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

From yields to profit: Conservation farming boosts livelihoods in Malawi

Summary and key facts

Despite clear evidence of the benefits of Conservation Agriculture-based Sustainable Intensification (CASI) practices, smallholder farmers are slow to adopt.

Slow adoption is due to limited awareness of the economic benefits of CASI technologies among smallholder farmers.

Research shows substantial increases in incomes, from US$702 per ha to a maximum of US$1374 per ha, among smallholder farmers practicing CASI.

Policies aimed at reducing production costs among smallholder farmers, such as moving away from labor intensive ridge and furrow systems to minimum tillage, jab planters, rippers, hand drawn and postharvest machinery, need to be promoted .

What is the problem?

Farmers fail to recognize the benefits of Conservation Agriculture-based Sustainable Intensification practices

Despite a wealth of evidence supporting improvements to food security and livelihoods, farmers fail to get the message as adoption of conservation agriculture remains sluggish.

Conservation farming: The shift Malawi needs to build resilient, productive farming systems

A wealth of evidence has been collected by national and international researchers to suggest current restraints, to agriculture in Malawi, such as erratic weather and soil erosion, require a paradigm shift in farming practice to ensure food security and environmental health. Researchers recognize the need for increasing production of staple crop yields while maintaining sustainable management of natural resources. Conservation Agriculture-based Sustainable Intensification (CASI) builds on practices, including reduced tillage, crop residue retention /mulching and crop rotation/ intercropping while promoting complementary applications, such as use of improved seed. There is increasing evidence base that these technologies reverse the effects of declining soil fertility and productivity in current farming systems as well as adapting to projected increases in climate variability and change.

Despite the evidence that CASI can provide benefits in both sustainability as well as intensification of production systems, research into farmer usage suggests there is sluggish adoption of these practices. Granted, the concepts of conservation farming are still novel and in some ways requires paradigm shift.

Therefore, if the policy makers, institutional and local leaders are to buy into the CASI agenda and convince farmers to transform from conventional tillage systems to CASI, there is a need for them to understand the larger economic, social and environmental benefits that the technology can offer.

What solutions were identified from research?

When done right, CASI practices have positive financial outcomes for farmers

In 2010, the International Maize and Wheat Improvement Center (CIMMYT) introduced the Sustainable Intensification of Maize-Legume Cropping Systems for Food Security in Eastern and Southern Africa (SIMLESA) project in Malawi to increase smallholders' food and nutrition security, and income levels by integrating sustainable intensification practices to increase productivity and protecting the environment at the same time. To achieve this, farmers were be exposed to conservation agriculture practices in conjunction with access to modern varieties and extension support as well as piloting opportunities to tap markets to support the use of better farming methods and the sale of increased production. The research team recognized that the core pillar of sustainable agricultural intensification is the farm level financial viability of such intensification. The team also recognized that like any other technology, the financial viability of these methods, will be mediated by well-functioning agricultural markets and value chains. This brief summarizes the evidence on the financial viability and suggests ways to sustain them.

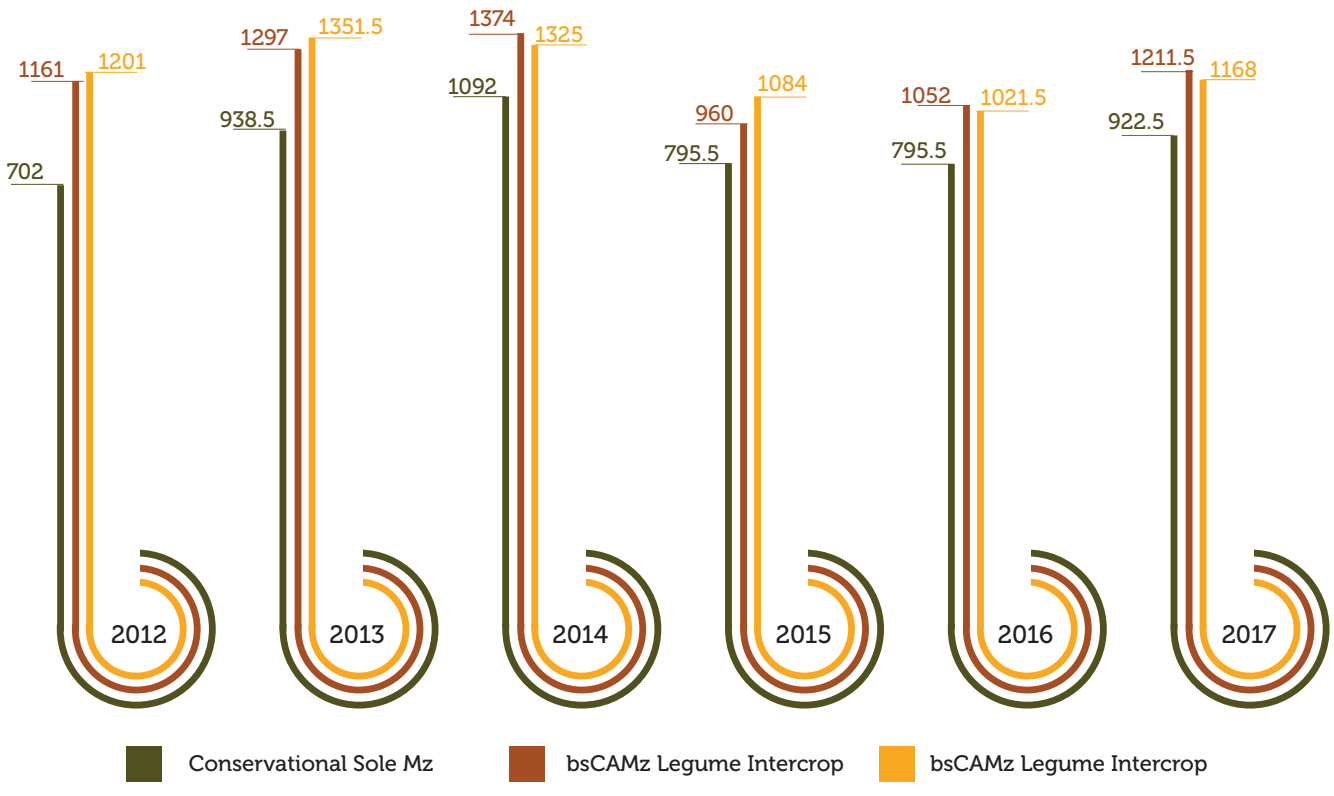
Farmers practicing CASI improved average yield

On-farm experimentation results show that fields under CASI technologies experienced a 27% increase in maize yields improving household food security. The increment was largely attributed to maize-legume associations within conservation agriculture complemented by various improved sustainable intensification practices. Evidence from plot level on-farm trials suggest that average maize yields among CASI options potentially increased from 1.2 tons per hectare to 3.8 tons per hectare.

Farmers practicing CASI improved incomes

Farm budget analysis for six years has shown that CASI technologies have yielded more positive economic benefits across the years compared to conventional technologies. The use of the dibble stick (a tool used to make planting stations) as a technology on fields that were minimally tilled (minimal soil disturbance) with maize and legume intercropped yielded a six year average gross margin of US$1188 per hectare. Using planting basins (as a way to minimize tillage and retention of moisture) produced an average financial benefit of US$1,175 per hectare. This is compared to conventional practice which saw farmers having an average gross margin of US$863 per hectare.

Fig 1: Net-benefits under different CASI technologies in Malawi



bsCA = Basin Conservation Agriculture; ds CA = Dibble stick conservation agriculture

What are the opportunities for policy action?

Financial profit is a strong pillar for sustainable intensification

A core pillar of sustainable agricultural intensification is the farm level financial gains of such intensification. This brief highlights the potential financial viability of CASI practices. To sustain this potential will, almost surely, be mediated by well-functioning agricultural markets and value chains. Policies to strengthen maize-legume value chains and raise awareness of CASI's economic feasibility can boost farmer adoption.

Communicating CASI economic benefits promotes farmer adoption

When CASI's profit benefits are communicated to farmers, it can help them make informed decisions as to which technology has the most benefits. Farmers will only invest in a technology if the marginal benefit is substantial compared to the current practice. In conventional farming systems, the production costs are mainly from fertilizer followed by labor. Costs to hire labor to help with weeding are saved under CASI practices, as residues are maintained in the field. Additionally, for households which are land constrained like those from the low latitude areas, maize-legume intercropping would be the best bet technology whilst for households from mid latitude areas, maize-legume rotation would yield higher returns.

Invest in maize legume value chains to ensure profitability

The economic returns suggest that moving away from a labor intensive ridge and furrow system has significant benefits for smallholder farmers. These benefits were based on commodity prices as at the time of research. In the event that the prices deteriorate, such as crop prices drop or inputs become too expensive the financial returns may not be sustained. Four key elements are required to improve value chains:

- Price information systems based on widely accepted quality definitions to transmit the right incentive signals to farmers to continue investing in new practices.
- Market development should focus on improvements in the infrastructure for auxiliary services such as transportation, post-harvest handling and grading.
- Options for reducing the distance to the value chains for farmersand integrate actors into wider markets.
- Future research should focus on determining the business cases and development gains from structured maize and legume value chains.

Why Act Now?

If smallholder farmers in Malawi continue to practice conventional agriculture, food insecurity and poverty shall continue to prevail. It is against this background that this policy brief aims to highlight the economic benefits associated with CASI technologies among smallholder farming systems in maize growing areas of the country.

Without strong efforts to educate farmers on the benefits of these new farming methods, little progress will be made in reducing soil degradation, improving yields or reducing poverty. Without corrective measures and a system shift towards sustainable intensification, development aspirations of the nation may not be realized.

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