

Enhancing Total Farm Productivity in Smallholder Conservation Agriculture-Based Systems in Eastern Africa

EC-IFAD Supported Project



Project's Results Feedback Workshop Summary Report, KARI-Embu *9th September 2013*

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1.0 Background

EC-IFAD project focusing on whole farm based agriculture was started in January 2011 under the administration of the Kenya Agricultural Research Institute (Embu) in eastern Kenya region. The project had emphasis on sustainable production and utilization of crops, trees and livestock by smallholder farmers. The project's activities linked closely with an earlier started project, Sustainable Intensification of Maize-Legume cropping systems for improved food security in Eastern and Southern Africa (SIMLESA) project through validation and promotion of conservation agriculture (CA) based systems in the same target area. Therefore the outputs from the EC-IFAD funded project add new dimensions to SIMLESA project by focusing on strategies that reduce competition between livestock and crops for use of residues as mulch or feed resource.

The EC-IFAD project had both on-farm (farmer managed) and on-station (researcher managed) trials and demonstrations to reconcile the smallholder farmers' objective of increasing crop and livestock feeds while optimising livestock systems and crop productivity. This was achieved by participatory undertaking activities whose results were therefore shared or presented to partners in a workshop.

2.0 Workshop Objective

The objective of the workshop was to share the EC-IFAD project outputs with farmers who participated in the trials implementation. Other participants included MoA officers and farmers who had adopted the project's tested and endorsed technologies.

3.0 Progress

A total of 48 EC-IFAD partners involving trial hosting and adopter farmers from the four project sites (Kyeni, Mweru, Mworoga and Mariani) were invited in the workshop (Table 1). The workshop was held on 9th September 2013 at KARI-Embu. The meeting moderated by the project site team leader (Mr. Alfred Micheni) and the Kyeni Division DAEO, Mr Albert Munyi.

Table 1: Participants, men and women members of farming communities and institutions who attended EC-IFAD project feedback workshop at KARI-Embu

Category	Gender		Total No.
	Male	Female	
1. Trial farmers	5	7	12
2. Adopter farmers	8	11	19
3. Project's champions	1	4	5
4. Extension providers	2	3	5
5. NGO partners	0	2	2
6. KARI officers	4	0	4
7. CIMMYT Scientists	1	0	1
Total	21	27	48

In attendance were also champion farmers and members of institutions that supported and guided the implementation of the project. There were 48 total participants of which 56.3% were females while the balance was made of males (Figure 1). Unfortunately there was no female representation from KARI and CIMMYT sub groups.

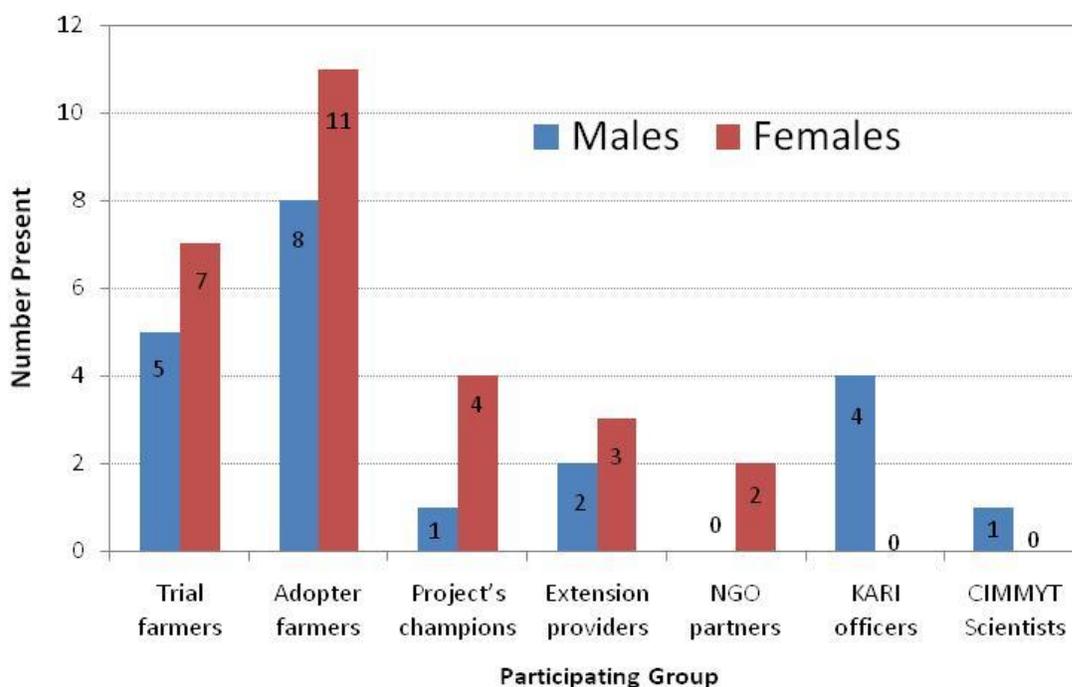


Figure 1: Eastern Kenya EC-IFAD project feedback workshop participants based on gender

Workshop program

Time	Activity	Responsibility
8.30 – 9.00 am	Registration of participants	Emily Njeru
9.00 – 9.30 am	Introductions (participants and KARI Embu programs)	Charles Mugo
9.30 – 10.15 am	Workshop objectives	Alfred Micheni
10.15 – 10.30 am	Tea/Coffee Break	All
10.30 – 11.00 am	Tour KARI-Embu On-station Demos and Labs	Silas Murithi
11.00 am – 12.00 pm	Overview of the EC-IFAD objectives, implemented activities and main results	Alfred Micheni
12.00 pm – 1.00 pm	Discussions on the presentations	Alfred Micheni
1.00 – 2.00 pm	Lunch Break	All
2.00 – 2.30 pm	Report from trial farmer	Albert Munyi
2.30 - 2.45 pm	Discussions on trial farmers' reports	Albert Munyi
2.45 – 3.15 pm	Report from adopter farmers	Albert Munyi
3.15 – 3.30 pm	Report from champion farmers	Albert Munyi
3.30 – 3.45 pm	Report from other partners	Albert Munyi
3.45 – 4.30 pm	General Discussions based on reports provided above	Alfred Micheni
4.30 – 4.45 pm	Tea/Coffee Break	All
4.45 – 5.20 pm	Conclusions	Alfred Micheni
5.20 – 5.45 pm	Way forwards	Alfred Micheni
5.45 pm	Vote of thanks and close of the meeting	Purity Wanjiku

4.0 Tour of KARI Embu on-station Demos

The participants were told that the center is one of the Kenya Agricultural Research Institute's Centers with a mandate to conduct adaptive research aimed at developing technologies necessary to improve agricultural production under diverse geo-physical and socio-cultural backgrounds. Commodity research mandate covers maize, food legumes, oil crops, root/tubers, horticulture, sorghum/millet, forages, livestock nutrition, animal health and soil and water management (Figure 2). They were also told that most of the centers activities are participatory conducted on-farm and focuses on integration of farm enterprises, knowledge and other locally available resources aimed at adding value to land for alleviating hunger and poverty.

The institute collaborates with partners to disseminate knowledge and technologies to farmers using the following approaches:

- i. Training of farmers and partners on topics relevant to natural resource management.
- ii. Establishment and management of on-station and on-farm crop/fodder and soil fertility management (incl. conservation agriculture) demonstrations and trials.
- iii. Bulking and distributing crop and fodder planting material to farmers and other partners.
- iv. Sensitize farmers to forming research/demonstration farmer groups for demanding technologies from KARI and other sources.
- v. Planning and hosting field days and other outreach activities/events
- vi. Conduct exchange visits for scientists, farmers and extension providers
- vii. Participation in agricultural shows and field days.

To address the constraints, the centre together with collaborators adopted technological strategies focusing on training via conducting on-farm and on-station demonstrations. The workshop participants toured the centre's on-station plots and observed some fodder crops (Figure 3a and 3b)



RESEARCH PROGRAMMES AT KARI-EMBU

Natural Resource Management

- Soil and Water Management (SWM)
- Integrated Soil Fertility Management (ISFM)
- Climate Change



Food Crops and Crop Health

- Cereals (maize, sorghums and millets)
- Legumes (beans, cowpeas, pigeon peas and rams)
- Roots and tuber crops (cassava, Irish potatoes, potatoes)




Horticulture and Industrial crops

- Fruits (mangoes, avocados, bananas, etc)
- Vegetables (indigenous leafy vegetables, etc)
- Flowers (Gladiolus, lily, etc)
- Oil crops (sunflower, groundnuts and soybeans)



Animal Production Research

- Dairy (Nutrition)
- Pastures and Fodders



Animal Health Research

- Zoonotic diseases



Cross-cutting Programmes

- KARI Seed Unit
- Socio-economics and Applied Statistics
- Adaptive research, Outreach and Partnerships

Figure 2: Research Programmes at KARI-Embu



Figure 3a: Appreciated two of the grass fodder species on demonstration at KARI-Embu during EC-IFAD project feedback meeting, 9th September 2013



Figure 3b: Appreciated fodder species: Leuceana (top left), Leuceana (top right), fodder sweet potato (bottom left) and mulberry (bottom right) on demonstration at KARI-Embu during EC-IFAD project feedback meeting, 9th September 2013

5.0 Summary of workshop observations

5.1 Presentations

Various topics were presented and discussed by the participants in the feedback workshop (Figure 4)



Figure 4: Mr Albert Munyi (DAEO, Kyeni) facilitating in the feedback workshop discussions

Observations made from the presentations and discussions touched on:

1. Priority enterprises in the region (e.g. horticultural crops, food crops, trees and livestock). It was further noted that less than 20% of farmers in the region have formal or informal methods of earning off farm income

that goes along boasting farming activities. The reports were provided based on SIMLESA and the project (IFAD supported) baseline studies conducted in 2010/2011 in the same sites.

2. Main land use systems were listed as tea/dairy, coffee/dairy and cotton/sunflower zones). The reports were provided based on SIMLESA and the project (IFAD supported) baseline studies conducted in 2010/2011 in the same sites. Figure 5 was showed to the participants who appreciated the diversity of the agro-ecological zones in the region. It was agreed that each system has its unique challenges and opportunities and that should be managed as such.
3. Livestock contributes dearly to food and cash generation via provision manure and food (meat, milk and eggs). An emphasis was put forwards to study and crop and livestock value chain for one to fetch more benefits. This was to be done concurrently with strict farm record keeping.
4. Maize and legumes production systems (e.g. intercrop or sole crop systems). It was noted and agreed that trees are also part of maize/legumes cropping system(s) due to the fact that the maize/legumes farms have trees naturally growing or/and planted by the farmer at different parts of the farm.
5. Main challenges affecting food production in eastern Kenya region. Table 2 provides a list of the challenges and interventions or coping strategies as provided by farmers.

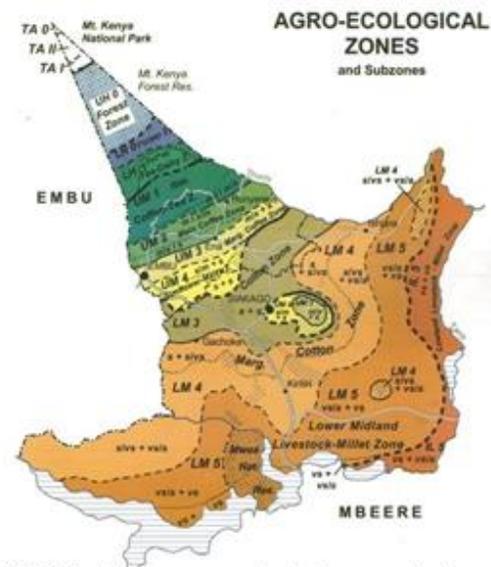


Figure 5 Main agro-ecological zones in the EC-IFAD project implementation areas; an example from Embu County Source (Jaetzold et al. 2006)

Table 2: Main Challenges and interventions/coping strategies narrated during EC-IFAD project feedback workshop at KARI-Embu, 9th September 2013

No.	Challenge	Intervention or coping strategy
1.	Low soil fertility	<ul style="list-style-type: none"> • Control erosion on sloppy farms • Apply manures in all crops • Crop residue return • Apply inorganic fertilizers • Integration of all (above)
2.	Limited knowledge on the appropriate cropping systems	<ul style="list-style-type: none"> • Attend training and participate in agricultural shows and exchange visits
3.	Low prices of farm produce	<ul style="list-style-type: none"> • Sell farm produce while in groups • Grow high value crops • Sell farm produce when prices are better in the market • Conduct market survey and keep farm records
4.	Small land sizes	<ul style="list-style-type: none"> • Improve land productivity (avoid wastage) • Diversify and intensify enterprises and systems • Reduce the number but improve on quality of animals
5.	Poor crop/livestock species	<ul style="list-style-type: none"> • Acquire improved crop species and animal breeds
6.	Limited livestock feed	<ul style="list-style-type: none"> • Establish tree nurseries and plant high quality fodder trees • Conserve (in the field or store) fodder materials • Add value to the available fodder/feeds • Purchase commercial feeds and minerals • Reduce the number but improve on quality of animals • Keep small animal types (e.g. pigs poultry and dairy goats)
7.	Limited or high cost labour for farm operations	<ul style="list-style-type: none"> • Employ labour saving technologies in the farm • Acquire appropriate tools and equipment • Utilize all members of the farming for farm operations; including school going children during week days and holidays. • Engage casuals or daily or monthly basis
8.	Crop and livestock pest and diseases	<ul style="list-style-type: none"> • Employ integrated pest management approaches • Embark of pest tolerant crop species and animal breeds • Control or manage the pests
9.	Limited and expensive credits	<ul style="list-style-type: none"> • Join farmer groups for cheap credits • Sell some capital, including labour • Get enterprise insurance
10.	Diverse weather variability	<ul style="list-style-type: none"> • Grow and keep appropriate crops and livestock • Early planting under conservation agriculture tillage systems • Do irrigation (where possible) • Intensify and diversify production and utilization of crops and fodder shrubs

- Contribution of maize and bean crops in providing residue for livestock feeding. It was noted that some farmers use some maize grains to feed dairy animals and even to fatten bulls and pigs. The maize had to be ground and mixed with some dry leaves of *Calliandra* or *Desmodium* as source of protein. Reference was made to lessons learnt from KARI livestock scientists during earlier farmers visit to KARI on preparation and utilization of homemade ration using inputs sourced from within the farm.
- Contribution of maize and beans crops in provision of mulch when practicing conservation agriculture farming practices was singled as an important practice, but with challenges such as:

- a) destruction of stored mulch by termite especially in the lower agro-ecological zones (Mariani and Mworoga);
 - b) theft of stored mulch left in the farms by farmers who have adopted the CA farming practices;
 - c) biting needs for household cash making farmers sell crop residues to the ever most willing buyers.
8. Farm level methods of improving crop residue quality. This included early residue harvesting and then:
- a) drying and storing under the shade to protect them from rain and direct sunlight.
 - b) drying and making bales that are stored and fed to livestock or sold later at higher prices.
 - c) making silage that is fed later to livestock as needs be.
 - d) treating the material with Magandi soda and molasses before feeding to livestock

5.2 Recommendations

The participants made and agreed on the following as recommendations for the future crop/livestock work, as a follow up of the past work:

1. To scale out the project and partners accrued technologies and benefits to other regions
2. To package and distribute the project technologies into farmer's friendly documents
3. To establish community tree nurseries for appropriate fodder species
4. To build strategic partnerships and alliances for higher adoption of accrued benefits.
5. To concentrate farmer groups formation with a mandate to consult and work with research and extension services.
6. To improve on capacity building and empowerment of men and women in handling crop and livestock enterprises
7. To get more focused on getting alternative (besides crop residues) sources of animal feed at farm level.
8. Conduct studies on contribution of men and women farmers in livestock feeding and sharing of accrued benefits.

5.3 Factors facilitating adoption of crop/livestock technologies

1. High demand of technologies from farmers who recognize that embracing new approaches such as planting fodder shrubs saves cash.
2. Developed partnerships between researchers, extensionists and farmers
3. Working through groups and training of trainers (incl. Champions). This has proved efficient way of promoting farmer-to-farmer dissemination of technologies.
4. Fairly good market access for crop and animal products.
5. Great scope for current and future scaling out. Less smallholder dairy farmers in the region are using fodder shrubs.
6. Diversity of crop and tree species in the region, in both high and lower altitude areas.

6.0 Acknowledgements

We wish to thank EC-IFAD for providing financial support. We also appreciate the contribution and collaborative efforts by the Kenya Agricultural Research Institute (KARI) Embu and CIMMYT in administering the project field activities and also the just concluded feedback meeting. We also acknowledged the effort showed by all participants in the feedback workshop.