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 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). Tanzania holds great potential for CSA, but this needs to be further explored. Although the country has traditional agricultural practices as well as research-based programmes and techniques that have CSA qualities, CSA promotion requires concerted action from multiple actors to allow for context-specific approaches.

KEY RECOMMENDATIONS

ONE: The implementation and widespread adoption of the recently developed CSA guidelines and the National CSA Program should receive high priority.

TWO: A strong emphasis must be placed on building the capacity of extension workers, producers and other stakeholders in the use of CSA technologies and practices in line with the Tanzanian CSA Guidelines.

THREE: Women, who play a key role in the agriculture sector, need to be provided with knowledge and training opportunities and be actively involved in the planning and implementation of CSA – in line with the Tanzanian CSA Guidelines.

FOUR: Work towards institutional coordination between private and public agriculture and climate-related institutions at national, regional, and international levels to enable increased investment from diverse sources.

FIVE: Implement a coordinated monitoring and evaluation framework to understand the social, economic and environmental impacts of CSA in Tanzania as a mechanism to understand pathways to success and to increase investment in Tanzanian CSA.

POPULATION Total population of 55.5 million of which approximately 70% live in rural areas (Trading Economics, 2017).

ECONOMY Real GDP growth increased to an estimated 7.2% in 2016, from 7% in 2015, with further increases projected for 2017 and 2018. A stable macroeconomic environment with single-digit inflation (averaging 5.6% in 2016) (African Economic Outlook, 2017).

POVERTY More than 45% of the population below the international poverty line (World Bank, 2017a).

AGRICULTURE IN ECONOMY Currently more than 30% of GDP is from agriculture (World Bank, 2017b). Two-thirds of the population is employed in agriculture.

FOOD SECURITY INDEX Low ratings on Food Security Index (relative to African countries); within lowest 50% of countries globally (Food Security Index, 2015).

CLIMATE CHANGE Tanzania’s greenhouse gas emissions contribute negligibly to global emissions (NDC, 2015).
Context Overview

AGRICULTURE IN TANZANIA

The main food crops in Tanzania are maize, sorghum, millet, rice, wheat, beans, cassava, potatoes, and bananas.

Agricultural products also make a large contribution to the country’s foreign exchange earnings. The main cash crops are coffee, sisal, cashew nuts, tea, cotton, and tobacco.

Out of the total meat production, 55% comes from cattle, 21% from sheep and goats, 14% from pigs, and only 10% from chicken.

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 Tanzania, 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), and the mean annual temperature for Tanzania is projected to increase by 1.7°C in North Eastern areas of the country and by 2.5°C in Western parts of the country by 2030 (Government of Tanzania, 2012).

A comparative assessment (FANRPAN, 2017) 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 Tanzania.

Tanzania’s agriculture is highly vulnerable to climate change adverse impacts due to its dependency on rainfall. The adverse impacts of climate change already being experienced in Tanzania include reduced crop yields due to drought and floods, reduced water availability, increased occurrence of crop and livestock pests and diseases among others.

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 East Africa, including Tanzania (IFPRI, 2017). 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 can increase the adaptive capacity of farming communities to long-term climatic trends (FAO, 2010).
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 others have National Adaptation Programmes of Action (NAPA) in place.

**INTERNATIONAL ENVIRONMENT**

As a non-Annex I party to the Paris agreement, the United Republic of Tanzania 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.

Tanzania submitted its intended nationally determined contribution (INDC) to the convention in 2015, but a nationally determined contribution (NDC) has yet to be submitted and ratified. Tanzania’s INDC states the intention to achieve a relative emission reduction of 10–20% by 2030, relative to a business-as-usual scenario.

Regionally, Tanzania 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.

Tanzania has signed its CAADP compact and has developed its National Agricultural Investment Plan (NAIP) – the Tanzania Agricultural and Food Security Investment Plan (TAFSIP).

**NATIONAL POLICY ENVIRONMENT**

Tanzania’s National Development Vision (NDV) 2025 guides economic and social development efforts up to the year 2025. The over-arching nature of the NDV means that it is the main policy document that guides all other programs.

The National Climate Change Strategy (NCCS) of 2012 recognizes that agriculture is the sector most vulnerable to and affected by climate change. The strategy proposes interventions that include CSA approaches such as conservation agriculture.

The Platform for Agricultural Policy Analysis and Coordination (PAPAC) has been established by the Government of Tanzania and its partners to improve the quality of agricultural sector policies and processes by enhancing national capacity for evidence-based agricultural policy planning, implementation, and monitoring.

<table>
<thead>
<tr>
<th>Selection of national policies, plans and strategies in Tanzania related to CSA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tanzanian National Adaptation Plan of Action (NAPA)</td>
</tr>
<tr>
<td>National Climate Change Strategy (NCCS) (2012).</td>
</tr>
<tr>
<td>Platform for Agricultural Policy Analysis and Coordination (PAPAC)</td>
</tr>
</tbody>
</table>
Climate Smart Practices

In 2017 Government in collaboration with development partners and the private sector have launched the National CSA Guidelines. This standard-setting document will address challenges and impacts of climate change on agriculture to ensure food and nutrition security in the country.

The recently developed National CSA Programme (2015 – 2025) aims to accelerate uptake of CSA in the country to increase productivity.

Some examples of CSA practices are described below.

**IRRIGATED CROP PRODUCTION**

Irrigation is meant to reduce vulnerability caused by rain-fed production systems and thus improve food security by preventing crop failure. Currently project plans and requests for funding small-scale irrigation schemes originate at village level but are submitted through the Agricultural Sector Development Program (ASDP) and Livestock Sector Development Program (LSDP). Small-scale old and new irrigation projects at village or catchment level have benefited.

Before the current system, new small-scale irrigation schemes were constructed, and old ones rehabilitated under the River Basin Management and Smallholder Irrigation Improvement Project (RBMSIIMP). The rehabilitation work involved construction of intakes fitted with gates to control water, and water conveyance canals aimed at reducing losses.

**NDIVA**

Ndava is a traditional water storage technology which is believed to have been in existence as early as the 18th century. These overnight storage reservoirs are suitable for use in the mid-slopes of mountainous areas, or where the slope is adequate to enable flow of water by gravity; water should be easily diverted without need for a pump.

These reservoirs reduce the risk of crop failure in Semi-Arid Lands (SAL) by providing supplementary irrigation during dry spells within the rainy season.

**BUNDED BASINS**

The majaluba – a form of bunded fields (i.e. with a low retaining wall built around them) – are widely used in many parts of Tanzania for growing different crops and in different soils (Rwehumbiza et al., 2001).
Gaps and Challenges in Climate-Smart Agriculture

POLICY GAPS

Tanzania has made significant strides in articulating its priorities around climate change, and in plotting out its strategy for CSA as an approach contributing to these broader climate change goals.

The most critical challenge currently is therefore to ensure the consistent and widespread implementation of the CSA guidelines and the CSA National Programme.

RECOMMENDATION: The implementation and widespread adoption of the CSA guidelines and the National CSA Program should receive high priority.

Doing so effectively will require significant coordination and cooperation between stakeholders at all levels. Institutionalizing a coordinating framework to enable this is an important step.

KNOWLEDGE SHARING, CAPACITY BUILDING, AND EXTENSION

Low or non-adoption of recommended CSA practices is one of the major problems currently facing most regions of Tanzania.

RECOMMENDATION: A strong emphasis must thus be placed on building the capacity of extension workers, producers and other stakeholders in the use of existing/new/improved CSA technologies and practices in line with the CSA Guidelines.

Tanzania’s CSA Guidelines very aptly acknowledge the impact of gender on adoption of new technologies and approaches. The integration of gender into CSA also means understanding how gender, and thus its adoption of CSA practices, will evolve together with climate change over time. Gender responsive actions are an essential element of the uptake of CSA practices.

RECOMMENDATION: Women, need to be provided with knowledge and training opportunities and be actively involved in the planning and implementation of CSA – in line with the Tanzanian CSA Guidelines.

INVESTMENTS AND FINANCIAL FLOWS

Financing the activities associated with upscaling and mainstreaming CSA is costly, and currently in Tanzania, most financing of CSA is based on donor funding.

The Government needs to secure funds for climate change in the agriculture sector. Mainstreaming of CSA into national and local level strategic investment is thus an important step.

Development partners should be engaged to give technical and financial support to the agricultural sector to prepare bankable project/program proposals to access the global climate funds such as Green Climate Fund.

Public-private partnerships also have high potential for contributing to the development and uptake of CSA in Tanzania through, for example, innovative insurance schemes and investment in (and testing of) new technologies.

RECOMMENDATION: Work towards institutional coordination between private and public agriculture and climate-related institutions at national, regional, and international levels to enable increased investment from diverse sources.

There is a need for a clear framework to evaluate performance outcomes of CSA initiatives, including technical and managerial aspects of performance, as well as the social, economic and environmental impacts of investments.

RECOMMENDATION: Implement a coordinated monitoring and evaluation framework to understand the social, economic and environmental impacts of investments in Tanzania as a mechanism to understand pathways to success and to increase investment in Tanzanian CSA.
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.
Promoting a Conducive Policy Environment for a Food and Nutrition Secure Africa
References


IFPRI. (2017). El Niño, La Niña, and climate resilience in Tanzania. Available at: https://www.ifpri.org/blog/el-ni%C3%B1o-la-ni%C3%B1a-and-climate-resilience-tanzania


Trading Economics. (2017). Tanzania Indicators. Available at: https://tradingeconomics.com/tanzania/indicators


This policy brief is a product of the 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 work was made possible by financial support from the Norwegian Agency for Development Cooperation (NORAD) and the African Capacity Building Foundation (ACBF).

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 born 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.

Copyright FANRPAN Regional Secretariat

141 Cresswell Road, Weavind Park 0184, Private Bag X2087, Silverton 014, Pretoria, South Africa
Telephone: +27 12 804 2966. Facsimile: +27 12 804 0600. Email: policy@fanrpan.org . Website: www.fanrpan.org