FANRPAN
Food, Agriculture & Natural Resources Policy Analysis Network

POLICY BRIEF 07/2017

CLIMATE-SMART AGRICULTURE IN ZAMBIA

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 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). Zambia holds great potential for CSA, but this needs to be further explored. Although the country has agricultural practices as 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 guidelines and approaches to mainstream climate change into National Development Planning processes should receive high priority.

TWO: Capacity strengthening – for governments, technical staff and farmers – is a high priority for enabling the implementation of CSA and should be a key area for investment.

THREE: Strengthen research and extension services at the local level to allow context-specific CSA approaches to be identified and implemented in collaboration with local farmers.

FOUR: The implementation and success of CSA projects in Zambia should be carefully monitored to understand the potential of initiatives to contribute to agricultural transformation, and attract increased investment.

POPULATION Total population of 16.6 million of which 69% live in rural areas (Trading Economics, 2016).

ECONOMY Real GDP growth marginally increased to an estimated 3% in 2016, from 2.9% in 2015, with further increases projected for 2017 and 2018. Double-digit inflation (averaging 17.8% in 2016) (African Economic Outlook, 2017).

POVERTY More than 60% of the population below the international poverty line (World Bank, 2017a).

AGRICULTURE IN ECONOMY Currently less than 10% of GDP is from agriculture (World Bank, 2017b). Out of the total labor force, 84% of Zambians work as subsistence farmers (FAO, 2002).

FOOD SECURITY INDEX Low scores on the Food Security Index (relative to other African countries) and within lowest 50% of countries globally (Global Food Security Index, 2015).

CLIMATE CHANGE Minimal contributor to greenhouse gas emissions (USAID, 2015).

Context Overview

AGRICULTURE IN ZAMBIA

The agricultural sector has a dual structure, wherein large commercial farms co-exist with scattered smallholder agricultural households.

The Zambian agriculture sector comprises crops, livestock and fisheries. The country's staple crop and most cultivated is maize. The livestock sub-sector produces everything derived from cattle, as well as d, chicken, eggs, pigs, hides and skins.

Despite good growth in the agriculture sector overall since 2009, low agricultural productivity and poverty remain stagnant in rural areas.

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 Zambia, to climate change is compounded by strong dependence on rain-fed agriculture and natural resources, high levels of poverty, low levels of human capital, low levels of preparedness for climate events, and poor infrastructure in rural areas.

Temperatures in Sub-Saharan Africa are already close to or beyond thresholds at which further warming reduces (already low) yields (Cline, 2008). Zambia's National Communication to the United Nations Framework Convention on Climate Change (UNFCCC) indicates that from 1960 to 2003 the mean annual temperature has increased by 1.3°C, with a continued upward trend. In the absence of interventions, agricultural yields in Zambia will continue to decline.

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

The country is already experiencing climate-induced hazards, which include drought and dry spells, seasonal and flash floods, and extreme temperatures. Some of these hazards, especially the droughts and floods, have increased in frequency and intensity over the past few decades and have adversely impacted food and water security, water quality, energy, and livelihoods of the people, especially in rural communities.

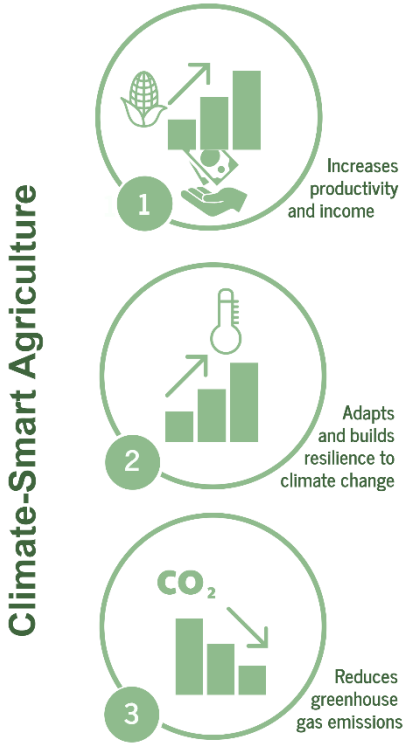
Countries in Southern Africa are also affected by El Niño (warm) and La Niña (cool) events in the tropical Pacific. The most recent El Niño (2014-2016) and La Niña (2016-2017) have impacted on agriculture in Southern Africa, including Botswana (UN News Centre, 2016). Although the El Niño has receded,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

These environmental factors are further complicated by lack of infrastructure, inadequate markets, lack of support services, and limited access to water systems.

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 Paris agreement, Zambia has no obligations to reduce GHG emissions, but 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.

Zambia has submitted its nationally determined contribution (NDC) to the convention and this was ratified in December 2016.

Zambia has stated its intention to reduce overall emissions by 47% by 2030 (with 2010 levels used as the baseline). This emission reduction is conditional and subject to the availability of international support in the form of finance, technology, and capacity building.

Regionally, Zambia 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.

Zambia has a signed CAADP compact, as well as a finalized National Agricultural Investment Plan (NAIP).

NATIONAL POLICY ENVIRONMENT

Zambia developed its NAPA in 2007, and has a draft National Climate Change Policy. Efforts are being made to establish the National Climate Change Development Council for climate change coordination in the country, as stipulated in this draft policy.

The National Designated Authority (NDA) for the Green Climate Fund (GCF) has already been designated and is expected to play a key role of "clearing house or entity" for climate change projects to be funded from GCF in Zambia. The process is ongoing to select a National Implementing Entity (NIE) and establish a National Climate Change Fund (NCCF).

The development of the Seventh National Development Plan is underway and guidelines for mainstreaming climate change into the plan will be developed.

CSA POLICIES

Zambia has several policies whose goal is to improve food security at both household and national levels, and also to conserve scarce agricultural and land resources for the future – this includes the National Agricultural Policy (2012-2030).

There is currently no specific climate-smart agriculture policy or strategy in place; however, Zambia's NDC clearly illustrates that CSA is recognized as an important priority in both mitigation and adaptation. The challenge will be to effectively coordinate broader climate-change actions into current agricultural policies and strategies.

Selection of national policies, plans and strategies in Zambia related to climate change

National Adaptation Programmes of Action (2007)	Identifies priority activities that address Zambia's urgent and immediate needs for adapting to the adverse impacts of climate change.
National Climate Change Response Strategy (2010)	Aims to make the country climate resilient and help fulfill the development priorities as listed under the National Long-Term Vision 2030. The strategy includes mainstreaming climate change concerns into the vulnerable sectors of the economy including land use, water, infrastructure, energy and governance among others.
National Climate Change Policy	Under development.

Existing Climate-Smart Practices

Zambia has identified sustainable agriculture as one of its three core pillars for mitigating climate change and one of 13 priority actions identified for adapting to climate change.

Zambia was one of the three initial pilot countries for the Africa Climate-Smart Agriculture Alliance (ACSAA), a platform, which seeks to foster collaboration between government, research-, and international organizations and has been focusing on the development of national CSA scaling-up plans.

Additionally, Vuna, a regional programme funded by the UK Department for International Development (DfID), works on identifying and scaling up new and existing CSA technologies in the country through research on drought tolerant crops, training of agricultural extension agents on locally appropriate CSA practices and identifying and developing financial services for smallholder investment in CSA.

The FAO project, *"Climate Smart Agriculture: capturing the synergies among mitigation, adaptation and food security",* aims to strengthen the technical, policy, and investment capacities of its three partner countries, including Zambia, at a national level. The partner countries have benefited from the project's capacity-building activities, which include (i) support to Master's and PhD students at leading universities to strengthen linkages between research and policy decision-making, (ii) a CSA training manual for training of extension workers, and (iii) support for the attendance by Ministry of Agriculture staff at the negotiations of the UNFCCC, to increase awareness of climate change issues within Agriculture Ministries, while strengthening the size and competencies of national delegations to UNFCCC sessions.

A selection of CSA practices in Zambia are discussed below.

CONSERVATION AGRICULTURE

Conservation agriculture (CA) and agro-forestry are the most widely promoted CSA practices in Zambia, with various impacts on livelihoods and the environment. Farmers accessing the government-supported Farmer Input Support Program (FISP) are required to practice conservation farming as a prerequisite for access to inputs. Despite the intention to require CA, implementation and enforcement of this requirement remain weak (CIAT, World Bank, 2017).

Current efforts need to be expanded to increase CA practices in crops, livestock, and fisheries. Manure management, integrated soil fertility management (ISFM), pasture and forage management, fodder production, improved livestock housing, and manure application all have potential to be well integrated into Zambia's production systems along with CA (CIAT, World Bank, 2017).

BUCKET OVERHEAD IRRIGATION

This type of irrigation consists of farmers digging wells in selected areas (transitional seepage and upper grassland zones known as *dambo*) and a rope and bucket are used to manually draw water from the well. The bucket is then taken by hand or on the head to the garden site. This is the most common method of irrigation prevalent in the provinces of Zambia where *dambo* gardens are found. The size of plot which can be irrigated depends largely upon its distance from the source, and the time it takes to fill the bucket at the source. This method, however, is done mostly when water is very limited and on very small areas.

USE OF RESIDUAL MOISTURE

Some farmers carefully select the *dambo* patches and cultivate crops utilizing residual moisture. The crops, mostly vegetables, are planted on ridges and irrigated by conventional bucket watering for the first one to two weeks to allow for the establishment of the root system. After this the crops are then left to grow using residual moisture (capillary water). This method is used mostly on the upland *dambos* found in the high rainfall zone of Zambia and becoming increasingly popular in Luapula Province.

FURROW IRRIGATION

In the furrow method water is channeled from a stream or river through a leveled main furrow to the garden site on the *dambo* or riverbank. This main furrow is blocked near the garden site; the water collects and is diverted to a sub-furrow leading to the field. The sub-furrows carry water down or across the slope of the garden to wet the soil and crops grown on ridges between the furrows. In *dambos* of the Southern districts of North-western Province the farmers using furrow irrigation have to irrigate the crop only twice or three times in a week while those using buckets or other smaller containers without a furrow system irrigate almost every day.

Gaps and Challenges in Climate-Smart Agriculture

POLICY GAPS

Zambia has taken several steps to integrate climate change and agriculture into national development planning, as well as to specifically ensure that CSA forms part of the country's national adaptation and mitigation goals and commitments. The challenge will be to ensure that the various policies, strategies and plans are well coordinated across sectors and appropriately integrated into national plans.

RECOMMENDATION: The development of guidelines and approaches to mainstream climate change into National Development Planning processes should receive high priority.

Several international stakeholders have provided financial and technical support to enable Zambia to invest strongly in promoting conservation agriculture, and other CSA approaches. Moving forward it will be important to work towards maximizing coherence and coordination between efforts for the greatest impact.

KNOWLEDGE SHARING, CAPACITY BUILDING, AND EXTENSION

Zambia has identified capacity strengthening and technology transfer as one of its three core programs to enable climate change adaptation. Zambia has thus appropriately identified improved technical and financial capacity of institutions and stakeholders to operationalize current policies on the ground remain key for scaling-up CSA.

RECOMMENDATION: Activities to strengthen capacities – for governments, technical staff and farmers – is a high priority for enabling the implementation of CSA and should be a key area of focus.

In this regard, awareness raising and training of CSA stakeholders from national to local level will be of great importance for the successful design, implementation, and monitoring of CSA programs and projects that help to translate the range of available policies and strategies into actions on the ground.

CSA approaches are highly context-specific, and ongoing research is needed to identify the most appropriate approaches for each of Zambia's agro-ecological zones, and extension staff should be trained to provide farmers with the opportunity to participate in the design and implementation of CSA practices in their immediate context.

RECOMMENDATION: Strengthen research and extension services at the local level to allow context-specific CSA approaches to be identified and implemented in collaboration with local farmers.

INVESTMENTS AND FINANCIAL FLOWS

Zambia's contribution to addressing climate change will be implemented with both domestic and international support. It is estimated that over USD 50 billion is required for both mitigation (USD 35 billion for Domestic efforts with substantial International support) and adaptation (USD 20 billion) actions across the programs up to 2030. Of this, USD 15 billion will be unconditional support provided by the Zambian Government.

Despite the active engagement of foreign actors, significant gaps remain when it comes to funding CSA-related technology development and dissemination (CIAT, World Bank 2017).

In seeking to diversify the funding base, Zambia should consider the Green Climate Fund (GCF) and the Adaptation Fund (AF) both of which the country has not yet accessed. The National Climate Change Fund (NCCF) can play a key role in ensuring the international and national funds are directed appropriately towards CSA activities.

RECOMMENDATION: The implementation and success of CSA projects should be carefully monitored to understand the potential of initiatives to contribute to agricultural transformation and livelihoods, and attract increased investment.

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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