



CLIMATE-SMART AGRICULTURE IN SOUTH AFRICA

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). South Africa (SA) 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 to be designed, implemented, and monitored.

KEY RECOMMENDATIONS

- ONE:** Moving forward, policy efforts should focus on integrating CSA priorities into cross-sectoral mechanisms, and should ensure that plans for CSA are filtered down from the national to the provincial and local level.
- TWO:** Identify appropriate strategies and mechanisms to address landlessness and poverty among smallholder farmers, and thereby also increase the uptake of CSA practices.
- THREE:** It is recommended that an appropriate mechanism for coordinating CSA in South Africa be identified and mandated.
- FOUR:** For maximum impact, CSA should be integrated into educational curricula across institutions, and materials related to CSA provided to extension workers and farmers.
- FIVE:** There is a lack of prioritization of funding to implement CSA approaches in South Africa. Agriculture-related policies should also look at the role of development finance institutions and commercial banks in strengthening climate change adaptation in the agricultural sector.



POPULATION Total population is 56 million, of which 35% live in rural areas (World Bank, 2017a).

ECONOMY Real GDP growth decreased to an estimated -0.5% in 2016, from 0.3% in 2015, with slight increases projected for 2017 and 2018. A stable macroeconomic environment with single-digit inflation – averaging 6.4% in 2016 (African Economic Outlook, 2017).

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

AGRICULTURE IN ECONOMY Currently less than 5% of GDP is from agriculture (World Bank, 2017b). The World Bank estimates that 6% of the total rural labor force is employed in agriculture (Trading Economics, 2017).

FOOD SECURITY INDEX High ratings on the Food Security Index (ranked first relative to other African countries), and within the top 50% of countries globally (Global Food Security, 2017). South Africa could be deemed food secure at national level, but not at household level, as an estimated 20% of South African households have inadequate or severely inadequate food access.

CLIMATE CHANGE South Africa contributes less than 1% to global GHG emissions (USAID, 2015).

Context Overview

SOUTH AFRICAN AGRICULTURE

South Africa has a dual agricultural economy, with both well-developed commercial farming and more subsistence-based production in rural areas.

Agricultural activities range from intensive crop production and mixed farming in winter-rainfall and high-summer-rainfall areas, to cattle farming in the bushveld, and sheep farming in the arid regions. Maize is most widely grown, followed by wheat, sugar cane, and sunflowers. Citrus and deciduous fruits are exported, as are local wines.

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 South Africa, 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).

Climate change projections for South Africa up to 2050 and beyond, under an unmitigated global emissions scenario, predict temperature increases as high as 5 to 8°C in the South African interior, and somewhat less in coastal regions (SANBI, 2013).

A comparative assessment (FANRPAN, 2017) reveals that the onset impacts of climate change are already being perceived. South Africa has observed and is projecting further trends of marked temperature increases, rainfall variation, and rising sea levels, as well as an increased frequency of severe weather events.

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 El Niño has receded, the impact of the higher-than-average temperatures and the lower-than-average rainfall continues to be felt.

South Africa's agriculture sector is facing numerous challenges that need to be resolved simultaneously. Cumulative resource restrictions include depleted soils and over-extracted and polluted water reserves (WWF, 2015).

South Africa's economic growth and development will increasingly be based on trade-offs between the competing sectors (mining, urban, industrial,

energy, and agriculture) for access to constrained resources. This includes increasing competition between these sectors for limited water, land, and energy resources (WWF, 2015).

AGRICULTURE AND 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).



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, South Africa has no obligations to reduce GHG emissions, but has an obligation under the United Nations Framework Convention on Climate Change (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.

South Africa submitted and ratified its Nationally Determined Contribution

(NDC) to the convention in November 2016. South Africa has transitioned its international mitigation commitment from a relative deviation from business-as-usual (BAU) to an absolute peak, plateau, and decline GHG emissions trajectory range. South Africa has pledged to reduce emissions by 42% below BAU by 2025.

NATIONAL POLICY ENVIRONMENT

In the short term (up to 2025), South Africa faces significant rigidity in its economy, and any policy-driven transition to a low-carbon and climate-resilient society must take into account and emphasize its overriding priority to address poverty and inequality.

Institutional arrangements for responding to climate change currently in place in South Africa consist of the National Committee on Climate Change (NCCC) and the Intergovernmental Committee on Climate Change (IGCCC), chaired by the Department of

Environmental Affairs (DEA). The Department of Agriculture, Forestry, and Fisheries (DAFF) is an active member of both committees.

The National Development Plan (NPC, 2012), which provides a '2030 Vision' to guide the country's sustainable development trajectory, is further elaborated in its climate policy (the 2011 National Climate Change Response Policy [NCCRP]), climate-compatible sectoral plans, and its National Sustainable Development Strategy. Good progress has been made in implementing climate-compatible sectoral plans, such as the integrated energy and electricity plans (IEP and IRP), industrial policy action plan (IPAP), and the new growth path (NGP).

South Africa is developing a National Climate Change Adaptation Strategy and Plan (which is currently in draft form) to be integrated into all relevant sector plans, and upon which its UNFCCC National Adaptation Plan (NAP) will be based.

The Integrated Growth and Development Policy (IGDP) serves as the agricultural sector policy, and the Agricultural Policy Action Plan (APAP) as a programmatic response to key policy documents.

CSA POLICIES

A CSA policy has not yet been formulated in South Africa, but the Climate Change Sector Plan (CCSP) for Agriculture, Forestry, and Fisheries has been completed and gazetted for comment (2015). The CSA policy is likely to be completed after the CCSP has been approved.

Existing Climate-Smart Practices

Even though the CSA policy is not yet in place, DAFF and the Agricultural Research Council (ARC) are already engaged in several joint CSA research and outreach activities, and most provinces are involved in activities that are in line with the principles of CSA.

DAFF has also indicated its intention to form a national network for CSA to facilitate the achievement of its stated objective of enhancing cooperation with all stakeholders involved in agriculture, including organized agriculture, the private sector, research and academic institutions, NGOs, CBOs, and others.

Farmer organizations have started to independently adopt and promote CSA principles. These include the Red Meat Producers Organization (RPO), the KwaZulu-Natal (KZN) No Till Club, the Grain Producers Association of South Africa (Grain SA), the South African Wine and Fruit Industries (SAWFI), sugarcane growers, the National African Farmers Union of South Africa (NAFU-SA), the National Wool Growers Association (NWGA), Mohair SA, Dairy SA, and the Ostrich Business Chamber (OBC).

There is thus considerable awareness of CSA in South Africa, and some examples of CSA approaches are discussed below.

CONSERVATION AGRICULTURE

DAFF is actively promoting conservation agriculture (CA) and in 2009 established the National Conservation Agriculture Task Force (NCATF) to drive the promotion of CA.

NEW CROPPING PRACTICES

In South Africa, new cropping practices have been achieved largely through changed water and fertilizer management to maintain yield quality and quantity under prevailing environmental conditions. Other practices include short- and long-rotation crop/pasture production systems, lower seeding, and lower fertilizer rates. This approach is promoted by several actors, including the ARC and several provincial departments.

DIVERSIFICATION OF ON-FARM ACTIVITIES

Diversification of on-farm activities involves enhancement of agro-biodiversity, with greater integration between livestock and cropping systems, and is closely aligned with agro-ecological agriculture in South Africa. Agro-ecology practices include crop rotation, polycultures, agro-forestry systems, cover crops, and animal integration; it is considered to be a long-term adaptation strategy.

Traditional practices have been in use by the majority of smallholder farmers – they grow landrace varieties of various crops and keep local livestock breeds such as Nguni cattle and free-range chickens, which are all preferred because of their tolerances to biotic and abiotic stresses.

The ARC also promotes adoption of an integrated crop-livestock system that effectively mitigates, adapts to, and reduces vulnerabilities to climate variability and climate change.

ADAPTED LIVESTOCK AND PASTURE MANAGEMENT

The adapted livestock and pasture management option includes re-matching stocking rates and timing with pasture production, new varieties and species of forage and livestock, updated fertilizer applications, and using supplementary feeds and concentrates. Adapted livestock breeds, especially the indigenous varieties, are known to be drought and disease tolerant, and have a lighter impact on the environment. Because of frame size differences, more of these can be carried on a given area than the larger-framed exotic breeds.

Fodderbanks are used to alleviate climatic events by managing animals away from vulnerable resources, and new forage and pasture cultivars are cultivated to have higher nutritive quality, resistance to diseases and pests, and tolerance to limiting conditions (soil fertility, drought, competition from weeds, etc.)

Gaps and Challenges in Climate-Smart Agriculture

POLICY GAPS

The South African government supports the development and promotion of CSA and this has been entrenched in several policies. Although there is considerable awareness of CSA in South Africa, the generally accepted understanding of CSA is being questioned by some civil society organizations. DAFF needs to engage all stakeholders through workshops to develop a common and accepted understanding of CSA. This will help in getting buy-in and unreserved support for CSA by stakeholders.

A CSA policy in South Africa is still under development, but good progress has been made in that its precursor has been drafted and gazetted. It will be important for any CSA policy that emerges from the CCSP to address the varying conflicts between the current policy documents (WWF, 2015; 2016).

At the provincial level, national climate change priorities have thus far not been adequately mainstreamed or integrated into specific provincial plans and strategies (with the exception of the Western Cape); the same is true at the local level (WWF, 2016).

Thus, despite a comprehensive policy framework, there is a lack of strategic and comprehensive integrated planning for CSA in South Africa.

RECOMMENDATION: Moving forward, policy efforts should focus on integrating CSA priorities into cross-sectoral mechanisms, and ensure that plans for CSA are filtered down from the national to the provincial and local level.

Two further major impediments to successful implementation of CSA in South Africa are landlessness and

poverty among smallholder farmers. It is extremely important that solutions to these problems are found. Access to land by smallholder farmers is critical for the implementation of CSA, but most smallholder farmers do not have access to land due to the historical legacy of apartheid (WWF, 2015).

RECOMMENDATION: Identify appropriate strategies and mechanisms to address landlessness and poverty among smallholder farmers, and thereby also increase the uptake of CSA practices.

KNOWLEDGE SHARING, CAPACITY BUILDING, AND EXTENSION

CSA practices are knowledge-intensive, and promoting their adoption requires well-designed and innovative knowledge-management systems. Although South Africa already has a strong focus on research-informed practices, there is a need for a more integrated approach to strengthening the translation of knowledge into practice.

RECOMMENDATION: It is recommended that an appropriate mechanism for coordinating CSA in South Africa be identified and mandated to address challenges of coordination.

Extension officers need to be re-trained to equip them with CSA technological packages. This knowledge could be summarized in the form of a handbook for CSA and used by farmers, extension officers, and agriculture training institutions.

In view of the importance of CSA, institutions teaching agriculture at different levels should include CSA in their curricula, and those engaged in

research should be encouraged to prioritize and include CSA in their institutional research strategies.

RECOMMENDATION: For maximum impact, CSA should be integrated into educational curricula across institutions, and materials related to CSA provided to extension workers and farmers.

INVESTMENTS AND FINANCIAL FLOWS

There is a lack of prioritization of funding to implement the proposed climate change adaptation response strategies in South Africa. Given the lack of national financing mechanisms on which municipalities might draw to address climate change locally, it is no surprise that the national configuration and content of the municipal climate adaptation programs are markedly different (WWF, 2016). More efforts are required to integrate climate change adaptation as a systemic element of municipal planning and budgeting, and to offer incentives for uptake and compliance. The current fiscal mechanisms do not provide municipalities with any incentive to integrate effective climate adaptation programs, and the National Treasury should reexamine the fiscal measures and incentives necessary for encouraging local government to drive adaptation and mitigation measures.

RECOMMENDATION: Agriculture-related policies should also look at the role of development finance institutions and commercial banks in strengthening climate change adaptation in the agricultural sector.

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 practices (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 (i) share the draft CSA scoping study report outputs with stakeholders; (ii) validate the outputs from the draft CSA scoping study report; and (iii) solicit policy recommendations from stakeholders. The draft reports were reviewed externally, and recommendations from both the national dialogues and the 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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