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Annual Report

Project **Sustainable Intensification of Maize-Legume based Cropping Systems for Food Security in Eastern and Southern Africa (SIMLESA)**

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SIMLESA target and spillover countries



** Zambia is currently benefiting from a US-AID SIMLESA related program, Sustainable Intensification of Maize-Legume Systems for the Eastern Province of Zambia (SIMLEZA)*

Acronyms

ACIAR	Australian Center for International Agriculture Research
AGRA	Alliance for a Green Revolution for Africa
AGRIMERC	Organisation for Sustainable Development of Agriculture and Rural Markets
AIFSC	Australian International Centre for Food Security
APSIM	Agricultural Production Systems Simulator
APSFarm	Agriculture Production Systems Simulation Model for the Whole Farm System
ARARI	Amhara Regional Agricultural Research Institute
ARC	Agricultural Research Council, South Africa
ASARECA	Association for Strengthening Agricultural Research in Eastern and Central Africa
ASSMAG	Association of Smallholder Seed Multiplication Action Group
BARC	Bako Agricultural Research Center
BMGF	Bill & Melinda Gates Foundation
BNF	Biological nitrogen fixation
BOM	Opportunity Bank of Mozambique
CA	Conservation agriculture
CIMMYT	International Maize and Wheat Improvement Center
CIRAD	Agricultural Research for Development, France
CORAF	Conference of the Agricultural Research Leaders in West and Central Africa
CRS	Center for Rhizobia Studies (Murdoch University)
CSIRO	Commonwealth Scientific and Industrial Research Organization
DALDO	District Agricultural and Livestock Development Officer
DEEDI	Department of Employment, Economic Development and Innovation, Queensland
DTMA	Drought Tolerant Maize for Africa Project
EGSP	Effective Grain Storage for Better Livelihood of African Farmers Project
EIAR	Ethiopian Institute of Agricultural Research
EPA	Extension planning area
FARA	Forum for Agricultural Research in Africa
HARC	Hawassa Agricultural Research Center
IAC	Chimoio Agriculture Centre
IARC	International Agricultural Research Center
IAV	Crops and Veterinary Inputs
ICARDA	International Center for Agricultural Research in the Dry Areas
ICIPE	International Center of Insect Physiology and Ecology
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics

IDEAA-CA	Associação dos Produtores de Oleaginosas (Oil crops association ex-Initiative for development of Agriculture in Africa)
IFAD	International Fund for Agricultural Development
IFDC	International Fertilizer Development Cooperation
IFPRI	International Food Policy Research Institute
IIAM	Mozambique's Agricultural Research Institute
IMAS	Improved Maize for African Soils Project
IITA	International Institute of Tropical Agriculture
ILRI	International Livestock Research Institute
IRRI	International Rice Research Institute
ISPM	Polytechnic Institute of Manica
KARI	Kenya Agricultural Research Institute
LER	Land equivalent ratio
MARC	Melkassa Agricultural Research Center
MASA	Malawi Seed Alliance
M&E	Monitoring and evaluation
NARES	National Agricultural Research and Extension System
NARI	National Agricultural Research Institute
NARS	National Agricultural Research Systems
NEPAD	New Partnership for Africa's Development
NGO	Non-Governmental Organization
OPV	Open pollinated variety
PARC	Pawe Agricultural Research Center
PASS	Program for Africa's Seed Systems
PVS	Participatory variety selection
QAAFI	Queensland Alliance for Agriculture and Food Innovation
SIMLESA	Sustainable Intensification of Maize and Legume Cropping Systems for Food Security in Eastern and Southern Africa Program
SPER	Provincial extension services
TLC	Total Land Care
TLII, TL-2	Tropical Legumes II Project
UCAMA	Manica Small-scale Farmers Association
WECARD	West and Central African Council for Agriculture Research Department

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1 Progress summary

The Sustainable Intensification of Maize-Legume cropping systems for food security in Eastern and Southern Africa (SIMLESA) is a multi-stakeholder collaborative research programme managed by the International Maize and Wheat Improvement Centre (CIMMYT) and implemented by national agricultural research systems (NARS) in Kenya, Tanzania, Ethiopia, Malawi and Mozambique with backstopping inputs from other partners. The programme focuses on leveraging science and technology to develop and deliver technological and institutional innovations in relation to maize-legume production systems. In turn it is envisaged that these will make significant measurable positive changes in the livelihoods of all categories of smallholder farmers.

The aim of SIMLESA program is to improve farm-level food security, in the context of climate risk and change, through the development of more resilient, profitable and sustainable farming system that overcome food insecurity for significant numbers of farm families in eastern and southern Africa. SIMLESA Program, is being funded by the Australian Centre for International Agriculture Research (ACIAR) launched in March 2010 and expanded in April 2012 (with funding support from AusAID) to cater for three additional regions in Ethiopia,.

SIMLESA Program falls under the African Food Security Initiative (AFSI) that was launched in 2009/2010 by the Australian Government to assist selected African countries reduce poverty and eliminate hunger as part of fulfilment of Millennium Development Goal Number 1 (MDG1). It is aligned within the African Union (AU) initiated and led made-in-Africa solution known as the Comprehensive Africa Agriculture Development Program (CAADP¹). CAADP was established as part of the New Partnership for Africa's Development (NEPAD), and endorsed by the African Union Assembly in July 2003.

SIMLESA is led and managed by the International Maize and Wheat Improvement Centre (CIMMYT), as the commissioned organisation. CIMMYT is assisted by the following in implementing the program: the national agricultural research systems (NARS) in five eastern and southern African countries; Association for Strengthening Agricultural Research in Eastern and Central Africa (ASARECA), International Crops Research Institute for the Semi-Arid Tropics (ICRISAT); Agriculture Research Council (ARC)-SA; Queensland Alliance for Agriculture and Food Innovation (QAAFI), in association with Queensland Department of Employment, Economic Development and Innovation, (QDEEDI); and Murdoch University. SIMLESA related activities have been initiated in four spillover countries (Botswana, Rwanda, South Sudan and Uganda) for wider impact. The leadership of the Queensland research component has been transferred from DEEDI to QAAFI. The main thrust of the SIMLESA program is increasing farm-level food security, productivity and incomes through promotion of maize-legume intercropping systems, in the context of reduced climate risk and change. SIMLESA Program is envisaged to reach 650,000 small farming households in the five countries over a period of 10 years.

¹ CAADP pillars number 3 and 4- increasing food supply and reducing hunger across the region by increasing smallholder productivity and improving responses to food emergencies; and improving agricultural research and systems to disseminate appropriate new technologies, and increasing the support given to help farmers to adopt them.

SIMLESA program is being implemented under the following five fundamental objectives:

Objective 1: To characterize maize-legume production and input and output value chain systems and impact pathways, and identify broad systemic constraints and options for field testing.

Objective 2: To test and develop productive, resilient and sustainable smallholder maize-legume cropping systems and innovation systems for local scaling out

Objective 3: To test and develop productive, resilient and sustainable smallholder maize-legume cropping systems and innovation systems for local scaling out

Objective 4: To support the development of regional and local innovations systems

Objective 5: Capacity building to increase the efficiency of agricultural research today and in the future

During the last two quarters of 2013, July-December main activities carried out under objective 1 were in accordance with the overall programme plan. The main activities carried out are surveys (adoption monitoring, market, partial analysis, completion of baseline and topology analysis) and marketing trainings. QAAFI continue with the preparation of journal articles for publication on households' typology across five SIMLESA countries of operation. Objective 1 achievements and scaling out plans were discussed at Annual Review Planning Meeting (ARPM) which were held between October and December 2013 in respective countries. Mozambique and Malawi meetings were combined as a cost cutting measure as well as enhancement of partner to partner collaboration and information sharing.

The period July to December 2013, has been mainly devoted to establishment of trials, technology analysis and implementation of identified scalable technologies under objective 2 of SIMLESA program. Activities carried out during this period include proper planning for effective scaling out of SIMLESA technologies to many farmers in all 5 core countries. Selection of scalable technology was conducted based on statistical results and target farmer's preference using participatory methodologies. Minimum tillage-maize-legume intercropping was identified as best-bet technology by farmers in most regions. Exchange visit, field days, trial evaluation, IP meeting and farmer training were conducted in all SIMLESA countries during the reporting period.

Main activities carried out under objective 3 in the last half of 2013 include PVS, seed increase, varietal characterization (distinctness, uniformity and stability (DUS), performance and yield potential), GXEXM analysis and testcross formations. The activities were complemented by efficacy of trial management, data collection, PVS evaluation and field days. During the reporting period scalable technologies including new seed varieties were identified and scaling out plans for the next production season were developed during ARPM country specific meetings. Scientists, seed companies, stockiest and farmers under objective three of the program continued with formal and informal evaluation and promotion of community endorsed maize and legumes new seed varieties.

Capacity building trainings and support of students (PhD and Msc students) in data collection were the main activities under objective 4 and 5. Gender Mainstreaming Unit (GMU) of the Association for Strengthening Agricultural Research in East and Central Africa (ASARECA), contributed to SIMLESA project activities by providing technical backstopping in gender mainstreaming. The overall objective is to ensure the consideration of gender aspect in the different activities of SIMLESA. In September 2013, GMU organized a meeting to validate case study report on “good practices and lessons learnt in gender mainstreaming” initiatives of SIMLESA. Country representatives and SIMLESA gender focal persons participated from all member countries Kenya, Ethiopia, Malawi, Mozambique and Tanzania.

In the last half of 2013 the focus of objective 5 activities was on supporting the MSC and PhD students in conducting field trails and data collection. One training session was conducted in Tanzania on Biometry Principles and Disease & Pest Management during the reporting period.

2 Achievements

2.1 Achievements against project activities and outputs/milestones: July 2013 – December 2013

This report is an outcome of activities conducted between July 2013 and December 2013 in eastern and southern Africa under SIMLESA Program. The first objective of the program is to characterize maize-legume production and input and output value chain systems and impact pathways, and identify broad systemic constraints and options for field testing. Under the reporting period various surveys were conducted which include surveys, typology, value chain and adoption monitoring. Value chain training was one of the key program components which were implemented in some countries. Program achievements are presented objective by objective from 1 up to 5.

Objective 1: To characterize maize-legume production and input and output value chain systems and impact pathways, and identify broad systemic constraints and options for field testing

The achievements of milestones towards objective 1 are summarized in table 1.1 below. For each objective, the achievements of each partner are presented in the following sub-sections.

Table 1.1 Objective 1 Summary of milestones according to the log frame and project work plan

Output	Milestone	Date due for implementation	Comments
1.1: Initial characterization of 10 maize-legume farming systems and selection of 30 research sites/communities	1.1.2: Indicative opportunities for agribusiness and market development in maize-legume systems identified	August 2010	Fully achieved in all countries
1.3: Understanding maize and legume input and output markets and value chains including chain constraints and opportunities, costs and pricing patterns associated with the ten farming systems.	1.3.1: Instruments, tools and protocols for survey data collection standardized for all participating countries	June 2011	Fully achieved in all countries
	1.3.2: Output market chain data and maps (maize, legumes, crop residues-including market shares, costs, price variability, role of grain quality) developed for selected markets/countries	March 2012	Market chain data available for all countries
1.4 Several farm-household system options identified which	1.4.1 Farm household typology developed and case studies identified based on household survey data (link	May 2013	Done for all the countries

are risk reducing and productivity enhancing for each other of the ten farming systems for testing in the research sites/communities	to 1,2)		
1.5 Effective adoption and impact pathways assessed for 10 maize-legume systems	1.5.1 Evaluation criteria, indicators and monitoring processes selected by the team.	Year 1-4	Done for all the countries

Ethiopia

Main activities carried out in Ethiopia under Objective one of SIMLESA program, during the reporting period include development of survey tools for adoption monitoring, market survey, baseline survey, topology analysis and marketing training.

Survey instruments for program adoption monitoring surveys were developed and circulated to national team coordinators in all of the Ethiopian SIMLESA sites. In this regard, identification of SIMLESA technology users is underway in most operational districts. This entails statistics analysis of the SIMLESA technology uptake.

Market survey was completed for maize-legume input and output urban consumers and market participants. Data entry and subsequent activities are underway; this is being spearheaded by CIMMYT, Ethiopia. Typology analysis is going on in collaboration with QAAFI.

Data entry of baseline surveys was completed and data was sent to Hawasa and Somali regions (expansion sites) in electronic form. Results of activities done over the past project period were summarized and presented at the national innovation platform meetings.

Training on marketing (value chain and market analysis) adoption and impact analysis was organised by the Ethiopian team during the reporting period, 14-18 October 2013. A total of 16 NARS objective one scientist were trained in collaboration with CIMMYT scientists.

Kenya

Kenya SIMLESA team in both Eastern and Western regions managed to implement various activities between July and December 2013. These activities include completion of baseline survey, market survey and technology adoption monitoring.

The main achievement undertaken was maize/legume agribusiness/market (value chains aspects and adoption) opportunity and technology adoption studies of CA practices and varieties in the 4 project sites, in collaboration with partners. Baseline surveys were completed and reports prepared. In addition farm household typologies were conducted and a manuscript was prepared for submission to global food security refereed journal. A total of 285 households were interviewed for determination of the project impact. Data is currently being entered with the hope of sharing results at feedback workshops planned for January 2014.

Tanzania

Activities under objective one in Tanzania were implemented as planned during the last half of 2013. The activities were:

- i) early, mid and end of season (after harvest) evaluation of farming technologies, Conservation Agriculture (CA), Conventional (CONV) and alongside with farmer practice (FP)
- ii) Evaluation of maize and pigeon pea in PVS trials in both Karatu district (Upper Kitete village) and Mbulu district (Bargish Uwa) in the northern zone, and Gairo district (Msingisi village), Kilosa district (Dodoma Isanga, and Manderu villages) and Mvomero district (Vitonga, Makuyu and Milama villages). Ten and twelve maize varieties were in the PVS in the northern and eastern zone, respectively. In addition, seven and six pigeon pea varieties were in the PVS in the northern and eastern zone respectively.
- iii) Training farmers and extension on partial budgeting was done. Thirty (30) farmers 21 Male and 9 Female including 4 extension making a total of 34 participants from Mbulu and Karatu districts in the northern zone were trained. Similarly 34 farmers 25 Male and 19 Female including 3 extension making a total of 37 participants from Gairo, Kilosa and Mvomero districts in the eastern zone.

Malawi

In Malawi under objective 1, economic analysis data from all CA trials was collected and economic analysis was done for all the trials. Results indicated that CA dibble stick gave higher net benefits compared to conventional farming system. The legumes included in the rotations i.e. groundnuts and soybeans had very high benefits due to the higher selling prices of \$0.80 and \$0.50 per kg respectively of these commodities compared to the maize staple. In districts like Salima, dibble stick groundnuts in the plot with rotation yielded net benefits of as high as over \$2000/ha which was nearly double with regards to the conventional maize plot that generated slightly over \$900/ha.

Baseline report was finalized. Effective adoption and impact pathways were assessed through adoption surveys. Major farm household typologies and system options that reduce risks and enhance profitability were identified.

Mozambique

Farmers' trials assessment and partial budget analysis

Farmers had the opportunity to evaluate different aspects of the plants (number of plants, weed control, height, uniformity and colour) at the different stages of growth. They were allowed to give 1 to 10 points at each treatment at each evaluation (early, mid and end of season). Additional to this, farmers also had the opportunity to compare the 6 treatments, with a field next to the trial. These results were compared with partial budget analysis of trial data. Results of the analysis showed that:

- **Manica:** At the early season evaluation, farmer's check and legume-maize rotation had the lowest score of 7. But at the mid and end of season evaluations there were not differences between the treatments. Analysis of the evaluation of the field next to the trial show that this field got the lowest score in all the seasons evaluated (5, 6 and 4 respectively). When analyzing profitability, it was found that all the treatments were profitable except legume-maize rotation that had a net benefit of - US\$60.43, which is consistent with farmer's evaluation. The most profitable treatment was maize-legume rotation that had a net benefit of US\$2,171.57.
- **Sussundenga:** Farmers check and the field next to trial had consistently lower scores in the 3 evaluation periods. Intercropping had lower score only for mid and ends of season evaluations. Profitability analysis shows that, all the treatments were profitable, with maize-legume intercropping (696.00US\$) being the most profitable treatment and direct seeded maize being the least profitable (US\$158). Direct seeded maize was outperformed by conventional that generated US\$332per hectare.
- **Rotanda:** Legume maize rotation and field next to the trial had consistently lower scores in the early (7), mid (5) and end (6) of season evaluations. Profitability analysis shows that, all the treatments were profitable, with legume-maize rotation being the most profitable treatment with a net benefit of US\$931.00. Net benefits increased under this plot as beans are sold at higher prices compared to maize on the markets. Conventional lot fetched the lowest net benefits of \$3 /ha followed by direct seeded maize that had USS\$21 /hectare as net benefits.
- **Gorongosa:** All treatments were profitable, with maize-legume intercropping (net benefit equal to 204.00US\$) and legume-maize rotation (net benefit equal to US\$202.00) being the most profitable treatments. The conventional treatment was the lowest in performance with US\$16 net benefits being realized per hectare.
- **Angonia (Ciphole):** All treatments were profitable, with farmer's check and maize basins being the most profitable treatments, with a net benefit of US\$446.00 and US\$450.00, respectively.
- **Angonia (Cabango):** All the treatments were profitable except legume-maize rotation that had a net benefit of \$288US\$. The two most profitable treatments were the conventional and the direct seeded maize intercropped with beans that had benefits of \$762 and \$461 respectively.

Major lessons learnt:

- Importance of on-farm demonstrations as a major source of information for farmers in target communities where different technologies are being promoted under the SIMLESA project
- Importance of integrating market (input-output) linkages when promoting technologies. Inclusion of legumes that fetch higher prices than the staple (even double) is crucial to allow for technology adoption among smallholder farmers rather than promoting staple only.

- Main benefits from CA compared to CN comes from labour saving, higher grain and stover yields and well as nitrogen benefits for the next crop that come as a result of including legumes in the farming system.

Queensland Alliance for Agriculture and Food Innovation (QAAFI) in association with Queensland Department of Employment, Economic Development and Innovation, (QDEEDI, Australia)

- Progress has continued with the preparation of journal articles describing the diversity of households across the five SIMLESA (household typologies).
- Progress has continued improving modelling tools to simulate smallholder farms in collaboration with ILRI (Mark VanWijk and Mariana Rufino) and CSIRO (Mario Herrero). This collaboration resulted in the development of a generic household model by linking the APSFarm (Rodriguez et al., 2011) and LivSim (Ruffino et al., 2008). This software development will allow scientists to model livestock integration activities (i.e. cattle, goats and sheep) across all SIMLESA countries. These activities have already started in other countries like Kenya. In Kenya household modelling results using the APSFarm-LivSim indicate important differences in terms of benefits and trade-offs from alternative intensification pathways across the different household typologies. These results support the hypothesis for the need to better target interventions to local agro-ecological and socio-economic conditions.
- Daniel Rodriguez presented a Key Note paper on pathways for agriculture intensification across the SIMLESA countries at the Fourth Farming Systems Design Conference during September 2013, Lanzhou, China <http://www.fsd2013.com/>

Objective 2: Develop productive, resilient and sustainable smallholder maize-legume cropping systems and innovation systems for local scaling out

In the last half of 2013, main SIMLESA activities under objective 2 conducted includes Annual Review Planning Meeting for scaling out phase, establishment of trials, identification of scalable technologies, farmer trainings, field days and strengthening of local innovation platforms. The achievements of milestones towards objective 2 are summarized in table 2.1 below. For each objective, the achievements of each partner are presented in the following sub-sections.

Table 2.1: Objective 1 summary of milestones according to the log frame and agreed work plan:

Output	Milestone	Date due for implementation	Status
2.1. Identified options for systems intensification and	2.1.2: Potential systems, practices and risk management strategies identified for the	October 2010	Done and ongoing

diversification, which reduce risk in the ten farming systems using systems modelling.	sustainable increase of maize system productivity and legume options for system diversification		
2.2. Functioning local innovation systems developed in each of ten maize-legume farming systems to help overcome system limitations and enhance scaling out of technologies	2.2.1: Diverse set of potential innovation system members invited to participate in field visits and efforts to increase the productivity of maize-legume systems in each of the 10 agro-ecologies; and initial innovation systems formed in each agro-ecology	January 2011	Done and ongoing
	2.2.2: At least one field visit with the innovation system members conducted during the crop season in each target maize-legume system and visiting at least half of the target communities; and post-harvest visit of the innovation system members to each target maize-legume system to discuss results, problems and limitations and measures to overcome them	Mid-crop season- approximately May 2010	Done and ongoing
	2.2.4: Innovation system members working on solutions to observed problems and limitations in the local maize-legume systems	December 2011	Done and ongoing
	2.2.5: Documentation of most effective innovation processes and reasons for their success	2011, 2012 & 2013	Done and ongoing
2.3. Evaluated exploratory trials of current best options for maize/legume smallholder systems for different farm types in with 5-6 cooperating farmers in each of thirty research sites/communities	2.3.3: Basic soil, climate, land use, topography and cropping history data available for each of the exploratory trial sites	December 2012	Done but continuing
	2.3.4 Exploratory trials established by farmers with program orientation and support	June 2013	Done but is ongoing
	2.3.5: Data available on qualitative and quantitative evaluations of exploratory trials by farmers and other members of the local innovation platforms	August 2011 and annually after that	Done
2.4 Adjustments to the maize-legume systems tested in the exploratory trials and farmer experiments developed with farm and soil quality, system productivity and disease, pest and weed dynamics	2.4.4: Precise data on crop productivity and water dynamics available for crop/soil simulation model validation	July 2011 and annually after that	Done and ongoing
	2.4.5 Data available on the effects of technology options on soil quality, BNF and system productivity and sustainability	July 2012 and annually after that	Done and ongoing
	2.4.6: Improved understanding of eco-physical	December	Done but

quantified.	traits to improved maize adaptation to different environments and management practices	2011.	ongoing
2.6 Lessons from active farmer experimentation with CA-oriented systems incorporated into on-farm research trials in each of the thirty research sites/communities.	2.6.1: Farmers installing or planning install maize-legume CA-based experiments on their own fields identified	December 2011 and annually thereafter	Done and ongoing
2.7 Farmer learning through annual facilitated visits of farmers and their local extension agents between the targeted communities in each of the five countries	2.7.2 Farmer-to-farmer networking for scaling out of knowledge and technological innovations. At least one farmer study will take place in each country in or before the 2011/2012 season and one community in each agro ecology in the subsequent season	Mar 2013	Done but ongoing
	2.7.3 Data on new farmer experiments permitting an evaluation of the effectiveness of the farmer-to-farmer visits	May 2013	Done but ongoing

Ethiopia

The period July to December, 2013 has been mainly devoted to establishment of trials and implementation of identified scalable technologies. This includes proper planning for effective scaling out of SIMLESA technologies to many farmers. Selection of scalable technology was conducted based on statistical results and target farmer's preference. Minimum tillage-maize-legume intercropping was identified as best-bet technology by farmers in most regions. In addition, posters, banners, and leaflets were prepared and distributed to farmers in operational regions. Exchange visit, field days, trial evaluation, IP meeting and farmer training were conducted at different Ethiopia SIMLESA target areas during this report period. Furthermore, a write-shop was arranged and responsible researchers have discussed on their manuscripts with each other and with CIMMYT Addis Ababa scientists. Therefore, at least five manuscripts were selected for submission, with minor modifications, to journal for publication. A three day workshop was held in November at Adama and all responsible stakeholders for objective-2 were invited to present the status of their work and plan for the coming season.

Main SIMLESA Sites

i. Melkassa Area

Soil and agronomic data collection at different stages of the crops is in progress mainly for 19 on farm trials established in SIMLESA operational districts namely Boset, Dugda, Adami Tulu and Shala and on-station exploratory trials. Soil water reading and soil sampling were done after harvest. Furthermore, access tubes were recently installed to measure the moisture status of the CA and CP plots after harvest. The tubes are also important in determining water balance starting from end of farming season throughout the dry period until the next planting

season. In addition to the permanent CA and CP plots, other on-going trials on water efficiency were established and data is continuously collected.

Ethiopian team finally agreed on SIMLESA technologies to be scaled out and strategy to be employed. Implementation strategy includes on farm demonstrations, field days, exchange visits, partner training, use of training guides/material and extension services. Half year (July-December 2013) monitoring records revealed that scaling out of maize haricot bean intercropped under CA was successfully achieved on 670 farmers' field and yield data collection is in progress.

A total of five hundred leaflets were prepared in Amharic and Afan Oromo languages. Leaflets were distributed to farmers and trial evaluation was conducted by Melkassa SIMLESA team together with CIMMYT staff. Dr. John Dixon (The SIMLESA program Coordinator, ACIAR) and Dr. Mellissa Wood, Australian International Food Security Center Director visited SIMLESA trials in the rift valley during the reporting period.

ii. Hawassa Area

Exploratory maize and common bean trials have been planted in Hawassa research station with a total of three replications. In Hawassa area SIMLESA activities are being implemented in Badewocho, Meskan and Hawasa Zuria districts. Data collection, farmer monitoring and evaluation, were done as planned in all districts.

Data collection on soil, water, yield components, agronomic, phenology and socio economic is in progress at Hawassa. Several basic information and scientific data were generated from three BNF trials conducted at Hawassa zuria. More than 500 farmers visited the CA plots in each districts during the reporting period especially at field days. Five field days and 1 regional IP meeting were conducted in the last half of 2013. One main exchange visit was organized in Hawassa which covered by the national media.

iii. Bako Area

Agronomic and soil data collection from Bako on-farm (10 farmers in Bako Tibbe and Gobbusayyo districts) and on-station exploratory trials for BNF activity are going on as planned.

During this reporting period, researchers conducted robust past year data analysis to set criteria for evaluating CA technologies besides farmers' local criteria. Researchers evaluated suitable CA technologies based on yield, land equivalent ratio (LER), economic benefits, labour productivity, soil properties, soil loss, and water use efficiency. Based on the step by step analysis and evaluation across cropping season, two CA technologies were identified as best-bet for the Bako. These technologies are:

- (1) Maize bean intercropping under CA
- (2) Bean maize rotation under CA.

The best bet technologies identified in Bako are to be scaled out in the coming season. More than 5000 farmers have been trying minimum tillage by themselves from nearby SIMLESA CA hosting farmers. Furthermore, three exchange visits were carried out of which 510 farmers were invited at Bako-Tibbe. The field day work was broadcasted through ETV and FM radio in

Ethiopia. A documentary film was prepared as way of documenting SIMLESA's work and also serves as teaching guide for future use. Project activities were visited by Dr. Mellissa Wood and other international scientists during the reporting period.

iv. Pawe Area

During this second semi-annual period of SIMLESA 2013 two local field days were held in two districts. More than 45 farmers and 39 participants representing different institutions participated in these field days. In trying to effectively spread best bet technologies especially CA practices awareness materials were listed below were produced:

- one poster
- one calendar,
- two leaflets
- three banners

These were displayed at field days. Important data collection of the on-farm and on-station exploratory trials initiated since 2010 is in progress.

SIMLESA Expansion Sites

i. Amhara regional state

Adet agricultural research center and Andasa livestock research center are the SIMLESA project implementing centres in Amhara regional research institute. Andasa is a specialized research center on livestock and handling forage aspects while Adet is handling crop component of the project. All necessary data on maize CA, maize PVS, Legumes PVS, and forage PVS activities were established and all necessary data collections are in progress. Recording on seed prices, amount, fertilizer, round up chemicals, crop residue on the plot, labour use-prices for planting, weeding and harvesting was done for both on-farm and on station trials.

Conservation Agriculture with maize variety BH-545QPY was selected by farmers as best bet technologies in Amhara region this season and in the previous one. Demo plots monitoring and field days records revealed that:

- BH-545QPY best performs under CA in all demonstration plots
- It holds the attention of farmers and other partners and stockholders
- Farmers are very interested and keen to scale it out

CA technology dissemination through community awareness creation and training reached a total of 92 (83 male and 9 female) who effectively participated mainly through training. During the training, importance of conservation agriculture was highlighted. The other key components covered during the training were roles and responsibilities of IP members (farmers, agricultural offices, community agricultural offices (DA) and Amhara Regional Agricultural Research Institutes). Manuals were prepared in Amharic, language of the target community, and distributed to farmers and other stakeholders. Two field days were conducted at Jabitehnan and South Achefer where 486 farmers and 154 participants from different institutions participated.

SIMLESA experiments conducted on farmers' and on-station field including demos were visited by key stakeholders during the reporting period. The visitors were Adet Agricultural Research Center (AARC) Technical team, ARARI management team, project management and technical team, BOARD extension team, Australia Ambassador in Ethiopia with the national SIMLESA project coordinator and Ethiopia CIMMYT scientists. A total of 54 officials including scientists visited SIMLESA activities in Adet area in the last half of 2013.

ii. Somali Pastoralist and agro pastoralist research institute

Data collection on soil and plant is in progress in Jijiga's established trials. Minimum data set for field characterization was defined and Soil profile samples were taken from Jijiga research station and in each host farmer field in Jijiga and Gursum districts for soil analysis.

Field days were carried out in operational districts. During the farmers' field days participants selected the following options from on-farm CA explanatory trials as scalable technologies:

1. Maize-haricot bean intercropping(CA)
2. Maize-Lablab intercropping(CA)

In addition, farmer's trainings were organized on CA options and CA trial management. In complementing farmer trainings community awareness creation meetings were held at farmer training center (FTC) in both Jijiga and Gursum districts. Community awareness meeting focused on the key fundamentals of conservation agriculture (CA) with comparison to conventional practice (CP) with regards of soil fertility, moisture retention, and cost of production.

iii. Southern Agricultural Research Institute (SARI)

Data collection has been done for all trials established in the Area. Based research results from 2013 and previous years, scalable technologies were identified for SIMLESA 2014 scaling out phase in Loka Abaya and Boricha districts. Selected technologies for scaling out are:

- CA + maize/pigeon pea cropping systems
- CA + maize/bean cropping systems
- Demonstration of oxen-pulled ripper

During the reporting period three field days were conducted and over 100 farmers participated in each field day.

Manuscripts

One manuscript from previous CA plot study around Melkassa area was finalised in this reporting period while another manuscript, which will include 2013 data, is in progress. Three manuscripts have been developed from previous SIMLESA Bako area and three manuscripts from Awassa area. These manuscripts will be submitted for publication as soon as the write up is finalized.

Kenya

SIMLESA team in Kenya continued to manage the CA and maize/legume cropping systems in 21 on-farms and two on-station sites. A 7th set of the trials was established at the start of

October 2013 short rains. More than 144 soil samples were sampled to determine the medium term effects of CA on soil quality.

Having identified minimum tillage practices and maize/legume cropping systems as the best bet technology, extra effort was built to co-opt and work with more partners in scaling-out the technology within and beyond the initial four project sites. Part of this has been strengthening of activities and processes of LIPs and also establishment of mega CA, cropping systems and resilient crops demonstration plots within and beyond the initial project sites. Over 950 partners, including CASFESA and Crop/Livestock projects (operating in the area) in the project were involved in the project implementation. Two exchange tours, three farm-farm monitoring events, one sites joint field day and two workshops were conducted with participation of over 240 stakeholders.

Impact assessments of farm households

Training and pretesting of household and individual questionnaires for the second round of data collection after the baseline survey conducted in 2011 (second wave of survey) was done for one week in the third week of September 2013 jointly with the pathways project. Adjustments were then made accordingly. The survey covered baseline farmers in Embu, Meru South and Imenti South. The survey was carried out for 30 days which started at the end of September 2013. Individual questionnaires were administered to husband and wife in the same households to understand gender dynamics in decision making. In addition joint questionnaire was also administered. 285 households were interviewed compared to 300 in the baseline of 2011, giving attrition rate of 5 %. The attrition rate was 5 %. Data is currently being entered at CIMMYT and the results will be shared at a feedback workshop to be held at Egerton in January 2014.

Annual Review and Planning Meeting

Participated and presented progress of activities carried out by objective 2 team members in collaboration with partners for the period 2010-2013 at the annual review and planning meeting held in Nairobi in the first week of November 2013. Prior to the meeting, internal meetings were held with the project team members in Nairobi to identify key areas to focus the presentations. Multiple delivery pathways such as KARI e-mimi (mimea, mifugo) web portal, radio, TV, phones, information technology units (ITUs) were identified as important in scaling SIMLESA technology. Further, multiple outreach approaches-Public extension officers, input service providers (agro-dealers), field days, Agricultural shows, demonstration plots, farmer exchange visits & Innovation platforms were also identified as key aspects in the outscaling phase of best bet technologies. The three typologies would also be used to match the different types of varieties and management practices to farmer resource endowments. The villages covered in the baseline survey would also be used in expansion of trials in the outscaling phase.

Community awareness meetings

Six community awareness meetings were conducted in each of the operational sites. The meetings had three crucial program components on the agenda: 1) introduce SIMLESA project in new areas, 2) discussion on SIMLESA implementation framework and accrued technologies, 3) how to scale-out the project technologies through partners.

Local Innovation Platforms

The project continued to encourage the 4 LIP initiatives in Kyeni, Mweru, Mworoga and Mariani to overcome operational challenges. Two exchange tours, 3 farm to farm monitoring, 1 joint field day and 2 workshops were conducted with participation of 240 members (160 females and 80 males) from Eastern Kenya partners. In addition 2 meetings/workshops were held to strengthen the LIP initiatives in the region as well.

Tanzania

Activities under objective two of SIMLESA were implemented according to plan during the reporting period. Thirty six (36) exploratory trials were established in four villages in the northern zone, namely, Masqaroda (9 trials), Bargish-Uwa (9 trials), Mbulu district, and Bashai (8 trials) and Rhotia villages (10 trials) in Karatu district. In Mbulu District, seeding was done on the second week of December while in Karatu District it will be done later, most likely in January 2014 due to late onset of rainfall. Crops at Rhotia village were destroyed by floods in some sites during the 2013 cropping season. Reseeding was done and better yields were from the plots that were not affected by the floods. In eastern zone, 35 exploratory trials were established in six villages across the three districts, namely, Gairo district (Msingisi village), Kilosa district (Dodoma Isanga, and Manderu villages) and Mvomero district (Vitonga, Milama and Makuyu villagea).

Eleven researcher managed trials were implemented during the 2013 cropping season. Three trials were established in Karatu district, in Tlawi, Bargish Antsi and Bashai villages while two trials were established at Selian Agricultural Research Institute in the northern zone. Additionally, 6 trials were established at Ilonga Research Station, Kilosa. Crop performance on long term trials at Selian and Ilonga Kilosa in 2013 cropping season seems to be better than 2012 cropping season.

Six field days were conducted in the five operational districts at the physiological maturity stage of maize. Participants included district, DAICOs, village leaders, researchers, extension staff, farmers, NGOs and representatives from seed companies attended field days. In the northern zone field days were held at Bargish Uwa village (100 males and 350 females participants) and Masqaroda (450 males and 180 females participants) in Mbulu districts. In the eastern zone, field days were held at Misingisi village (282 males and 174 females) in Gairo district and at Manderu village(255 males and 205 females) in Kilosa district.

Soil samples were collected in all farms for field characterization determination of initial soil condition. In addition soil extensive sampling was done on one farm in each village together with researcher managed trials at Karatu and on station for characterisation of soils for plant available water capacity (PAWC). Variables for PAWC such as bulk density, soil moisture content have been determined. Soil analysis is in progress.

Fifteen farmers from Karatu and Mbulu districts in the northern zone visited Mvomero and Kilosa districts in the eastern zone in September 2013. Five District level Innovation platforms (IP) were established in five districts namely, Karatu and Mbulu in the northern zone and Gairo, Mvomero and Kilosa in the eastern zone were strengthened. Members of IP included village leaders, researchers, extension staff, farmers, NGOs, CBOs and input providers. Members of

IP were involved in site and farmer selection, motivation of farmers to engage in conservation agriculture (CA). In addition, 4 and 6 IPs were established at community level in the five districts in the northern and eastern zone, respectively.

Malawi

In Malawi objective 2 activities were implemented with much focus of achieving the main objectives of testing and developing productive, resilient and sustainable smallholder maize-legume farming systems during the reporting period.

In six SILESA districts, on-farm exploratory conservation agriculture trials were implemented. All were managed by extension agents with close supervision by researchers. Other activities carried out were:

Planning and review meeting at Chimoio, Mozambique

Agronomic results for 2012-13 cropping season from on-farm trials were presented and reviewed. Work plans for the 2013-14 cropping season were presented and reviewed before implementation. SIMLESA best bet technologies for Malawi were identified for out scaling. Nongovernmental organizations (NGOs) that were operating in Malawi were carefully selected by key stakeholders for scaling out SIMLESA technologies. The selected partners are Total Land Care Malawi (TLC), Catholic Development Commission in Malawi (CADECOM), National Smallholder Farmers Association of Malawi (NASFAM), FUNWE Farms, National Association of Smallholder Farmers of Malawi (NASFAM) and The Clinton Hunter.

Partners who participated in the review and planning review meetings in Mozambique committed their effort to out-scale best bet technologies through signing the CIMMYT/DARS drawn MOU. During the meeting with stakeholders prior to signing MOU, CIMMYT/DARS had a meeting with the partners. This meeting provided a platform for mutual understanding of the SIMLESA activities and that of partners; understanding the notion and interests of stakeholders. This was of paramount importance in reducing conflicts of interests or duplication of activities which will not be cost effective.

Implementation of on-farm field trials

Prior to implementation of core on-farm trials and out-scaling demonstrations, agricultural inputs were purchased; protocols prepared and distributed to respective coordinators in readiness for implementation in all SIMLESA project sites. A total number of 35 on-farm exploratory trials instead of 36 were implemented. In Lilongwe, one farmer migrated and sold his land including the trial site, leaving a total of 5 farmers instead of 6. A total of 240 out-scaling plots were planned to be established in the six participating districts i.e. 40 out-scaling plots per district.

Long-term trial Research

A long-term trial established in 2012 was implemented at Chitala Agricultural Research Station with the following different objectives (i) to evaluate different tillage practices against different maize-legume cropping systems (ii) to evaluate interactions of different levels of crop residues and varied amounts of nitrogen on soil quality, nutrient and water dynamics and (ii) to evaluate different weed management regimes in CA systems.

Out-scaling CA best bet technologies

In an effort to out-scale different CA best bet technologies in the SIMLESA implementing districts, more than 40 farmers per district were supported with inputs to carry out this exercise. Additionally, nongovernmental stakeholders also had taken a leading role to out-scale some of the identified best bet technologies into new communities. In order to achieve significant success of CA adoption, innovation platforms were used, where additional stakeholder were identified to assist with out-scaling activities. Local comedies were formed and used to disseminate the best technologies in their messages. A harmonized protocol for implementation of demonstrations across different participating partners was developed and shared amongst.

Innovation platforms

In collaboration with the Department of Agricultural Extension Services (DAES) in the Ministry of Agriculture and Food Security, the innovation platforms were strengthened. Major players in the value chain of implementing CA technologies like seed companies, NGOs, agro-dealers etc were identified. The identified stakeholders were trained at Chitedze Research Station on the principles of CA, implementing modalities of demonstration plots, data collection and management techniques. Amongst those trained are scaling out partners in Malawi; National Smallholder Farmers Association of Malawi (NASFAM), Catholic Development Commission in Malawi (CADECOM), Total Land Care (TLC). Also trained were the newly recruited extension agents coming from the SIMLESA implementing districts and data collectors.

Achievements and plans for second quarter

All planned activities were implemented as planned with the exception of farmer planning meetings which were not done. In the next quarter, the following activities were planned to be carried out:

- i. Continue data collection on trials and demonstrations
- ii. Visiting out-scaling partners to check on progress and identify possible interventions
- iii. Participating in farmer field days
- iv. Conducting farmer exchange visits with farmers hosting SIMLESA trials, village heads and CA farmer adopters and followers
- v. Conducting pre-harvest training with extension agents in the SIMLESA implementing sites
- vi. Training lead farmers on CA principles and implementation.

- vii. Engage more out-scaling tools of CA, e.g. Involvement of mass media adverts and drama
- viii. Continue collecting data for use in Agricultural Production Systems Simulator (APSIM) in analysis of CA systems
- ix. Produce CA manual for use by Malawian farmers and extension agents

Mozambique

Under objective 2, 36 CA exploratory trials were harvested and harvest analysis was done. Harvests results were presented during the ARPM-Malawi and Mozambique, September, 30 – October, 2, 2013 in Chimoio.

Six long term trials placed at ISPM and Angonia covering different studies were also harvested and results analysed. The trials are focusing on:

- 1) 1 trial with 12 treatments with different CA options;
- 2) 1 for termite control options and 1 for weed control options and Angonia Research Station
- 3) 1 crop intensification trial.
- 4) 2 fields with CA, 1 in Angonia and another in Sussundenga were selected for APSIM data collection.

All the trials are continuing for the 4th consecutive year in order to access the long term effect of CA in maintaining soil fertility.

Local innovation platforms (IP's) were established in 3 sites. 72 Outscaling trials from those IP's (laid down in Manica Angonia, Sussundenga and Gondola districts with the best bet treatments in new 12 communities (4 in Manica IDEAA), 2 in Sussundenga (IFDC), 2 in Dombe (CARITAS), 2 in Angonia (TLC) and 2 in Gondola (ISPM)) were successful harvested and relevant data analysed.

The number of outscaling trials and hence the coverage of farmers was increased for the season 2013/14 as part of outscaling efforts as follows:

- 1) TLC from 12 to 48 farmers (Angonia)
- 2) UCAMA from 12 to 18 farmers (Gondola)
- 3) IDEAA-CA from 12 to 18 farmers (Sussundenga and Gondola)
- 4) ADEM from 0 to 18 farmers (Gorongosa)
- 5) ISPM from 6 to 18 farmers (Gondola)

It is agreed that every 6 trials should cover on average 1,200 farmers! MoU will be drawn with all relevant partners. Protocols have been distributed after farmer's selection. Inputs and materials and a small amount of cash to purchase other materials and inputs were allocated to all IP's.

Table 2.2: Role of IPs

Type of Institution	Role	Institutions
Research and Development	Assistance, provision of technologies, training, basic seed	IIAM, IAC, ISPM
Private Sector (agro-dealers)	Input supplier (seeds, fertilizers, pesticides and herbicides)	IAV, Dengo Comercial, EMILIA SAVAIO, Semente Perfeita, Mozseeds
Farmers and Farmers Organization	Trials, demonstration trials, field day, scaling out, seed suppliers	IDEAA-CA, UCAMA and SIMLESA farmers
NGO and Development Organization	Demonstration trials, field day, training	IFDC, CARITAS, ADEM, TLC, PROMAC, Caritas
Extension	Demonstration trials, demos and experience exchange visits	SPER/DPA

During the first week of November, 2 extensionists from Gondola, 4 researchers and 15 IP members attended the agronomy training on:

1. Knowledge and skills on concepts and principles of CA and general agronomy issues in maize –legume cropping systems under SIMLESA
2. Skills in running outscaling programmes under SIMLESA
3. Data collection requirements in outscaling programmes under SIMLESA

Australia

Objective two activities carried in the last half of 2013 are categorized into three, African activities, APSIM modelling activities and Australian activities as detailed below:

African activities

- The research from a SIMLESA PhD student in Queensland (Abeya Tefera) showed that benefits from the adoption of intercropping across environments of contrasting levels of productivity depend on the metric used for the evaluation. When evaluated in terms of the land equivalent ratio (LER) intercropping systems are less suitable, compared to sole cropping systems, under the intensification of African maize-legume farming systems (by Daniel Rodriguez).
- Experimentation in Queensland is adding value to the African SIMLESA activities by providing hands-on training for African scientists to become familiarized with modern data collection and agronomic research technologies (this activity was co-funded by Crawford Fund and SIMLESA-CIMMYT) (by John Dimes).
- Investment fairs under cash constraints have helped identify possible entry points for intensification strategies; sunflower production for fertilizer intensification at Mandela

(Tanzania); more balanced fertilizer investment allocation (starter vs top-dress) to increase maize profitability at Rotanda (Mozambique), (by John Dimes).

- Real-time data acquisition and monitoring systems developed and implemented that enable on-line data visualization and sharing (<http://cropdesign.net/MetStations/>). The technology has been disseminated to SIMLESA partners through one initial training course at Melkassa Ethiopia (by Joe Eyre and James Mclean).

APSIM modelling activities

- Improved APSIM capability for simulating growth and yield of bean crops as sole and intercrops evaluated using on-station results from Melkassa and Bako sites (poster presentation at the Project Annual Meeting, Chimoio, 2013) (by John Dimes).
- APSIM model analysis by Malawi agronomists highlighted that well fertilised continuous maize crops have potential to input higher levels of soil carbon than maize-legume rotations because of the much larger biomass yield of the maize crops (by John Dimes).
- Simulation results of on-station results at Harare workshop highlighted complete absence of short term yield differences between CA and Conventional tillage in well fertilized improved maize systems and strong yield ceilings for low stature legume species when intercropped with well fertilized maize (by John Dimes).
- So far APSIM has been used to simulate on-farm and on-research station experimental results across all SIMLESA countries. For example labour saving (DSSAT) and soil moisture benefits of mulching (APSIM) in CA systems have been modelled to assess early sowing benefits to maize production in Zimbabwe, Malawi and Mozambique. DSSAT results for Zimbabwe presented at Farming Systems Design Conference, China, August 2013. Analysis approach and results to be combined and prepared for journal publication (by John Dimes).
- Model analysis of climate-related production risk and its response to fertiliser inputs across SIMLESA sites (n=14) in Eastern and Southern Africa are being prepared for journal publication (by John Dimes).
- Model analysis outputs generated for economic analysis of CA technology interventions at Bako and AdamiTulu sites in Ethiopia (Yohannis PhD Confirmation Study, Qld Univ) (by John Dimes).

Australian activities

- Queensland research on opportunities for the intensification of summer cropping are showing that relay cropping a legume crop into a standing maize crop during grain filling can double land productivity and farmers profits (by Joe Eyre and James Mclean).
- Relay cropping opportunities in Queensland were disseminated to growers, advisors and agribusiness across Australia's Northern Grains Region (See Technical Report, Objective 2). SIMLESA related project submissions in Australia were funded by the Grains Research and Development Corporation showing SIMLESA's relevance and benefits to Australian grain growers (by Joe Eyre and Daniel Rodriguez).
- Four high quality on-station trials over three seasons were successfully conducted and data sets obtained that explore water and light dynamics in novel multi-crop systems.

These experiments explore the potential for temporally and spatially offsetting interspecific and intraspecific competition (by Joe Eyre and James Mclean).

- Additional treatments of interest to SIMLESA partners, that is mulching cereals vs. legumes, were incorporated into Australian on-farm trials run in collaboration with Conservation Farmers Inc. Field days are being organized with Australian growers for January and February (by Joe Eyre and Daniel Rodriguez).

Objective 3: Increase the range of maize and legume varieties available for smallholders through accelerated breeding, regional testing and release, and availability of performance data.

During the reporting period, under objective 3 key activities carried out are participatory variety selections, experimental trials, GxExM analysis, scaling out of improved technologies and test cross formation. Table 3.1 summarizes objective achievements.

The table 3.1 Objective 3 progress summary

Output	Milestone	Date due	Status/ comments
3.1. Ten to 15 stress tolerant maize varieties, 10 higher yielding legume varieties and five appropriately adapted fodder/forage species available to farmers in the selected farming systems through farmer- and seed company-participatory variety evaluation and release	3.1.2: Per farming system, 1-2 potential legume species and two varieties each for the target communities identified	Dec 2010	Ongoing
	3.1.3: Seed for farmer-participatory maize and legume variety evaluation	Dec 2010	Ongoing
	3.1.4: Maize hybrids and OPVs and OPVs and legume varieties of different of different species suitable for the targeted farming system	Dec 2011	Done and ongoing
	3.1.5: Per country, 3 productive maize hybrids and OPVs and 2 legume varieties suitable for the targeted farming system identified	Dec 2011	Done but ongoing
3.2. Regional nursery for further improved (2nd generation) maize and legume varieties and hybrids	3.2.4: Testcross characterization in various legume systems	Dec 2012	Done
	3.2.7: Irrigation for nurseries, contribution to cold room maintenance	Dec 2012	Done in Kenya and Tanzania

The specific country and partner achievements of outputs and milestones towards Objective 3 are detailed below:

Ethiopia

In Ethiopia under objective three of SIMLESA project, main activities accomplished were PVS, seed increase, varietal characterization (distinctness, uniformity and stability (DUS), performance and yield potential), GXEXM analysis and testcross formations. These activities were implemented between July to December 2013 in each of the seven study areas. Study sites are Bako Agricultural Research Center (BARC), Hawasa maize Research Center (HMRC), Pawe Agricultural Research Center (PARC), Melkasa Agricultural Research Center (MARC) South Agricultural Research Center (SARI), Amhara Regional Agricultural Research Institute (ARARI) and Somali Pastoralist-agro pastoralist Research Institute (SORPARI). The last three are for the SIMLESA expansion sites while the remaining are under main SIMLESA.

Major activities during this period include trial management, data collection, PVS evaluation and field days. Harvesting and yield data collection are underway since the crops are recently harvested. Partly, breeder/pre-basic seed production of recently released hybrid maize varieties is underway on about 1 ha of land at MARC (on station) and at Meki Batu Union (4 ha) under irrigation. About 4.7 tons of different forage crops were multiplied at MARC on station and ARARI for the next season scaling out activities in the expansion sites. With the effort made to disseminate information on the varieties, different promotion materials such as leaflets/pamphlets and banners were produced and distributed to field day participants in all locations. About 1751 (male) male and 527 (female) on farm demos of different varieties of maize, legume and forage conducted. On the other hand more than 5211 male and 769 farmers and IP members and partners visited the technologies on the exchange visits. A total of 5182 (4096 men and 1086 female) participants attended the field days organized on the crops among which 2928 (610 female), 1478 (369 female) and 776 (107 female) visited maize, legumes and forage trials/demos respectively. Field days programs were recorded and broadcasted in different languages mainly using different TV and radio programs all over the country. More than 10 TV and radio programs each were broadcasted these activities and more than 5,000 Leaflets/Pamphlets and banners were produced and disseminated.

During the reporting period scalable technologies including new seed varieties were identified and scaling out plan for the next production season has been prepared. The varieties identified for the scaling out based on the previous and 2013 trial evaluations as detailed below:

1. Maize:

- a. Melkassa II (OPV), MH130, MHQ138 and MH140 for LMSAs including CRV
- b. MH-130 and Gib-2 for Jijiga area
- c. BH661, BH546, BH547, BHQY545 and Gibe2 for potential areas especially under Bako NMRC, PARC, HMRC and ARARI
- d. Shalla and Abaraya under CA for Southern part of Ethiopia under SARI

2. Legume

- a. Common Bean: SER-125, Awash-1, Beshbesh and Nasir in CRV
 - SER-118 under BARC
 - Hawasa Dume and TBD (both under CA & non-CA) under SARI

- b. Soybean: AGS-7-1, TGX-13-3-26-44, Nyala, Gozilla under PARC
- c. Ground nut- Fetene

3. Forage Crops

- Cowpea: - Sewnet under PARC
 - Acc-12688 & Acc-17216 under SARI and SORPARI
- Sweet lupine: Sanabor under ARARI

Finally, since harvesting and weighing is under way for the 2013 year, the yield data and quantity of seeds produced will be reported in the next reporting phase.

Kenya

Scientists, seed companies, stockiest and farmers under objective three of the program continued with formal and informal evaluation and promotion of community endorsed maize and legumes seed varieties. Participatory variety selection approach was used by LIP members in all four sites. The process of hybrid seed production to meet the seed road map was continued with the partners and scientists providing backstopping. Seventy maize demonstrations were planted in October/November 2013 season to promote the community based varieties such as KH 539-E, KDV 1 and KDV 6. In addition, 24 beans and further 24 pigeon pea PVS trials were planted in the region. Planted four maize-legume testcross trials in pure and intercropped systems, each trial consisted of 30 test crosses where maize is intercropped with Embean 14 bean variety.

Tanzania

Main objective three activities in Tanzania were implemented as planned both in the northern as well as eastern zone. Activities done during the 2013 cropping season were i) Participatory Variety Selection (PVS) with farmers. Ten maize varieties, namely, TZH 536, TZH 538, SELIAN H 208, SELIAN H 308, IF 510, SC 627, H 614 D, LISHE H2, CKH 10692 and MERU HB 513 were evaluated in northern zone. Similarly, twelve maize varieties, namely, TMV 1, ZM 309, ZM 525, SITUKA M1, ZM 523, SELIAN H 208, SELIAN H 308 TAN H 600, TZH 538, MERU, HB 515, MERU HB 513 and MERU HB 409 were evaluated in the eastern zone. In addition, 7 pigeonpea varieties, namely ICEAP 00936, ICEAP 00576-1, ICEAP 00040 (MALI), ICEAP 00911, ICEAP 1514/15, ICEAP 00850 and ICEAP 00068 (TUMIA) were evaluated in the northern zone. In eastern zone 6 pigeon pea varieties, namely, ICEAP 00554, ICEAP 00557, ICEAP 00053, ICEAP 00932, ICEAP 00040 (MALI) and ICEAP 00068 (TUMIA) were evaluated. ii) Seed increase of the pre-release and newly released maize and pigeon pea varieties, iii) licensing of the maize and pigeon pea protected varieties to private seed companies.

Malawi

The following activities were carried out during the reporting period under objective 3 in Malawi:

Scaling-up of maize and legume seed production

Quantities of breeder /basic seed of inbred lines and single cross hybrids for newly released maize hybrids (MH30, MH31, MH32) were distributed and shared between the Department of Agricultural Research Services (DARS) and Private Seed Companies for multiplication. The

seed companies that were involved in the multiplication program were Funwe Farm, Peacock Investment Limited, Demeter Agriculture Limited and CPM Agri-enterprise limited. The quantities of maize seed distributed against each company were as shown in tables A, B and C. In addition, some legume seeds (Table D) for soybean, pigeon peas and ground nuts were procured and distributed to CPM Agri-enterprise Limited and NASFAM for multiplication. The aim of this seed multiplication program was to produce more seed that would be made available to the farmers during next growing season.

A. Table 3.2. MH30: CML444/CML489//CML537

		FUNWE	PEACOCK	DARS
AB	CML44/CML489=40Kg	19Kg	19Kg	2Kg
A	CML444=21.5Kg	8kg +2kg(S)	8kg +2kg (S)	1Kg+0.5Kg (S)
B	CML489=10Kg	3Kg + 1Kg (S)	3Kg + 1Kg (S)	1Kg + 1Kg (S)
C	CML537=16Kg	6Kg +1Kg (S)	6Kg +1Kg (S)	1Kg +1Kg (S)
BA	CML489/CML444=10Kg	4.5Kg	4.5Kg	1Kg
	CZH0713 =17Kg	8Kg	8Kg	1kg

B. Table 3.3. MH31: CML444/CML547//CML539

		CPM LTD	DARS
AB	CML444/CML547=50Kg	48Kg	2Kg
A	CML444 =21.5 Kg	18Kg + 2Kg (S)	1Kg +0.5kg (S)
B	CML547 =12Kg	9Kg +1.5Kg (S)	1Kg +0.5kg (S)
C	CML 539 =24Kg	20Kg +2Kg (S)	1Kg +1Kg (S)
	CZH0819 =5.3Kg	4Kg	1.3Kg

C. Table 3.4: MH32: CZL0811/CZL0812//CML544

		DEMETER	DARS
AB	CZL0811/CZL0812 =8Kg	6Kg	2Kg
A	CZL0811 =3Kg	1.5Kg + 0.5Kg (S)	0.5Kg + 0.5 Kg (S)
B	CZL0812 =3Kg	1.5 Kg + 0.5 Kg (S)	0.5 Kg + 0.5 Kg (S)
C	CML544 =4Kg	2.5 Kg + 0.5 Kg(S)	0.5 Kg + 0.5 Kg (S)
	CZH0829 =14Kg	12Kg	2Kg

Note: s = selfing

D. Table 3.5: LEGUMES

Legume name	CPM AGRI ENTERPRISE LTD
Soybean (NASOKO)	500 kg
Ground nut (CG7)	500 kg
	NASFAM
Pigeon pea (Mwaiwathu Alimi)	75 kg

Conduct on –farm maize/legume PVS /Mother Baby trials (MBTs)

A total of six maize mother baby trials (three in each agro-ecological zone) were planted. Each trial consisted of twelve potential newly developed hybrids that farmers would select preferred varieties based on their performances in each agro-ecology.

Formation of maize test crosses

Sixty five single cross maize hybrids formed during winter season at Masenjere Irrigation scheme were planted at Chitedze Research Station to form three-way cross hybrids using drought tolerant testers. About 150 lines were also planted for formation of early and intermediate single cross hybrids.

Conduct maize/legume intercropping studies

Two sets of trials one comprising 30 potential new three-way cross maize hybrids and another one consisting of ten released maize hybrids were both planted and intercropped with pigeon peas and cow peas at Chitala Research Station in the low land agro-ecology and the later was planted at Chitedze Research Station in the mid altitude agro-ecological zone. The main

objective of the studies is to identify best performing maize hybrids and legumes that do well under inter cropping production systems.

Evaluate Regional on-farm maize/legume trials.

Three sets of regional on-farm maize trials consisting of early and intermediate maturity open pollinated (OPV) maize varieties, extra early, intermediate and late maturity maize hybrids were requested from CIMMYT-Zimbabwe and each set was planted on station at Chitala and Chitedze Research Stations representing the lowland and mid altitude agro-ecological zones respectively.

Mozambique

The seed production was done in partnership with IDEAA-CA, Dengo Seed Company and Semente perfeita. This season IDEAA produced soybean in Macate and Dengo produced cowpea, soybean and pigeon pea.

Seed availability and quality are very sensitive issues because they are related to the national seed system in place in the country. Private seed companies in the country are emerging institutions which are still at infant stage. They facing many challenges for instance financial constraint, lack of technical and management skills. At IIAM level there is a seed policy which is unclear and full of gaps. Our basic seed unity (USEBA), for example was supposed to be the source of major part of seed to be used in the project, particularly OPVs. Among many other challenges in the phase-2, for objective 3 the direct intervention of IIAM team in all the process of seed production, processing and storage by collaborators (seed companies and selected farmer seed producers) is crucial.

Australia: QAAFI in association with QDEEDI

The modelling based GxExM analysis framework has been shown to be an effective tool to integrate variety development and crop management optimization for sustainable productivity improvement (by Solomon Fekybelu and Yash Chauhan).

The modelling based approach to analyse G x E x M showed how it could assist to minimize production risks while maximizing opportunities to increase productivity across a range of contrasting target environments (by Solomon Fekybelu and Yash Chauhan). Required data for environmental characterization was obtained from six African countries, and simulations are being run using three different check varieties for a total of 29 distinct environments (by Solomon Fekybelu and Yash Chauhan).

Objective 4: Support of Regional and Local innovations systems (ASARECA)

During the reporting period, the following key activities were carried out under program objective 4. Table 4.1 below summarizes program achievements under objective four.

Table 4.1 below outlines the relevant outputs and milestones during this reporting period

Output	Milestone	Date due for implementation	Status
4.1. Mainstreaming of gender sensitivity in research activities in the five primary program countries	4.1.1: M&E system incorporates gender aspect	December 2012	Done
	4.1.3: NARS scientists in Ethiopia, Kenya, Tanzania trained in implementing gender issues into research design, monitoring and evaluation	December 2012	Done and ongoing
	4.1.4: Understanding of processes and compilation of data on effects of gender sensitive research designs	December 2012	Done.
4.2. Functioning program M&E system incorporated into the program providing information system assessments to national and regional program managers	4.2.1: Functioning common M&E system established based on experiences in eastern Africa	December 2012	Done and ongoing
	4.2.2: NARS scientists in five program countries trained in implementing common M&E system in ten local innovation systems	December 2012	Done
4.3. Knowledge of relevant program innovations and germplasm available in five additional countries in the region	4.3.3: Maps demonstrating agro-ecological analogues between Australia and eastern and southern Africa as well as Conclusions for effective sharing of research results on CA-based maize/legume systems in eastern and southern Africa	December 2012	Done and ongoing
	4.3.4: Shared understanding of regional research challenges and products; sharing of innovative agronomy, breeding and socio-economic research methods and maize-legume system products	December 2012	Done and ongoing

The gender Mainstreaming Unit (GMU) of the Association for Strengthening Agricultural Research in East and Central Africa (ASARECA), contributed to SIMLESA project activities by providing technical backstopping in gender mainstreaming. The overall objective is to ensure the consideration of gender aspect in the different activities of SIMLESA. Achievements accomplished during the reporting period, July to December 2013 are detailed below:

In September 2013, The GMU organized a meeting to validate case study report on "good practices and lessons learnt in gender mainstreaming initiatives of SIMLESA. Country

representatives and SIMLESA country gender focal persons participated from all member countries Kenya, Ethiopia, Malawi, Mozambique and Tanzania.

The report indicated that a total of twenty-five case studies, (five from each country), were identified. A thorough discussion was made on the delivered information on findings and reflections from different countries. The case studies brought out a range of issues that needs a follow up as a lesson for future research design.

Major findings of the case studies collected were summarized into six broad categories that relate to;

- **Labour:** The impact of Conservation Agriculture on gender divisions of labour is apparent in the crop-livestock interactions. There was an initial increase in labour and time for the women who feed the animals and young boys herd animals. They tend to spend more time and travel longer distances to herd and find feed for animals as stover is retained in the fields.
- **Fostering equitable representation:** Various categories of beneficiaries the youth, groups, polygamous families, female headed households, people with disabilities, had different kinds of response to the programme. Their ability to benefit from the programme depends on the strategies put in place to address the various gender constraints relating to services like extension among others.
- **Gender and Technology:** Technology preferences were observed among different categories of people; women, men, the elderly tending to adopt some technologies and not others depends their enquiry and compromises on classifying priority needs and allocating resources.
- **Seed System:** Women tended to be the custodians of seed in the community.
- **Gender and Assets:** Matrilineal and patrilineal societies exhibited varying power relations in access to and control of assets as well decision making which has an effect on access to information, technology adoption and utilization
- **Data:** The SIMLESA baseline data sets in each country have potential for in-depth analysis to support development of various interventions and extract Sex and Gender Disaggregated Data.

Objective 5: Capacity building to increase efficiency of agricultural research today and in the future

Table 5.1: Relevant outputs and milestones during this reporting period are outlined in the below:

Output	Milestone	Date due for implementation	Status
5.2. Training course on simulation model utilization and participatory evaluation	5.2.1: Capacity built in the program countries in utilizing the outputs from systems modeling to evaluate technology options and risk management strategies;	December 2012	Work is continuing. Agronomists from all

	and assist in ex-ante analysis of technology options and farming systems designs		countries have been to Australia for further APSIM training
5.3. Training on cropping systems management research including the principles and practice of conservation agriculture	5.3.1: One training course of one week duration held for approximately 25 agronomists in each of the program countries	December 2012	Ongoing
5.4. Training on crop improvement	5.4.1: Regional training course including 5-10 maize and legume breeders from partner countries	December 2012	Ongoing in collaboration with DTMA.
5.5. Training on APSIM model parameters	5.5.1: Two CIMMYT staff trained in environmental characterization	December 2012	To be done

Below are the specific details on achievements of the outputs and milestones towards Objective five.

In the last half of 2013 the focus of the activities was on supporting the MSC and PhD students in conducting their field trails and data collection. One training session was conducted in Tanzania on Biometry Principles and Disease & Pest Management.

Training in Tanzania (25-29 November 2013)

The training in Tanzania had 29 participants and covered the following modules:

- Statistical Guideline module (1 day) was presented to the two groups. In general all participants find the course useful to very useful and 70% say it was clear to very clear. They would like this course to be repeated over a longer period with more practical examples
- Data Analysis with Excel2010 (1.5 days) workshop was too short for all the participants and they requested that the workshop should be repeated for at least one week period. In general all participants find the course useful to very useful and 90% say it was clear to very clear
- The Pivot table session in the Excel2010 workshop was presented on the 29th of November 2013. 62% of the participants found the course to be clear to very clear. The course was also regarded as useful by 75% of the participants. However 75% of the participants indicated that the time allocated for the course was too short and that the length of the course should be made longer.
- The Graphical presentation using Excel2010 workshop was presented on the 29th of November 2013. The workshop was attended by 26 participants. 87% of the participants said the aims of the workshop were made clear to them. Even though all

participants (100%) found the workshop very useful and 96% were very satisfied with the trainer, more than 60% of the participants found the duration of the workshop too short. Due to the time allocated that was too short, all participants requested that the workshop repeated another time and for a longer period so that they can be confident in applying the knowledge applied to them.

- The Weed Management course was presented from the 26 – 27 November to 29 participants. Topics like weed biology, adjuvants, weed management and knapsack calibration were addressed during the two day course. 100% of the participants found it useful to very useful. 75% of the candidates found it too short. The course was very interesting, particularly the calibration part which included a practical part which improved confidence levels.

General comments:

An enormous need for training still exists. Participants are very grateful and participate enthusiastically in all activities, however, it's clear that most of them are struggling with basic concepts and therefore extended training is needed.

1.1 Human Capital Development

- 1.1.1 One PhD candidate (Tanzania) is registered with the University of KwaZulu Natal (Frank Mmbano), collecting data in Tanzania until early February 2014.
- 1.1.2 Two MSc candidates (Mozambique) Gabriel Bragga and Custodia Jorge registered with the University of Free State. Conducting field and glasshouse trials until March 2014.

3 Variations to future activities

During the reporting period there are no major changes. The SIMLESA Program Mid-Term Review was carried out during the first quarter of 2012 and it came up with very insightful recommendations some of which are being incorporated into specific in country annual review and planning meetings. A no cost extension of SIMLESA phase 1 will be implemented from January 2013 to June 2013 whilst waiting for the approval of the second phase.

In Kenya SIMLESA team at KARI Embu proposed to take on board Embean 14 bean variety to replace Embean 118. This is due to its adaptation and adoption in the region while at KARI Kakamega More new bean varieties and especially the KATs and EMBEAN 14 that seem to be preferred by farmers will be used in most trials. In eastern Kenya, the maize row spacing was changed from 75cm to 125 cm to accommodate 2 rows of beans under project objective 2.

4 Variation to personnel

During the period under review, there were no personnel variations.

5 Problems and opportunities

Challenges

Erratic rains and the overall effect of climatic change is one of the main problems being experienced in all countries. In Malawi it was discovered that most seed companies' staff involved in seed multiplication programs had little experience in seed production hence they required constant backstopping by the department of agricultural research services (DARS) as well as training to be conversant with seed productions issues. Lack of irrigation facilities for most seed companies limited their seed production.

Opportunities

In all SIMLESA operational countries it was noted that farmers, key stakeholders and members of the community are ready to work and scale out the project technologies. Participatory methodologies used in the selection process of the best bet technologies empowered the communities and it divulged sense of ownership. Farmer's effort is also being complemented by the established local innovation platforms. This will enable effective transfer of SIMLESA technologies to many farmers in a sustainable manner.

ANNEX 1: ASARECA REPORT

Association for Strengthening Agricultural Research in East and Central Africa (ASARECA)

Gender Mainstreaming Unit Semi - Annual progress Report July to December 2013

Overview

The gender Mainstreaming Unit (GMU) of the Association for Strengthening Agricultural Research in East and Central Africa (ASARECA), contributed to SIMLESA project activities by providing technical backstopping in gender mainstreaming. The overall objective is to ensure the consideration of gender aspect in the different activities of SIMLESA.

Progress

The progress of the reporting period July to December indicated:

In September 2013, The GMU has organized a meeting to validate case study report on "good practices and lessons learnt in gender mainstreaming initiatives of SIMLESA". SIMLESA country representatives and SIMLESA country gender focal persons have been participated from all member countries Kenya, Ethiopia, Malawi, Mozambique and Tanzania. A total of ---- participants

The report was presented describing twenty-five case studies, (five from each country), identified. A thorough discussion was made on the delivered information of findings and reflections from participants were captured to enrich the document and country representatives were requested to provide additional input where it was appropriate. The case studies brought out a range of issues that needs a follow up as a lesson for future research design.

Major findings of the case studies collected were summarised into six broad categories that relate to;

- **Labour:** The impact of Conservation Agriculture on gender divisions of labour is apparent in the crop-livestock interactions. There was an initial increase in labour and time to the women who feed animals and young boys who are engaged in herding cattle. These tend to spend more time and travel longer distances to herd and find feed for animals as stover yield is retained in the fields.
- **Fostering equitable representation:** Various categories of beneficiaries the youth, groups, polygamous families, female headed households, people with disabilities, had

different kinds of response to the programme. Their ability to benefit from the programme depends on the strategies put in place to address the various gender constraints relating to services like extension among others.

- **Gender and Technology:** Technology preferences were observed among different categories of people; women, men, the elderly tending to adopt some technologies and not others depends on their enquiry and compromises on classifying priority needs and allocating resources.
- **Seed System:** Women tended to be the custodians of seed in the community.
- **Gender and Assets:** Matrilineal and patrilineal societies exhibited varying power relations in access to and control of assets as well decision making which has an effect on access to information, technology adoption and utilization
- **Data:** The SIMLESA baseline data sets in each country have potential for in-depth analysis to support development of various interventions and extract Sex and Gender Disaggregated Data.

Capacity development

Experience from the field and observation demonstrate that there is a need for additional capacity building on understanding of gender and its applicability. Therefore, the amount of 5000 USD each was transferred to Ethiopia, Malawi, Mozambique and Tanzania. It was not possible to transfer the money to Kenya, due to difference in agreement of accepting some of the statements in the sub-grant agreement. The report obtained from Malawi, Mozambique and Ethiopia are summarized and presented in the following table.

Table 1. Gender mainstreaming training provided for SIMLESA group 2013

Country	Ethiopia		Malawi		Mozambique	
Title	Community Level Gender Analysis Capacity Building for SIMLESA Ethiopia program staff		Gender Mainstreaming in Agricultural projects		Gender mainstreaming training workshop	
Number of beneficiaries	Women	Men	Women	Men	Women	Men
	2	23	8	10	8	12
Topics covered	<ul style="list-style-type: none"> • Overview of SIMLESA program in Ethiopia and gender dimensions in the project • Prospect and issue of gender in maize-legume production system and value chain • Gender responsive situation analysis and sampling procedure: proper farmers' representation against resource access and ownership, education, agricultural technology, different needs, concerns, and capabilities (demand assessment, training, PVS, demonstration, field days/exchange visits, technology scaling out, etc.) • Collection, analysis, and interpretation of gender disaggregated data: tools and application 		<ul style="list-style-type: none"> • Overview of SIMLESA project • Introduction to gender and HIV in agriculture • Introduction to gender analysis – HAF • Gender responsive tools • Gender and HIV mainstreaming in agriculture • Gender responsive reporting 		<ul style="list-style-type: none"> • Common understanding of gender concepts and tools • Understanding of relationship between gender, extension and rural development • Basic skills in applying gender analysis to agriculture programming; • A draft of a simple gender action plan for extension agents working with SIMLESA. 	

Summary

Training report was obtained from three SIMLESA member countries Ethiopia, Malawi and Mozambique. The objectives and methodology was nearly similar in all the three training processes. The approach used by the Ethiopian group promotes the use of gender disaggregated field data as a major guide for project appraisal and its implementation. The approach used by Ethiopian group is regarded as pertinent and applicable attempt to ensure full integration of gender in programme /project activities of SIMLESA. It is therefore suggested that the following major recommendations drawn from the report needs to be further designed and shared with other SIMLESA group.

1. Understand and recognize household dynamics, their resource base and its management practices for project appraisal and implementation
2. Focus on factors influencing demand as related to values, norms and economic reasons for choosing technologies
3. Recognize differences between women's and men's resource and time allocation
4. Establish a system for gender responsive monitoring and evaluation
5. Identify priority needs and initiate SIMLESA activities specific to women and youth economic empowerment
6. Focus on designing a strategy on how to engage the youth in SIMLESA activities
7. Encourage and design the use of gender disaggregated data and promote gender responsive reporting for project design, monitoring, evaluation and learning

Follow up action:

1. Further communication to be made with SIMLESA group in Tanzania and Kenya and resolve discrepancies if any
2. Further communication with SIMLESA group in Ethiopia, Malawi and Mozambique in financial reports and accountability
3. Facilitate experience sharing among SIMLESA staff in different member countries for harmonizing the understanding and applicability of gender and its related terms and approaches
4. Review the field report of the case study on "good practices and lessons learnt in gender mainstreaming in the SIMLESA programme", and extract major issues and future areas of focus that ensure SIMLESA programme to address gender gap.
5. Attend Annual Review & Planning Meeting (ARPM) of SIMLESA to be held in Addis Ababa, Ethiopia on 7th to 11th of April 2014

ANNEX 2: ARC SEMI ANNUAL REPORT-July 2013-December 2013

1. Progress summary

During this time the focus of the activities were on supporting the MSC and PhD students on conducting their field trails and data collection. One training session was conducted in Tanzania on Biometry Principles and Disease & Pest Management.

2. Activities/Output

1.2 Training in Tanzania (25-29 November 2013)

The training in Tanzania had 29 participants and covered the following modules:

- 1.2.1 Statistical Guideline module (1 day) was presented to the two groups. In general all participants find the course useful to very useful and 70% say it was clear to very clear. They would like this course to be repeated over a longer period with more practical examples
- 1.2.2 Data Analysis with Excel2010 (1.5 days) workshop was too short for all the participants and they requested that the workshop should be repeated for at least one week period. In general all participants find the course useful to very useful and 90% say it was clear to very clear
- 1.2.3 The Pivot table session in the Excel2010 workshop was presented on the 29th of November 2013. 62% of the participants found the course to be clear to very clear. The course was also regarded as useful by 75% of the participants. However 75% of the participants indicated that the time allocated for the course was too short and that the length of the course should be made longer.
- 1.2.4 The Graphical presentation using Excel2010 workshop was presented on the 29th of November 2013. The workshop was attended by 26 participants. 87% of the participants said the aims of the workshop were made clear to them. Even though all participants (100%) found the workshop very useful and 96% were very satisfied with the trainer, more than 60% of the participants found the duration of the workshop too short. Due to the time allocated that was too short, all participants requested that the workshop repeated another time and for a longer period so that they can be confident in applying the knowledge applied to them.
- 1.2.5 The Weed Management course was presented from the 26 – 27 November to 29 participants. Topics like weed biology, adjuvants, weed management and knapsack calibration were addressed during the two day course. 100% of the participants found it useful to very useful. 75% of the candidates found it too short. The course was very interesting, particularly the calibration part which included a practical part which improved confidence levels.

General comments:

An enormous need for training still exists. Participants are very grateful and participate enthusiastically in all activities, however, it's clear that most of them are struggling with basic concepts and therefore extended training is needed.

1.3 Human Capital Development

- 1.3.1 One PhD candidate (Tanzania) is registered with the University of KwaZulu Natal (Frank Mmbano), collecting data in Tanzania until early February 2014.
- 1.3.2 Two MSc candidates (Mozambique) Gabriel Bragga and Custodia Jorge registered with the University of Free State. Conducting field and glasshouse trials until March 2014.

2. Milestones

Activity	Description (Modules)	Date
Executive Study Tour	5 Executives from the different NARs will go on a study tour at relevant ARC Institutions and Universities. Course modules to be covered include: Governance and Science Communication	17- 22 February 2014
Training of Trainers	20 Scientists from all 5 SIMLESA countries will undergo training in Facilitation skills, Data Management and Analysis; Disease & Pest Management	19-31 May 2014

ANNEX 3: Ambassador's Visit to Ethiopia

Australian Ambassador Visited SIMLESA Activities in Ethiopia

The Sustainable Intensification of Maize-Legume Systems for Food Security in Eastern and Southern Africa (SIMLESA) program activities have been implemented in different parts of Ethiopia since 2010. Ambassador Lisa Filipetto, Australian Ambassador to Ethiopia, visited one of SIMLESA sites in the North-Western part of the country, implemented by Amhara Regional Agricultural Research Institute (ARARI) on November 7, 2013. The Ambassador was accompanied by scientists from CIMMYT-Ethiopian office and the Ethiopian Institute of Agricultural Research (EIAR) who are actively working on SIMLESA program. Dr. Biru Yitafere, Director General and Dr. Likawent Yeheyis, Director of the livestock research of ARARI warmly welcomed the visiting team. Thereafter, Dr. B. Yitafere presented highlights of ARARI missions, mandates, managerial structure, human and physical resource capacities. Dr. L. Yiheyis briefly presented an overview of SIMLESA program implementation in the region.

ARARI directors indicated that maize based farming systems in the region are characterized by monocropping, repeated tillage and residue removal which results into unsustainable production systems. Therefore, SIMLESA program which promotes reduced tillage, year round residue coverage and maize-legume rotation or intercropping is a desirable and timely program for the region. The presentations showed the extensive research and development activities being implemented under the program on conservation agriculture (CA)-based exploratory trials; farmer participatory variety selection (PVS) of maize, grain legume and forage/fodder varieties; and up-scaling of best bet technologies in South Achefer and Jabitenan districts.

A field visit was made to South Achefer, where a number of SIMLESA activities on-farmers' fields and Abchikli farmers' training center (FTC) are implemented. CA-based maize-grain legume intercropping, maize-forage/fodder crops relay cropping, PVS trials of hybrid and open-pollinated maize varieties, and sweet lupine varieties were visited. Four of the sweet lupine varieties being evaluated in the PVS trials are under the process of release for commercial production. Accordingly, the varieties have already been visited by the National Variety Release Committee, and hopefully two of them will be released.

SIMLESA hosting communities are exposed to new crop varieties and production practices. Newly released and pre-release varieties of maize, legume and fodder/forage crops are used in all PVS trials. Integrated maize-grain legume and maize-fodder/forage cropping practices have been newly introduced to the region by SIMLESA program. Farmers in the areas who have been practicing maize monocropping over the last many years highly appreciated the new practices. The practices helped them to get additional harvest from their plots without significantly affecting the maize yield while replenishing soil fertility. As reported by Dr. L. Yeheyis, Amhara regional government bureau of agriculture has decided to include CA practice, and maize-legume intercropping and maize-fodder/forage relay cropping practices in the regular extension program. This will significantly contribute to an increased adoption of SIMLESA technologies among wider range of farming communities in the region.

At the end field visit, Ambassador Lisa Filipetto expressed her appreciation of the extensive work being implemented in the country under SIMLESA program.