FANRPAN
Food, Agriculture & Natural Resources Policy Analysis Network

POLICY BRIEF 10/2017

CLIMATE-SMART AGRICULTURE IN BOTSWANA

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). Botswana 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: Critically analyze the current National Policy on Agricultural Development to determine alignment with and opportunity for CSA.

TWO: Identify and eliminate perverse incentives that limit CSA uptake among farmers, and implement incentives that reward CSA practices.

THREE: Empower stakeholders in government, NGOs, and extension services to understand, promote, and implement CSA in varying agro-ecological contexts in Botswana.

FOUR: Work towards institutional coordination between private and public agriculture and climate-related institutions at national and international levels to enable increased and diversified investments in CSA priorities in Botswana.

FIVE: Closely monitor the impact and success of CSA projects to understand the potential of initiatives to contribute to agricultural transformation and livelihoods, and attract increased investment.

POPULATION Total population of 2.25 million of which <50% live in rural areas (UN, 2017).

ECONOMY Real GDP growth increased to an estimated 2.9% in 2016, from -0.3% in 2015, with further increases projected for 2017 and 2018. A stable macroeconomic environment with single-digit inflation (averaging 2.8% in 2016) (African Economic Outlook, 2017).

POVERTY < 20% of the population below the international poverty line (World Bank, 2017a).

AGRICULTURE IN ECONOMY Currently less than 5% of GDP is from agriculture (World Bank, 2017b). Agriculture historically played a significant role in the economy, but its contribution to GDP has been gradually decreasing. Statistics Botswana (2014) revealed that almost 90% of the total rural labor force is directly or indirectly involved in agriculture.

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

CLIMATE CHANGE Botswana's greenhouse gas emissions contribute 0.07% of global emissions (USAID, 2015).

Context Overview

AGRICULTURE IN BOTSWANA

Botswana's agriculture sector consists of crops and livestock production, and traditional farming remains the dominant farming system. The principal crops grown are sorghum, maize and millet.

Cattle rearing is the main agricultural activity in Botswana and the beef industry is the only sub-sector of the agriculture sector that has constantly remained a significant contributor to the national Gross Domestic Product (UNDP, 2012)

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 Botswana, 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 Botswana's Communication to the United Nations Framework Convention on Climate Change

(UNFCCC) notes that the country is expected to be 1-3°C warmer by 2050.

In the absence of interventions, agricultural yields in Botswana could fall by as much as 30% by 2050 (World Bank, 2015).

Drought is a frequent occurrence in Botswana, and crop production is mainly rain-fed, making it most vulnerable to climate change. Relatively poor soil quality, coupled with an overreliance on rain for production, has resulted in low productivity of crops in Botswana.

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.

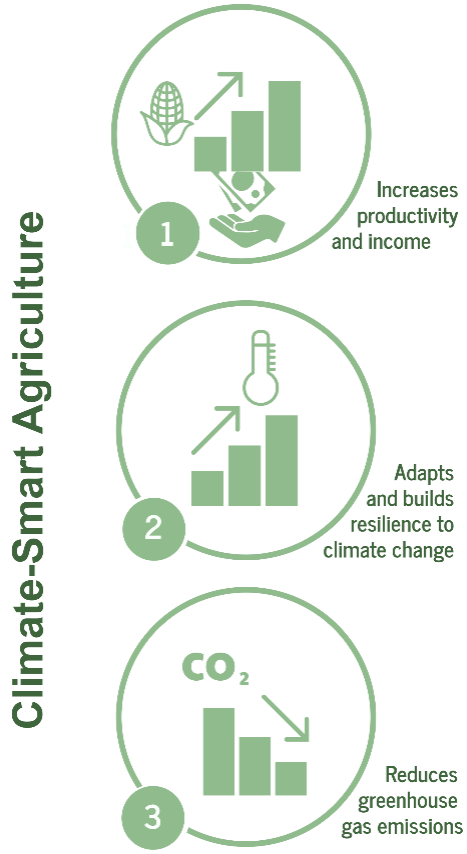
These environmental factors are further complicated by lack of infrastructure, inadequate markets, lack of support services, and limited access to water systems.

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 Botswana (FANRPAN, 2017).

AGRICULTURE & 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).



CSA Related Policy Environment

INTERNATIONAL ENVIRONMENT

As a non-Annex I party to the Paris agreement, Botswana has no obligations to reduce greenhouse gas emissions, but has obligations under the UNFCCC Paris Agreement to report on the anthropogenic sources and sinks of greenhouse gases, and to identify measures to minimize the impacts of global warming and climate change.

Botswana submitted its Nationally Determined Contribution (NDC) to the convention in 2016, and this was ratified in November 2016. The NDC states the intention to achieve an overall emissions reduction of 15% by 2030.

Regionally, Botswana 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. Botswana launched its CAADP implementation process in December 2015 and is working towards finalising its compact.

Eastern and Southern African countries generally have policies on agriculture and climate change, and do recognize the impacts of the latter on the former.

NATIONAL POLICY ENVIRONMENT

Botswana is fully committed to the implementation of global initiatives outlined in the UNFCCC, hence the establishment of the national focal point at the Department of Meteorological Services (DMS), under the Ministry of Environment Wildlife and Tourism, to coordinate and implement climate-change initiatives.

Botswana set up a multi-sectoral National Committee on Climate Change (NCCC) in 1995 to provide, amongst other things, guidance on development areas; to facilitate national research programmes concerning global warming and climate change; and to advise government.

Developing a response to climate change is an objective in several policy documents, including the National Development Plan (NDP).

Botswana is developing a Climate Change Policy and Institutional Framework. The country is also developing a National Adaptation Plan (NAP) and Action Plan which will highlight all the priority areas, including Climate-Smart Agriculture. The National Adaptation Plan development is coordinated by the Ministry of Environment, Wildlife, and Tourism, with support from the National Committee on Climate Change.

CSA POLICIES

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

Botswana has several agricultural policies all nested in the National Policy on Agricultural Development, whose goal is to improve food security at both household and national levels, as well as to conserve scarce agricultural and land resources for the future.

RECOMMENDATION: Critically analyze the current National Policy on Agricultural Development to determine alignment with and opportunity for CSA.

Selection of national policies, plans and strategies in Botswana related to CSA

National Policy on Agricultural Development	Goal is to improve food security at both household and national levels, as well as to conserve scarce agricultural and land resources for the future.
Climate Change Policy and National Action Plan	Pending development and approval, with the purpose to operationalize the climate change policy. Will include a focus on CSA as a priority
National Master Plan for Arable Agriculture and Dairy Development (NAMPAADD)	Focuses on dairy, horticulture and rainfed farming, through production and Training Farms (PTFs). And establishing Agricultural Service Centres (ASCs) at each PTF. These will be operated on a commercial basis and will provide the necessary inputs for the different sectors that the PTFs cover with extension services provided by Ministry of Agriculture staff.

CSA Practices

Botswana 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. Such practices include both agroecological techniques (e.g. minimum tillage and conservation agriculture) and agricultural biotechnology, such as high-yield and/or drought-tolerant crop varieties.

MINIMUM TILLAGE

Minimum tillage is practiced in Pandamatenga dryland crop commercial farming area, where a third of the farmers use this approach. The practice is not a concerted effort by the farmers' association, but rather an individual farmer option.

CONSERVATION AGRICULTURE

Conservation Agriculture (CA) is still at its infancy stage. Several community trusts are being trained by experts from Botswana College of Agriculture; this training is funded by various funding agencies. Although the National Development Plan 10 mentions conservation agriculture as one of the tools for increasing food production in the country, there are no tangible activities on the ground.

IRRIGATION & WATER MANAGEMENT

This is well-grounded in policy instruments; for instance, the Zambezi Integrated Agro-Commercial Development Project and Agricultural Infrastructural Development, through which it will later be cascaded down to farm level.

Apart from these macro irrigation projects, private investors are also engaged in irrigation projects, particularly in the horticultural sector.

NEW CROP VARIETIES

The Department of Agricultural Research is developing crop technologies that are suited to the existing agro-ecological conditions in Botswana. These technologies come in the form of crop varieties that exhibit different characteristics, thus giving farmers an opportunity to choose varieties that are best suited to the prevailing conditions. For example, inbuilt into the crop varieties could be drought tolerance, pest resistance, and high yield. Currently there are sorghum lines in early stages of development with regards to early maturity. At the same time, conversion of released sorghum lines to male sterility for potential hybrid combination is being done. The old varieties that are no longer in production are maintained and conserved for future use.

Selection of national projects and initiatives in Botswana related to CSA

Integrated Support Programme for Arable Agriculture Development (ISPAAD)	Aims to commercialize agriculture through mechanization, facilitates access to farm inputs and credit also improve extension outreach. Programme has several components, including payment minimum tillage.
Livestock Management and Infrastructure Development (LIMID)	Composed of animal husbandry and fodder support, water development, cooperative poultry abattoirs for small-scale poultry producers, small stock, guinea fowl and Tswana chickens. Aims to improve livestock and range resource management and conservation and provides support to resource poor farmers.
Zambezi Integrated agro-commercial development project	Includes two components. The first, development of the main water supply and infrastructural systems on a turnkey basis, and the second is the development of agro-industry and farming. This includes developing on farm water distribution systems, agro-industries and agricultural machinery.
Agricultural Infrastructural Development initiative (AIDI)	Provision and development of infrastructure in key areas, i.e. road, power, telecommunications and water.

Gaps and Challenges in Climate-Smart Agriculture

POLICY GAPS

Climate-smart agriculture is context- and location-specific; therefore, implementation of CSA in Botswana's agricultural system should use existing policy instruments as a launch pad.

Current agricultural and related sectoral policy instrument objectives resonate with a CSA framework to address food security in a sustainable manner that results in adaptation to and mitigation of climate change.

However, there are currently some perverse incentives that undermine a CSA approach. For instance, the Integrated Support Programme for Arable Agriculture Development pays P500.00 per hectare for minimum tillage but P800.00 for conventional tillage, although minimum tillage has the potential to increase yield through soil moisture conservation, while at the same time increasing soil carbon. Thus, a minor alteration to the programme such that minimum tillage receives the same payment as conventional tillage, and this is augmented with demonstration sites in farmers' fields, could be an option for early action on climate-smart agriculture in the country.

RECOMMENDATION: Identify and eliminate perverse incentives that limit CSA uptake among farmers, and implement incentives that reward CSA practices.

KNOWLEDGE SHARING, CAPACITY BUILDING, AND EXTENSION

Although there are few farm- and landscape-level CSA activities in the country, the current agricultural and allied sectors policy instruments provide a launch pad on which CSA could be built.

A crucial precursor for the uptake of CSA in the country is the sensitization and institutionalization of the concept within the ministry of agriculture through leadership awareness of the potentials benefits of CSA, as well as training of extension staff and other stakeholders (farmer organizations, NGOs) on CA frameworks.

RECOMMENDATION: Identify ways to empower stakeholders in government, NGOs, and extension services to understand, promote, and implement CSA in varying agro-ecological contexts in Botswana.

INVESTMENTS AND FINANCIAL FLOWS

The Livestock Management and Infrastructure Development Programme provides an opportunity for climate-smart pastoral farming through its fodder production and water development initiatives.

Long-term investment in farm and rural infrastructure such as roads and water development through the Zambezi Integrated Agro Commercial Development Project and Agricultural Infrastructural Development initiative will further enhance the environment for CSA in the country through irrigation and improved communication.

RECOMMENDATION: Work towards institutional coordination between private and public agriculture and climate-related institutions at national and international level to enable increased and diversified investments in Botswana's identified CSA priorities.

Closely monitor the impact and success of CSA projects 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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