FIELD DAYS AND PARTICIPATORY EVALUATION IN MTUNTHAMA, KASUNGU DISTRICT, MALAWI

Participatory evaluation of innovation bundles

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The Sustainable Intensification of Mixed Farming Systems Initiative aims to provide equitable, transformative pathways for improved livelihoods of actors in mixed farming systems through sustainable intensification within target agroecologies and socio-economic settings.

Through action research and development partnerships, the Initiative will improve smallholder farmers' resilience to weather-induced shocks, provide a more stable income and significant benefits in welfare, and enhance social justice and inclusion for 13 million people by 2030.

Activities will be implemented in six focus countries globally representing diverse mixed farming systems as follows: Ghana (cereal–root crop mixed), Ethiopia (highland mixed), Malawi: (maize mixed), Bangladesh (rice mixed), Nepal (highland mixed), and Lao People's Democratic Republic (upland intensive mixed/ highland extensive mixed).

Contents

Abbreviations and acronyms

ABC	Alliance of Bioversity International and the International Center for Tropical Agriculture (CIAT)
CA	Conservation agriculture
CADECOM	Catholic Development Commission in Malawi
CIMMYT	International Maize and Wheat Improvement Center
DARS	Department of Agricultural Research Services- Malawi
EPA	Extension Planning Area
GESI	Gender and Social Inclusion
IITA	International Institute of Tropical Agriculture
ILRI	International Livestock Research Institute
IRRI	International Rice Research Institute
IWMI	International Water Management Institute
K2 TASO	K2 Tigwiranemanja AIDS Support Organization
SDG	Sustainable Development Goals
SI-MFS	Sustainable Intensification of Mixed Farming Systems Initiative
WP	Work Package

Background

The vast majority of Malawians rely on small-scale, rain-fed agriculture, making them highly dependent on weather patterns. Climate change increasingly exacerbates droughts, flooding, and inconsistent rainfall—contributing to food insecurity and threatening to derail progress toward Malawi's goal of self-reliance (USAID, 2023). The Consultative Group on International Agricultural Research (CGIAR) Mixed Farming Systems initiative (MFS) has introduced various climate-resilient technologies to farmers, including conservation agriculture, maize-legume integration, the use of inorganic and organic fertilizers, crop rotation, inoculants, improved seeds, optimized ridge and plant spacing, as well as forages. These innovations aim to enhance agricultural productivity, build natural, social, and human capital, and increase the flow of environmental services.

Kasungu is one the districts in Malawi where CIMMYT is implementing the MFS initiative. Like every other district, Kasungu is divided into extension planning areas (EPAs) and Mtunthama is one of them. In its first year of implementing the initiative in Kasungu, CIMMYT has engaged 43 farmers spread across 8 sections of Mtunthama EPA who are hosting mother trials. The sections have been grouped into 3 clusters as follows: Cluster 1 – Livwezi, Liziri and Mchezi; Cluster 2 – Kasikidzi, Mtunthama and Nthema; and Cluster 3 – Chambwe and Kadifula.

Prior to laying out the trials, farmers were engaged to understand their current farming systems status in terms of range and farm practices; access to input and output markets; environment and climate change effects; and profitability of agrarian livelihoods. In addition, these engagements were also used to introduce the SI-MFS initiative and co-design the innovations with farmers. Farmers were given the opportunity to decide on the crops of their interest based on their needs. The table below highlights the crops employed in these trials, their varieties and corresponding key traits.

Table 0.1 Key traits of crops and varieties used in the MFS mother trials

Crop	Variety	Key traits/ descriptors	Year of release
Pigeon pea	Mwaiwathualimi	• Medium maturing • 159-165 days, semi-spreading growth habit, yellow flower color, green pods with brown stripes, • small seeded 14g/100 seeds • yield is 2.5-3.0 t/ha	2009
Soybean	Chitedze 4	• Indeterminate • High yield • Early maturing.	2020

		• Small seeded • Brown Hilum • Purple flower Yield potential 2 to 3.5t/ha	
Cowpea	Sudan 1	• Early maturing- 50-60 days, • Indeterminate, semi-prostrate growth habit, small elongated dark green leaves which are palatable, violet flowers, • small seeded (13g/100 seeds) grain, kidney seed shape, • Tolerant to Aphid Borne Mosaic Virus and smooth texture	2003
Maize	MH43A	• Early to medium maturity 120 days • Yield potential 5 to 7 t/ha • Double or multiple cobbing • Flint and sweet characteristics • High in Vitamin A • Drought and disease tolerant • Suitable for both summer and winter production • High popping characteristics and suitable for roasting	
Lablab	Hayworth	•	

MFS innovations – Changing the narrative of mixed farming in Mtunthama

Each mother trial is testing the production of maize as a sole crop, intercropped with cowpea or lablab and in rotation with soybean or pigeon pea all under conservation agriculture and compared with the conventional practice of growing maize under Sasakawa. The detailed treatment description is as follows:

1. Conventional ridging with continuous sole maize: Maize planted into conventional ridge tillage plots at 75 cm between rows and 25 cm between stations, 1 plant per station. Maize will be planted in all seasons.
2. CA with continuous sole maize: Maize planted at 75 cm between rows and 25 cm between stations, 1 plant per station. The maize will be planted in all seasons.
3. CA with maize/cowpea double-row strip cropping: Maize planted at 50 cm between rows and 25 cm between stations, 1 plant per station with a double-row intercrop of cowpea planted in rows 45 cm apart and 20 cm in-row spacing. Alternate two rows of maize with two rows of cowpea (Figure 1).
4. CA with maize/lablab double-row strip cropping: Maize planted at 50 cm between rows and 25 cm between stations, 1 plant per station with a double-row intercrop of lablab planted in rows 45 cm apart and 20 cm in-row spacing. Alternate two rows of maize with two rows of lablab (Figure 1).
5. CA with cowpea-maize rotation: 5a) Maize direct seeded at 75 cm between rows and 25 cm between stations, 1 plant per station. Split the plot into half and plant maize on one half and cowpea on the other half and rotate the portions annually.
6. CA with lablab-maize rotation: Maize direct seeded at 75 cm between rows and 25 cm between stations, 1 plant per station. Split the plot into half and plant maize on one half and lablab on the other half and rotate the portions annually.
7. CA with pigeon peas-maize rotation: Maize direct seeded at 75 cm between rows and 25 cm between stations, 1 plant per station. Pigeon peas directly seeded at 75cm between stations ,2 plant per station. Split the plot into four parts (1) Inoculated and fertilized with Mbeya (2) non inoculated and fertilized with Mbeya (3) Inoculated and fertilized with inorganic fertilizer (4) Non inoculated and fertilized with inorganic fertilizer.
8. CA with soybean -maize rotation: Maize direct seeded at 75 cm between rows and 25 cm between stations, 1 plant per station. Soybean direct seeded at 45cm rows, 5cm between stations ,1 plant per station. Split the plot into four parts (1) Inoculated soybean, fertilized with Mbeya (2) non inoculated soybean, fertilized with Mbeya (3) Inoculated soybean fertilized with inorganic fertilizer (4) Non inoculated soybean fertilized with inorganic fertilizer.
9. CA with sole maize: Maize planted at 75 cm between rows and 25 cm between stations, 1 plant per station. This will be rotated with pigeon peas
10. CA with sole maize: Maize planted at 75 cm between rows and 25 cm between stations, 1 plant per station. This will be rotated with soybean

While farmers expect MFS innovations to enhance their dietary diversity, they are also being shown the potential of boosting their livestock production through residues of these crops.

The field day approach

A farmer field day is an approach that accompanies a new technology that has been introduced and tested by a group of farmers and then an NGO or extension worker engages neighbouring farmers and the community in a meeting where the attributes of the technology are discussed, and its performance is observed in the field. The field day thus creates an opportunity for farmers to share information, observe performance, and deliberate on technological attributes Emerick & Dar, 2021). A joint MFS field day was held with ABC and IITA in Mtunthama followed by CIMMYT cluster-level field days in each of the three clusters.

Objectives of the field days

The objectives of the field days were:

1. To strengthen awareness of the MFS initiative and innovations among farmers and other stakeholders in Kasungu
2. To obtain feedback from farmers on the MFS innovations being tested

MFS joint farmers' field day

A pre-harvest farmers' field day was held on 20th March 2024 in Mtunthama jointly with ABC and IITA. The day began with a tour of MFS innovations stationed at the EPA office premises then on to farmers' fields where the CGIAR centres are working with farmers in testing the MFS innovations. Participants of the tour included CADECOM, CGIAR centers staff, Kasungu Agro-dealer Association, Kasungu District Agriculture office staff, K2 TASO, Mtunthama EPA farmers, Mtunthama extension staff, various media houses and others. Two CIMMYT mother trial sites were visited; one in cluster one hosted by Mrs. Sarai Mkanase and another one in cluster 2 hosted by Mr. Charles Kanyenda. Each farmer explained the treatments on the site, challenges faced, and benefits observed so far. The tour ended with a plenary session at Chilowamatambe section (the last site of the tour – one of the sections where ABC is implementing their MFS activities) with an attendance of 411 participants. Representatives from the various stakeholders made remarks on the MFS initiative as observed from the tour.

Cluster-level field days

The joint field day was followed by cluster-level field days which were held from 17 to 19th April 2024 with a total of 302 farmers in attendance. The cluster field days were advertised only to farmers in the same clusters as the implementing farmers. CIMMYT is implementing the initiative in 3 clusters. Farmers were taken through the treatments at the mother trial sites with the hosts explaining each innovation to the other farmers and attributes discussed in plenary. Farmers were then split into men and women; with each farmer given three tickets to vote for their three preferred innovations. This was followed by a plenary discussion where men and women explained reasons for their choices.

Farmers' experience with MFS innovations in the first year of implementation in Mtunthama

Lessons and challenges

The 2023/2024 season was greatly affected by the El Niño weather conditions. Overall, the country experienced a late and erratic onset of effective planting rains, inadequate rains, reduced rainy days as well as prolonged dry spells which significantly affected crop production prospects. Unfortunately, Mtunthama was not spared from this shock with crops wilting over a 2 weeks' drought in February 2024. However, this served as a firsthand experience for farmers as crops under CA did not wilt. Sarai Mkanase one of the mother trial host farmers in Mchezi section was all smiles as she took the joint field day participants through her field explaining the different technologies displayed. "I have so far learnt the importance of mulching and intercropping maize with legumes such as cowpea as these provide good soil cover that conserves moisture. As you can see, my crops did not wilt despite having no rainfall for two weeks. Other farmers in the area have experienced wilting of their crops and this should affect their yields", explained Sarai.

However, farmers cited several challenges faced in implementing the trials. The first challenge was that MFS innovations significantly increased drudgery and overall labor costs. For example, CA required that farmers re-do their land preparation from ridge system to flat surfaces. In addition, planting involved taking different row spacing measurements for the different crops, an activity that took a considerable amount of time. Also, being the first year of implementation, farmers had difficulties sourcing mulch to apply in the CA plots. Under conventional practice, farmers normally burn their residues or use them to feed their livestock (FAO, 2022); and that by the onset of a season, there are hardly any maize straws available to apply as mulch.

Participatory innovation evaluation by farmers

Cluster level field days were used to collect data on participatory innovation evaluation by farmers. There was a total of 302 participant farmers making a total of 906 votes. The figure below summarizes the results of the evaluation. The most preferred innovation by women was the maize-cowpea strip cropping because the cowpea variety used is short duration and had already been harvested by the time we had the cluster field days. Women explained that by intercropping maize with cowpea, they were guaranteed of having both 'nsima' and roan the other hand, men preferred the maize sole cropped under conservation agriculture with inorganic fertilizer. It was noted that men would rarely prefer to intercrop but rather rotate to focus their effort on one crop. Overall, with men and women's votes combined, the maize-cowpea strip cropped under CA had comparably the highest votes. A second season of implementation will help to conclude on the farmers perspectives.

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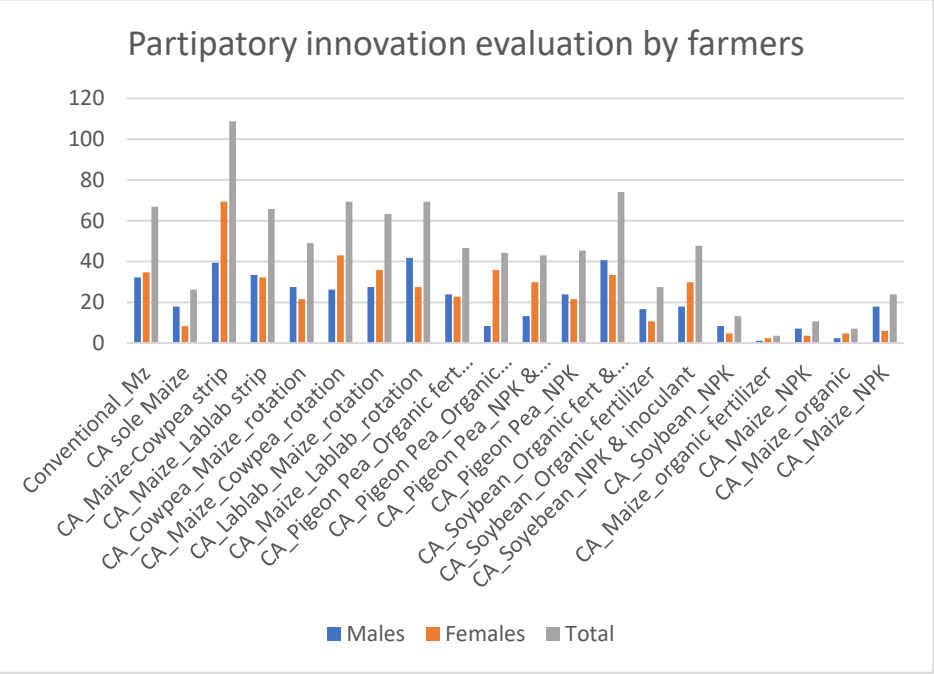

Figure 0.1 Summary of outcomes from participatory innovation evaluation

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Appendix

Table 2***: Summary of participatory evaluation votes***

Plot	Treatment	Males	Females	Total
Plot 1	Conventional_Mz	32	35	67
Plot 2	CA sole Maize	18	8	26
Plot 3	CA_Maize-Cowpea strip	39	69	109
Plot 4	CA_Maize_Lablab strip	33	32	66
Plot 5A	CA_Cowpea_Maize_rotation	27	22	49
plot 5B	CA_Maize_Cowpea_rotation	26	43	69
Plot 6A	CA_Lablab_Maize_rotation	27	36	63
plot 6B	CA_Maize_Lablab_rotation	42	27	69
Plot 7A	CA_Pigeon Pea_Organic fertilizer & inoculant	24	23	47
Plot 7B	CA_Pigeon Pea_Organic fertilizer	8	36	44
Plot 7C	CA_Pigeon Pea_NPK & inoculant	13	30	43
Plot 7D	CA_Pigeon Pea_NPK	24	22	45
plot 8A	CA_Soybean_Organic fertilizer & inoculant	41	33	74
plot 8B	CA_Soybean_Organic fertilizer	17	11	27
plot 8C	CA_Soyebean_NPK & inoculant	18	30	48
plot 8D	CA_Soybean_NPK	8	5	13
plot 9A	CA_Maize_organic fertilizer	1	2	4
Plot 9B	CA_Maize_NPK	7	4	11
Plot 10A	CA_Maize_organic	2	5	7
plot 10B	CA_Maize_NPK	18	6	24
	TOTALS	**528**	**478**	**906**

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