



FANRPAN

Food, Agriculture & Natural Resources Policy Analysis Network



POLICY BRIEF 16/2017

CLIMATE-SMART AGRICULTURE IN MALAWI

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). Malawi 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: In the implementation of the National Agricultural Policy and the National Climate Change Management Policy, the targets for CSA should receive priority in planning processes and funding allocations.

TWO: The socio-economic benefits of CSA approaches and the barriers to uptake need to be studied in Malawi, and nuanced knowledge-sharing strategies employed to promote uptake among farmers.

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 Malawi.

FOUR: Identify efficient mechanisms to strengthen local institutions – including extension service and microfinance options – and improve coordination between them.

FIVE: Actions to increase investment in CSA, as identified in the National Climate Change Investment Plan (NCCIP), must take high priority to enable increased investment.



POPULATION Total population of 18 million of which more than 80% live in rural areas (Trading Economics, 2017).

ECONOMY Real GDP growth decreased to an estimated 2.7% in 2016, from 2.9% in 2015, with increases projected for 2017 and 2018. Average annual headline inflation in 2016 stood at 22.6%, (African Economic Outlook, 2017).

POVERTY More than 70% of the population lives below the international poverty line (World Bank, 2017a).

AGRICULTURE IN ECONOMY Agriculture contributes about a third of the country's GDP and 90% of its export revenues (World Bank, 2017b). Two-thirds of the population are employed in agriculture (GoM, 2016).

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 Levels of GHG emissions in Malawi are very low, amounting to 0.04% of total global emissions (USAID, 2015).

Context Overview

AGRICULTURE IN MALAWI

Agriculture in Malawi is comprised of the smallholder and the estate subsectors, with more than 70 percent of agricultural GDP coming from smallholders. These farmers mostly grow food crops, such as maize, rice, cassava, sweet and Irish potatoes, and legumes to meet the subsistence requirements of their households. In addition, smallholder farmers grow cash crops such as tea, tobacco, sugarcane, and coffee.

The estate subsector focuses primarily on the commercial production of high-value cash crops such as tobacco, tea, sugarcane, and macadamia, all of which contribute significantly to the agricultural exports of the country.

Of the total land cultivated, over 90 percent is under rain-fed agriculture, even though there are 407,862 hectares of land in Malawi that could be irrigated (GoM, 2016).

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 Malawi, 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 it is predicted that the temperature will be 1 to 2.2°C warmer by 2050 (Stevens and Madani, 2016).

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 Malawi. The agricultural sector in Malawi is constrained by recurrent drought and high year-to-year rainfall variability, which contributes to the country being ranked as one of the world's twelve countries most vulnerable to the adverse effects of climate change.

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 Malawi (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.

These environmental factors are further complicated by lack of infrastructure,

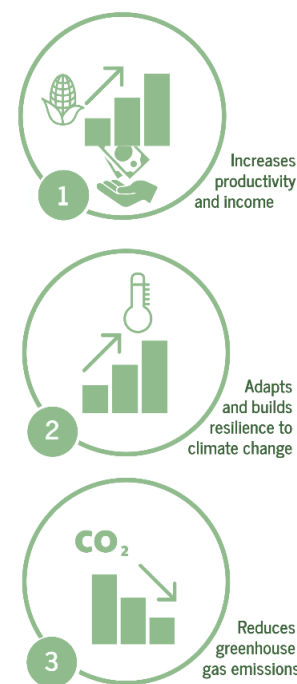
inadequate markets, lack of support services, and limited access to water systems.

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).

Climate-Smart Agriculture



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, Malawi 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.

Malawi has submitted its nationally determined contribution (NDC) to the convention and this was ratified in June 2017. In its NDC, Malawi states its intention to implement a series of policies and measures to reduce GHG emissions by 47% by 2030. Some of these measures are unconditional, while others are conditional and subject to the availability of international support in the form of

finance, technology, and capacity building.

Regionally, Malawi 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.

Malawi submitted its CAADP compact in 2010 and has developed its associated National Agricultural Investment Plan (NAIP).

NATIONAL POLICY ENVIRONMENT

The Government of Malawi has developed the National Climate Change Management Policy, which was approved in 2016, to promote climate change activities in Malawi.

Malawi's National Environmental Action Plan of 1994 and National Environmental Policy, provide policy guidance and direction to manage the environment, natural resources, and climate change.

Strategic documents such as the NAPA (2006), National Environment and Climate Change Communication Strategy (2012), Climate Change Learning Strategy

(2012), and National Climate Change Investment Plan (2014) have mainstreamed climate change adaptation and mitigation activities.

Malawi's National Agricultural Policy (NAP) was developed in 2016, and aims to achieve sustainable agricultural transformation that will result in significant growth of the agricultural sector, expanding incomes for farm households, improved food and nutrition security for all Malawians, and increased agricultural exports.

CSA POLICY ENVIRONMENT

An agriculture NAMA (Nationally Appropriate Mitigation Action) is being developed, but its implementation and monitoring are classified by Malawi as intended policy-based mitigation actions.

The recently approved National Agricultural Policy (NAP) (2016) identifies CSA as a priority area and has identified specific targets for monitoring.

In its NDC, Malawi identified CSA as a specific mitigation measure which it aims to implement extensively by 2040.

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

National Climate Change Management Policy (2016)	Goal is to promote climate change adaptation and mitigation for sustainable livelihoods through measures that increase levels of knowledge and understanding, and improve human well-being and social equity, while pursuing economic development that significantly reduces environmental risks and ecological scarcities.
National Agricultural Policy (2016)	To achieve sustainable agricultural transformation that will result in significant growth of the agricultural sector, expanding incomes for farm households, improved food and nutrition security for all Malawians, and increased agricultural exports.

Existing CSA Practices

There is a strong focus on agroforestry in Malawi, which has high potential for ecological and economic benefits, but to date uptake has been limited. In fact, widespread implementation of conservation agriculture and other climate-resilient agronomic practices are currently classified as intended policy-based adaptation actions.

There are notable successes, however. The largest in Malawi is the Agroforestry Food Security Program, a joint Government-ICRAF endeavor to provide tree seeds, nursing materials, and extension advice for farmers. Such direct assistance has allowed over 180,000 farming households so far to undertake agroforestry practices. A second stage of the program is currently underway (Kaczan, Arslan & Lipper, 2013). An overview of agro-forestry practices is described below.

AGROFORESTRY - 'FERTILIZER TREE SYSTEMS'

Agroforestry is a cost-effective approach which can be used together with or sometimes as a replacement for inorganic fertilizers (Ajayi *et al.*, 2008). Malawi's practice of agroforestry is known as 'fertilizer tree systems'. Certain tree and shrub species are planted sequentially (during the time when a field is left fallow), or at the same time as food crops, i.e. intercropping. This increases nutrient levels in the soil, helps to maintain soil cover, increases soil organic matter by providing mulch, improves water filtration, and gives a secondary source of fodder, fiber, food, and fuel (Garrity *et al.*, 2010). There are several types of agroforestry used in Malawi.

Permanent tree intercropping

Permanent tree intercropping has two forms: tree intercropping systems and parkland systems. Parkland systems involve planting scattered nutrient-fixing species in a field, or protecting existing scattered trees. Tree intercropping involves planting nutrient-fixing trees in closer proximity in rows, with crops planted between them. Tree intercropping systems requires trees to be cut back to reduce light competition with crops, thus providing mulch (Kaczan, Arslan & Lipper, 2013).

Sequential tree fallow

Sequential tree is when soil quality in fields is improved by planting fast-growing leguminous trees or shrubs. These stay in place for 1 to 3 years to fix atmospheric nitrogen, thereby improving soil nitrogen availability and adding organic matter to the soil. Such longer fallows increase the benefits of fallowing – which are dependent on accumulation of nutrients and biomass – thus contributing to larger yield effects but a higher opportunity cost. When the fields are reused for growing food crops, the trees are mulched or burned, thereby returning carbon and nutrients to the soil.

Annual relay intercropping

Annual relay intercropping involves planting fast-growing legumes alongside a crop, with planting taking place a short time after the crop becomes established. Once the crop is harvested, the legumes are left to grow through the off-season; they are plowed into the soil just before the field is re-sown the next year. The major advantage of this technique is that there is no need to fallow, or to wait for an initial period in which trees are established.

Biomass transfer

Biomass transfer consists of the shifting of twig and leaf matter from fertilizer vegetation in one area to be used as mulch on fields. This material is gathered from hedges, natural forests, roadsides, or otherwise unused farmland. Careful, site-specific consideration of nutrient dynamics is required, since this practice is unsustainable when the transfer of nutrients outstrips their fixation at the source (Akinifesi *et al.*, 2008).



Gaps and Challenges in Climate-Smart Agriculture

POLICY GAPS & STRENGTHS

At the national policy level, links are clearly made between agriculture and climate change, but Malawi's unified NAP was only enacted in 2016. Encouragingly, the main operational rationale for the NAP is to improve coherence across the wide range of agricultural sub-sector policies and to better coordinate their implementation.

The NAP has identified investments in CSA and sustainable land and water management as priorities.

Performance targets and indicators for each priority area have already been determined; the primary challenge is thus to ensure consistent and effective implementation and uptake.

The next and necessary step will be to integrate the goals of the NAP, including CSA, into the medium- and long-term planning processes in Malawi.

RECOMMENDATION: In the implementation of the National Agricultural Policy and the National Climate Change Management Policy, the targets for CSA should receive priority in planning processes and funding allocations.

KNOWLEDGE SHARING, CAPACITY BUILDING, AND EXTENSION

One of the barriers to the increased adoption of CSA in Malawi is the relatively weak local institutions and the poor coordination between them.

CSA can and will be extensively adopted if local institutions such as agricultural input and output markets, extension services, and micro-finance are strengthened.

RECOMMENDATION: Identify efficient mechanisms to strengthen local institutions and improve coordination between them.

There is strong evidence for the benefits on annual food crop yields from agroforestry in Malawi, and although it appears to offer income and livelihood benefits, the profitability and socio-economic impacts of agroforestry in Malawi are understudied. Relatively slow adoption rates suggest that more research is needed, especially on the drivers of adoption and to build a strong body of evidence on the socio-economic impact of agroforestry (Kaczan, Arslan & Lipper, 2013).

RECOMMENDATION: The socio-economic benefits of CSA approaches and the barriers to uptake need to be studied in Malawi, and nuanced knowledge-sharing strategies employed to promote uptake among farmers.

A strong evidence base would then need to be linked to a nuanced knowledge-sharing strategy that is cognizant of constraints to adoption and that empowers smallholders, particularly women, to adopt CSA approaches.

Investment in CSA may provide opportunities for increased attention to gender issues in agriculture through participatory approaches.

RECOMMENDATION: 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 Malawi.

INVESTMENTS AND FINANCIAL FLOWS

A National Climate Change Investment Plan (NCCIP), the first of its kind in Africa, was launched in April 2014 and forms the basis for engaging donor funding related to climate change adaptation. It identifies funding requirements for adaptation projects of USD 460m up to 2018.

RECOMMENDATION: Actions to increase investment in CSA, as identified in the National Climate Change Investment Plan (NCCIP), must take high priority to enable 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 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.



References

- African Economic Outlook. (2017). ISBN 978-92-64-27426-6
- Ajayi, O, Akinnifesi, F, Mullila-Mitti, J, Dewolf, J, Matakala, P and Kwesiga, F. 2008. 'Adoption, profitability, impacts and scaling-up of agroforestry technologies in southern African countries', in Batish, D, Kohli, R, Jose, S and Singh, H (eds.) 'Ecological basis of agroforestry', Taylor and Francis Group, Boca Raton, Florida.
- Akinnifesi, F, Chirwa, P, Ajayi, O, Sileshi, G, Matakala, P, Kwesiga, F, Harawa H and Makumba, W (2008) 'Contributions of agroforestry research to livelihood of smallholder farmers in southern Africa: 1. Taking stock of the adaptation, adoption and impact of fertilizer tree options', *Agricultural Journal*, 3: 58-75.
- Cline, W. (2008). 'Global Warming and Agriculture'. *Finance and Development* 45(1). <http://www.imf.org/external/pubs/ft/fandd/2008/03/cline.htm>.
- FANRPAN. (2017). *Policies and practices for climate-smart agriculture in sub-Saharan Africa*.
- Food and Agriculture Organization of the United Nations [FAO]. (2010). "Climate-Smart" Agriculture: Policies, Practices and Financing for Food Security, Adaptation and Mitigation. Rome, FAO.
- Garrity, D, Akinnifesi, F, Ajayi, O, Weldesemayat, S, Mowo, J, Kalinganire, A, Larwanou, M. and Bayala, J (2010) 'Evergreen Agriculture: a robust approach to sustainable food security in Africa', *Food Security*, 2:197–214.
- Global Food Security Index. (2015). *Rankings and Trends*. <http://foodsecurityindex.eiu.com/Index>
- Government of Malawi. (2016). *National Agricultural Policy*. Available at: https://reliefweb.int/sites/reliefweb.int/files/resources/NAP_Final_Signed.pdf
- Intergovernmental Panel on Climate Change [IPCC]. (2014). *Climate Change 2014: Impacts, Adaptation and Vulnerability*. IPCC WGII AR5 Summary for policy-makers. http://ipcc-wg2.gov/AR5/images/uploads/IPCC_WG2AR5_SPM_Approved.pdf
- Kaczan D, Arslan A, Lipper L (2013) Climate-smart agriculture? A review of current practice of agroforestry and conservation agriculture in Malawi and Zambia ESA working paper No. 13-07, Rome, 60 pp
- Nationally Determined Contribution, Malawi. (2016). <http://www4.unfccc.int/ndcregistry/PublishedDocuments/Malawi%20First/MALAWI%20INDC%20SUBMITTED%20TO%20UNFCCC%20REV.pdf>
- Stevens, T. and Madani, M. (2016). 'Future climate impacts on maize farming and food security in Malawi'. *Scientific Reports* 6, Article number: 36241. doi:10.1038/srep36241
- Trading Economics. (2017). *Rural Population Malawi*. Available at: <https://tradingeconomics.com/malawi/rural-population-percent-of-total-population-wb-data.html>
- UN News Centre. (2016). *El Niño passed peak, but UN weather agency warns 'not to lower guard' as impacts continue*. Available at http://www.un.org/apps/news/story.asp?NewsID=53266#.WgFojFtL_SE
- World Bank. (2008). *The Agenda for Agriculture Based Countries of Sub-Saharan Africa. World Development Report, Agriculture for Development*. Washington D.C., World Bank.
- World Bank. (2017a). *World Development Indicators: Poverty rates at international poverty lines*. Available online at: <http://wdi.worldbank.org/table/1.2>
- World Bank. (2017b). *Agriculture, value added (% of GDP)*. Available online at: <https://data.worldbank.org/indicator/NV.AGR.TOTL.ZS?end=2016&start=2016&view=bar>
- World Food Program (WFP). 2010. 'Malawi: Overview'. www.wfp.org/countries/malawi/overview

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 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.

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