CIMMYT

SIMLESA
Sustainable Intensification of Maize and Legume Systems for Food Security in Eastern and Southern Africa

Ministry of Agriculture, Irrigation & Water Development

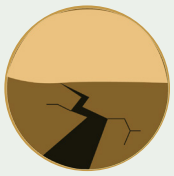
Australian Government
Australian Centre for International Agricultural Research

COUNTRY POLICY BRIEF

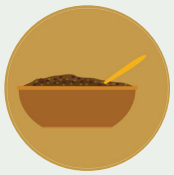
ENHANCING AGRICULTURAL RESILIENCE AND SUSTAINABILITY IN MALAWI

# Grow More with Less: Maximizing yield through Conservation Agriculture-based Sustainable Intensification in Malawi

## Summary and key facts



Environmental degradation is a major threat to Malawi's food security and economic potential.



Given resource degradation and adverse climatic changes, attaining food security depends on how best farmers utilize limited resources. Shifting to Conservation Agriculture-based Sustainable Intensification (CASI) has shown significant promise.

CASI practices have shown the ability to improve yields by as much as 37% in the low altitudes of Malawi and reduce the risk of weather related crop failure by 16%.

Policies that will enhance institutionalization of CASI technologies will lead to a higher adoption rate and consequently food security.

## What is the problem?

### Conventional agriculture practices are limiting yield and income potential in Malawi

Crop yields in Malawi remain low and smallholder farmers are at worsening risk of food insecurity and poverty, due to farming practices that fail under the adverse effects of climate change, deforestation, and land degradation. For instance, the country loses 20 tons of soil per hectare each year due to erosion; translating into yield losses of 4-25% per year.

The rapid increase in population puts pressure on the arable land and results in shrinking land holding sizes, and monocropping. This is compounded by smallholder farmers' overreliance on rainfall which renders the country vulnerable to weather shocks and hazards. The combined effect of all these constraints is sluggish economic progress, undernutrition and poor human development outcomes. The imperative to increase yields and protect resources is therefore a national priority consistent with African designed and international notions of development including the UN Sustainable Development Goal 2.

# What solutions were identified from research?

## Conservation farming practices build climate-resilient, productive farming systems

In 2010, the International Maize and Wheat Improvement Centre introduced the Sustainable Intensification of Maize-Legume Cropping Systems for Food Security in Eastern and Southern Africa (SIMLESA) project in Malawi to increase smallholders' productivity, food and nutrition security and income levels while simultaneously protecting the environment by integrating sustainable intensification practices by integrating sustainable intensification practices to increase productivity and protect the environment at the same time. To achieve this, farmers were exposed to conservation agriculture practices in conjunction with access to modern stress-tolerant varieties and extension support as well as piloting opportunities to open markets to support. Opportunities to tap into markets for increased production were piloted to support use of better farming methods.

SIMLESA researchers with participating farmers trialed Conservation Agricultural-based Sustainable Intensification (CASI) technologies in different agroecologies. Evidence has shown CASI can increase yield by maximizing limited resources, hence improving farmer resilience to shocks vis-à-vis effects of climate change such as rising temperatures and prolonged dry spells. It builds on the three principles of Conservation Agriculture (CA) which are; reduced tillage, crop residue retention /mulching and crop rotation/ intercropping while promoting good agricultural practices such as use of improved seed.

CASI practices improved yield by 17% in the mid altitudes and by 37% in the low altitudes of Malawi. Results from the long-term experimental trials show CASI practices can reduce the risk of crop failure during climatic shocks by 16%. This means that farmers who practiced CASI reduced the lean period from 4 to 1 month, i.e they have 3 more months of extra food security than those who are not practicing the technologies.

### Average maize yields (kg/ha) by cropping system in the low-altitude districts of Balaka, Ntcheu and Salima for 2010/11-2013/14 cropping seasons

| | Conventional practice | CA basins maize-pigeon pea intercrop | CA dibble stick maize-pigeon pea intercrop | CA dibble Maize sole | CA dibble stick Maize-groundnut rotation |
|---|---|---|---|---|---|
| Overall 4 years mean (Kg/ha) | 2,397 | 2,824 | 2,628 | 2,718 | 3,286 |
| % yield increase | 0 | 18% | 9% | 12% | 37% |

The results above show that in general, farmers who practiced CASI technologies realized an increase in yield compared to those who did not practice. Among the CASI technologies, farmers who practiced CA, dibble stick, and maize-groundnut rotation in low altitude areas realized a higher increase in yield.

### Average maize yields (kg/ha) by cropping system in the mid-altitude districts of Kasungu, Lilongwe and Mchinji for 2010/11-2013/14 cropping seasons

| | Conventional practice (Farmers' check) | CA + sole maize no herbicide | CA + sole maize + herbicides | CA + herbicides + maize soybean rotation |
|---|---|---|---|---|
| Overall 4 years mean | 3798 | 3889 | 4088 | 4434 |
| % yield increase | NA | 2% | 8% | 17% |

# What are the opportunities for policy action?

## Include CASI in agricultural programing and budgeting

The scientific evidence produced throughout the project shows that CASI practices offer a good opportunity for farmers to increase yields and protect their soils. However, farmers often will be unable to get information about these practices, nor observe or access scientific results. The approach used by SIMLESA was to extend on-station research to adaptive agronomic trials and demonstration in farmers' fields. In these fields, most farmers can observe CASI practices and learn how to implement and benefit from them. Yet this process requires budgetary and human resource commitments from extension departments. The following opportunity can be considered to facilitate this process.


### Budget for and invest in long-term demonstrations for farmer capacity building on CASI

Translating scientific research results into farmer-centered tools and actionable information is critical to technology adoption. The activities completed by SIMLESA remain limited in scale and require future sustained investments in scaling. Using the networks created by SIMLESA, public-private partnerships can be used to manage extensive networks of demonstrations. Technical support can be provided by the local public extension system. Complimentary financial support can be provided by private sector actors, for example seed companies, who can use the community-based demonstrations to market their products including seeds, fertilizers, equipment and agro-chemicals. Peer to peer learning between successful farmers who have progressed from the demonstration plots and trials to their larger farms and farmers who are not yet using CASI also drives adoption.

# Why act now?

The absence of specific actions will lead to continued pressure on land leading to degradation and farmer vulnerability to shocks. The lack of action will only postpone the time when Malawian agriculture can start to progress towards higher productivity, better resource management and development. These actions need to be tested, tried and scaled widely as a matter of national development urgency.

## References and sources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## Please also visit us at:

**www.simlesa.cimmyt.org** for more publications and data on Malawi and other SIMLESA program countries

## Acknowledgements


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