



Food Agriculture, Natural Resources Policy Analysis Network

FANRPAN



**A COMPREHENSIVE SCOPING AND ASSESSMENT
STUDY OF CLIMATE SMART AGRICULTURE POLICIES IN
MALAWI**

Report

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BY

DEPARTMENT OF AGRIBUSINESS MANAGEMENT

**LILONGWE UNIVERSITY OF AGRICULTURE AND NATURAL
RESOURCES, BUNDA CAMPUS**



Food, Agriculture and Natural Resources Policy Analysis Network (FANRPAN)
Physical address: 141 Cresswell Road, Weavind Park 0184, Pretoria, South Africa
Postal address: Private Bag X2087, Silverton 0127, Pretoria, South Africa
Tel: +27 (0) 12 804 2966 or +27 (0) 12 804 3186
Fax: +27 (0) 12 804 0600
Email: policy@fanrpan.org
URL: www.fanrpan.org

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We also thank all the organisations represented at the Stakeholder National Dialogue in Malawi for their suggestions. Lastly, we would like to thank FANRPAN for providing financial resources for this scoping study.

2. LIST OF ACRONYMS

ASWAp	Agriculture Sector Wide Approach
CAADP	Comprehensive African Agriculture Development Programme
CSA	Climate Smart Agriculture
FAO	Food and Agriculture Organisation
FANRPAN	Food Agriculture and Natural Resources Policy Analysis Network
GHG	Greenhouse Gases
MGD	Millennium Development Goals
NASFAM	National Smallholder Farmers Association of Malawi
IWRM	Integrated Water Resources Management (IWRM)
NEPAD	New Partnership for Africa's Development
NWRA	National Water Resources Authority
UNFCCC	UN Framework Convention on Climate Change

4. EXECUTIVE SUMMARY

This report details the results of a comprehensive scoping and assessment study on Climate Smart Agriculture (CSA) in Malawi. The study was commissioned by the Food Agriculture and Natural Resources Policy Analysis Network (FANRPAN). FANRPAN is implementing a programme that comprises a number of climate-smart agriculture (CSA) projects. The projects seek to (a) generate CSA research-based evidence and address knowledge gaps; (b) strengthen CSA institutional capacity and support capacity building of young professional on CSA and food security research; (c) support advocacy campaigns for the development and implementation of responsive CSA policies; and (d) support the uptake of CSA best practices.

The overall objective of the FANRPAN CSA policy programme is to increase agricultural productivity and strengthen the resilience of vulnerable smallholder farmers to the impact of climate change. The FANRPAN CSA programme currently covers 16 countries: Angola, Botswana, Democratic Republic of the Congo, Kenya, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, South Africa, Swaziland, Tanzania, Uganda, Zambia and Zimbabwe.

It was against this background that the comprehensive scoping and assessment study was commissioned. The objectives of the study were to:

1. Conduct comprehensive reviews of the existing CSA policy context in each study country;
2. Analyse gaps in the existing policy frameworks;
3. Identify relevant policy recommendations;
4. Develop and share policy recommendations (briefs) at national and regional levels.

Two study approaches were used in the study, including review of relevant documents and key-informant interviews.

Many issues were analysed in the study, such as the concept of climate-smart agriculture, the key stakeholders dealing with the issues of CSA, the specific technologies that various stakeholders are implementing, policies, gender issues etc. These analyses and the review of various relevant documents have led the study team to draw a number of lessons as outlined in the section below:

1. Agroforestry and Conservation Agriculture are the main CSA technologies being promoted and implemented in Malawi
2. Many policies in Malawi do recognise the negative effects of climate change, though specific issues (*such as recommended technologies*) of climate-smart agriculture are not implicitly indicated.
3. Many stakeholders such as... are involved in the promotion of CSA in Malawi and they work in collaboration with the Government of Malawi, especially the Ministry of Agriculture and Food Security.
4. Farmers through farmers organisations like NASFAM have embraced CSA technologies
5. Research into the socio-economic impact of CSA is still limited in Malawi. There is therefore a lot of research scope that individual researchers and institutions can undertake.
6. Women are highly involved in CSA as focus crops (soybeans and ground nuts) are less labour intensive; hence suitable for them.

7. There are no clear guidelines to govern the implementation of CSA in Malawi

The aforementioned lessons present both the successes and existing challenges in the program areas. Further scrutiny into the challenges has elicited some important recommendations as follows:

1. Bringing together a group of sector professionals to operate as a "Think Tank" to advance a common vision of the issues related to scaling-up CSA programmes;
2. Initiating specific "projects" (e.g. action research, workshops) involving a wider group of stakeholders to improve our understanding of the scaling up;
3. Engaging in advocacy activities to support, promote scaling up community management. Advocacy will be principally aimed at: a) policy makers and b) the wider community of sector professionals.
4. The Malawian government and all relevant stakeholders should use CSA to adapt to the vagaries of climate change, but clearly women's participation must be central to any of these efforts.
5. Malawian policies related to agriculture should be reviewed to include specific recommendations and strategies how CSA will be implemented.
6. More research is required to quantify the socio-economic benefits of CSA in Malawi. Evidence based approach in the promotion of CSA will encourage and motivate various stakeholders (including farmers) to take action in favour of CSA.
7. Land tenure regulations at individual and community level are a critical success factor to the adoption of CSA, providing incentive for investment in farm resources. In this way, these regulations should be formulated in such a way as to provide security in land ownership so that rural people can be motivated to invest in CSA.
8. CSA can and will be extensively adopted if local institutions are strengthened, such as agricultural input and output markets, extension services and micro-finance.

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1. Introduction

This report details the results of a comprehensive scoping and assessment study on Climate-Smart Agriculture (CSA) in Malawi. The Food Agriculture and Natural Resources Policy Analysis Network (FANRPAN) is implementing a programme that comprises a number of climate-smart agriculture (CSA) projects. The projects seek to (a) generate CSA research-based evidence and address knowledge gaps; (b) strengthen CSA institutional capacity and support capacity building of young professional on CSA and food security research; (c) support advocacy campaigns for the development and implementation of responsive CSA policies; and (d) support the uptake of CSA best practices.

The overall objective of the FANRPAN CSA policy programme is to increase agricultural productivity and strengthen the resilience of vulnerable smallholder farmers to the impact of climate change. Specifically, under this programme FANRPAN sought to

- a) Conduct comprehensive reviews of the existing CSA policy context;
- b) Analyse gaps in the existing policy frameworks;
- c) Identify relevant policy recommendations;
- d) Develop and share policy recommendations (briefs) at national and regional levels.

The FANRPAN CSA programme currently covers 16 countries: Angola, Botswana, Democratic Republic of the Congo, Kenya, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, South Africa, Swaziland, Tanzania, Uganda, Zambia and Zimbabwe.

1.1. Country overview of land, agriculture, and food security issues

Malawi is a land-locked country located in south-east Africa lying along a sector of the East African Rift Valley between latitudes 9° and 18°S, and longitudes 33° and 36°E. The country's territorial area is slightly over 118,000 square kilometres, of which 61% is arable land, 20% is taken up by the lakes and the remaining 19% is covered by forest reserves, human settlement and public infrastructure.

The agriculture sector is the backbone of Malawi's economy. Agriculture generates over a third of the country's gross domestic product (GDP) and 90 percent of its export revenues (CIA 2012). While tobacco, sugar, coffee and tea are Malawi's primary cash crops, corn is the primary staple of domestic consumption. More than 90% of the people, mainly comprising resource-poor rural communities, are predominantly engaged in subsistence rain-fed agriculture, 60% of whom are food insecure on a year-round-basis. The food security situation that has been exacerbated by increasing poverty and population pressures on a limited land resource base, low economic productivity of the land, labour and capital, and extreme weather events due to climate variability, and low capacity to adapt to the adverse impacts of climate change. More than 40 percent of the smallholder farms cultivate fewer than 0.5 hectares on average, much of which is over-cultivated and under corn production (WFP 2010). Agricultural expansion to marginal lands and deforestation, inadequate knowledge and skills in the productive use and management of land and natural resources, inadequate access to land and credit, poor health services, and gender inequalities have led to female- and children-headed households, the elderly and women to be the most vulnerable.

1.2. Scope and Methodology

The CSA scoping studies addressed five key issues. First the studies addressed what is known on CSA and what gaps exist based on national, regional and international CSA literature. Second the studies looked at the current CSA related policies of the country (including environmental policies, water policies, agricultural policies, land policies and development policies). Third the studies identified current on-going CSA development and research programme initiatives in the study country. Fourth national CSA institutional arrangements and how different stakeholders are involved were identified. Lastly the performance of current CSA policies and their major gaps were analysed.

To cover the five key issues outlined above, the study employed two major methods of data collection: (a) a review of relevant documents and (b) key informant interviews / consultations.

A number of relevant documents were reviewed in the course of this study. The documents included research documents, national policies (especially Malawi Government Policies) and project documents sourced from various organisations. The organisations that were contacted are listed in the Appendix 1 of this report. Fifteen key-informant interviews were also conducted. The key informants included some researchers skilled in CSA, Government officials, members of the Civil Societies and NGOs who have been involved in CSA in Malawi.

Furthermore, a national dialogue on CSA was organised by FANRPAN on 26 February, 2014 in Lilongwe City where the preliminary findings of this report were presented. The workshop attracted the participation several organisations involved in CSA. The delegates provided their comments to the report and provided more insights to the study team which helped to improve the report. Comments were also solicited from anonymous reviewers identified by FANRPAN and all these comments were considered in the revision of the report.

2. Farming systems and CSA technologies and practices

2.1 Background on climate-smart agriculture

Agriculture in developing countries must undergo significant transformation if it is to meet the growing and interconnected challenges of food insecurity and climate change (FAO, 2010). Recent projections suggest global population will grow from a current 7 billion to more than 9 billion people in 2050 (UNESCO, 2012). Given both food consumption trends and population growth, it is expected that a 60 percent increase in global agricultural production will be required by 2050 (FAO 2012a).

Although crop output has been increasing in Sub-Saharan Africa, this has been largely driven by an expansion in the area of cultivated land rather than by productivity gains. Average cereal yields in the region have remained below 1 tonne per hectare for the past 50 years, compared to average yields of 2.5 tonnes per hectare in South Asia and 4.5 tonnes per hectare in East Asia (FAOSTAT, 2012).

The challenge of rapidly boosting productivity is compounded by the current and expected impacts of climate change. Changes to precipitation and temperature, especially in marginal areas, are expected to reduce productivity and make production more erratic (Cline, 2008; Lobell *et al.* 2008; Boko, *et al.* 2007). The SSA countries in particular are most at risk: resources for adaptation are scarce, temperatures are already close to or beyond thresholds at which further warming reduces yields, and agriculture forms a larger share of national economies than elsewhere in the world (Cline, 2008).

Consequently, there is a need to simultaneously improve agricultural productivity and reduce yield variability over time under adverse climatic conditions. A proposed means to achieve this is increased adoption of a 'climate-smart agriculture' (CSA) approach (FAO, 2010).

The FAO (2013) defines Climate-smart Agriculture as agriculture that sustainably increases productivity, resilience (adaptation), reduces/removes greenhouse gases (mitigation) from the atmosphere, and helps achieve of national food security and development goals. Climate-smart promotes agricultural best practices, particularly integrated crop management, conservation agriculture, intercropping, improved seeds and fertilizer management practices, as well as supporting increased investment in agricultural research. Climate-smart agriculture encourages the use of all available and applicable climate change solutions in a pragmatic and impact-focused manner.

Climate-smart Agriculture contributes to the achievement of sustainable development goals. It integrates the three dimensions of sustainable development (economic, social and environmental) by jointly addressing food security and climate challenges. It is composed of three main pillars:

1. sustainably increasing agricultural productivity and incomes;
2. adapting and building resilience to climate change;
3. reducing and/or removing greenhouse gases emissions, where possible.

The CSA is therefore an approach to developing the technical, policy and investment conditions to achieve sustainable agricultural development for food security under climate change. The magnitude, immediacy and broad scope of the effects of climate change on agricultural systems create a compelling need to ensure comprehensive integration of these effects into national agricultural planning, investments and programs. The CSA approach is therefore designed to identify and operationalize sustainable agricultural development within the explicit parameters of climate change.

Kaczan *et al.* (2013) reports that the agricultural technologies and practices that constitute a CSA approach are, in most cases, not new, and largely coincide with those of sustainable agriculture and sustainable intensification. However, under a CSA approach, these are evaluated for their capacity to generate increases in productivity, resilience and mitigation for specific locations, given the expected impacts of climate change.

2.2 Climate-Smart Agriculture Practices and Technologies

The Malawi Government has long recognised the importance of Climate-Smart Agriculture in the socio-economic development of the country. The Government has therefore been advising farmers to embrace sustainable agriculture that mitigates the impacts of climate change. The Government in collaboration with other stakeholders has been promoting employment of Soil and Water Conservation measures to preserve soil and water in Agriculture; conservation agriculture (minimum tillage, ground cover, reduced use of herbicides etc.), legume intercropping, crop rotation, use of improved seed, agroforestry and tree planting; use of organic fertilizers and use of herbicides (just to mention a few).

The major technologies that have been used in Malawi are Conservation Agriculture (CA) and agroforestry. According to FAO (2011), CA is based on the integrated management of soil, water and biological resources, and external inputs. It attempts to achieve 'resource-efficient' crop production by utilizing three farming principles: (1) *minimum soil disturbance*, (2) *organic soil cover* and (3) *diversified crop rotations*. In focusing on three specific farming practices, the CA concept is more limited in scope than CSA, which is defined less by specific practices and more by a set of outcomes (e.g. food security, adaptation and mitigation).

Agroforestry may represent a cost effective and sustainable complement, or in some cases a substitute, to the use of inorganic fertilizer, especially if fertilizer costs rise in the future (Ajayi, *et al.* 2008). Agroforestry as practiced in Malawi is termed 'fertilizer tree systems'. Selected tree and shrub species such as *Faidherbia albida*, *Sesbania sesban*, ***Gliricidia sepium*** and ***Tephrosia vogelii*** are planted either sequentially (during fallow) or simultaneously (intercropped) with an annual food crop. Doing so helps maintain soil cover, improves nutrient levels, increases soil organic matter (via the provision of mulch), improves water filtration, and provides a secondary source of food, fodder, fibre and fuel (Garrity, *et al.* 2010). Leguminous agroforestry species such as *Sesbania sesban*, *Tephrosia vogelii* and *Cajanus cajan* (pigeonpea) are generally used due to their ability to fix atmospheric nitrogen in the soil in a form available to plants. In addition to offering potential food security benefits, agroforestry goes some way towards countering deforestation, estimated in Malawi to occur at a rate of 1.0 to 2.6 percent annually (1990 – 2000 data, FAO, 2005).

Quinion *et al.* (2010) interviewed adopters of agroforestry technology in Malawi to evaluate socio-economic impacts. Their sample of 131 farmers in two study sites, Kasungu and Machinga, was limited by the lack of randomization or a control group. However, they drew some conclusions regarding the benefits of agroforestry. Incomes were diversified due to opportunities to harvest wood for construction materials and firewood, in addition to improved yields. According to Jack and Dan (2012), intercropping

of maize with legumes such as pigeon peas, cowpeas, beans, groundnuts and other crops such as pumpkins, cassava, and sweet potatoes has made farmers to realise yields of up to 1215 kg maize and 545kg of soya / ha. When intercropped with ground nuts with maize yields up to 5330kg per ha and 1203 kg per ha have been realised. Agroforestry has helped farmers to increase yields by 280% in the zone under canopy of *Faidherbia* trees.

Agroforestry and CA are climate smart because of the fact that they contribute to increasing food security and they raise climate adaptation and mitigation in a sustainable way (Ouya, 2013)ⁱ. CSA offers triple wins for food security, adaptation and mitigation. As one of the climate smart agriculture approaches, integrating trees into the agricultural systems (cropping, pastures, fences or home gardens) agroforestry has already proven to be an effective strategy to protect arid areas against land degradation and reduction of biomass. CA and Agroforestry are therefore in line with Malawi's national food security goals.

2.3 CSA Programmes and Projects

There is a lot of collaboration among various stakeholders in an effort to identify effective ways of responding to the negative effects of climate change in Malawi. This section samples out some of these activities.

A workshop, organized by Price Waterhouse Coopers LLP and sponsored by the British Government was held in Lilongwe, Malawi on the 26th October 2012. The workshop brought together over 40 stakeholders from the climate, development and agricultural communities and included representatives from the Ministry of Environment and Climate Change, donor governments, multilateral institutions, research institutions, civil society, NGOs and the private sector. The workshop was structured to achieve three aims: (a) understand the opportunities and challenges of measuring mitigation benefits of CSA in Malawi; (b) explore how tools such as SHAMBA¹ could be applied to monitor smallholder mitigation benefits; (c) understand how government, NGOs, research institutions, and the private sector can work together to develop CSA project idea plans.

Participants heard firsthand the experiences of practitioners working with smallholders in adoption of climate-smart projects and programmes in Malawi. These included representatives from the Concern

¹ *The Small -Holder Agriculture Monitoring and Baseline Assessment (SHAMBA) carbon accounting methodology, tool.*

Universal (an NGO), ICRAF Malawi, and Bio Energy Resources Limited (BERL). This provided a basis for group discussions exploring key challenges and potential solutions related to measuring the mitigation benefits of CSA.

Another event was a workshop that was organized by FAO and the Malawi Government (August, 2013). The Food and Agriculture Organization (FAO) of the UN in partnership with the Government of Malawi through its Ministry of Agriculture and Food Security (MoAFS) and with financial support from the European Commission, is implementing the project “***Climate-Smart Agriculture: capturing the synergies among mitigation, adaptation and food security***” . The project intends to contribute towards the achievement of the Millennium Development Goals numbers 1 and 7, which focus on Eradicating Extreme Poverty and Hunger and ensuring environmental sustainability, as well as Article 2 of the UNFCCC².

In line with the objectives of the project, a policy dialogue workshop was organized between MoAFS and MoECCM and other stakeholders to discuss how linkages between climate change and agriculture might be captured in a harmonized way in agricultural and climate change policies. The national agricultural policy will seek to mainstream climate change, while the national climate change policy addresses climate change as a cross-cutting issue, with a section of the policy devoted agriculture. The workshop was attended by over 24 participants from the two ministries, civil society organizations (CSOs) and academia.

During the policy dialogue participants considered agriculture in the draft National Climate Change Policy (NCCP) and climate change in the Agriculture Sector Wide approach (ASWAp) and used these to consider elements and design features for a National Agricultural Policy (NAP), currently under preparation by MoAFS.

2.4 Past and Present CSA

A number of stakeholders collaborate with the Malawi Government to counter the negative effects of climate change. The various stakeholders and their activities related to CSA are in Appendix 2.

² Article 2 specifies examples of dangerous climate changes that have been proposed by the UN that suggest limits on global warming ranging from 1 to 4oC and on concentrations ranging from 450 to 700ppm CO₂

As can be seen from Appendix 1 many stakeholders' activities are involved in CSA in Malawi. The stakeholders include Government, NGOs, Farmers Organisations and Civil Society organisations. An interview with Mr Wycliffe Kumwenda, the Programme Development Manager for Conservation Agriculture at NASFAM, revealed that NASFAM, for example, undertakes the following activities:

- Conservation Agriculture
- Conservation agriculture with trees implemented together with ICRAF
- Legume seed program as legumes help fix nitrogen in the soils
- Afforestation programme with funding from NORAD. According to Mr Kumwenda, two million trees are planted every year and have so far planted 18 million trees through the program
- Promotion of energy saver stoves. This reduces cutting down of trees as it requires less firewood

The success of the activities was attributed to the fact that farmers were given adequate information about the benefits of CSA and it was therefore easy for them to make decisions about adoption. In addition, farmers already had the basic understanding about the importance of crop rotation and they knew that energy saver stoves really worked and helped to reduce deforestation.

2.5 Constraints in Implementing CSA in Malawi

2.5.1. Land Pressure

The Malawi Government (2002a) estimates that 25% of the smallholder farmers cultivate less than 0.5 hectares; 30% between 0.5 and 1.0 hectare; 31% between 1.0 and 2.0 hectares; and 14% cultivate more than 2.0 hectares on customary land. Customary land which is under the traditional authority administration has come under pressure through subdivision among family members with increases in the population, with the average household land holding declining from 1.5 hectares in 1969 to 0.80 hectares in 2000 (Malawi Government, 2002a). A study by Bosworth, (1998) found that the frontiers of land available for allocation from the traditional chiefs have declined and most land is inherited from parents. It was estimated further that about 3 percent of households (about 75,000 households) were landless by 1998.

This increase in land pressure has also meant that many smallholder farms are reducing or foregoing crop rotation; continuous cultivation is the most predominant cropping system characterized by low yields, with the majority of farmers growing (indigenous/traditional) varieties of maize and other crops without proper management practices and external inputs. Since the removal of the input subsidies following the country's adoption of the Structural Adjustment Program's (SAP) policy reforms in the early 1980s (World Bank, 2003), the real prices of inorganic inputs have increased much faster than output prices, resulting in reduced value/cost ratios, especially among smallholder farmers (Chirwa, 2004). Consequently, less than 25% of the smallholder farmers apply recommended levels of inputs. As a result, Malawi experiences high rates of nutrient depletion, with over 100 kg of nitrogen, phosphorous

and potash (NPK) per ha per year. This has placed Malawi as one of the countries in Sub-Saharan Africa where excessive negative nutrient balances are experienced, implying that not enough nutrients are being applied to the soils (Henao and Baanante 1999). Adoption of organic fertility management practices is constrained by high labour intensity, bulkiness, lack of vegetative planting material in markets, low capacity of extension services to advise farmers on sustainable land management and lack of well-adapted organic soil fertility technologies.

2.5.2 Conventional land preparation practices

Conventional land preparation practices in Malawi are those where crops are planted on ridges that are remade every season (Mloza-Banda, & Materechera, 1999). The ridges are constructed by hand using a broad bladed hoe, and, in the following season, the ridge is split and remade in the previous furrow. It is known that this practice dates back to the 1930s during the colonial era and was aimed as a primary strategy for erosion control where farmers were forced to align the ridges along the contour (Douglas *et al.*, 1999). However, cultivation using the hoe to the same depth annually has resulted in the formation of a compacted horizon immediately below the crop ridge. The hard pan prevents infiltration leading to ponding of water that accumulates, breaking ridges and running off with soil. Often, farmers have difficulties in constructing properly aligned contour ridges and do not maintain ridges effectively (Mohamoud and Canfield, 1998). On areas with low infiltration rate soils and steep slopes, water temporarily accumulated behind ridges overtops ridges often causing destruction of ridges and formation of rills and gullies. Bishop (1990) stated that the erosion of topsoil and the exhaustion of soil fertility under continuous cultivation are the most serious forms of resource degradation occurring on farm land in Malawi.

2.5.3 Scarcity of Resources

There is a shortage of appropriate hoes (e.g.) chaka³ hoes, jab planter and other support implements. For example, some CA stakeholders promote the use of the standard hand hoe for constructing planting basins. FAO, CRS, TLC and Concern Universal have provided packages of herbicides in some communities. Farmers have been lamenting over the price and scarcity of the herbicides on the local markets (Sosola *et al.* (undated).

2.5.4. Lack of clear guidelines for a specific CSA practices

Malawi has no clear guidelines for promoting some CSA practices as regards to suitability to agro-ecological zone. For example, CA is not a blueprint technology to be promoted as a “one-size-fits-all” approach. For example, under Evergreen Agriculture project of ICRAF, farmers used both old ridge approach and planting basins depending on the topography and dryness of the areas. The dimensions of the planting basins and the spacing between the basins and rows are not uniform amongst CA

³If the soil is hard, the chaka hoe is recommended as ordinary weeding hoes will break and are not suited to digging. The Chaka hoe has an extra strong and long blade.

stakeholders. One option is 15cm, 30cm and 20 cm for width, length and depth, respectively and the spacing of 90cm and 70cm between the row and planting basins, respectively (CFU, 2007). Others promote 45cm and 55cm whereas others 30cm by 30cm basins for width and length, respectively. FIDP and Government of Malawi promoted that the basins should be staggered to capture water more efficiently as opposed to regular patterned basins.

2.5.5 Lack of adequate financing

Increased uptake of CSA will require training, tools and seeds which need financing. Climate mitigation finance represents a new and additional opportunity to help pay for these. However all sources of finance require measurement of the mitigation benefits (although to different degrees of accuracy). The inability of projects to cost effectively measure these benefits presents a key barrier preventing them from scaling up.

2.5.6 Summary of Opportunities and Constraints

As has been pointed out in the preceding sections of the report, CA and Agro forestry have been the major CSA technologies that have been promoted in Malawi. A major benefit of CA is that it can reduce and mitigate the effects of greenhouse gases (GHGs), the main contributor to climate change. For example, [low-tillage farming](#) emits far less GHGs than tractor ploughing. There is also evidence that CA can help [store carbon dioxide](#) within soil, thereby reducing the amount of GHGs in the atmosphere. Organic fertilizer also helps protect soil from the elements, making it easier for farmers to adapt to climactic changes. There is therefore lots of opportunities for Malawi farmers to practice CSA since these technologies are not as expensive as total reliance on inorganic fertilizers. Smallholder farmers in Malawi can easily adopt low tillage farming and the emission of GHGs will be greatly minimized. Agro forestry on the other hand improves soil fertility and many famers already know the benefits of using fertilizer trees. In this way, promotion of CSA will be relatively easy.

CA and Agroforestry have also presented farmers with a number of challenges. For example, EPIC's preliminary findings show that financial constraints have proved difficult for farmers in Malawi and Zambia to fully adopt CA without threatening food security. For example, many farmers that use crop remnants for animal feed cannot afford to use them for soil cover (Arrington, 2013). In addition, farmers need proper seedlings for them to be engaged in agroforestry. Seedlings for some fertilizer tree species are not easily available to the farmers.

3. CSA Policy framework in Malawi

3.1 Background Context

The Government of Malawi emphasises and supports the need to conserve the limited resources of land, soil, water and nutrients through sector, national and international level policy frameworks (Tchale *et al.*, 2001). At *sector level*, since 2004, government has provided agricultural subsidy in form of

improved seed and fertiliser which has enabled many smallholder farmers to access farm inputs⁴. In addition, in the public works sector, there has long-term commitment towards cash-for-work, asset-for-work or input-for-work programmes⁵ (MASAF, 1998). These policies have been intended to improve productivity, reduce soil nutrient depletion, soil erosion and encroachment of agriculture into marginal lands. This implies improvement in natural resource availability in the form of sinks for climate change mitigation and adaptation as well as improved resilience of the agro-ecosystem to climate variability.

Malawi recently adopted the Agriculture Sector Wide Approach (ASWAp) Support Programme. The ASWAP is a priority investment framework to achieve the Malawi Growth and Development Strategy (MGDS) targets in the agricultural sector. The MGDS is an overarching national strategy aiming at creating wealth through sustainable economic growth and infrastructure development as a means of achieving poverty reduction. ASWAp aims at improving food security and nutrition, increasing agricultural incomes, achieving more than 6% agricultural growth annually, and ensuring sustainable use of natural resources.

In 2009, the country adopted the Agricultural Development Programme Support Project (ADPSP) (2009-2013) whose overall objective is to improve food security and generate agricultural growth through increased productivity of food and cash crops, while ensuring sustainable use of natural resources. The global environmental objective is to strengthen the natural resource base in agricultural lands through doubling the area under sustainable land management as a basis for securing ecosystem services and sustainable agricultural productivity. It is a singular piece of support framework that articulates aspirations for ecological farming principles such as conservation agriculture.

At *national level*, the country instituted the Malawi Growth and Development Strategy (MGDS) which 'aims at creating wealth through sustainable economic growth and infrastructure development as a means of achieving poverty reduction. It is a single reference document for policy makers in government; the private sector; civil society organizations; donors and cooperating partners and the general public on socio-economic growth and development priorities for Malawi. The MGDS is intended to transform Malawi from being a predominantly importing and consuming to a predominantly manufacturing and exporting country'. The MGDS is also a strategic plan contributing to attaining Vision 2020 (Ng'ambi, 2000).

⁴ The programme is centred on provision of chemical fertilizers and high yielding maize varieties to rural households. Each beneficiary is entitled to receive two maize fertilizer and fertilizer coupons that are redeemable for a 50 Kg basal fertilizer (NPK) and 50 Kg Urea. In addition to the two fertilizer coupons, each beneficiary receives two coupons for seeds, one for maize seed and another one for legumes

⁵ Food for work programs, asset for work and cash for work programs are similar in that both employ people to contribute to public works programs. On one hand, food for work programs pay workers in food, directly addressing the problem of under nutrition by raising calorie intake. On the other hand, cash for work programs address this problem more indirectly by providing workers with income with which they can then buy higher quantities of food and/or higher quality food. The programs possess advantages over direct food aid by targeting the poor and by encouraging local economic growth since they support local food producers and economies. Incidentally, these programs strengthen long-term food security by improving local infrastructure and/or agricultural potential.

At *international level*, Malawi is a signatory to the African Union's New Partnership for Africa's Development's (NEPAD's) Comprehensive African Agriculture Development Programme (CAADP). The CAADP is based on two major principles: the pursuit of a six percent average annual growth rate at the national level in the agricultural sector, and the allocation of ten percent of national budgets to agriculture. The CAADP initiative was endorsed by the African Union Heads of State in 2003 in Maputo, Mozambique. CAADP's agenda reflects a fundamental shift in the way Africa's leadership looks at agriculture and its potential contribution to ending poverty, hunger, and malnutrition. The program-fully owned and led by African governments-is at the heart of efforts to achieve growth and national development in line with the Millennium Development Goals (MDGs) (Ng'ambi, 2000).

Malawi is also a signatory to various other international treaties and instruments which oblige it to develop climate change policies and legislation. For example, Malawi signed the United Nations Framework Convention on Climate Change (UNFCCC) on 10th June 1992 and ratified it on 21st April 1994. Malawi also ratified the Kyoto Protocol On 26th October 2001. ***These efforts demonstrate the commitment of Malawi Government to meeting its obligations towards addressing the challenges of climate change.***

3.2 Key Policies and Institutions Relevant to CSA in Malawi

This section examines and summarizes the policies that are related to issues of climate change and climate smart agriculture. A comprehensive analysis of the same is presented in **Annex 2** of this report.

National Climate Change Policy

The Government of Malawi does recognize that Global Climate Change has serious implications for the country. As such the Government formulated the National Climate Change Policy (Malawi Government, 2012). The goal of the National Policy on Climate Change is to contribute to the attainment of sustainable development in line with Malawi's National goals, as outlined in Malawi's Growth and Development Strategy II (MGDS II) and Vision 2020. One of the key priority areas in the MGDS II is enhancing "resilience to climate change risks and impacts".

The Policy will achieve the goals through better adaptation to, and mitigation against, climate change, with a focus on resilience building for Malawi's citizens. This Climate Change Policy will create an environment for the development of a country-wide, coordinated and harmonized approach, which attends to the needs and concerns of all sectors of society, while ensuring continued sustainable development. This Climate Change Policy is intended to guide actions that reduce community and ecosystem vulnerability through adaptation and mitigation a, the policy is also intended to guide harmonized approaches by different sectors and institutions towards building community and ecosystem resilience to climate change.

This policy was developed after extensive consultations with Government Officials, Civil Society, Academia, NGOs, Experts and Development Partners. District consultations were conducted in districts of Lilongwe, Karonga, Rumphi, Kasungu, Balaka, Ntcheu, Machinga, Thyolo and Chikwawa. These districts were also carefully selected through a consultative process to ensure that all critical climate change issues would be adequately covered through the sampled districts.

The policy recognizes Malawi's vulnerability to climate change and the need to promote sustainable agricultural intensification practices that increase productivity while maintaining environmental integrity and ecosystem services. It also recognizes the importance of mainstreaming gender by increasing awareness and education on linkages between population, sexual and reproductive health, gender and climate change.

The Climate Change Policy strives to contribute towards the stabilization of green-house gas concentrations in the atmosphere using an inclusive approach by among other things improving land use and agricultural practices for sustainable intensification of crop and livestock production, including. **The policy emphasizes the need for conservation agriculture, improved management of manure and fertilizers, improved soil and water management practices, integrating crop and livestock production in agriculture production systems to enhance resilience to climate change and development of human settlement policy to optimize and land use and building resilience to climate related disaster risks.**

Agriculture and Food Security Policy (2006)

Malawi's food security policy recognises that natural disasters, such as drought, floods and crop destruction by pests and diseases, have had adverse effects on the country's national food supply situation. Poor land use management and inadequate use of fertilisers exacerbate the effects of natural disasters. Experience with these types of problems has heightened the Government's commitment to ensure that the country has access to adequate supplies of food at all times to meet subsistence and commercial needs.

The policy recognizes the existence of the National Environmental Policy and advocates participation of all stakeholders in sound management, conservation and utilization of natural resources and the environment to achieve increased but sustainable productivity and development now and in the future.

Although the Food Security Policy does not directly mention Climate-Smart Agriculture, one of its policy objectives is relevant to CSA. The Policy aims “to ensure that the ways in which food is produced and distributed is environmental friendly and sustainable”. To this extent the Policy does recognise the importance of and advocates the participation of all stakeholders in sound management, conservation and utilization of natural resources and the environment to achieve increased but sustainable agricultural productivity. By linking agricultural productivity with conservation and utilization of natural resources and the environment, the policy implicitly acknowledges the link between agriculture and CSA since CSA is agriculture that sustainably increases productivity, resilience (adaptation), reduces/removes greenhouse gases (mitigation), and enhances achievement of national food security and development goals (FAO, 2013). Conservation and efficient utilisation of natural resources such as (vegetative cover) and the general environment reduces greenhouse gases and constitutes one of the ways that farmers can develop resilience to the negative effects of climate change.

One of the strategies to achieve food security that is enshrined in the Food Security Policy is the promotion of irrigation and integrated water resources management with a view to boosting agricultural productivity. It calls for the creation of a conducive environment for the private sector investment and local community participation in irrigation development; facilitate investments in rainwater harvesting and water management; encouraging use of lakes, rivers, and underground water resources for irrigation and encouraging sustainable utilization of wetlands for agricultural use. All these practices are constituents of CSA.

The policy further emphasises the need for the Malawi Nation to be food secure –ensuring that a population, household, or individual must have access to adequate food **at all times**. They should not be at risk of losing access to food as a consequence of an economic or **climatic crisis or seasonal food variations**. Climate change has increased the incidences of floods in Malawi. As such the policy promotes a coordinated approach to disaster preparedness and management; ensuring allocation of adequate resources to disaster management and improvement of systems of assessing possibilities of a shock. In this way the policy recognises the importance of approaching agriculture through the lens of climate change.

Agriculture sector is one of the contributors to Greenhouse Gases (GHG) emissions. This policy does not explain measures to regulate GHG emissions by various agricultural activities. It does give a definition of “environmental friendly and sustainable” but that remains broad in the context of climate change mitigation. The agricultural and food security policy does not have objectives to control production of tobacco which has led to heavy use of forest products resulting in loss of carbon sink hence increase in greenhouse gases which leads to global warming and climate change.

To deal with some of the gaps in the Agriculture and Food Security Policy, a Draft National Agriculture Policy was developed in 2011. The draft policy has a thematic area on climate change and environment whose objective is to promote adaptation and mitigation technologies and interventions to minimize future adverse effects of climate change on agricultural production and rural livelihoods. The policy is still a draft; however the issues of climate change should have been tackled in each thematic area to address adaptation and mitigation issues for each theme. Promotion of Conservation Agriculture is not articulated as a policy action towards climate change adaptation; yet Conservation Agriculture has potential as a Climate Change adaptation measure

National Land Policy

Land is the most basic of all resources available for social and economic development in Malawi. When considered in combination with water, it produces other resources including arable soils, forest, pasture, wildlife habitat and marine ecosystems valuable to people. These are the issues that the National Land Policy addresses.

Malawi's land is in a crisis. The level of environmental damage done through bush fires, poor farming practices, overgrazing, over harvesting of trees and others calls for better management of forests and woodlands. **Periods of severe drought** have combined with high population growth and rising inflation to increase Malawi's dependence on international aid. More than 90% of Malawians use fuel wood (firewood) for cooking (Government of Malawi, 2011). The current annual rate of consumption is estimated to exceed the rate at which natural regeneration is able to replenish the stock. Forest clearing for agriculture, fuel wood and for tobacco curing is therefore a major problem and a leading cause of degradation. The need for more land for cultivation, as cultivable land becomes scarce pushes farmers into marginal areas.

Agriculture exerts various forms of land degradation; chief among these is high smallholder population concentrations, primitive agricultural technology, soil erosion, and the effects of land clearing and deforestation on the environment.

The overall objective of the National Land Policy is thus "to ensure land security and equal opportunities for access to and use of land; to promote social cohesion and economic development through the optimum and ecologically balanced use of land and land-based resources". The Malawi's National Land Policy advocates a community approach to resource management with an emphasis on customary land as the property and responsibility of the traditional authorities. The Policy recommendations focus on: land tenure, acquisition and disposal; land administration, land use planning, registration and protection of property rights, adjudication and dispute settlement procedures and environmental management. The Policy thus recommends that local/village communities should be encouraged to manage forest products locally and be watchdogs to protect community forests and woodlands. It further encourages

the practice of **agro-forestry** and recommends prohibition of cutting of trees on steep slopes, hilly areas and watershed areas, unless it is done under strict control and guided by selective pruning for sustainable management. These recommendations will ensure that the practice of agriculture that takes into account the vagaries of climate change as secure land tenure at individual and community level are a critical success factor to the adoption of CSA, providing incentive for investment in farm resources.

Despite the good recommendations mentioned above, the National Land Policy has multiple institutions and statutory agencies dealing with land. This creates confusion over jurisdiction and inadequate policy interventions. To overcome this, there is a need to assign clear and identifiable roles to each player.

Livestock Policy (2006)

The overall goal of the Livestock Policy is to contribute towards improved household, national food security and poverty reduction through sustainable private sector and farmer demand driven livestock services. The policy recognizes the need to employ environmentally sustainable technologies in livestock farming. It recognizes that Malawi is facing increasing land pressure, thus grazing areas are getting smaller and smaller.

The policy also recognizes that weather pattern changes have not been predictable in the recent past despite improved technologies in forecasting. The livestock industry has not fared well when crop production has failed, and livestock farmers have not prepared themselves for eventualities when adverse climate conditions have occurred.

In terms of gender, the policy recognizes the importance of conferring equal opportunities to livestock services and thus aims to promote equal access to provision of livestock programmes.

Although the Livestock Policy recommends the use of environmentally sustainable technologies in livestock farming, it does not specifically mention these technologies to guide the implementation of the policy.

National Environmental Policy

The overall policy goal is the promotion of sustainable social and economic development through the sound management of the environment and natural resources. The policy seeks to among things

promote sustainable utilization and management of the country's natural resources and encourage, where appropriate, **long term self-sufficiency in food**, fuel wood and other energy requirements. It further seeks to facilitate the restoration, maintenance and enhancement of the ecosystems and ecological processes essential for the functioning of the biosphere and prudent use of renewable resources.

The Environmental policy thus encompasses all environmentally related aspects and this includes, land, forests, water resources, including all activities and factors affecting the environment. One such activity is agriculture. With respect to agriculture, the policy is geared towards promoting environmentally sustainable agricultural development by ensuring sustainable crop and livestock production through ecologically appropriate production and management systems, and appropriate legal and institutional framework for sustainable environmental management. The policy stipulates that increased agricultural production should be based on improved, appropriate and recommended farming techniques and increased security of land tenure, on currently allocated land rather than on expansion of cropland.

The environmental policy further recognises, for example, that water is an important habitat for a number of natural resources such as forests, fisheries, wildlife and other aquatic biodiversity and has considerable bearing on climate change. It is necessary therefore that its management should follow an ecosystem approach.

The Environmental Policy does not explicitly mention the concept of CSA, but it recognises that agriculture is one of the activities that need to be undertaken sustainably through improved, appropriate and recommended farming techniques to mitigate the effects of climate change. The recommended farming techniques are not clearly spelt out in the policy and this is one of the areas of the policy that needs to be clarified since agriculture is not an ordinary activity in Malawi. It is a livelihood that has forward and backward interactions with climate change.

In addition, the NEP is a general policy directed towards achieving environmental, natural resource and poverty reduction goals. It also indirectly relates to the United Nations Convention on Biodiversity (UNCBD) and the United Nations Convention to Combat Desertification (UNCCD) but indirectly contributes to possibly meeting the United Nations Framework Convention on Climate Change (UNFCCC) objectives. The issue of climate change mitigation is at the centre of the UNFCCC but the NEP has quickly tackled it. The lack of effective enforcement presents the key challenge facing implementation of the NEP. For example cultivation along riverbanks to meet food security has eroded stability of river ecosystems consequently changes in river courses have resulted in frequent floods. Actual implementation of policies and legislative reform is stalled or deadlocked as legal mechanisms

have yet to be developed. For example, to date there are few endorsed village by-laws or signed resource management contracts under the new legislation. Most agreements have to be negotiated with the ministry concerned on a case-by-case basis.

National Water Policy (2007)

The overall national water policy goal is sustainable management and utilization of water resources, in order to provide water of acceptable quality and of sufficient quantities, and ensure availability of efficient and effective water and sanitation services that satisfy the basic requirements of every Malawian and for the enhancement of the country's natural ecosystems.

One of the specific policy goals is to promote efficient and effective utilization and conservation of water resources for sustainable agricultural development in relation to the relevant policies. It also promotes proper management and development of fisheries services that do not adversely affect water resources.

The policy incorporates a provision that disaster preparedness and management should cope with climate change and climate variability to minimise the impact of such changes on the socio-economic status of the nation. In terms of agricultural activities, the policy promotes participation of agriculture services in Integrated Water Resources Management (IWRM).

The Policy further promotes and ensures that good land husbandry practices are followed in all land use and cultivation endeavours to prevent water resources degradation and pollution from soil erosion and agrochemicals; promotes collaboration with NWRA so that good watershed management and catchment protection practices are followed in controlled areas and along river banks; promotes agriculture practices that improve food security and poverty reduction and encourages and promote on-the-farm water harvesting and conservation.

Fisheries Policy (2001)/Fisheries Conservation and Management Act (1997)

The overall objective of the Policy is "to maximize the sustainable yield from the national waters of Malawi and man-made water bodies". Secondary objectives are to improve the efficiency of exploitation, processing and marketing of quality fish products, promote investment in the fishing industry, rural fish farming units and exploit all opportunities to expand existing and develop new aquatic resources. Particular care will be taken to protect endemic fish fauna, not only because these are scientific and educational assets, but also because they represent a major economic resource.

Although the Policy has some relevance to CSA and is able to identify vulnerable fish species, it does not provide for measures for adaptation. In relation to CSA, three major gaps exist in the policy.

- There is competing use of wetlands for fish habitat and farming. Farming is destroying the habitats for fish. However, these could have been complementary uses to enhance adaptation strategies for both fisheries and agriculture sector.
- Increased construction of dams is a recipe for soil disturbance and hence increased release of CO₂ from the soils. The policy does not provide measures to control these activities.
- The interaction between the impacts of climate change (i.e. fluctuating water levels) and water resource degradation (pollution) which lead to declining fish diversity and productivity are increasingly becoming too complex to be addressed by the policy objectives outlined in the Fisheries Policy

Comprehensive Africa Agriculture Development Programme (2003)

The overall objective of The CAADP is to promote agriculture as a cornerstone for sustained growth and poverty reduction. The CAADP sought to increase public investment in agriculture to a minimum of 10% the National budget in order to increase agricultural productivity by at least 6% annually. Malawi entered the CAADP compact in 2010 with a focus on food security and risk management, commercial agriculture, agro-processing and market development, and sustainable agricultural land use and water management. The CAADP is very relevant to CSA from two angles. Firstly there is a parallel between the CAADP focus areas for Malawi and the objectives of CSA. Secondly, an increased investment in the agricultural sector would allow for increased funding for CSA practices. However, in light of rising agricultural input prices, governments are finding it difficult to sustain increased investments to agriculture.

Malawi National Forest Policy (1996)

The overall objective of the Policy is to promote a sustainable quality of life through the conservation of national forestry resources. Specifically, the Policy aims at providing an enabling framework for promoting the participation of communities and the private sector in forest conservation and management, eliminating restricted utilization of essential forest products by local communities and promoting sustainable resource management through the establishment of Village Natural Resources Committees (VNRCs). These objectives are a key to CSA practice in that the promotion of sustainable management of forest resources at village level can support the restoration of community watersheds.

Despite being a key to CSA, the Forestry Policy faces a number of challenges. Consultations with key stakeholders revealed that there is:

- lack of understanding of policies, standards and guidelines by field staff and communities
- lack of funding for implementation. District forest offices have inadequate technical and financial resources
- ambiguity around division of district- and central-level decision making responsibility

- unclear benefits sharing mechanisms between forest dependent communities, district and central government authorities

3.3 Key Institutions

A number of institutions are involved in CSA in Malawi. For example, the current drive for conservation agriculture in Malawi rests with the National Conservation Agriculture Task Force whose secretariat is at the Department of Land Resources and Conservation in the Ministry of Agriculture and Food Security. The Task Force remains a grouping of practitioners but in this framework, it is being mandated to be a technical network (CA Network Technical Committee) that is linked to the decision and policy makers at the Ministry of Agriculture and Food Security, for example, interfacing with the Directors and Programme Managers of agriculture to augment policy decisions. The Principal Secretary of the Ministry of Agriculture & Food Security or his appointee will chair an integrated committee of decision makers and policy makers, which will be the CA Network Advisory Committee. The Committee will give policy direction to improve the impacts of the programme. Activities will be coordinated by a CA Network Secretariat. The Network Secretariat, Technical Committee and Advisory Committee with all CA stakeholders will together comprise the CA Network in Malawi.

The chairmanship of the Taskforce is on a rotational basis. Table 2 below show the composition of and the roles played by each member of the National Conservation Agriculture Taskforce.

Table 1: National Conservation Agriculture Taskforce

MEMBER	ROLES PLAYED
1. Ministry of Agriculture and Food Security- Department of Land Resource and Conservation	Secretariat
2. The Food and Agricultural Organization (FAO)	Donor and Technical Advisor
3. Irish Aid	Donor (through funding from IFFPR)
4. Farmers Union of Malawi	Implementer-policy component and current Chairman
5. ICRAF	Implementer of CA-Extension services
6. Concern Universal	Implementer of CA-Extension services
7. World Vision	Implementer of CA-Extension services
8. NASFAM	Implementer of CA-Extension services
9. Lilongwe University of Agricultural & Natural Resources	Researcher
10. Department of Agricultural Research Services (DARS)	Researcher

3.4 CSA Practices and Policies, Gender and Social Equity

Despite the fact that Malawi's greenhouse gas emissions are minuscule, climate change is hitting poor countries like Malawi first and worst and people are suffering, especially women (Awasthi, 2009). Climate change in Malawi is pushing people further into poverty and women are suffering most. As women have multiple roles in Malawi as farmers, child carers, providers of food, water and firewood, they are affected most by the changing climate.

In addition, results from consultations with various stakeholders have shown that women in Malawi are more vulnerable to climate impacts than men, for many reasons, including their greater dependence on natural resources livelihoods; responsibility for securing food, water and fuel for their households; more limited assets, and social, cultural and political barriers that restrict their decision-making power, access to information, and even mobility. In addition, the same factors that make women's farm plots less productive – such as poor soil quality, lack of organic or chemical fertilizers, and lack of adequate farming tools can make them more vulnerable to climate change and land degradation as well.

Gender inequality can also hinder adaptation to adapt to climate change, including the adoption of climate-smart strategies. Women's weak position in Malawian society also means that, generally, they have less access to income and credit and no voice in decision-making, making it difficult for them to find other sources of income or influence action on climate change in Malawi.

Climate change adaptation should therefore take women's needs into consideration. It should include things like practical help for women caring for orphans to allow them time and energy to cultivate their gardens and implement soil and water conservation, and access to credit to allow them to start small businesses.

One organisation that has mainstreamed gender in its CSA activities is NASFAM. The consultations done with the officers of NASFAM revealed that more than 60% of the CA adopters are women because the focus crops (soybeans and g/nuts) are less labour intensive; hence suitable for women farmers.

As regards youth, NASFAM is working with FAO in advocating for youth involvement in CA. FAO is running Junior Farmer Field Schools where the age limit for beneficiaries is not more than 25. FAO trains the youths in blocks of two weeks and provides inputs for demonstrations at clubs for junior farmers.

4. Conclusions and recommendations

Climate change is already happening and the impact on Agricultural production is diverse is already severe in Malawi. Considering that the Agricultural Sector contributes 13% of national GHG emissions in Malawi and forestry/land use changes an additional 60%, there is need for urgent action to adapt to climate change and mitigate its negative effects.

This scoping study has revealed that Sustainable land management practices such as agroforestry, soil and water conservation and maize-legume rotations were found to be most frequently adopted and maintained by farmers in areas of highly variable and sparse rainfall. They are likely to become increasingly important for adaptation as extreme events of climate change increase.

A number of stakeholders are promoting CSA in Malawi, especially Conservation Agriculture techniques and Agroforestry. As such, there is an urgent need to synergize efforts in CSA development and to advocate for radical change in Malawi's traditional tillage system. The deficiency of information persists despite some adaptive research on various technologies of CSA. Adaptive research is needed to develop practice appropriate for the various farm and agro-ecological conditions. In addition, there are no guidelines to coordinate the implementation of CSA in Malawi.

In view of the various challenges that have been identified through this study, a number of recommendations have been drawn as follows:

- a) Bringing together a group of sector professionals to operate as a "Think Tank" to advance a common vision of the issues related to scaling-up CSA programmes;
- b) Initiating specific "projects" (e.g. action research, workshops, etc) involving a wider group of stakeholders to improve our understanding of the scaling up; and,
- c) Engaging in advocacy activities to support, promote scaling up community management. Advocacy will be principally aimed at: a) policy makers and b) the wider community of sector professionals.
- d) The Malawian government and all relevant stakeholders should use of CSA to adapt to the vagaries of climate change, but clearly women's participation must be central to any of these efforts as they are actively involved in agricultural activities. Women in Malawi bear the greatest burdens from climate change so it is crucial that their participation is made central to adaptation efforts.
- e) Malawian policies that are related to Agriculture should be reviewed to include specific recommendations and strategies how CSA will be implemented.
- f) More research is required to quantify the socio-economic benefits of CSA in Malawi. Evidence based approach in the promotion of CSA will encourage and motivate various stakeholders (including farmers) to take action in favour of CSA.
- g) Land tenure regulations at individual and community level are a critical success factor to the adoption of CSA, providing incentive for investment in farm resources. In this way, these regulations should be formulated in such a way as to provide security in land ownership so that rural people can be motivated to invest in CSA.
- h) CSA can and will be extensively adopted if local institutions such as agricultural input and output markets, extension services and micro-finance are strengthened. We therefore recommend development and adoption of policies that will strengthen these institutions.

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6. Annexes

Annex 1: List of Stakeholders in Malawi

Name	Organisation	Position
Dr Judith Kamoto	LUANAR	Academician
Dr John Kazembe	LUANAR	Academician
Mr William Mitembe	Department of Forestry	Chief Forestry Officer
Mr Ng'oma	Total Land Care	Field Operations Manager
Mr John Mussa Paul	Total Land Care	Project Manager
Mr. Wycliffe Kumwenda	NASFAM	Program Development Manager-Conservation Agriculture
Mr. Frank Masankha	NASFAM	Farmer Services Officer-Central-Conservation Agriculture
Mr. Francis Maguza-Tembo	LUANAR	Lecturer & PhD Student (PhD Dissertation-Climate Smart Agriculture)
John J Mussa	Ministry of Agriculture & Food Security	Director of Land Resources and Soil Conservation

Appendix 2: Stakeholders and their activities for CSA in Malawi

Name of Organisation	CSA Technologies Employed	Where in Malawi	Comments
Ministry of Agriculture and Food Security	Conservation Agriculture Sasakawa Global 2000 programme in partnership with Extension Department of the Ministry of Agriculture and Food Security and Monsanto showed that CA increased maize yields tremendously to an average of 3.0 tonnes/ha	Country Wide	Conservation Agriculture has proven to be a technological revolution where maize yield tremendously increased from a national average yield of 1.38 tonnes per hectare to 3.0 tonnes per hectare (a 162 % increase) by using zero tillage technology. Government of Malawi and Lake Malawi Basin project in implementing

			an AGRA project on CA in Kasungu, Lilongwe and Salima districts.
Ministry of Environment and Climate Change	Conservation Agriculture		
Department of Research Services (DARS)	Conservation Agriculture	Nkhotakota	Department of Research Services (DARS) and TLC collaborate in CA technology testing and scaling up of CA with demo farmers in Nkhota Kota district under MACC project funded by the Royal Norwegian Embassy.
Department of Forestry	Planting of fertilizer trees	Nation wide	
NASFAM	Minimum tillage, Ground cover and Crop rotation. Re-forestation programme Also collaborates with ICRAF in Evergreen Agriculture in some parts of Malawi.	Kasungu, Mchinji and Chiladzulu districts	
Chitedze Research Station			
Total Land Care	Conservation Agriculture		TLC has also been implementing 'Management for Adaptation of Rural Communities to Climate Change (MACC)' in Salima, Dowa, Ntchisi, Nkhotakota, Nkhata Bay The project has been promoting Integrated rural livelihoods program: NRM, Farm Diversification, Irrigation, Sustainable Ag Practices, Enterprise Development
ICRAF	Agro forestry. Implements	Kasungu, Mchinji and	

	'Evergreen Agriculture for Food Security project' in Malawi which aims at improving food security through agroforestry based conservation agriculture which is termed "Evergreen Agriculture.	Chiladzulu Districts	
LUANAR (Bunda College)	Numerous on-farm demonstrations of Conservation Agriculture mounted by Bunda College of Agriculture through Agricultural Innovation in dryland Africa (AIDA), Farm Income Diversification Programme (FIDP), DARS, International Maize and Wheat Improvement Center (CIMMYT) and Total LandCare (TLC) have empirical data comparing maize yield, labour consumption, gross margins under CA and conventional agriculture.		
FAO	Conservation Agriculture		
World Vision Malawi	Conservation Agriculture through the use of on-farm demonstrations with their project beneficiaries.	Selected parts of Malawi	Use of on-farm demonstrations with project beneficiaries
Evangelical Lutheran Development Services (ELDS),	Conservation Agriculture	Selected parts of Malawi	Use of on-farm demonstrations with project beneficiaries
Development Aid from People to People (DAPP)	Conservation Agriculture	Selected parts of Malawi	Use of on-farm demonstrations with project beneficiaries
Catholic Relief Services	Conservation Agriculture	Selected parts of Malawi	Use of on-farm demonstrations with project beneficiaries
Danish Church Aid	Conservation Agriculture	Selected parts of Malawi	Use of on-farm demonstrations with project beneficiaries
Christian Aid	Conservation Agriculture	Selected parts of Malawi	Use of on-farm demonstrations with project beneficiaries
Norwegian Church Aid	Conservation Agriculture	Selected parts of Malawi	Use of on-farm

		Malawi	demonstrations with project beneficiaries
Save the Children	Conservation Agriculture	Selected parts of Malawi	Use of on-farm demonstrations with project beneficiaries
Civil Society for Agriculture Network (CISANET)	Conservation Agriculture	Country wide	Policy advocates in agricultural development to lobby for a change from conventional agriculture to CA.
Farmer Union of Malawi (FUM)	Conservation Agriculture	Country wide	Policy advocacy for Climate Smart Agriculture
Landnet		Country wide	Policy advocacy for Climate Smart Agriculture

Annex 2: Comprehensive Policy Analysis

<p>National Climate Change Policy (2012)</p>	<p>Goal: to contribute to the attainment of sustainable development in line with Malawi's National goals, as outlined in Malawi's Growth and Development Strategy II and Vision 2020.</p> <p>Description: The National Climate Change Policy guides and articulate National vision on Climate Change Management Policy Goals and Objectives for Climate Change Management in Malawi guides actions that reduce community and ecosystem vulnerability through adaptation and mitigation Principles, Strategies and Institutional Framework for effective management of critical Climate Change issues harmonized approaches by different sectors and institutions towards building community and ecosystem resilience to climate change</p> <p>Relevance to CSA: Emphasizes the need for: controlling deforestation, conservation agriculture, improved management of manure and fertilizers, improved soil and water management practices, integrating crop and livestock production in agriculture production systems to enhance resilience to climate change and development of human settlement policy to optimize and land use and building resilience to climate related disaster risks.</p> <p>Challenges:</p>
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	<p>The major challenges facing the Policy are weak capacity and knowledge on climate change issues inadequate financial resources Disintegrated and overlapping sectoral mandates that do not clearly define roles and responsibilities of stakeholders Poor linkage between central level and local level institutions, which results in inadequate climate change structures at the lower levels.</p>
<p>Agriculture and Food Security Policy (2006)</p>	<p>Goal: To improve food security of the population through increasing agricultural productivity as well as diversification of sustainable agricultural growth and development.</p> <p>Description: Recognizes the existence of the National Environmental Policy and advocates participation of all stakeholders in sound management, conservation and utilization of natural resources and the environment to achieve increased but sustainable productivity and development now and in the future. Recognizes the adverse effects that natural disasters, such as droughts and floods have had on the country’s national food supply situation. These are important points for both disaster risk reduction and climate change adaptation.</p> <p>Relevance to CSA: the Policy recognises the importance of and advocates the participation of all stakeholders in sound management, conservation and utilization of natural resources and the environment to achieve increased but sustainable agricultural productivity</p> <p>Policy Gaps: Agriculture sector is one of the contributors to Greenhouse Gases (GHG) emissions. The policy does not explain measures to regulate GHG emissions by various agricultural activities The policy is silent on climate change adaptation and disaster risk reduction interventions to ensure food security considering that they cause significant challenges to food security. The policy does not have objectives to control production of tobacco which has led to heavy use of forest products resulting in loss of carbon sink hence increase in green house gases which leads to global warming and climate change.</p>
<p>National Land Policy (2002)</p>	<p>Goal: To ensure land security and equal opportunities for access to and use of land; to promote social cohesion and economic development through the optimum and ecologically balanced use of land and land-based resources.</p> <p>Description: Advocates a community approach to resource management Emphasis on customary land as the property and responsibility of the traditional authorities Has recommendations focusing on: land tenure, acquisition and disposal; land administration, land use planning; registration and protection of</p>

	<p>property rights; adjudication and dispute settlement procedures and environmental management</p> <p>Relevance to CSA: Secure land tenure at individual and community level is a critical success factor to the adoption of CSA which will provide incentive for investment in farm resources</p> <p>Policy Gaps: The Policy has multiple institutions and statutory agencies dealing with land. This creates confusion over jurisdiction and inadequate policy interventions.</p>
Livestock Policy (2006)	<p>Goal: to contribute towards improved household, national food security and poverty reduction through sustainable private sector and farmer demand driven livestock services</p> <p>Description: Recognizes that weather pattern changes have not been predictable in the recent past despite improved technologies in forecasting. In terms of gender, the policy recognizes the importance of conferring equal opportunities to livestock services and thus aims to promote equal access to provision of livestock programmes.</p> <p>Relevance to CSA: Advocates the need to employ environmentally sustainable technologies in livestock farming.</p> <p>Policy Gaps: Does not specifically mention the technologies that are environmentally sustainable to guide the implementation of the policy.</p>
National Environmental Policy	<p>Goal: To promote sustainable social and economic development through the sound management of the environment and natural resources</p> <p>Description: The Policy aims to Promote the sustainable utilization and management of the country's natural resources and endorsement, where appropriate, of long-term self-sufficiency in food, fuel wood and other energy requirements. Facilitate the restoration, maintenance and enhancement of essential ecosystems and ecological processes and advocate prudent use of renewable resources Integrate sustainable environmental and natural resources management into Malawi's decentralized governance systems and reinforce the institutional framework for the management of the environment and natural resources Promote local community, NGO and private sector participation in environmental and natural resource management Minimise the adverse impact of climate change and variability to reduce air pollution and greenhouse gas emissions</p>

	<p>Promote environmentally sustainable agricultural development by ensuring sustainable crop and livestock production as well as sustainable management of forestry resources</p> <p>Relevance to CSA: Provision of tax benefits to land/property owners linked to implementation of: soil and water conservation methods, agro-forestry techniques, good husbandry practices, development and maintenance of tree plantations or woodlots, or use of appropriate livestock stocking rates The policy contains a specific strategy to promote development and dissemination of agro-forestry practices</p> <p>Policy Gaps: Does not explicitly mention the concept of CSA, but it recognises that agriculture is one of the activities that need to be undertaken sustainably through improved, appropriate and recommended farming techniques to mitigate the effects of climate change. Does not clearly spell out the recommended farming techniques The lack of effective enforcement presents the key challenge facing implementation of the NEP</p>
<p>Fisheries Policy (2001)/Fisheries Conservation and Management Act (1997)</p>	<p>Goal: In relation to environmental issues, the goal of the policy is to distribute extension messages on fisheries and on environmental issues to sensitize the fishing communities.</p> <p>Description: The Policy outlines strategies for achieving the above goal namely; identifying and addressing relevant environmental issues, conducting regular field trips to support capacity building in fishing communities, and promoting and supporting private investment in fish farming and capture fisheries.</p> <p>Relevance to CSA: The policy has some relevance to CSA as it is able to identify vulnerable fish species and; identify and address relevant environmental issues</p> <p>Policy Gaps: The Policy does not address the issue of competing use of wetlands for fish habitat and farming. Farming is destroying the habitats for fish. The policy does not provide measures to control the increased construction of dams which is a recipe for soil disturbance and hence increased release of CO2 from the soils. The policy objectives outlined in the Fisheries Policy are too weak to address the complex interaction between the impacts of climate change (i.e. fluctuating water levels) and water resource degradation (pollution) which lead to declining fish diversity and productivity.</p>
<p>Comprehensive Africa Agriculture Development Programme (2003)</p>	<p>Goal: To promote agriculture as a cornerstone for sustained growth and poverty reduction</p> <p>Description:</p>

	<p>Seeks to increase public investment in agriculture to a minimum of 10% the National budget in order to increase agricultural productivity by at least 6% annually.</p> <p>Malawi entered the CAADP compact in 2010 with a focus on food security and risk management, commercial agriculture, agro-processing and market development, and sustainable agricultural land use and water management</p> <p>Relevance to CSA: There is a parallel between the CAADP focus areas for Malawi and the objectives of CSA An increased investment in the agricultural sector would allow for increased funding for CSA practices</p> <p>Policy Challenges: In light of rising agricultural input prices, governments are finding it difficult to sustain increased investments to agriculture</p>
<p>Malawi National Forest Policy (1996)</p>	<p>Goal: to promote a sustainable quality of life through the conservation of national forestry resources</p> <p>Description: the Policy aims at providing an enabling framework for promoting the participation of communities and the private sector in forest conservation and management, eliminating restricted utilization of essential forest products by local communities and promoting sustainable resource management through the establishment of Village Natural Resources Committees (VNRCs)</p> <p>Relevance to CSA: The Policy objectives are a key to CSA practice as the promotion of sustainable management of forest resources at village level can support the restoration of community watersheds</p> <p>Policy Challenges: Lack of understanding of policies, standards and guidelines by field staff and communities Lack of funding for implementation. District forest offices have inadequate technical and financial resources Ambiguity around division of district- and central-level decision making responsibility Unclear benefits sharing mechanisms between forest dependent communities, district and central government authorities</p>
<p>National Water Policy (2007)</p>	<p>Goal: sustainable management and utilization of water resources, in order to provide water of acceptable quality and of sufficient quantities, and ensure availability of efficient and effective water and sanitation services that satisfy the basic requirements of every Malawian and for the enhancement of the country's natural ecosystems.</p>

	<p>Description: Promotes efficient and effective utilization and conservation of water resources for sustainable agricultural development in relation to the relevant policies. Promotes proper management and development of fisheries services that do not adversely affect water resources. Incorporates a provision that disaster preparedness and management should cope with climate change and climate variability to minimise the impact of such changes on the socio-economic status of the nation. Promotes participation of agriculture services in Integrated Water Resources Management (IWRM)</p> <p>Relevance to CSA: Promotes and ensures that good land husbandry practices are followed in all land use and cultivation endeavours to prevent water resources degradation and pollution from soil erosion and agrochemicals; Promotes collaboration with NWRA so that good watershed management and catchment protection practices are followed in controlled areas and along river banks</p> <p>Policy Gaps: The policy is relevant but very weak in mainstreaming climate change issues. The Policy does not address climate change issues directly and systematically</p>
<p>Agriculture Sector Wide Approach (ASWAp)</p>	<p>Goal: a means for achieving the agricultural growth and poverty reduction goals of the Malawi Growth and Development Strategy (MGDS)</p> <p>Description: Focuses on food security and risk management, commercial agriculture, sustainable agricultural land and water management. Focuses on gender equity and empowerment</p> <p>Relevance to CSA: The ASWAp outlines measures that will help mitigate the effects of climate change. These measures include: “ <i>a) development of early warning systems, b) development of drought resistant crop varieties and promoting hardy animal species and breeds c) improved crop management practices (timing of planting, plant spacing, varieties) d) improvement in land and water management practices (irrigation systems, water harvesting systems) efficient fertilizer use, soil and water drainage and conservation farm structures, e) control of soil erosion, f) dam construction g) rehabilitation of degraded lands g) protection of fragile lands (hills, wetlands, water catchment areas) h) management and control of disease and pest outbreaks particularly army worm and red locust and i) development of community based storage systems for both food and seed</i>”.</p>
<p>Malawi Growth and Development Strategy (MGDS)</p>	<p>Goal: The MGDS is the overarching operational medium-term strategy for Malawi designed to attain the nation’s Vision 2020. The main aim of the MGDS is to create wealth through sustainable economic growth and infrastructure development as a means of achieving poverty reduction.</p>

	<p>Description & Relevance to CSA:</p> <p>The Strategy recognizes the need for conservation of the natural resource base. To this effect, the MGDS has devoted Sub-theme 4 to outlining strategies and key actions that will lead to achieving conservation of Malawi’s natural resource base in the medium term. The strategies and actions include:</p> <p><i>Improved productivity and value added by the industrial forestry sector, while balancing it with sustainable practices</i></p> <p><i>Increased reforestation efforts for key areas and improve enforcement of regulations for forestry management</i></p> <p><i>Improved enforcement of environmental policies and legislation</i></p> <p><i>Increased awareness of issues of protecting the environment</i></p>
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ⁱⁱ Climate-Smart agriculture must be farmer-smart, gender-smart and equity smart too
<http://blog.worldagroforestry.org/index.php/2013/11/15/climate-smart-agriculture-must-be-farmer-smart-gender-smart-and-equity-smart-too/>