology of an area, water managers can develop strategies for sustainable groundwater usage, such as implementing recharge projects, monitoring water levels, and regulating pumping rates.</p>	<p>ODA, Philanthropies and Development Partners Grant funding for research grants (promote partnerships with other academic institutions in the north and south) for:</p> <ul style="list-style-type: none"> • Data and information collection • Research on open data platforms • Modelling • Development of technology transfer strategy <p>Government Budgets</p> <ul style="list-style-type: none"> • Enhancing Institutional arrangements • Intellectual property rights • Piloting technologies • Strengthening institutional coordination • Establishment of communication structures <p>Private Sector Funding</p> <ul style="list-style-type: none"> • Corporate Social Responsibility from large technology solution providers 	<ul style="list-style-type: none"> • University of Eswatini • WaterNet • International Cooperating Partners (JICA, EU Horizon Grants, GIZ, ADA) • UN Agencies (CTCN, UNDP) • SADC GMI <hr/> <ul style="list-style-type: none"> • Eswatini Environmental Fund • IDCE • Eswatini Agriculture Development Fund • National Disaster Management Agency • Ministry of Natural Resources and Energy • Ministry of Agriculture • Eswatini Water Services Cooperation <hr/> <ul style="list-style-type: none"> • Tech firms (Google, Microsoft) • Royal Eswatini Sugar • Illovo Sugar • CONCO • Eswatini Breweries
<p>8. Monitoring of licensing and permit compliance continuously</p> 	<p>This ensures that water users adhere to regulations and guidelines for water use. This monitoring involves regular inspections, data collection, and reporting to ensure that water users are using water resources sustainably and within the allocated quotas. Continuous monitoring helps identify any violations and allows for timely enforcement actions.</p>	<p>ODA, Philanthropies and Development Partners Grant funding for research grants (promote partnerships with other academic institutions in the north and south) for:</p> <ul style="list-style-type: none"> • Research on existing water use monitoring, compliance, enforcement and audit processes and legislation • Stakeholder engagement • Piloting technology • Building institutional capacity on the use of technology • Research on policy amendments required to strengthen enforcement • Development of Repository <p>Government Budgets for</p> <ul style="list-style-type: none"> • Enhancing Institutional arrangements • Intellectual property rights • Piloting technologies • Strengthening institutional coordination • Education and awareness-raising • Upskill SMMEs and government institutions to undertake compliance monitoring and auditing. • Conducting compliance audits • Establishment of communication structures 	<ul style="list-style-type: none"> • University of Eswatini • WaterNet • International Cooperating Partners (JICA, GIZ, ADA) • UN Agencies (CTCN, UNDP) <hr/> <ul style="list-style-type: none"> • Department of Water Affairs • Decentralized Water Management Institutions (RBAs, IDs, PBs, WUAs) • National Water Authority. • Ministry of Agriculture
<p>9. Urban green spaces</p> 	<p>This refers to parks, gardens, and other green areas within urban areas. They provide numerous benefits, such as improving air quality, reducing urban heat, and promoting mental well-being. Urban green spaces also play a role in stormwater management and biodiversity conservation.</p>	<p>ODA, Philanthropies and Development Partners Grant funding for research grants (promote partnerships with other academic institutions in the north and south) for:</p> <ul style="list-style-type: none"> • Research on current and potential sites in Eswatini for urban greening and global best practices • Stakeholder engagement • Piloting technology • Building institutional capacity on the use of technology • Development of Repository • Feasibility study <p>Government Budgets for</p> <ul style="list-style-type: none"> • Piloting technologies • Strengthening institutional coordination • Education and awareness-raising • Upskill SMMEs and government institutions to undertake compliance monitoring and auditing. • Conducting compliance audits • Establishment of communication structures • Maintenance and safekeeping <p>Multilateral and Development Finance Institutions Loans and equity:</p> <ul style="list-style-type: none"> • Feasibility studies • Construction 	<ul style="list-style-type: none"> • University of Eswatini • International Cooperating Partners (JICA, GIZ, ADA) • UN Agencies (UNDP, FAO) <hr/> <ul style="list-style-type: none"> • Municipalities • Ministry of Housing and Urban Development • Ministry of Tourism and Environmental Affairs – (Forestry and Meteorology Departments) • National Disaster Management Agency • Eswatini Environmental Authority <hr/> <ul style="list-style-type: none"> • AfDB • DBSA • World Bank

Financing Instruments	Description	Financing Instrument	Relevant support institutions responsible for sourcing identified finance
<p>10. Climate change vulnerability assessments</p> 	<p>This involves analysing the potential impacts of climate change on a particular region or system. This assessment helps identify the areas or sectors that are most vulnerable to climate change, such as agricultural systems affected by temperature changes, or communities prone to extreme weather events. These assessments use a combination of climate models, socio-economic data, and vulnerability indicators to evaluate the potential risks and develop strategies for adaptation and resilience.</p>	<p>ODA, Philanthropies and Development Partners Grant funding for research grants (promote partnerships with other academic institutions in the north and south) for:</p> <ul style="list-style-type: none"> • Research and development of CVA frameworks • Stakeholder engagement • Piloting technology • Building institutional capacity on the use of technology • Data collection <hr/> <p>Government Budgets</p> <ul style="list-style-type: none"> • Stakeholder engagement • Development and implementation of the CVA framework • Capacity development <hr/> <p>Multilateral Climate Funds and DFIs</p> <ul style="list-style-type: none"> • Technical assistance • Capacity development • Implementation of CVA 	<ul style="list-style-type: none"> • University of Eswatini • International Cooperating Partners (JICA, GIZ, ADA) • UN Agencies (FAO, UNDP) <hr/> <ul style="list-style-type: none"> • Ministry of Tourism and Environmental Affairs – (Forestry and Meteorology Departments) • National Disaster Management Agency • Eswatini Environmental Authority <hr/> <ul style="list-style-type: none"> • Adaption Fund • Global Environment Facility (GEF) • Global Climate Change Alliance • Green Climate Fund (GCF) • Least Developed Countries Fund
<p>11. Model predictions on available seasonal water supply</p> 	<p>This involves using hydrological models to forecast water availability during different seasons. These models consider factors such as precipitation patterns, snowmelt, evaporation rates, and river flow. By predicting the seasonal water supply, water managers can plan for water allocation, reservoir operations, and water conservation measures.</p>	<p>ODA, Philanthropies and Development Partners Grant funding for research grants (promote partnerships with other academic institutions in the north and south) for:</p> <ul style="list-style-type: none"> • Research and development of appropriate technology requirements and open data platforms • Modelling • Piloting technology • Building institutional capacity on the use of technology • Data collection <hr/> <p>Government Budgets for</p> <ul style="list-style-type: none"> • Enhancing Institutional Arrangements and Coordination • Piloting technologies • Information dissemination • Stakeholder engagement • Capacity development <hr/> <p>Multilateral Climate Funds and DFIs</p> <ul style="list-style-type: none"> • Technical assistance • Capacity development • Establishment of river flow measuring stations 	<ul style="list-style-type: none"> • University of Eswatini • International Cooperating Partners (JICA, GIZ, ADA) • UN Agencies (UNDP) <hr/> <ul style="list-style-type: none"> • Ministry of Finance • Eswatini Environmental Fund • Eswatini Agriculture Development Fund • River Basin Authorities • National Disaster Management Agency • Ministry of Natural Resources and Energy <hr/> <ul style="list-style-type: none"> • Adaption Fund • Global Environment Facility (GEF) • Global Climate Change Alliance • Green Climate Fund (GCF) • Least Developed Countries Fund
<p>12. Real-time monitoring networks</p> 	<p>These involve the use of sensors and data collection systems to monitor water resources continuously. This allows for the real-time measurement of parameters like water levels, flow rates, and water quality. Real-time monitoring networks provide valuable data for decision-making and early warning systems.</p>	<p>ODA, Philanthropies and Development Partners Grant funding for research grants (promote partnerships with other academic institutions in the north and south) for:</p> <ul style="list-style-type: none"> • Data and information collection • Research on existing real-time monitoring technologies • Modelling and database development • Development of technology transfer strategy • Capacity building <hr/> <p>Government Budgets for</p> <ul style="list-style-type: none"> • Enhancing Institutional arrangements • Piloting technologies • Strengthening institutional coordination <hr/> <p>Private sector funding</p> <ul style="list-style-type: none"> • Acquiring or filing intellectual property rights • Early-stage venture capital funds for Demonstration and patent rights • Financing technology companies via debt or equity • Corporate Social Responsibility from large technology solution providers <hr/> <p>Multilateral Climate Fund</p> <ul style="list-style-type: none"> • Building institutional capacity on the use of technology • Education and awareness-raising • Establishment of communication structures • Piloting technologies 	<ul style="list-style-type: none"> • University of Eswatini • WaterNet • International Cooperating Partners (JICA, EU Horizon Grants, GIZ, ADA) • UN Agencies (CTCN, UNDP) <hr/> <ul style="list-style-type: none"> • Ministry of Finance • Eswatini Environmental Fund • Eswatini Agriculture Development Fund • River Basin Authorities • National Disaster Management Agency • Ministry of Natural Resources and Energy • Eswatini Water Services Cooperation <hr/> <ul style="list-style-type: none"> • Tech firms (Google, Microsoft) • VC Firms (Acuity Ventures, Vantage Capital, Convergence Partners, Seedstar Africa) • Insurance companies <hr/> <ul style="list-style-type: none"> • GEF • GCF • Adaptation Fund

Financing Instruments	Description	Financing Instrument	Relevant support institutions responsible for sourcing identified finance
15. Multi-purpose Dams 	<p>These are large structures built across rivers or streams to provide numerous benefits. They can serve purposes such as flood control, water supply, hydropower generation, and irrigation. Multipurpose dams play a crucial role in water resource management and regional development.</p>	<p>ODA, Philanthropies and Development Partners</p> <ul style="list-style-type: none"> • Pre-feasibility studies • Stakeholder engagement • ESIA • Gender equity and mainstreaming <hr/> <p>Development Finance Institutions</p> <ul style="list-style-type: none"> • Loans • Feasibility and detailed design studies • Financial and deal Structuring • Construction <hr/> <p>Multilateral Climate Fund</p> <ul style="list-style-type: none"> • Grant/Co-financing <hr/> <p>Government budgets</p> <ul style="list-style-type: none"> • Co-financing for acquisition of land, engagement efforts, construction, design etc <hr/> <p>Private sector funding (PPP modalities)</p> <ul style="list-style-type: none"> • Equity financing • Long-term investment loans • Financing for operations and maintenance 	<ul style="list-style-type: none"> • University of Eswatini • International Cooperating Partners (JICA, EU Horizon Grants, GIZ, ADA) • UN Agencies (UNDP) • Development Partners (GWPSA, IUCN, WWF) <hr/> <ul style="list-style-type: none"> • AfDB • DBSA • World Bank • Eswatini Development Bank <hr/> <ul style="list-style-type: none"> • Green Climate Fund • Global Environmental Fund • Adaptation fund <hr/> <ul style="list-style-type: none"> • Ministry of Natural Resources and Energy • Ministry of Agriculture • Ministry of Finance <hr/> <ul style="list-style-type: none"> • Fichtner
16. Water Recycling and reuse 	<p>Water recycling and reuse is the process of collecting, treating, and using wastewater, particularly from municipalities, industry, and agriculture. The recycled water can be used for irrigation or industrial purposes, as well as domestic purposes if properly treated. In some cases, treated wastewater is indirectly used for drinking purposes, for example by injecting it into groundwater aquifers to increase capacity and minimize saltwater intrusion.</p>	<p>ODA, Philanthropies and Development Partners</p> <p>Grant funding for research grants (promote partnerships with other academic institutions in the north and south) for:</p> <ul style="list-style-type: none"> • Research on existing water recycling and reuse technologies • Development of technology transfer strategy • Piloting • Capacity development <hr/> <p>Government budgets</p> <ul style="list-style-type: none"> • Piloting technologies • Strengthening institutional coordination • Retrofitting • Capacity development <hr/> <p>Private sector funding</p> <ul style="list-style-type: none"> • Financing small-scale demonstrations on private sites • Venture capital financing for demonstration and acquiring IP rights • Financing companies via debt or equity <hr/> <p>Multilateral and Development Finance Institutions</p> <ul style="list-style-type: none"> • Loans and equity • Feasibility studies • Construction 	<ul style="list-style-type: none"> • University of Eswatini • International Cooperating Partners (JICA, EU Horizon Grants, GIZ, ADA) • UN Agencies (CTCN, UNDP) <hr/> <ul style="list-style-type: none"> • Eswatini Water Services Corporation • Department of Water Affairs • River Basin Authorities • Eswatini Water and Agricultural Development Enterprise • Municipal Councils <hr/> <ul style="list-style-type: none"> • VC Firms (Acuity Ventures, Vantage Capital, Convergence Partners, Seedstar Africa) • Royal Eswatini Sugar • Illovo Sugar • CONCO • Eswatini Breweries <hr/> <ul style="list-style-type: none"> • AfDB • DBSA • World Bank

3

Roadmap for Scaling Up Water-Related Climate Technologies Through Financing

To accelerate the adoption of these high-priority technologies, a multi-phased roadmap is recommended. This roadmap outlines key actions across short, medium, and long-term timeframes to

facilitate successful implementation of the financing strategy to ensure the ultimate wide scale adoption of these priority water technologies.

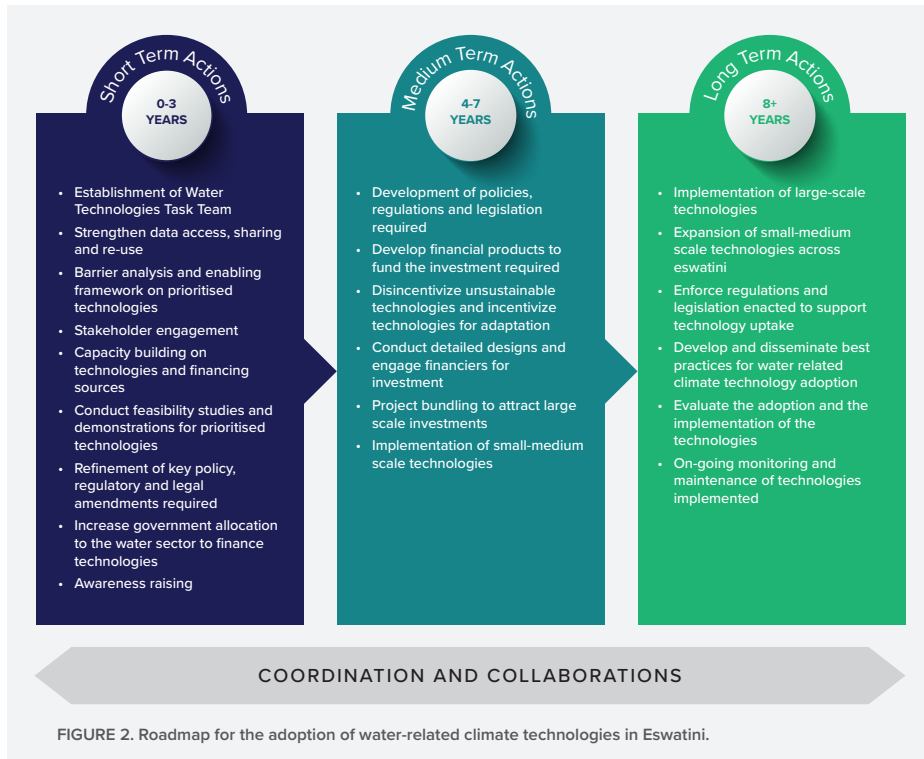


FIGURE 2. Roadmap for the adoption of water-related climate technologies in Eswatini.

4

Conclusion

Water technologies offer a dual benefit for climate action, simultaneously reducing greenhouse gas emissions and enhancing Eswatini's ability to adapt to a changing climate. The financing strategy explores the financial opportunities and challenges of adopting these prioritized technologies. The key to success is collaboration wherein public and private sectors, alongside research institutions, need to work together throughout each technology's development and implementation (innovation chain). Moreover, financing the outlined actions must be aligned with national priorities. This includes plans for reducing emissions, achieving sustainable development goals (SDGs), and overall national development. This alignment unlocks efficient public and private financing. The government also has a key role to increase water budgets, build capacity, and raise awareness to attract private sector investment. Creating a more attractive investment environment through regulatory reforms, information sharing, and fostering collaboration to maximize resources and technology adoption is also critical.

Key prioritised technologies identified in this strategy include flood and drought risk assessment and mapping, central data storage facilities, optimization of reservoir operations, and water recycling and reuse. These technologies are crucial

for enhancing water management and resilience in Eswatini. To finance these technologies, a variety of instruments and sources have been outlined. Official Development Assistance, philanthropy and development partners play a significant role in providing grant funding for research, data collection, and technology transfer strategies. Government budgets are essential for enhancing institutional arrangements, piloting technologies, and establishing policy frameworks. Private sector funding through venture capital, corporate social responsibility initiatives, and public-private partnerships is crucial for early-stage development, demonstration, and scaling of technologies. Multilateral and development finance institutions offer loans, equity financing, and technical assistance for feasibility studies and capacity building. The Eswatini Government through the National Water Policy commits to ensuring that appropriate and gender sensitive technology shall be introduced while promoting innovation in the design, development and use of appropriate technology. Therefore, by leveraging these financing instruments and fostering collaboration among key stakeholders, Eswatini can successfully adopt and implement these water-related climate technologies, ensuring long-term water security and resilience against climate change.

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