RUFORUM Working Document Series (ISSN 1607-9345) 2016, No. 14 (4):217-223.
Available from *http://repository.ruforum.org*

Research Application Summary

Upscaling climate smart agriculture in Malawi

Hunga, H.G. & Mussa, J.J.
Department of Land Resources Conservation, P.O. Box 30291, Lilongwe, Malawi
Corresponding author: henryhunga@ymail.com

Abstract

Effects of climate change, drudgery of farming operations and reducing soil fertility over time have exacerbated food insecurity at the smallholder farm level in Malawi. The Government of Malawi has put in place mechanisms to reverse this situation through a sector wide approach. The approach promotes climate smart technologies that help farmers adapt to climate change effects and use sustainable land and water management principles for improved agricultural production. Technologies are being promoted through the use of on-farm demonstrations mounted across the country. All institutions involved in the agriculture sector have been brought on board through technical working groups and the formulation of a National Conservation Agriculture Task Force whose aim is to regulate activities in the promotion of climate smart agriculture. This paper present experiences in Malawi in promoting climate smart agricultural production for small scale farmers.

Key words: Conservation Agriculture, crop residue, moisture, small holder farmers, soil erosion

Résumé

Les effets des changements climatiques, la pénibilité des opérations agricoles et la réduction de la fertilité des sols au fil du temps ont exacerbé l'insécurité alimentaire au niveau des petites exploitations au Malawi. Le gouvernement du Malawi a donc mis en place des mécanismes pour renverser cette situation grâce à une approche plus large, qui encourage les technologies intelligentes, permettant aux agriculteurs de s'adapter aux effets du changement climatique et d'utiliser des principes de gestion durable des terres et en eau pour améliorer la production agricole. Les technologies ont été encouragées à travers des démonstrations à la ferme dans tout le pays. Toutes les institutions du secteur agricole ont été associées à des groupes de travail techniques et à la formulation d'un groupe national de travail sur l'agriculture de conservation dont le but est de réglementer les activités de promotion d'agriculture intelligente face au climat. Cet article présente des expériences du Malawi en termes de promotion de production agricole intelligente face au climat pour les petits agriculteurs.

Mots clés: Agriculture de conservation, résidus de cultures, humidité, petits exploitants agricoles, érosion des sols

Background

Agricultural production in Malawi has been on the decline over the years leading to food insecurity. Among other factors, the use of poor farming practices, particularly poor land and water management practices, have led to loss of soil fertility and reduced productive capacity of once fertile lands. The Government and other development actors have through various programmes made considerable investments in promotion of sustainable land and water management practices in order to reverse land degradation. Climate smart agriculture technologies have been a key focus of these programmes aimed at increasing productivity and production.

Soil degradation can be attributed to common, but exploitative farming practices such as ploughing that destroy the soil structure and degrade organic matter, burning or removing crop residues, mono cropping, among others. Soil and water management practices that sustain and enhance the productivity of arable soils are important elements of any restoration strategy. Climate change has resulted in erratic, unreliable rains such that smallholder farmers must find ways to make use of existing moisture. They are a vital part of the long-term solution to food insecurity and poverty.

Various studies have shown that where labour is limiting, CA offers opportunities for greater gains by reducing or spreading the labour to avoid bottle necks. Where inputs are limiting, CA ensures efficient utilization through precision placement. Where land is limiting, CA offers maximum possible yields through rotations and combinations. Where soils are depleted, CA encourages restoration of structure and fertility. In dry lands, CA brings just that extra drop of water the crop needs through in-situ water harvesting.

Various actors have been promoting conservation agriculture over the past few years in Malawi. To consolidate the approach and resources to upscale climate smart agriculture technologies, CA has been included in the Ministry of Agriculture and Food Security formulated the Agriculture Sector Wide approach (ASWAp) and priotised and harmonized with the agricultural investment framework towards the achievement of the Malawi Growth and Development Strategy (MGDS II, 2012). The framework provides a platform for donor support harmonization in the Malawi agriculture sector (ASWAp, 2009).

Objective. Promotion of climate smart agriculture technologies is aimed at making a Malawian smallholder farm resilient to erratic and changing rainfall patterns, long and frequent dry spells and improve soil fertility and structure over time for sustainable production. The goal is to use CA to promote sustainable agricultural land management. Specifically it aims at:

- Conserving moisture in the soil for prolonged periods
- Controlling weed infestation
- Controlling soil erosion as no/minimum tilling is done
- Improving soil fertility and structure as crop residues are left in the field
- Increased gross margin due to reduction in labor requirements
- Smallholder farmers adapting to climate change

Methodology

The project is targeting upland rain fed farming systems where 90% of Malawi staple food of maize is produced. Three principles of CA (Fig. 1), i.e., maximum soil cover, minimum soil disturbance and crop association plus permanent planting basins are being promoted. Herbicides are used in the first two seasons of climate smart agriculture technology adoption to reduce the level of weed infestation in the gardens.

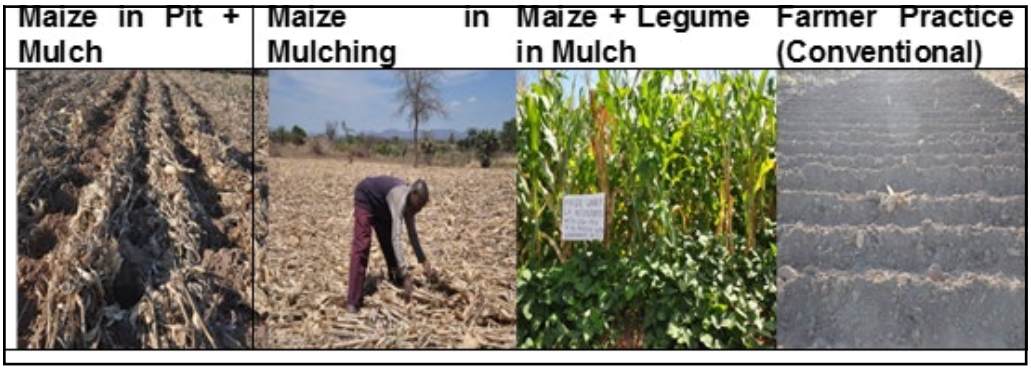


Figure 1. The three principles being demonstrated in the mother demostrations

Generally maize yields have been affected by long dry spells, droughts and drudgery of farm operations at peak labor demand. With this in mind climate smart agriculture technologies were deemed appropriate to improve moisture retention, soil structure and reduce weed infestation.

The ASWAp targets resource poor smallholder farmers as technology dissemination support tool for the Farm Input Subsidy Program (FISP) whose beneficiaries are smallholder farmers. The Ministry of Agriculture and Food Security is the lead institution but working closely with key stakeholders within the ministry various organs and comittees support and operationalisation. These include:

- Executive Management Committee: provides strategic direction and inter-ministerial coordination, oversees implementation of policy decisions through approval of annual work plans and monitoring progress.
- ASWAp Secretariat: consolidates work plans, liaises with development partners; convenes meetings of the Management Working Group, the Technical Working Group, the Partnership Forum and the Executive Management Committee. The secretariat ensures timely reporting, monitors adherence to the Malawi CAADP compact and national investment plan.
- Sector Working Groups: provides for dialogue between government and development partners on financial management, planning, monitoring and evaluation. They support line departments in the same areas.
- Technical Working Groups: supports line departments on technical issues and methodologies for implementation of activities and reflect on informal feedback from stakeholders
- District Executive Committee: reviews progress in implementation and represents

stakeholders' views at district level

To replicate this approach the Department of Land Resources Conservation spearheaded the formation of the National Conservation Agriculture Task Force. The Task Force is comprised of stakeholders promoting climate smart agriculture technologies in their programmes. It has developed a strategic plan (2012-17) which includes the transformation of the Task Force into a Trust and accesses direct funding with a permanent staffing.

Action location and what is being done. The Department of Land Resources Conservation through ASWAp is coordinating on farm demonstrations on sustainable agricultural land management throughout Malawi through promotion of climate smart agriculture technologues. There is at least one mother demonstration in each of the country's 187 Extension Planning Areas (Fig. 2).

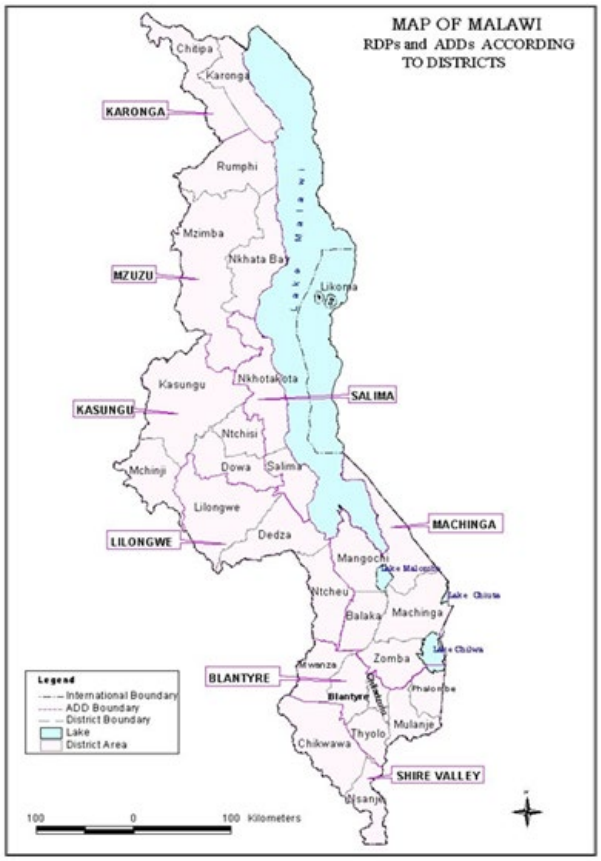


Figure 2. Map of Malawi showing districts

Emerging Trends and Issues

Food security. There is increased food production in households that have adopted conservation agriculture. Their crops are able to survive droughts and dry spells as compared to gardens under conventional system. In some cases there has been literally no harvest under conventional farming as compared to more than one and a half tons

of maize from climate smart agriculture plots. In drought prone districts of Malawi, i.e., Chinkhwawa, Nsanje, Mwanza and Neno CA farmers have appreciated the positive impact of the intervention. Households have been able to produce food with minimal labor requirements as in cases of conventional farming. This is important to homes that have been infected or affected by HIV/AIDS whose time may be shared between caring for the sick and farming.

Climate change adaptation. Resource poor smallholder farmers are assured of harvesting some crop from climate smart agriculture fields as opposed to conventional ones during season of drought and or long dry spells. Reduced erosion and runoff has helped to improve water availability both in aquifers and streams making irrigation cropping possible after the rains.

Ecosystem productivity. Reduced soil erosion has lessened silting of rivers that are essential for fish and a source of water for irrigated crop. The irrigation provides supplementary yields to the rain fed crop. Improved soil structure due to availability of organic matter from decomposing biomass had improved crop performance hence high yield from the gardens under climate smart agriculture.

The impact to date. Several achievements have been registered by the Department in terms of capacity building and promotion of climate smart agriculture technologies to be adopted by farmers across the country.

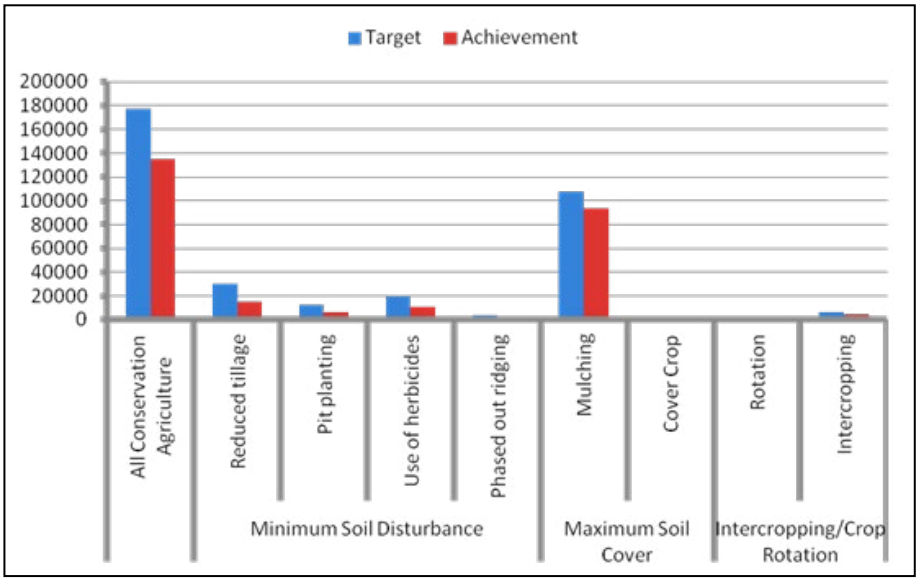
Capacity building. The department has conducted a number of trainings for members of staff to build capacity in the area of conservation agriculture. The trainings have been supported by several partners and aimed at imparting varying skills to different members of staff from Government and partner institutions in Malawi (Table 1).

Field tours have also formed part of awareness raising and building capacity among conservation agriculture stakeholders. In March 2011 the Parliamentary Committee on Agriculture and Natural Resources toured some farmers in Central and Northern Malawi to appreciate the level of adoption of conservation agriculture technologies by smallholder farmers. The technologies that they saw included pit planting, crop association and mulching. Farmers explained why they adopted each of the techniques and what the benefits are as compared to conventional farming.

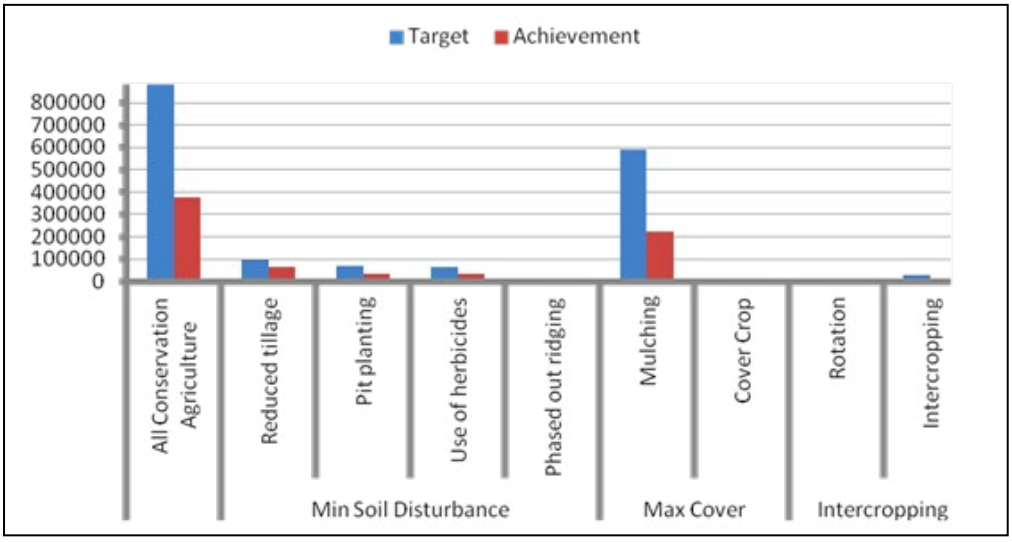
Technology transfer and adoption. The number and area under climate smart agriculture has significantly increased in Malawi from 43772 hectares in 2006/07 growing season to 13,5000 hectares in 2011/12 season which was at least under one or a combination of conservation agriculture principles of maximum soil cover, minimum soil disturbance and rotation/association (Graph 1).

Table 1. List of trainings conducted across Malawi to build capacity in CA

Date	Training purpose	No. of participants	Supported by
August 2011	Training of trainers for CA	34	ASWAp
21-25 May, 2012	GIS-based CA monitoring and evaluation	30	FAO
9-14 September, 2012	GPS/GIS Training for Cartographic staff	17	ASWAp
21-24 November and 5-8 December, 2012	CA Training for District SMS's and AEDO's	46	FAO
17-19 October, 2012	CA Training for AEDC's from Machinga, Blantyre and Shire valley ADD	26	ASWAp



Graph 1. Cumulative hectares under climate smart agriculture as adopted by farmers in Malawi between 2006 and 2012



Graph 2. Cumulative number of farmers practicing climate smart agriculture from 2006-2012

Over 375000 farmers have adopted and are practicing climate smart agriculture in one form or other in Malawi (Graph 2) by 2011/12 growing season up from 73452 farmers in 2006/07 growing season. More men are taking part as compared to women farmers. On average each farmer has 0.34 ha under a form of climate smart agriculture which is on the lower side compared to the average land holding size of 0.8 ha/farmer in Malawi (IFAD on-line).

Conclusion

Cost implications and the need for labor may have led to the high adoption of maximum soil cover principle as compared to the other technologies. Small landholding size does not allow Malawian farmers the opportunity to rotate crops hence the little achievement under this principle.

Gathering of economic data on the three principles in Malawi is very critical to determine adoption drivers. The different CA principles would certainly give the farmers different gross margins which in the end propel adoption of those with better margins aside the biophysical benefits. Some data on biophysical benefits is being collected though results are not currently available.

Differences exist between various players promoting climate smart agriculture in Malawi especially regarding measurements of permanent planting basins. There is need for standardization of the measurements and planting system as farmers are usually confused with the variations.

Reference

http://www.ruralpovertyportal.org/country/home/tags/malawi. Accessed May 20, 2013.

The Malawi Growth and Development Strategy II (MGDS II) (2012), Government of Malawi

The Agriculture Sector Wide Approach (ASWAp) Malawi's prioritised and harmonised Agricultural Development Agenda. 2009. Ministry of Agriculture and Food Security, Malawi.