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

Australian Government
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Sustainable Intensification of Maize-Legume Cropping Systems for Food Security in Eastern and Southern Africa

END OF PROJECT REVIEW

ADDIS ABABA, ETHIOPIA
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Uganda SIMLESA Project

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Background

- Average maize yields on smallholder farms in Uganda, which on average are between 0.5–1.0ha, range from 0.8 to1.6t/ha; this is less than 20% of the potential (RATES,2003;Otunge et al.,2010)
- Average yields of legumes such as beans are less than 0.6t/ha; which is 30% of the potential (Sebuwufu et al. 2010).
- Potential maize yield in Uganda is estimated to range from 3.8 to 8.0t/ha (Semaana,2010) while that of beans is 2.0t/ha.
- About 30% of what is produced by smallholders is lost due to poor post harvest handling (FAO, 2010)
- Adoption of new technologies and practices is still very low

Interventions: Uganda SIMLESA Project

Overall objective

➢To improve livelihoods of maize and legume producers by addressing pre-production, production and post-harvest challenges of the commodity value chains.

Specific Objectives

- Assess the technical and socio-economic potential of conservation farming
- Develop, test, adapt, and demonstrate various conservation farming practices
- Develop strategies to improve post-harvest handling
- Establish market information
- Support skills development / improvement

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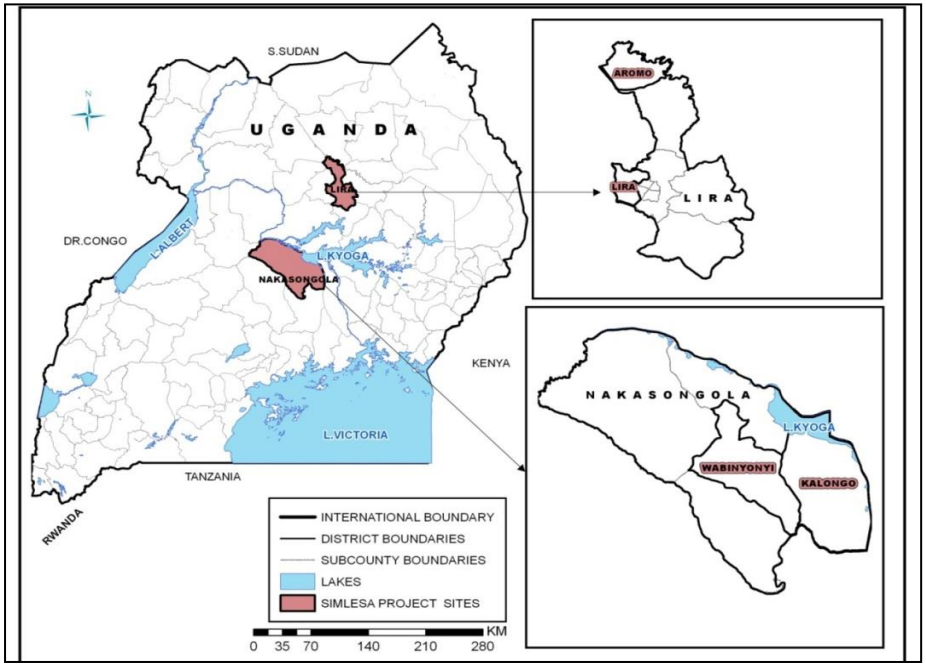
Project Sites

The Uganda SIMLESA Project is being implemented in two rural districts:

- Nakasongola & Lira
- With a total rural population of 623,100 (UBOS, 2015)



Since 2012, the project has supported 16 farmer groups with total membership of about 320 farmers , each farmer representing a household of five members, on average.

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Interventions along commodity value chains – informed by a socioeconomic and biophysical study

Phase	Constraints/ challenges	Interventions
Pre-production	Poor quality seed	**Improved seed:** Maize [10H, PH5052] drought tolerant & high yielding Bean [NABE 14 & 15] drought tolerant & high yielding
	Failure to open land on time	**Implements:** spray pumps, pedestal sprayers, rippers and ox-yokes, and direct seeders **Inputs:** herbicides
Production	Low productivity	**Inputs:** fertilizers **Technologies:** PPBs, rip-lines, intercropping, agronomic practices e.g. proper spacing, mulching, pest and disease mgmt.
Post-harvest	Spoilage due to lack of storage facilities	**Capacity bldg.:** Training in post harvest handling **Facilities:** Maize storage cribs

Studies conducted

- A socio economic and biophysical study was done in Nakasongola and Lira districts to understand the producers' challenges, constraints and prevailing circumstances in order to set the stage for technology exposure and skills improvement.
- Quantification of bare ground coverage in Nakasongola District due to extreme cases of soil degradation
- Tillage methods – convention vs. conservation farming [Permanent Planting Basins & Rip lines]
- Maize-bean intercropping patterns
- Maize and bean seeding rates/ plant populations under PPBs & rip lines
- Business model analysis
- Elite pigeon pea profiling, seed multiplication and dissemination

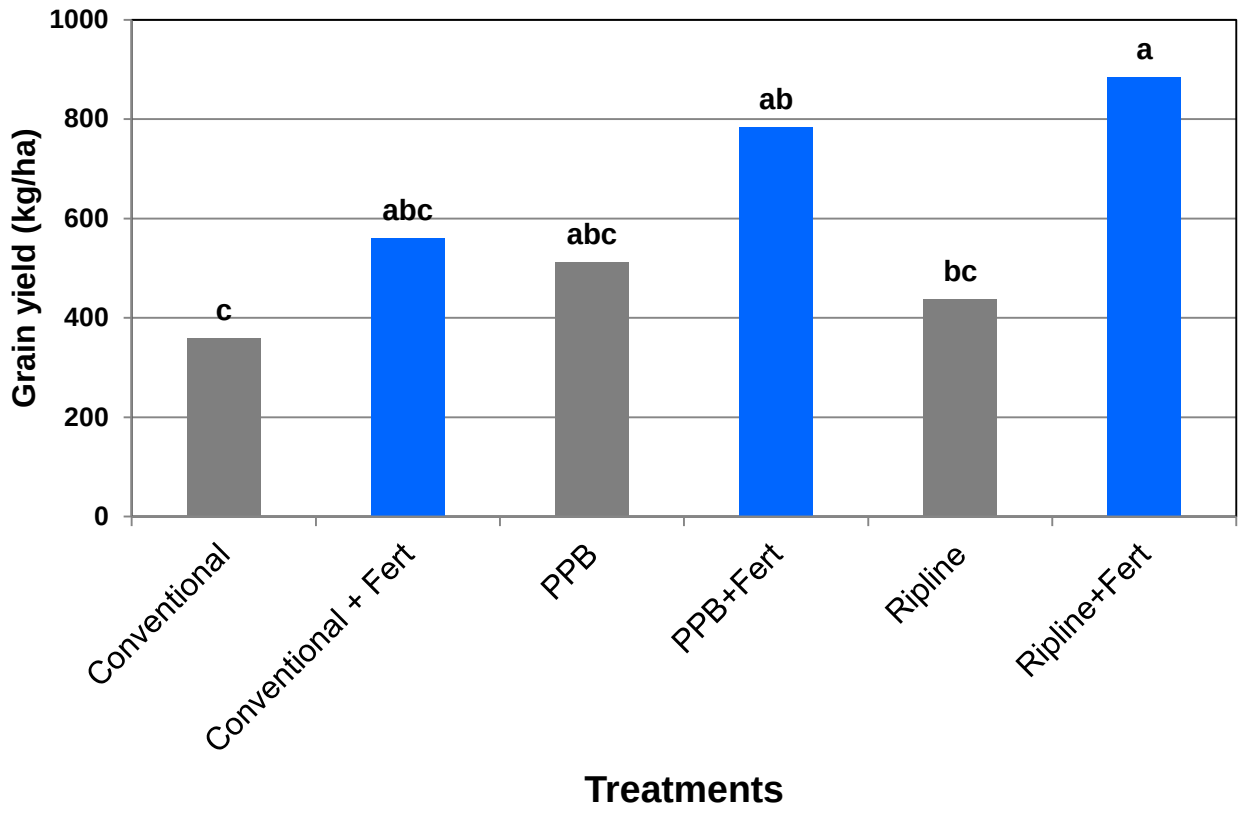
✓ Mubiru, D.N., J. Namakula, J. Lwasa, G.A. Otim, J. Kashagama, M. Nakafeero, W. Nanyeenya, and M.S. Coyne. 2017. **Conservation Farming** and Changing Climate: More Beneficial than Conventional Methods for Degraded Ugandan Soils. Conservation farming tillage methods are more beneficial than conventional methods on degraded Ugandan soils. Sustainability (ISSN 2071-1050, IF 1.343). Online at http://www.mdpi.com/journal/sustainability/

✓ Operational Field Guide for Establishing and Managing **Conservation Agriculture** Demonstrations . Drake N. Mubiru et al. (eds.). NARO/ New Vision

✓ Permanent Planting Basins (PPB): Bridging the yield gap – a brochure

✓ Rip lines: Egging you on to food security – a brochure

Evidence of impact in terms of 30% increases in yield and 30% reduction in production risks

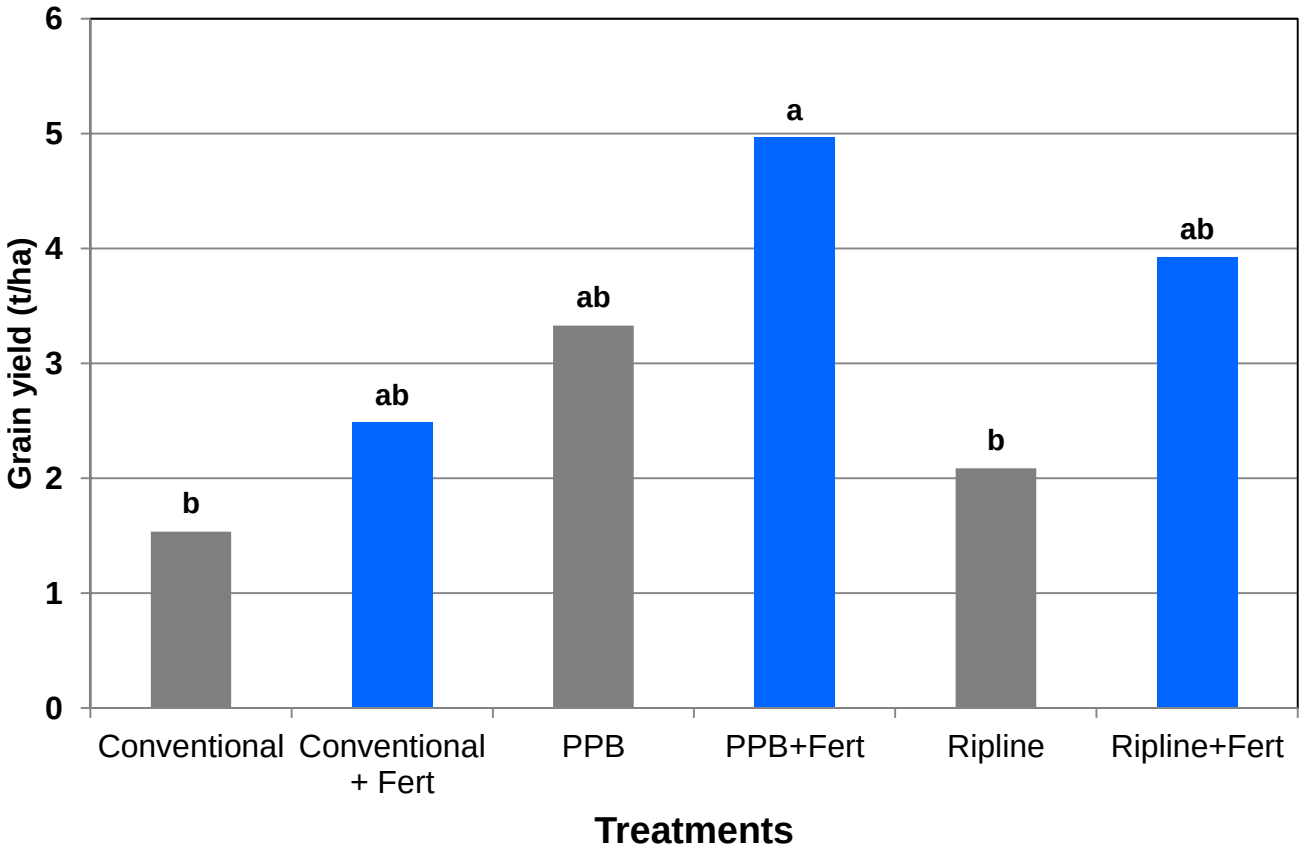


Response of bean grain yield to different tillage practices with and without fertilizer - an average of 2 seasons

➢Farmers using technologies such as rip lines and permanent planting basins (PPB), introduced by the SIMLESA project, in combination with improved seeds and fertilizers and/ or manure have seen their bean grain yields increase from as low as 300 kg ha^{-1} to 1,000 kg ha^{-1}, although the yield potential of beans in Uganda is 2,000 kg ha^{-1}.

Mubiru et al., 2017

Evidence of impact in terms of 30% increases in yield and 30% reduction in production risks



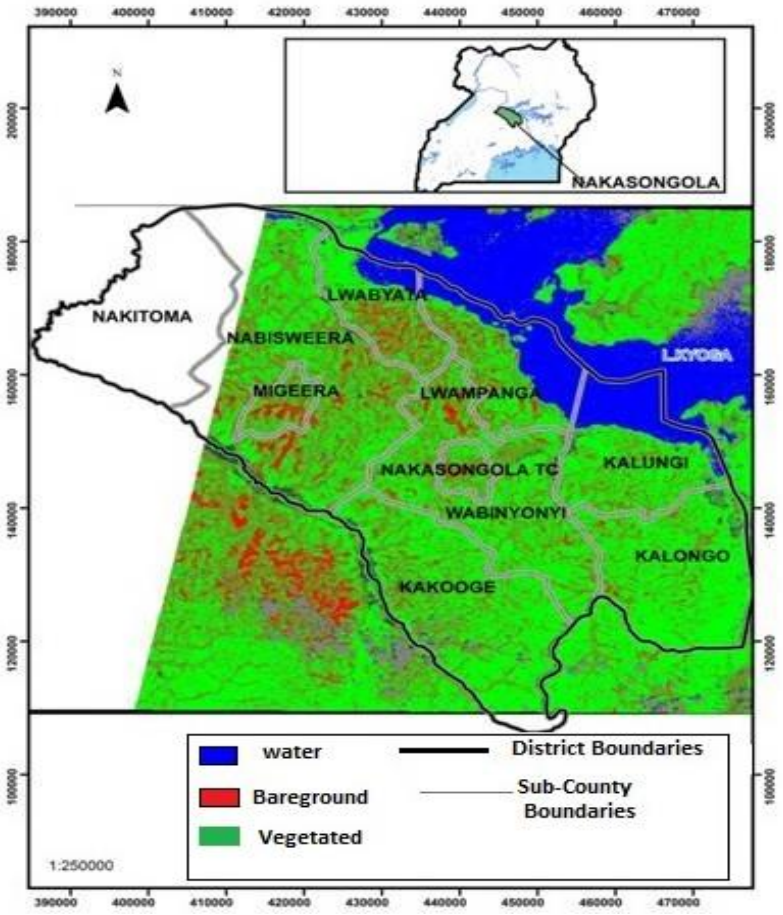
Response of maize grain yield to different tillage practices with and without fertilizer - an average of 2 seasons

- Maize grain yield has increased from an average of 3,000 kg ha^{-1} to 5,000 kg ha^{-1}; yield potential for hybrid maize ranges from 5,000 to 8,000 ha^{-1}.

Mubiru et al., 2017

Evidence of increased environmental sustainability

In Uganda, land degradation has led to significant impacts upon the smallholder agro-ecosystems including direct damage and loss of critical ecosystem services such as agricultural land/ soil and biodiversity.



Spatial distribution of bare-grounds in Nakasongola District and surrounding areas

Bare ground coverage in Nakasongola District due to extreme cases of soil compaction was 187 km^2 (11%) of 1,741 km^2 of arable land – **Mubiru et al., 2017**

In tillage trials/ demonstrations on degraded farmer plots, conservation farming tillage methods **[PPBs]** proved beneficial relative to conventional methods on degraded soils, with a short term benefit of increasing land productivity leading to better harvests and food security.

In tillage trials/ demonstrations on degraded farmer plots, conservation farming tillage methods **[Rip lines]** proved beneficial relative to conventional methods on degraded soils, with a short term benefit of increasing land productivity leading to better harvests and food security.

Key messages to farmers, agribusiness, extension and policy

Farmers	With project support, farmer groups have been strengthened and are now more coherent. Achieved through constant engagement, hands-on training, and exposure to technologies, and tools and implements along the commodity value chains
Extension	The project has introduced technical service units, AIPs, communication materials [brochures & CA demo implementation guide]
Agri-business	Business model analysis revealed that private entrepreneurship has the potential to contribute significantly to the adoption and scaling of research technologies
Policy	Policy recommendations have been made on promoting sustainable intensification through enhanced input access

Key impacts and in invisible benefits

Reduced production risks and improved food security	- PPBs and Rip lines spreading quite fast - Maize storage cribs have helped to reduce post-harvest losses and farmers can now afford to hold onto their produce for better prices
Business outlook along the commodity value chains	- Agricultural Innovation Platforms (AIP) - Mechanization service providers [spraying, ripping, and shelling] - Bulking and collective marketing
Capacity development	- Farmer level – targeting men, women and youths - Field ext. worker level - targeting both men and women - Scientist staff level - targeting mainly young scientists
Mechanization	- Youths have been targeted to coordinate Technical Service Units [trained and equipped with conservation farming tools and implements]

Prospects and challenges to scaling

- SIMLESA to capture best bet practices for the AIPs
- For sustainability of the AIPs, skills development for the facilitators and some AIP members in savings and financial management is required
- Organize exchange visits for the AIPs to other successful platforms
- Link farmers to financial institutions
- Embed the technical service units model in AIPs
- Highlight exit plan of project to stakeholders

Prospects and challenges to scaling

- Put more emphasis on post-harvest handling and marketing
- SIMLESA to draw expertise from local artisans who make ox drawn ploughs for ripper making.
- Boost acquisition of supplementary feeds for oxen most especially in drought conditions by involving animal husbandry experts from national institutes and local government officials
- Promote the introduced elite pigeon pea varieties to SIMLESA project areas (Nakasongola and Lira)
- Engage ASARECA in policy formulation dissemination and advocacy for conservation farming equipment and implements

ACKNOWLEDGEMENTS

- The farming communities in Lira and Nakasongola districts
- The district local governments
- The National Agricultural Research Organization (NARO)
- SIMLESA
- CIMMYT
- ACIAR

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Thank you for listening!

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