



CLIMATE-SMART AGRICULTURE IN SWAZILAND

Introduction

The effects of climate change on agriculture are severe, and one of the most significant emerging challenges to household livelihoods in Africa. As such, it is imperative that efforts to address agriculture in the context of food security and rural development need to take climate change into consideration. Climate-smart Agriculture (CSA) is defined as agricultural practices that sustainably increase productivity and system resilience, while reducing greenhouse gas (GHG) emissions. It is not a single specific agricultural technology or practice that can be universally applied; it is a combination of policy, technology, and finance options that involves the direct incorporation of climate change adaptation and mitigation into agricultural development planning and implementation (FAO, 2010). Swaziland holds great potential for CSA, but this needs to be further explored. Although the country has traditional agricultural practices as well as research-based programs and techniques that have CSA qualities, CSA promotion requires concerted action from multiple actors to allow for context-specific approaches.

KEY RECOMMENDATIONS

- ONE:** The development of the National Adaptation Plan is a key opportunity to develop a coherent and coordinated approach to climate change, including CSA, and should be prioritized.
- TWO:** Establish an inclusive, gender-sensitive space that promotes multi-stakeholder dialogue about CSA – including cross-ministerial, multi-stakeholder platforms for strategy development, and participatory approaches at the community level.
- THREE:** Provide immediate and long-term incentives for CSA adoption, for example tax rebates or subsidies for organizations or individuals that invest in CSA, and certifying products from farmers who employ CSA practices.
- FOUR:** Adequately train extension officers in climate change and CSA, as well as participatory methods for knowledge-sharing to increase adoption and promote the inclusion of marginalized groups such as women.
- FIVE:** Identify ways to diversify the funding base and increase investments in CSA within Swaziland to enable more widespread uptake.



POPULATION Total population of 1.3 million of which 79% live in rural areas (Trading Economics, 2017).

ECONOMY Economic growth remains subdued and is estimated to have slowed down in 2016 to -0.6%, while prospects will be sluggish in 2017 and 2018. A stable macroeconomic environment with single-digit inflation (averaging 7.8% in 2016) (African Economic Outlook, 2017).

POVERTY 42% of the population below the international poverty line (World Bank, 2017a).

AGRICULTURE IN ECONOMY Currently less than 10% of GDP is from agriculture. More than 70% of the population rely on agriculture for livelihood (Government of Swaziland, 2016).

CLIMATE CHANGE Botswana's greenhouse gas emissions contribute 0.01% of global emissions (USAID, 2015). Agriculture contributes 57% of the nation's greenhouse emissions (World Bank, 2017b).

Context Overview

AGRICULTURE IN SWAZILAND

Agriculture in Swaziland is dualistic – divided into commercial estates and subsistence farms, known as Swazi Nation Land (SNL). The commercial sector occupies about 40% of the cultivated land, and generates 80% of the national agricultural commodity value (RSA DWAF, 2002).

Swaziland has four ecological zones that show clearly different climatic conditions, ranging from sub-humid and temperate to semi-arid and warm (Government of Swaziland, 2005)

Swaziland’s agricultural sector is the second largest contributor to the economy, and the commercial agriculture sector is dominated by sugar, canned fruit and beef production for export.

VULNERABILITIES

The Fifth Assessment of the Intergovernmental Panel on Climate Change (IPCC) has shown that global climate change is already damaging crops and undermining food production capacity, particularly in poorer countries (IPCC, 2014).

The vulnerability of African countries, including Swaziland, to climate change is compounded by strong dependence on rain-fed agriculture, high levels of poverty, low levels of human capital, low levels of preparedness for climate events, and poor infrastructure in rural areas.

A comparative assessment (FANRPAN, 2017) reveals that the onset impacts of climate change are already being perceived both by formal experts and by rural populations across Eastern and Southern Africa, including Swaziland.

Temperatures in Sub-Saharan Africa are already close to or beyond thresholds at which further warming reduces (already low) yields (Cline, 2008). But, climate change models predict a temperature increase of 1 to 1.5°C across Swaziland for the average daily maximum between 2000 and 2050, and a decrease of up to 200mm in annual precipitation over much of the country (Manyatsi *et al.*, 2013). In the absence of interventions, agricultural yields in Africa will continue to decline (World Bank, 2008).

Swaziland is prone to several hydrological disasters, the most frequent of which is drought (Government of Swaziland, 2016). Crop production among smallholder farmers is mainly rain-fed and it is thus the most vulnerable to climate change (Penin and Hlophe, 2013).

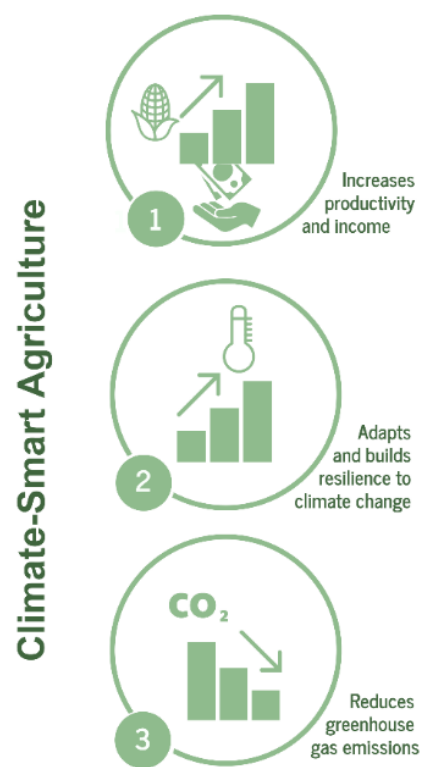
Countries in Southern Africa are also affected by El Niño (warm) and La Niña (cool) events in the tropical Pacific. The most recent El Niño (2014-2016) and La Niña (2016-2017) have impacted on agriculture in Southern Africa, including Botswana (UN News Centre, 2016). Although the El Niño has receded, the impact of the higher- than-average temperatures and the lower-than-average rainfall continue to be felt.

The constraints in adopting and up scaling CSA in the country include lack of a local infrastructure to support the manufacture and repair of CSA equipment, land tenure, permanent soil cover, and integration of livestock into CSA. Furthermore, farmers’ commitment to land management is affected by the lack of land property rights in Swaziland.

AGRICULTURE IN DEVELOPMENT

Agriculture remains one of the most effective pathways out of poverty. Gross domestic product (GDP) growth that originates in agriculture is approximately four times more effective in reducing poverty than GDP growth that originates in other sectors (World Bank, 2008). The risk which climate change poses to the sector thus has significant implications for poverty-reducing capacity.

In this context, CSA is critical for food security and development. It is an approach that can help reduce the negative impacts of climate change and increase the adaptive capacity of farming communities to long-term climatic trends (FAO, 2010).



Climate-Related Policy Environment

Eastern and Southern African countries generally have policies on agriculture and climate change – and do recognize the impacts of the latter on the former. Some countries have developed National Climate Change Policies, while other countries have National Adaptation Programmes of Action (NAPA) in place, and/or National Climate Change Response Strategies.

INTERNATIONAL ENVIRONMENT

As a non-Annex I party to the Convention, Swaziland has an obligation under the UNFCCC Paris Agreement to report on the anthropogenic sources and sinks of GHGs and to identify measures to minimize the impacts of global warming and climate change. Swaziland submitted and ratified its Nationally Determined Contribution (NDC) to the Convention in 2016.

Due to measurement challenges, there is no clear departure point for Swaziland’s emission trajectory and therefore Swaziland’s mitigation contribution is frame on an action-based approach that is strongly dependent on financial and technical support as well as capacity building.

Regionally, Swaziland is implementing the Comprehensive Africa Agriculture

Development Programme (CAADP) Framework (2010) which emphasizes sustainable land and water management for improved agricultural productivity through research, technology adoption and dissemination, and agricultural GHG emissions reduction.

Swaziland signed its CAADP compact in 2010, and released its Swazi National Agricultural Investment Plan (NAIP) in 2014. To date, Swaziland has not met the CAADP target of investing 10% of GDP in agriculture.

NATIONAL POLICY ENVIRONMENT

Swaziland has developed a series of notable climate actions which include the establishment of a multi-stakeholder National Climate Change Steering Committee in 2011. This Committee spearheaded the development of Swaziland’s 2014 Climate Change Strategy and Action Plan and 2015 National Climate Change Policy.

The goal of this Policy is a sustainable, climate resilient, and inclusive low-carbon green growth economy in line with the vision outlined in the 2022 National Development Plan.

Swaziland is developing a National Adaptation Plan (by 2020) which will contribute Swaziland’s institutional and regulatory framework and which will enable and enhance investments in adaptation for vulnerable sectors.

The National Adaptation Plan will also facilitate the integration of climate change adaptation, in a coherent manner, into relevant new and existing policies, programs and activities, in particular development planning and budgeting processes within relevant sectors at different levels.

CSA POLICIES

Swaziland has several agricultural policies whose goal is to improve food security and conserve scarce agricultural and land resources for the future. These include the National Food Security Policy, the Comprehensive Agriculture Sector Policy (CASP), and the National Programme for Food Security (NPFS).

There is currently no specific CSA policy or strategy in place; however, the forthcoming National Adaptation Plan will include CSA as a priority area.

Selection of national policies, plans and strategies in Swaziland related to CSA	
National Climate Change Policy (2015)	The goal of this Policy is a sustainable, climate resilient, and inclusive low-carbon green growth economy in line with the vision outlined in the 2022 National Development Plan.
National Adaptation Plan (currently under development)	Will contribute Swaziland’s institutional and regulatory framework to enable and enhance investments in adaptation for vulnerable sectors. Will also facilitate the integration of climate change adaptation, in a coherent manner, into relevant new and existing policies, programs and activities.
Comprehensive Agriculture Sector Policy (CASP) (2005)	The goal of CASP is to ensure that the agriculture sector contributes fully to the socioeconomic development of the country.

Existing Climate-Smart Practices

Swaziland has examples of both traditional and research-based agricultural practices that can be deemed climate-smart, but they are not mainstreamed and still receive limited support. Swaziland has also identified several CSA practices as key to its adaptation plan in its NDC submitted to the UNFCCC in 2016.

Conservation agriculture

Swaziland has been practicing conservation agriculture for over 10 years, with the use of champion farmers, demonstrations, and continuous extension contact training for farmers in all four regions of the country.

Most of the training and practice has, however, been on manual or hand-operated implements such as jab planter and hoe; this is against the back-drop of an agricultural system that has embraced mechanization, with a Government-led tractor system in place. Whilst all initiatives have successfully promoted CA, there is a need to mechanize it, thereby increasing its attractiveness to a broader spectrum of farmers, and thrusting it into the commercial front.

An FAO project funded by the European Union, The Swaziland Agricultural Development Project (SADP), and the Swaziland component of the project “Conservation Agriculture Coordination and Advocacy in Southern Africa” – funded by the United States Office of Foreign Disaster Assistance – aim to increase sustainable food security and household income generation by following a conservation agriculture approach. These projects trained more than 9 000 smallholder farmers in good practices – including agroforestry and seed production techniques, as well as conservation agriculture. The livelihoods of almost 5 000 participating households

were strengthened, and the projects served to improve coordination and collaboration. A draft three-year Conservation Agriculture Strategy and Work Plan has also been developed (FAO, 2015).

Drought-tolerant seed varieties

It is estimated that about 50% of the farmers in Swaziland use recycled seeds (which are in most cases open-pollinated varieties). The open-pollinated maize varieties have an advantage in that the seed can be recycled and they are cheaper than hybrids. On the other hand, some hybrid seed varieties are reported to be drought- and heat-tolerant. Most smallholder farmers cannot, however, afford to purchase these hybrid seeds.

Use of kraal manure

Kraal manure (organic material from residues of digested plants) is collected from the night enclosure and transported to the fields to use as fertilizer.

The advantages of using organic fertilizer, such as kraal manure, include addition of nutrients to the soil, and also the sequestration of carbon dioxide, thus reducing its adverse effects on global warming. In addition, inorganic fertilizers require energy – and thus greenhouse gas emissions – to be produced. Kraal manure is relatively inexpensive compared to inorganic fertilizers.

About 23% of farmers in SNL used kraal manure. More male (70.4%) than female farmers (20.6) used animal manure and the reason for male farmers applying more kraal manure than female farmers could be attributed to the fact that men generally own the cattle (FAO, 2005).

Irrigation schemes

Government and partners have invested over E20 million in developing three irrigation schemes to improve the quality of life for rural households and communities. These are in addition to other water-harvesting initiatives such as small earth dams which are developed in the dry regions of the country to improve access to water for agriculture and other activities. These initiatives strive to achieve improved resilience of smallholder farmers to the impacts of climate change, and to strengthen marketing systems for agriculture production, in order to achieve sustainable food security.

COMESA CSA pilot project

In 2016 the Common Market for Eastern and Southern Africa (COMESA) handed over a CSA pilot project implemented at a cost of USD 385,519.00 to the Government of Swaziland. Under the project, COMESA supported smallholder farmers with irrigation infrastructure, technical capacity building, and inputs. The project was implemented by the Ministry of Agriculture and supported by the European Union, the UK Department for International Development (DfID), and the Norwegian Ministry of Foreign Affairs.

Farmers were found to have changed farming technology from conventional methods to CSA technologies. Eighty-one percent of the farmers at Mphatheni changed farming technology used in production of crops, whilst 87% of farmers at Nkhungwini changed technology used in farming crops under CSA. The change from conventional methods to CSA farming technology is an indication of acceptance of the advantages of using the technology.

Gaps and Challenges in Climate-Smart Agriculture

POLICY GAPS

Climate-smart agriculture is context- and location-specific; therefore, implementation of CSA in Swaziland's agricultural system should use existing policy instruments as a launch pad. This approach will not only increase chances of success but will also reduce additional funding resources required to achieve success.

RECOMMENDATION: The development of frameworks to coordinate climate change responses across different sectors and levels – such as the National Adaptation Plan which is currently under development – should be prioritized, and a focus on CSA clearly incorporated.

Significant challenges to implementing CSA in Swaziland are the land tenure system that does not provide security over investment, as well as traditions and norms that disadvantage females. Context-appropriate approaches to addressing these culturally embedded norms need further investigation. Efforts to secure land rights for users should be considered, through for example developing a comprehensive and integrated land policy.

RECOMMENDATION: Establish an inclusive, gender-sensitive space that promotes multi-stakeholder dialogue about CSA – including cross-ministerial, multi-stakeholder platforms for strategy development, and participatory approaches at the community level.

INVESTMENTS AND FINANCIAL FLOWS

The extent to which Swaziland's adaptation contribution can be achieved is dependent on the level of technical and financial support received, thus it is important to increase funding to Swaziland for CSA activities.

Although several development partners internationally and in Africa have made contributions to enhancing CSA in Swaziland, significantly more funding is required.

RECOMMENDATION: Identify ways to diversify the funding base and increase investments in CSA within Swaziland to enable more widespread uptake.

KNOWLEDGE SHARING, CAPACITY BUILDING, AND EXTENSION

CSA practices are knowledge-intensive, and promoting their adoption requires well-designed, inclusive, and innovative knowledge-management systems. Participatory information dissemination methods – involving farmers in problem analysis, setting extension priorities, planning, and obtaining feedback from farmers – are well recognized for their impact on technology adoption. Community involvement in planning through demonstration plots and farmers field schools provides platforms for farmers to participate and give feedback. The availability of extension services is critical for up scaling CSA in Swaziland.

RECOMMENDATION: Extension officers should be adequately trained in climate change and CSA, but also have the requisite skills to facilitate knowledge-sharing in a participatory manner to increase adoption and promote the inclusion of marginalized groups such as women.

Farmers are more likely to implement CSA if they can see both immediate and long-term benefits from implementing these approaches. The incentives should aim at overcoming barriers to adopting CSA practices – the two main barriers being upfront investment, which takes time to bring about gains in productivity, and markets that cannot accurately account for the value of environmental benefits that CSA delivers.

RECOMMENDATION: Provide immediate and long-term incentives for CSA adoption, for example tax rebates for organizations or individuals that invest in CSA and recognition of environmental benefits of CSA by certifying products from conservation agriculture and related services.



Mapping CSA Policy and Practice in Africa

This policy brief is an output emanating from a larger study conducted in collaboration between the Food, Agriculture and Natural Resources Policy Analysis Network (FANRPAN) and the Earth System Governance Project, on policies for climate-smart agriculture. The Earth System Governance Project is an international social science research network in the area of governance and global environmental change.

The study was funded by the Norwegian Agency for Development Cooperation (NORAD) and the African Capacity Building Foundation (ACBF).

The research project consisted of a comparative assessment of relevant CSA policies and practices in 15 countries across Eastern and Southern Africa. The research was commissioned by FANRPAN to analyze the barriers and opportunities for promoting CSA in sub-Saharan Africa. This means agriculture that (i) increases productivity and income, (ii) adapts and builds resilience to climate change, and (iii) reduces greenhouse gas emissions where needed.

FANRPAN commissioned CSA Policy scoping studies through the work of national consultants and assessed the responsiveness of policy frameworks in 15 Eastern and Southern African countries (, Botswana, Democratic Republic of Congo, Kenya, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, South Africa, Swaziland, Uganda, Tanzania, Zambia and Zimbabwe).

The main objectives were to:

- Conduct a comprehensive review of the existing CSA policies at national level,
- Analyze gaps in the existing policy frameworks,
- Assess the CSA technologies, innovations and practice (as well as untapped opportunities),
- Identify key stakeholders in CSA,
- Identify relevant policy recommendations, and
- Develop and share policy recommendations at national and regional levels.

The study processes included review of existing documents and interviews with key informants from a wide range of organizations. In all countries, national policy dialogues were convened to a) share the draft CSA scoping study report outputs with stakeholders; b) validate the outputs from the draft CSA scoping study report; and c) solicit policy recommendations from stakeholders. The draft reports were reviewed externally, and both recommendations from the national dialogues and external reviewers were incorporated into the CSA scoping study's final reports.





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About FANRPAN

The Food, Agriculture and Natural Resources Policy Analysis Network (FANRPAN) is an autonomous regional stakeholder driven policy research, analysis and implementation network that was formally established by Ministers of Agriculture from Eastern and Southern Africa in 1997. FANRPAN was borne out of the need for comprehensive policies and strategies required to resuscitate agriculture. FANRPAN is mandated to work in all African countries and currently has activities in 17 countries namely Angola, Benin, Botswana, Democratic Republic of Congo, Kenya, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, South Africa, Swaziland, Tanzania, Uganda, Zambia and Zimbabwe.

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