

## Progress Report

1<sup>st</sup> August 2014 – 28<sup>th</sup> February 2015

# **CONSERVATION AGRICULTURE AND SMALLHOLDER FARMERS IN EASTERN AND SOUTHERN AFRICA- LEVERAGING INSTITUTIONAL INNOVATIONS AND POLICIES FOR SUSTAINABLE INTENSIFICATION AND FOOD SECURITY (CASFESA) PROJECT**

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Submitted by the International Maize and Wheat Improvement Center (CIMMYT) to

**IFAD**



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**Disclaimer**

The authors accept sole responsibility for the contents of this report. The report does not necessarily reflect the views of the European Commission or IFAD.

## **Acronyms**

ARARI	Amhara Regional Agricultural Research Institute
ARC	Agricultural Research Center
ATA	Agricultural Transformation Agency
CA	Conservation Agriculture
CASFESA	Conservation Agriculture and Smallholder Farmers in East and Southern Africa
CIMMYT	International Maize and Wheat Improvement Center
DAO	District Agriculture Officer
DAEO	Divisional Agriculture Extension Officers
DARTS	Department of Agricultural Research and Technical Services
EC	European Commission
EIAR	Ethiopian Institute of Agricultural Research
FEO	Frontline Extension Officer
ICARDA	International Center for Agricultural Research in Dryland Areas
IFAD	International Fund for Agricultural Development
KALRO	Kenya Agriculture and Livestock Research Organization
MoA	Ministry of Agriculture
NCE	No Cost Extension
RCT	Randomized Control Trial
R&D	Research and Development

## Summary

Conservation Agriculture and Smallholder Farmers in Eastern and Southern Africa-Leveraging Institutional Innovations and Policies for Sustainable Intensification and Food Security (CASFESA) project is funded by EC-IFAD and implemented by CIMMYT in Ethiopia and Kenya (Eastern Africa), and Malawi (Southern Africa) in collaboration with national partners, namely; Amhara Regional Agricultural Research Institute (ARARI in Ethiopia), Kenyan Agricultural and Livestock Research Organization (KALRO), and Department of Agricultural Research and Technical Services (DARTS in Malawi). The overall goal of the project is increasing food security and incomes of resource poor smallholder farmers in Eastern and Southern Africa through pro-poor technological and institutional innovations that improve productivity and enhance the resilience and sustainability of farming system.

To systematically assess the role of institutional innovations and technological interventions in enhancing crop productivity and income of resource poor smallholder farmers, the project was implemented using a Randomized Control Trial (RCT) approach where Conservation Agriculture (CA) technologies were demonstrated in randomly selected treatment villages. Each cropping season, farmers in the treatment villages were invited to visit the demonstration plots in their villages and participated in the CA-based technology evaluations. With the aim of supporting better adoption of CA-based practices in the treatment villages, in addition to CA-based technology demonstrations, the project facilitated/strengthened institutional and market arrangements that could enhance resource-poor smallholder farmers' access to CA related inputs like herbicides and farm equipments. After some years, depending on availability of further funding, CA adoption and impacts assessment will be conducted by comparing randomly selecting smallholder farmers from from the treatment villages with their counterfactual farmers in the control villages. To make the assessment/comparison statistically sound, control villages were randomly selected along with the treatment villages when the project implementation started in 2012 and left aside with no intervention.

This report covers activities conducted during the period of **1<sup>st</sup> August 2014 to 28<sup>th</sup> February 2015**. During this period, a number of project activities were implemented in Ethiopia and Kenya and Malawi. This period marks the third and fourth cropping seasons of the project in Ethiopia and Kenya, respectively.

The main activities implemented during this period include CA adoption survey in Malawi, adoption monitoring study at Embu (Kenya), farmers' field days both in Ethiopia and Kenya, harvesting and replanting the demonstration plots in Kenya, harvesting in Ethiopia, and organizing project closing workshop in Ethiopia.

Adoption monitoring survey results show that there is an encouraging effort in the expansion of CA-based practices in the treatment villages, though it has been apparently observed that farmers have been adopting part of the CA principles than going for a complete package where they need to use minimum soil disturbance, crop association, and permanent soil cover/mulching using either green crops or crop residues. In most cases, farmers adopted two of these three practices. There are few farmers who adopted the whole package on small farm areas. Yield advantage of CA based practices was the main reason for adoption whereas lack of cash, lack of labor and shortage of livestock feed were reported as main reason for not adopting these practices. Though minimum tillage saves labor, making permanent furrows and ridges demands more labor in the first year.

In Kenya/Ebmbu, a total of 809 participants (304 male and 505 female) attended farmers' field days organized in 14 treatment villages. Similarly in Ethiopia, a total of 478 farmers (354 male and 124 female) participated in the field days organized in October 2014 at both districts.

During this period, one scientific paper was published in *Environmental Management*. The journal paper identified potential recommendation domains of CA in Ethiopia, Kenya and Malawi. Based on literature and earlier research results tested the suitability of biophysical and socioeconomic factors that potentially affect the adoption of CA, the paper mapped croplands of the three countries by overlying nine different clusters identified based on the combinations of three biophysical and three socioeconomic factors we have got data at the national level. Results show that there is a considerable farmland area highly suitable for CA in the three countries. However, taking the proportion of cropland suitable for CA, Malawi stands ahead of the other two project countries (Ethiopia and Kenya).

Like in the earlier seasons, during the fourth cropping season, the number female participants in farmers' field days were larger than the number of male participants in Kenya. Maize is a food security crop in Kenya and female farmers are more interested to technologies related to food security crops like maize and beans. Number of female participants in farmers' field days also showed increment in Ethiopia.

During the project closing workshop conducted at Bahar Dar (Ethiopia) the need for strong partnership among stakeholders working on CA was emphasized. Accordingly, the Ethiopian Agricultural Transformation Agency (ATA), Ministry of Agriculture (MoA), the Amhara Regional Agricultural Research Institute (ARARI), CIMMYT, and others agreed to develop a package of CA-based practices that could best suit to smallholder farmers' circumstances. The National CA Task Force (NCATF) has also been started for strong collaboration in popularizing CA and building evidence on the benefits of CA in sustainable intensification and natural resource management.

Under the Ministry of Agriculture, the Sustainable Land Management (SLM) project in Ethiopia planned to pilot CA in 45 districts in six Regional States. The National CA Task Force (NCATF) also planned to demonstrate CA in some districts during the coming cropping season. All these efforts show the need to coordinate efforts and interact closely to share information and knowledge on CA for a better uptake of the technology by smallholder farmers.

In addition, during the upcoming SIMLESA project annual review and planning meeting at Harare, CASFESA project experience in scaling out CA through demonstration plots and better institutional arrangements will be presented to participants gathered from five Eastern and Southern African Countries including the three CASFESA project countries.

Overall, the project achievement during this reporting period was good. We still have one more month to wrap up activities not finished yet. The final project technical report will be submitted by July 2015 (four months after the end of the project).

# **Conservation Agriculture and Smallholder Farmers in Eastern and Southern Africa-Leveraging Institutional Innovations and Policies for Sustainable Intensification and Food Security (CASFESA)**

## **I. BACKGROUND**

**Project goals:** Increasing food security and incomes of resource-poor smallholder farmers in Eastern and Southern Africa through pro-poor technological and institutional innovations that improve productivity and enhance the resilience and sustainability of farming systems.

**Project objectives/Purpose:** Increasing incomes and food security of poor smallholder farmers and women by developing and adapting profitable and low risk technological innovations, and institutional and policy options that improve their access to information, inputs and markets to accelerate the diffusion and up-scaling of innovations for enhancing productivity, food security, and natural resource management.

### **The specific objectives**

**Objective 1:** Participatory on-farm evaluation and adaptation of CA-based technologies and analysis of farm level economic incentives (including profitability and risk mitigation benefits) under risk-prone mixed smallholder systems in eastern and southern Africa.

**Objective 2:** Enhance the pro-poor and gender sensitive targeting of CA based interventions through analysis of farmer perceptions, sustainability gains, and trade-offs in utilization of crop residues in mixed smallholder systems.

**Objective 3:** Improve the delivery of information, technologies and market opportunities through institutional innovations and value chains for active participation of low income farmers and women and for stimulating CA based intensification of mixed smallholder systems.

**Objective 4:** Develop policy options and recommendations that create an enabling environment for scaling up/out and widespread farmer investments in CA based productivity growth to increase food security and adaptation to climate change.

**Objective 5:** Enhance the capacity of R&D stakeholders for participatory learning and k-sharing by developing client oriented knowledge management systems that facilitate generation of national and regional public goods.

### **Project Components/Output:**

- a) The agronomic performance of CA based technologies tested and demonstrated on farm and the economic incentives for smallholder farmers (including profitability and risk mitigation benefits) under risk-prone mixed smallholder systems evaluated and documented.
- b) The pro-poor and gender sensitive targeting of CA based interventions enhanced with better understanding of farmer perceptions, sustainability gains, and trade-offs in utilization of crop residues in mixed smallholder systems.

- c) Institutional innovations and efficient value chains identified and the delivery of information, technologies and market opportunities enhanced to foster participation of low income farmers and women in CA based intensification of mixed smallholder systems.
- d) Policy options and recommendations that create an enabling environment identified and developed for stimulating farmer investments and scaling up/out CA based productivity growth for increasing food security and adaptation to climate change.
- e) The capacity of R&D stakeholders for participatory learning and k-sharing strengthened by developing client oriented knowledge management systems that facilitate generation of national and regional public goods.

## II. IMPLEMENTATION PROGRESS:

### A. Project expenditure by year

Table 1. Summary of funds received, expenditure and balance (in EUROS)

Total Project Budget	Year 1 (2012)	Year 2 (2013)	Year 3 (2014)	Total Expenditure <sup>[1]</sup>
Funds received	328,700	-	333,650	662,350
Expenditure	123,576	210,425	433,434	767,435
Balance	205,124	(210,425)	(99,784)	(105,085)

Note: <sup>[1]</sup> This financial summary is till 31<sup>st</sup> December 2014.

### B. Brief comments on expenditure

As of 31<sup>st</sup> December 2014, expenditure was ahead of the funds received under this project. CIMMYT financed the negative balance with the expectation that IFAD will transfer the third payment to CIMMYT at the end of the project and when the project end line technical and financial reports are submitted. More expenditure is expected during the first three months of 2015, i.e., till the last date of the NCE, 31<sup>st</sup> March 2015.

### C. Physical progress by component/output

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### D. Progress by Components

- i. **Component 1: Participatory on-farm evaluation and adaptation of CA-based technologies and analysis of farm level economic incentives (including profitability and risk mitigation benefits) under risk-prone mixed smallholder systems in eastern and southern Africa**

Participatory on-farm evaluation of CA-based practices both in Ethiopia and Kenya and took place in October 2014 and February 2015, respectively. These periods are when maize and legume crops on CA demo-plots were in good stand. Demo-hosting farmers with development agents explained the history of each blocks in the demo-plots, inputs used and technologies tested. Field days organized in the two countries during the months mentioned above are briefly presented below.

**Kenya: Farmers' Field Days**

In Kenya, 304 male and 505 female farmers participated in the field days organized in 14 treatment villages (figure 1). Similar to the field days organized in the previous cropping seasons, the field visits were accompanied by general discussions on the cumulative effects of CA on maize productivity and soil fertility and soil moisture contents. Networking farmers with inputs and service providers invited to the field visits were also another part of the field days.

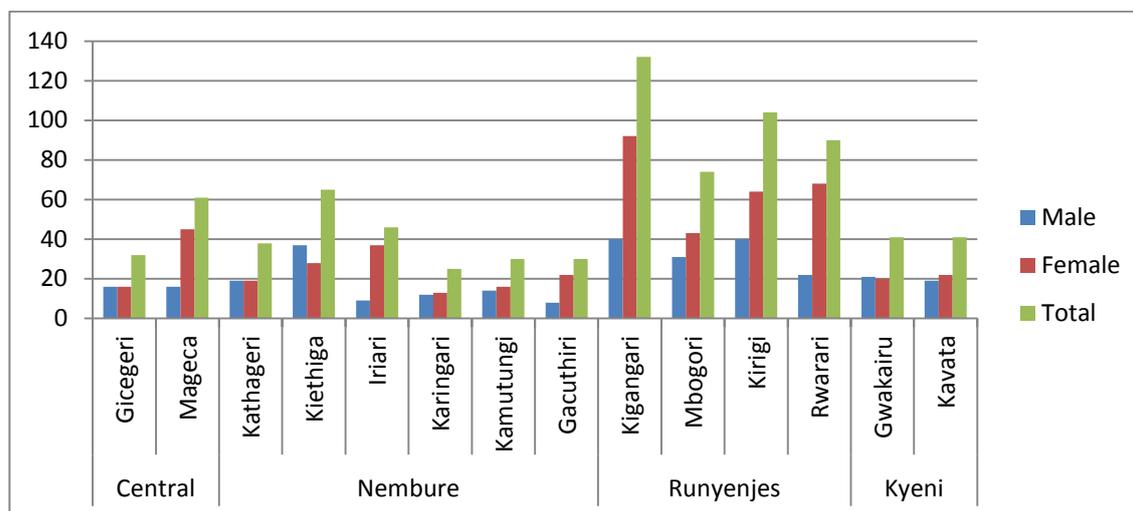


Figure 1. Number of farmers attended field days organized in the treatment villages (Embu/Kenya, February 2015)



Figure 2. Discussions on benefits, challenges and opportunities of CA going on after field visits (Embu/Kenya, February 2015)

**Ethiopia: Farmers' Field Days**

Farmers' field days were organized both in Jabitehnan and South Achefer Districts in October 2014. Diverse groups were invited to attend and evaluate the CA-based technologies on the CA demo-plots and on farmers' own farmland under zero tillage. Evaluation was made by observing at and comparing CA with conventional practices based on soil nutrient (colour and organic matter content), moisture content under residue and bare soil, maize and legume crop stands on conventional and conservation

tillage plots, etc. Like in the earlier field days, farmers (both male and female), extension agents, agricultural experts from district and zonal office, cooperative unions, agro-chemical dealers and researchers were invited and participated. After the field visits, general discussions were made to identify major opportunities, benefits and constraints of CA expansion on their own farmlands.



Figure 3. Farmers visiting demo-plots at Geray Village, South Achefer District, Ethiopia (October 11, 2014)



Figure 4. Farmers visiting Demo-plot at Kurbeha Village, South Achefer, Ethiopia (October 12, 2014)

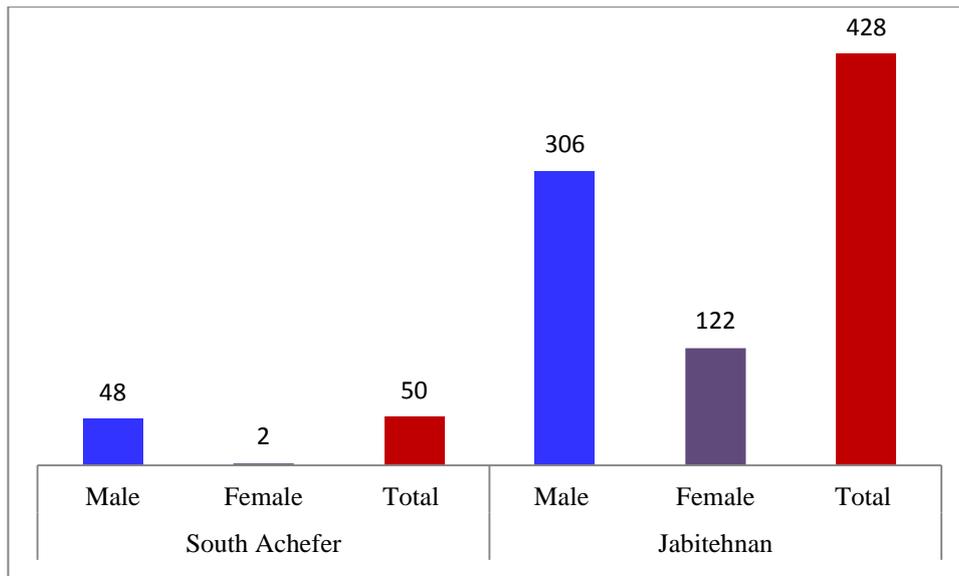


Figure 5. Number of Farmers' Field day participants in Jabitehnan and South Achefer Districts (Ethiopia, October 2014 )

### **Project closing workshop: Dialogue on the benefits, challenges and opportunities of CA in the Ethiopian smallholder maize-based system**

During this closing workshop, CASFESA's three years progress was presented. Paper on economic and environmental benefits of Sustainable Intensification practices were presented and discussed. Farmers hosting the CA demonstration plots in the 30 treatment villages (in the two districts) were also reflected. Lessons from the project on the economic benefits of CA and its challenges under the existing cropping system and extension packages were deliberated on. Future research directions on the identified gaps were listed. Most important issue raised both by researchers and farmers to be researched was the identification of appropriate legume species and varieties that could adapt to the humid mid-highland agro-ecology.

Experts from the Ministry of Agriculture appreciated the research effort CASFESA project has been doing and the research outputs presented at the workshop. Experts witnessed that some of the CA based practices like intercropping and crop rotation are commonly known practices in most farming systems. If these two practices might be neglected by farmers, the experts showed interest to put more efforts in convincing farmers on the benefits of intercropping and/or rotating maize with legumes. For the crop residue retention, they also indicated the need to include forage production in the extension package for areas of mixed crop livestock system. However, participants from MoA did not hide their fear of considering zero tillage component of CA as a wider extension package. The argument they put forward was that CA experiments conducted in the country were just pilot projects that could not be representative of the whole maize-based system in the country. Thus, they emphasized on doing further research to refine and come up further evidence on the benefit costs of CA under smallholders' circumstances. Overall, the workshop ended agreeing on the importance of continuous dialogue on CA by all relevant stakeholders dealing with climate change, sustainable intensification, smallholder farmers, etc.

A total of 50 people attended the workshop. Program of the workshop and list of workshop participants are included in the annex (see Annex 3a and 3b).



Figure 6. Project closing workshop participants (23<sup>rd</sup> February 2015, Bahar Dar, Ethiopia)

**Comparing maize yield data from the demonstration plots**

Comparison made on maize yield data over the three cropping seasons in Ethiopia showed consistently higher maize yield on CA plots where maize was intercropped with legumes (Figure 7 and 8). The average yield data was rather low for the 2012/13 cropping season. That season was unique due to late arrival of rains (late June) and early termination (early September). Yield advantage of CA is commonly expected over a longer period but such results are encouraging as they showed that yield advantage (though small) could even happen at the early years of CA practices.

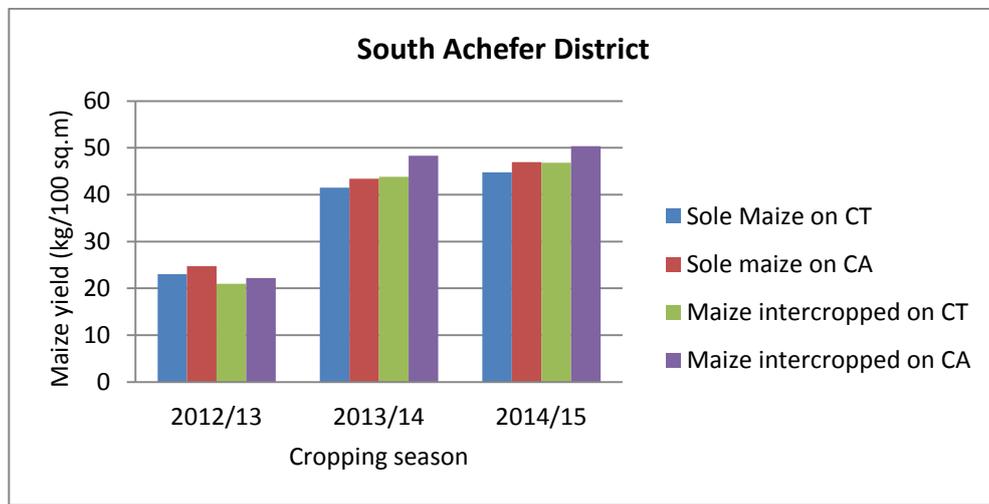


Figure 7. Average maize yield under different agronomic practices on the demo-plots (South Achefer District).

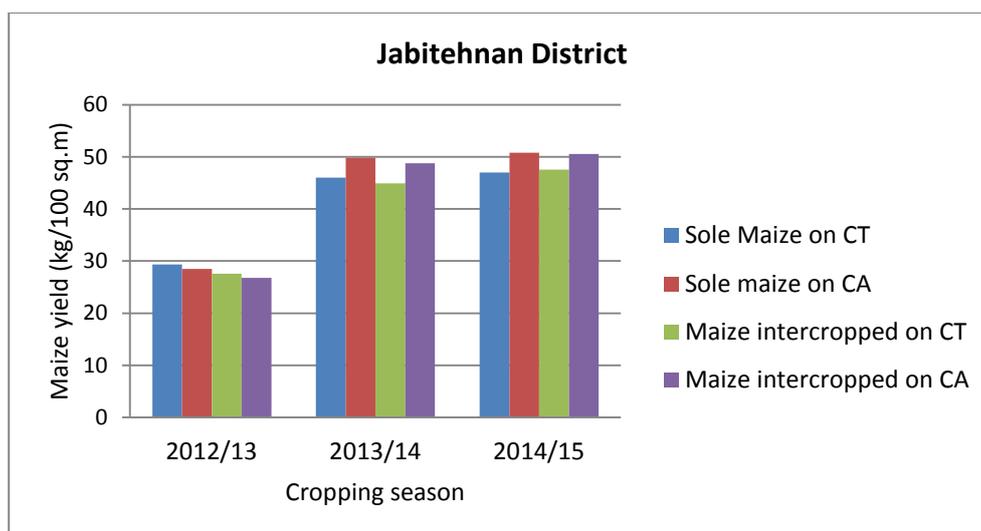


Figure 7. Average maize yield under different practices on the demo-plots (Jabitehnan District).

### **CA Adoption/Dis-adoption study in Malawi**

With the aim of building up a longitudinal database on CA adoption study, in September 2014, the project financed CA adoption/dis-adoption study survey in Malawi. Before this survey, there were two rounds of surveys conducted in 2005 and 2012. Randomly selected 332 sample farmers were interviewed (i.e., 246 adopters and 86 dis-adopters). Farmers who have adopted at least two CA technologies (mainly minimum tillage and mulching) at some point in time and continue to use the practices were defined named as adopters. Farmers that adopted the practice at some point in time and then stopped using the practice were defined as dis-adopters. The main focus of this study was to assess the adoption and dis-adoption dynamics of CA technologies.

**Preliminary Findings:** Results showed that dis-adopters tend to be primarily engaged in tobacco production, have more family labour available for agriculture, and have significantly large number of livestock units compared to adopters. The three most important reasons for dis-adoption were weed control problem (84%), lack of cash to buy inputs particularly fertiliser (47%), and no significant benefit from CA (22%). Dowa district had the highest proportion of dis-adopters (32%) followed by Nkhoskhota (18%) district, all in the high potential area. Results from further analysis showed that farmers with more land allocated to tobacco production and had more total livestock units were more likely to dis-adopt CA technologies in the first 3 years of adoption.

The results further revealed that the larger the proportion of maize plots managed by male and households deriving much of their income from off farm activities, the more likely they dis-adopt CA technologies within the first three years of adoption. Intensity of adoption increases on plots managed by women, in households where crop production was the main source of income, by households who had frequent contacts with extension officers and increased experience with the technology.

#### ***ii. Component 2: Enhance the pro-poor and gender sensitive targeting of CA based interventions through analysis of farmer perceptions, sustainability gains, and trade-offs in utilization of crop residues in mixed smallholder systems***

In addition to what have been done under this component over the last three years, during this reporting period, adoption monitoring study was conducted in Embu/Kenya. The monitoring study aimed at

generating lessons on the adoption paths of the practices we demonstrated in the treatment villages and how the market and institutional arrangements helped in enhancing the adoption CA-based practices.

Since the project was in its fourth cropping season in Kenya, to some extent we expected adoption of CA-based practices in the treatment villages. Accordingly, we conducted an adoption monitoring survey in December 2014 at Embu. Following the sample distribution we had in the baseline survey, in total we interviewed 256 farmers. In the sampling procedure, we followed both random sampling and snowball method. The randomly selected households would be used in the statistical inference of CA adoption study. On the other hand, those selected using snowball approach would be used to see how information flow and networking could help in facilitating adoption of CA. Demonstration plots hosting farmers were also included in the survey to see whether they were convinced in the benefits of CA-based practices and expanded these practices to their own maize farm. Table 2 shows distribution of sample households surveyed.

Preliminary results from the adoption monitoring survey shows that more than half of the demo-hosting farmers expanded the CA-based practices demonstrated on their plots to the rest of their own maize farmlands. From the four CA-based practices introduced at Embu under this project (zero tillage, furrows and ridges, maize legume intercropping, and residue retention), on average, those who adopted CA based practices adopted two of them. Furrows-and-ridges and maize-legume intercropping were CA-based practices strongly preferred and adopted by farmers. Farmers reported maize yield gain as their main reason for adopting CA-based practices (see figure 10).

Table 2. Size of sample households interviewed for adoption monitoring from different groups

<b>Farm household type</b>	<b>Sample households</b>
Randomly selected from the Treatment Villages	142
Randomly selected from a randomly selected Control Villages	41
Demonstration plots Hosting farmers	26
Purposively selected follower farmers who adopted some CA based practices	47
<b>Total</b>	<b>256</b>

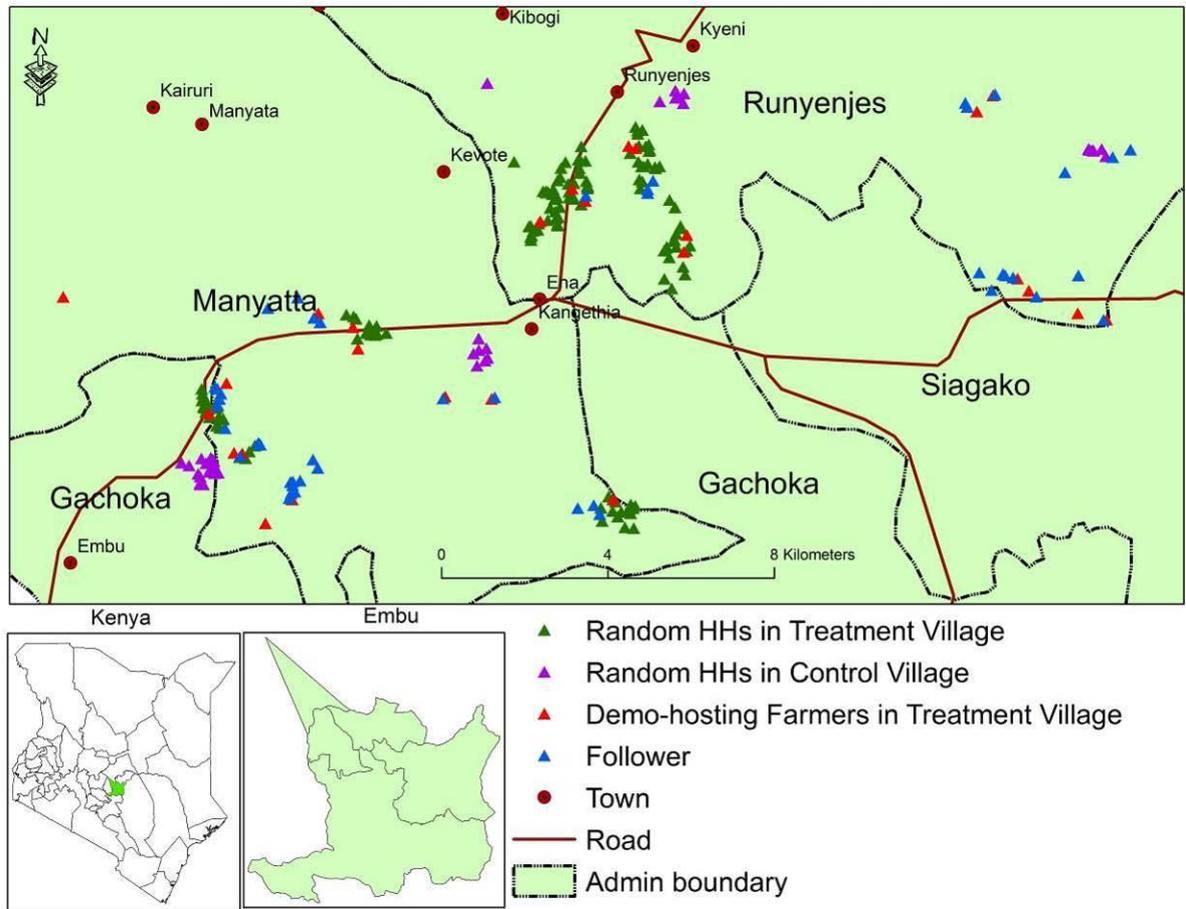


Figure 9. Map showing the distribution of sample households interviewed for the adoption monitoring study at Embu (Kenya)

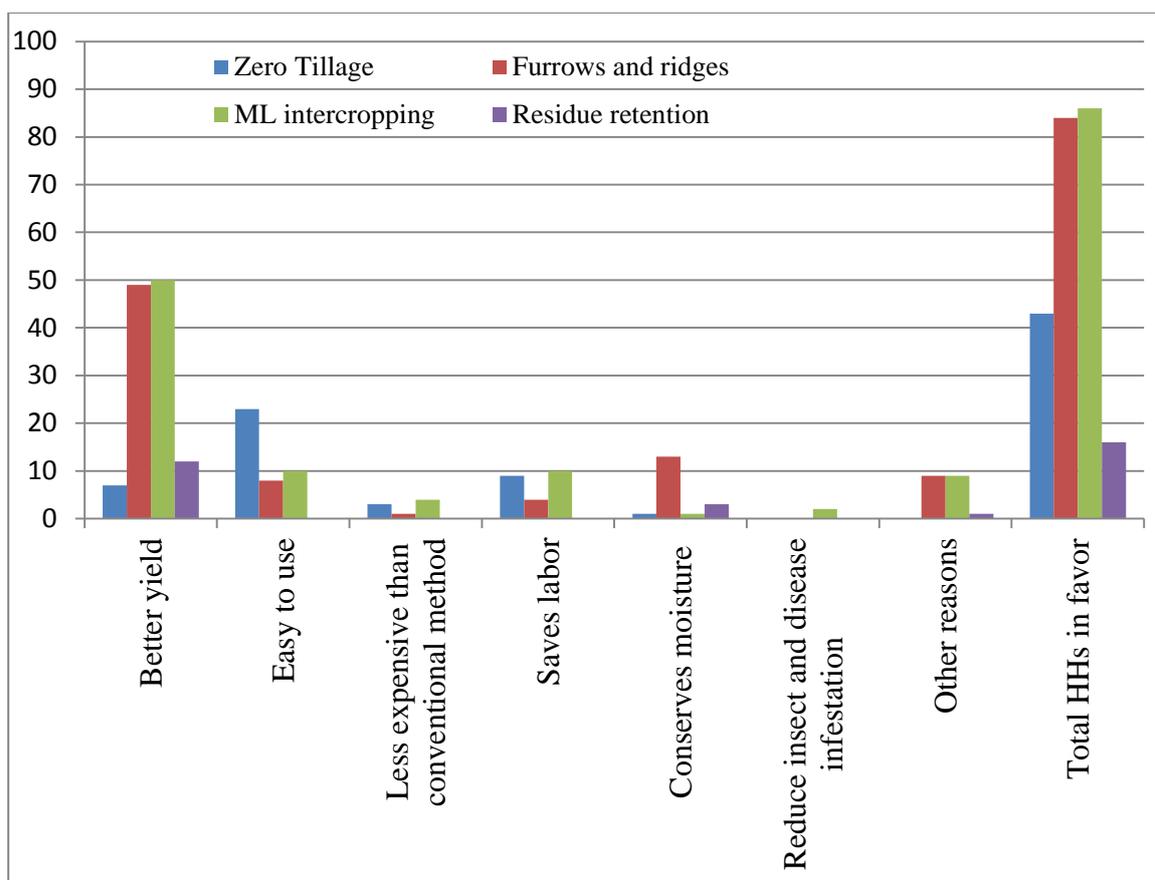


Figure 10. Frequency of main reasons farmers reported for liking the introduced CA-based practices (Embu/Kenya).

Compared to other farmers in the treatment villages, demo-hosting farmers are generally expected to have better information and knowledge on the performance of CA-based practices introduced on their farm. Accordingly, they are expected to adopt these practices much better than other farmers. A separate analysis done using data from farmers hosting the CA demo plots showed that all the four introduced CA-based practices were expanded, but at a different proportion (Table 3). Maize legume intercropping was the leading practice both in terms of number of demo-hosting farmers adopted and area of maize under this practice. On average, maize area under intercropping expanded from 0.335 acre to 0.537 acre in two years. Least adopted practice was residue retention. Potential reason for this could be livestock feed shortage farm households have (see figures 11 and 12).

Table 3. Expansion of CA-based practices by demo-hosting Farmers (Embu/Kenya)

CA practices	Percent of host farmers expanded (out of the 26 HHs surveyed)	2012	2014
		(Before intervention)	(After Intervention)
		Mean	Mean
Zero-tillage	54.5	0.167	0.506**
Furrows and ridges	60.9	0.129	0.390**
Maize-beans intercropping	69.2	0.335	0.537***
Residue retention	45.8	0.136	0.304**

Note: \*\*\* and \*\* are significantly higher than the other mean at 1% and 5% respectively.

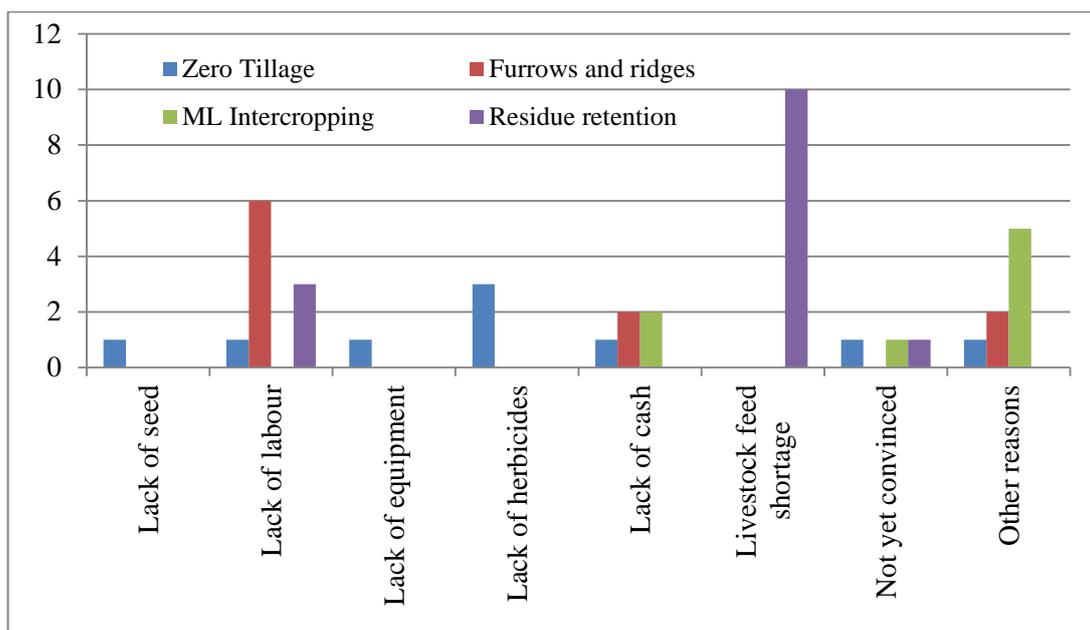


Figure 11. Reasons for not expanding area under CA practices (for demo-hosting farmers)

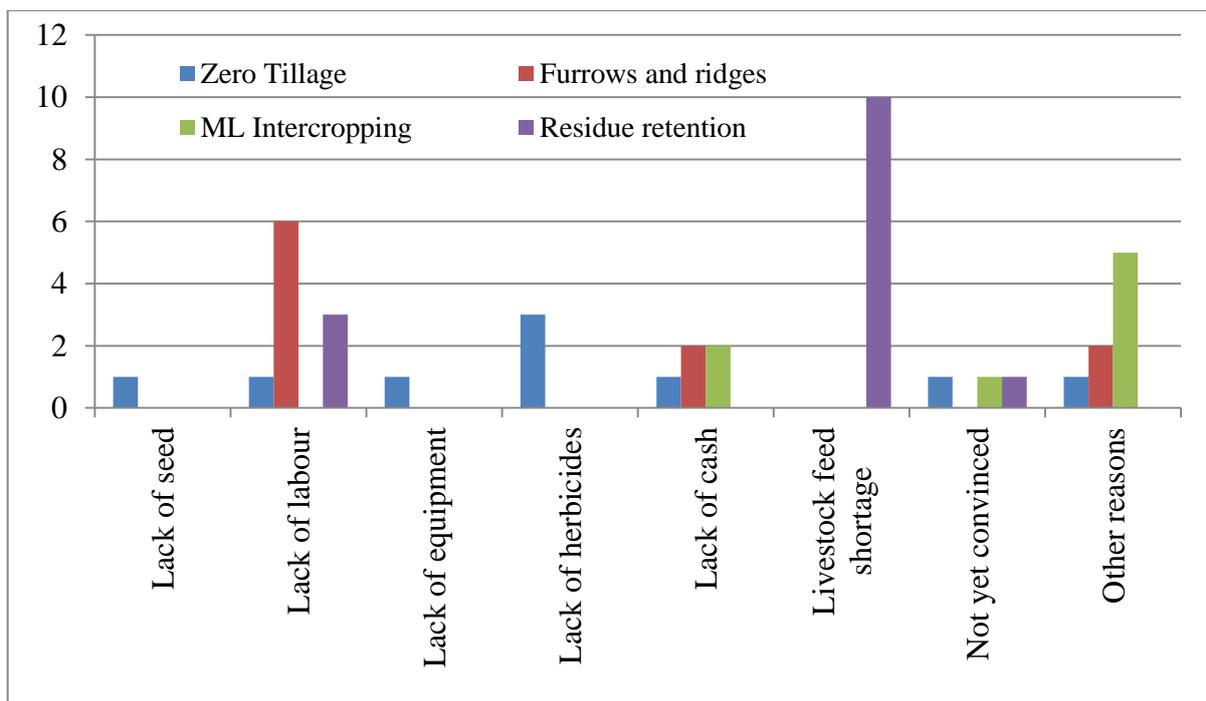


Figure 12. Main reasons for not adopting CA practices (though aware of these practices -whole sample))

Table 4. Summary of the main reasons for not adopting/expanding CA-based practices at Embu

CA-based practice	Main reason for not expanding
Zero tillage	Lack of the necessary skill in technology use Lack of cash (herbicide use in weed control)

Furrows and ridges	Lack of cash and labor ( <i>first year and seasonal maintenance</i> )
Residue retention	Livestock feed shortage

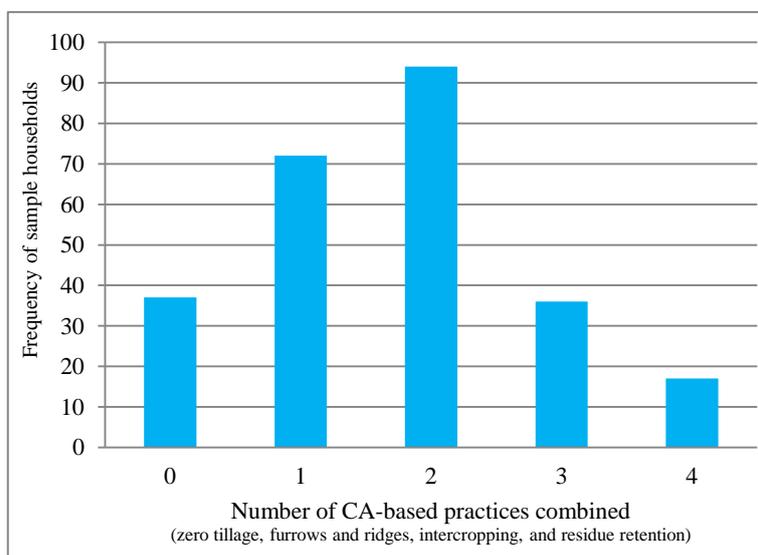


Figure 13. Number of CA based practices adopted by the samples surveyed under adoption monitoring (Embu/Kenya)

**iii. Component 3: Improve the delivery of information, technologies and market opportunities through institutional innovations and value chains for active participation of low income farmers and women and for stimulating CA based intensification of mixed smallholder systems**

Input and output side value chain analyses for maize and legumes were done based on the markets and value chain survey data collected in the previous reporting period. Results showed that different actors have different sources of price information. Table 5 below shows that producers are mainly getting market price information from their neighbours/relative farmers. For most cooperatives, government departments are their major source of price information. On the other hand, personal contacts are the major source of price information for grain traders.

Table 5. Price information sources for actors in the value chains

Information sources	Producers		Cooperatives		Grain traders	
	Frequency	%	Frequency	%	Frequency	%
Traders/agents	28	22.95	1	14.29	5	9.09
Government department	13	10.06	4	57.14	0	0
Radio/ Television	7	5.74	1	14.29	2	3.64
Personal contacts	0	0	1	14.29	48	87.27
Farmers cooperatives	13	10.06	0	0	0	0
Neighbours/relative farmers	61	50.81	0	0	0	0

Though maize is a staple crop, farmers sell some proportion of their maize produce to markets. Thus, availability of better functioning grain markets could encourage smallholder farmers in investing their limited resources in maize grain production above their home consumption level. Efficiency in maize marketing depends on the level of different marketing costs producers and traders incur in the process. Data analysed from the markets and value chain survey data showed that, in the overall maize

marketing, transportation and storage are the major costs (Figure 14). Any effort made in reducing transport and storage costs could help decreasing the overall marketing costs in maize.

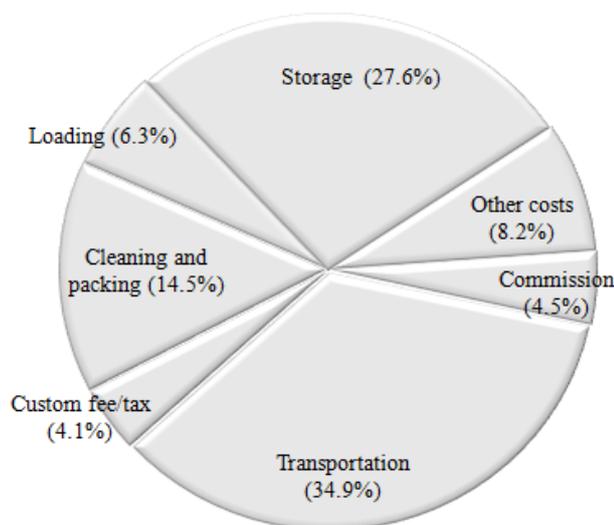


Figure 14. Percentage share of maize marketing costs

**iv. Component 4: Develop policy options and recommendations that create an enabling environment for scaling up/out and widespread farmer investments in CA based productivity growth to increase food security and adaptation to climate change**

Using a household survey data of the three countries, analysis was made to predict the effects of policy changes in Ethiopia, Kenya and Malawi on the expansion of CA-based sustainable intensification practices. The three countries have three distinct features. In Ethiopia, the extension system is strongly supported by the government and the ratio of extension agent to farmer ratio is smaller than any of the two countries. Kenya’s input market is relatively liberal and farmers have choices on the varieties and the type of fertilizer they could buy and from whom to buy. In general, farmers in Kenya have better access to input markets. In Malawi and Ethiopia, this is rather limited. However, Malawi is known for its smart subsidy program in maize production. The policy study used these three features and tried to estimate the effects of these three policies in each of the three countries.

Preliminary results showed that the probability of CA adoption in Kenya could increase from its current 4.3% to 41.7% and for Malawi from its current 34.8% to 89.3%. If Kenyan and Ethiopian smallholder farmers could get similar subsidy on inputs like the Malawian farmers, their probability of CA adoption could increase from its current 29.7% to 98.2% (for Ethiopia) and from 4.3% to 67.4% (for Kenya). On the other hand, if Ethiopian and Malawian smallholder farmers could have similar access to markets like the Kenyan farmers (access measured in terms of distance to the nearest main inputs and outputs markets), on average, their probability of CA adoption could increase from its current 29.7% to 30.8% in Ethiopia and from 34.8% to 35.8% in Malawi. The draft paper is under further refinements.

**v. Component 5: Enhance the capacity of R&D stakeholders for participatory learning and k-sharing by developing client oriented knowledge management systems that facilitate generation of national and regional public goods.**

Under this project, one paper titled as “Identifying the Potential Recommendation Domains of Conservation Agriculture in Ethiopia, Kenya, and Malawi” has been published in the journal of *Environmental Management* (Volume 55, Issue 2, pages: 330-346). The paper clustered cropland in

each of the three countries into nine zones combining the biophysical suitability (soil type, rainfall amount and slope of the farmlands) and the socio-economic factors affecting CA adoption (population pressure, livestock density and access to markets). Looking only from bio-physical suitability point of view, the study showed about 76.2%, 86.8%, and 92.2% of the croplands, respectively, in Ethiopia, Kenya and Malawi have the potential suitability for CA. From this overall biophysical suitability, about 43.3%, 54.5% and 83.5% of the cropland in Ethiopia, Kenya and Malawi, respectively, were categorized as high potential suitability for CA. Putting the socioeconomic factors with the biophysical factors together, the potential suitability of farmlands for CA goes down. Within the identified biophysical domains, high socioeconomic potential for CA adoption exists in 9%, 20%, and 46% of the crop areas in Ethiopia, Kenya and Malawi, respectively. For further details on the methodologies used and analysis results, we encourage one to read the whole paper.

#### **E. Difficulties encountered and measures taken to resolve problems**

During this reporting period, cowpea leaf blight in Ethiopia was the only difficulty we faced. The disease devastated all intercropped cowpea in both districts at vegetative stage. Farmers preferred to produce cowpea seed for marketing than using cowpea as feed at its vegetative stage. However, due to the heavy rains and extreme humidity during the specific cropping season, the plant couldn't manage to withstand leaf blight problem.

#### **III. INNOVATIONS (If applicable)**

No new innovations during this reporting period.

#### **IV. INTERNATIONAL PUBLIC GOODS**

Apart from the journal article indicated under component 5, there are other three draft papers submitted to journals for publication. Two papers focus on the adoption and impacts of minimum tillage on labour saving and enhancing maize productivity (one in Kenya and one in Ethiopia). The third manuscript focused on predicting the adoption of conservation agriculture under alternative agricultural policy environments in Eastern and Southern Africa. Details of manuscripts developed under this project are listed under *Annex 2*.

#### **V. NUTRITION AND HEALTH (If applicable)**

This is not directly applicable to the project's goals, but the beans intercropped under maize by farmers hosting demo-plots have a positive effect on the level of household protein consumption. The beans harvested from the demo-plots are not much in terms quantity and are mostly consumed at home and used as seed for the next cropping season.

#### **VI. GENDER ISSUES**

Unlike in Kenya, getting large number of female participants in farmers' field days was difficult in Ethiopia. However, during this reporting season, efforts were made to encourage female farmers to attend field days in their villages. Accordingly, a relatively large turnout of female farmers was observed at the field days organized in October 2014 in Jabitehnan district. Field day participant female farmers, especially those heading their families with limited male labour in the family, showed strong interest in zero-tillage as it demands no oxen power and labour for ploughing maize plots before planting. In the district, it is a common phenomenon to see that female headed households normally rent-out or share-out their lands due to lack of male labour and/or shortage of draft power for ploughing/land preparation. According to the female farmers who reflected their view during the field

days, zero tillage is the best technology they would adopt to enhance income and food security from maize production by keeping their land to their own use.

## **VII. PARTNERSHIPS**

During this reporting period, a new partnership was developed with the Ethiopian Agricultural Transformation Agency (ATA), Department of Conservation Agriculture. The Department is mandated to synthesize benefits of CA and advise the Ministry of Agriculture on the pros and cons of promoting CA based practices and CA components as a package. In Ethiopia, the Extension Directorate at the Ministry of Agriculture was also approached to get a buy-in on promoting CA in maize based systems under the Ministry's extension system. Both the Extension Directorate Director and head of the CA department at ATA were invited and participated on the CASFESA project closing workshop held at Bahar Dar on 23<sup>rd</sup> February 2015.

## **VIII. CONCLUSIONS (including outline workplan for next reporting period).**

The overall progress of the project activities during this reporting period was good. Agronomic data from the third season in Kenya was fully collected. The fourth season was planted and field days in all the treatment villages were conducted. Adoption monitoring survey was conducted in Kenya. Household level CA adoption study was conducted in Malawi. Project closing workshop was organized in Ethiopia.

Under this project a journal article titled as *"Identifying Potential Recommendation Domains of Conservation Agriculture in Ethiopia, Kenya and Malawi"* was published in *Environmental Management*. There are other three papers submitted to journals (Ecological Economics, Land Use Policy and Agricultural Economics) for publication. All are under review process.

Third cropping season Kenya was successfully finished with a good field day participation of male and female farmers, extension agents, experts from office of agriculture, etc. Maize and beans yield data from both the conventional and conservation tillage plots were documented for further analysis.

A project closing workshop was organized in Ethiopia where all relevant stakeholders and project partners were participated. Lessons from the project implementation process were presented. Results of agronomic data from the demo-plots showing the maize yield advantage on zero tillage plots over the three seasons was presented. Discussions were made on the gaps, challenges and opportunities of CA expansion in the country. Workshop participants agreed to have further and continuous dialogues on CA and plan how to incorporate it in the countries extension package at least for targeted regions/areas where research results confirmed positive economic and environmental benefits.

### ***Plan for the next four months (March-June 2015):***

- Project closing workshop in Kenya will be conducted on 5<sup>th</sup> March 2015 at Embu. Farmers, frontline extension agents, agricultural experts at County, Division and Sub-location levels, NGOs working on agriculture in the county, agro-dealers, and researchers from KARLO-Embu are already invited to participate. Discussions will be made on the lessons learned during the last four cropping seasons under this project and the way forward in supporting the scaling out of CA in the County.
- Final project technical report will be compiled, syntheses of lessons generated will be documented, and policy briefs will be developed from the research findings and scientific papers published.
- Scientific papers drafted will be finalized and submitted for publication. Follow the status of papers under review process and revise them based on comments from editors/reviewers and re-submit for publication.

- The compiled agronomic data from the demonstration plots will be analysed for both Ethiopia and Kenya to see any possible changes in production/productivity of maize on the zero tillage plots compared to the one on conventional tillage plots.
- CA adoption and dis-adoption analysis for Malawi will be done using the household survey data collected in September 2014.
- In addition, during the upcoming SIMLESA project annual review and planning meeting at Harare/Zimbabwe, CASFESA project experience in scaling out CA through demonstration plots and better institutional arrangements will be presented to participants gathered from five Eastern and Southern African Countries including the three CASFESA project countries.

**Challenge:**

During the third cropping season, both Jabitehnan and South Achefer districts (in Ethiopia) received large amount of rainfall and the air was humid for a number of weeks. This caused leaf blights to legumes and the cowpea intercropped with maize on the CA demo-plots was lost completely. For the coming cropping season, demo-hosting farmers and researchers from ARARI planned to look for alternative legume species or cowpea varieties that could withstand such an excessive rainfall under maize-legume intercropping system.

## Annexes 1:

### Results-Based Logframe

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
Goal: Increase food security and incomes of poor smallholder farmers through sustainable intensification of mixed cereal based systems			
Purpose: <ul style="list-style-type: none"> <li>• Low income smallholder farmers (including women) in mixed cereal systems adopt CA based innovations and benefit from integration into markets and value chains</li> <li>• Pro-poor service providers enhance the delivery of information, technologies and services to support CA based intensification</li> <li>• Policy makers and development partners utilize research results for evidence based decision making and better targeting and scaling up/out CA-based innovations</li> </ul>	<ul style="list-style-type: none"> <li>• At least 10% of smallholder farmers in targeted areas adopt CA based innovations by 2014.</li> <li>• At least 10% increase in the agricultural productivity for adopting farmers in the targeted areas by 2014</li> <li>• At least one value chain better engaging resource poor farmers and women to support CA based intensification.</li> <li>• Policy analysts and development partners sensitized about policy options to enhance food security using CA-based innovations</li> </ul>	<ul style="list-style-type: none"> <li>– Peer-reviewed research reports and adoption studies</li> <li>– Annual technical reports to IFAD</li> </ul>	<ul style="list-style-type: none"> <li>- Governments and extension systems will be able to enhance the delivery of CA based innovations to farmers</li> </ul>
Narrative Summary	Objectively verifiable indicators	– Means of Verification	Assumptions
Output 1. The agronomic performance of CA based technologies tested and demonstrated on farm and the economic incentives for smallholder farmers (including profitability and risk mitigation benefits) under risk-prone mixed smallholder systems evaluated and documented	<ul style="list-style-type: none"> <li>• At least five demonstration trials for CA and conventional practices conducted annually in each country</li> <li>• The on-farm performance and economic viability of CA-based interventions assessed at least in two CA hubs in each country</li> </ul>	<ul style="list-style-type: none"> <li>– Field day reports</li> <li>– Reports to IFAD</li> <li>– Working paper on farm level economic viability of CA</li> </ul>	<ul style="list-style-type: none"> <li>- Availability of adequate and timely funds to support the project</li> <li>- Climatic conditions will be suitable for conducting field trails in cereal-legume systems</li> </ul>

			- Socio-political conditions will remain stable
Output 2: The pro-poor and gender sensitive targeting of CA based interventions enhanced with better understanding of farmer perceptions, sustainability gains, and tradeoffs in utilization of crop residues in mixed smallholder systems.	<ul style="list-style-type: none"> <li>• A tradeoff analysis on the economic and environmental benefits of CA and use of crop residues for alternative uses</li> <li>• Pro-poor targeting capacity enhanced through analysis of farmer perceptions and returns to CA investments</li> </ul>	<ul style="list-style-type: none"> <li>– Working paper on pro-poor targeting and tradeoff analysis</li> <li>– Report to IFAD</li> </ul>	- do -
Output 3: Institutional innovations and efficient value chains identified and the delivery of information, technologies and market opportunities enhanced to foster participation of low income farmers and women in CA based intensification of mixed smallholder systems.	<ul style="list-style-type: none"> <li>• At least two efficient and equitable marketing channels and CA-relevant value chains identified and defined</li> <li>• At least three farmer groups in each targeted country linked to promising input/output value chains</li> </ul>	<ul style="list-style-type: none"> <li>– Annual technical reports to IFAD</li> <li>– Farmer organization annual reports</li> <li>– IFAD investment project reports</li> </ul>	- do -
Output 4: Policy options and recommendations that create an enabling environment identified and developed for stimulating farmer investments and scaling up/out CA based productivity growth for increasing food security and adaptation to climate change	<ul style="list-style-type: none"> <li>• A synthesis of CA relevant agricultural and environmental policies in the region</li> <li>• Policy recommendations outlining gaps and implications of existing policies for CA diffusion and sustainable food security in target countries</li> </ul>	<ul style="list-style-type: none"> <li>– Working paper on CA relevant policies and recommendations for target countries</li> <li>– Policy workshop</li> <li>– Reports to IFAD</li> </ul>	- do -
Output 5: The capacity of R&D stakeholders for participatory learning and k-sharing strengthened by developing client oriented knowledge management systems that facilitate generation of national and regional public goods.	<ul style="list-style-type: none"> <li>• Local partners and lead farmers trained in each country</li> <li>• At least one national CA k-sharing and learning network established/strengthened per country</li> <li>• Relevant regional stakeholders linked through a k- sharing and learning platform for CA</li> </ul>	<ul style="list-style-type: none"> <li>– Training report</li> <li>– CIMMYT newsletter</li> <li>– Reports to IFAD</li> </ul>	- do -
<b>NARRATIVE SUMMARY</b>	<b>OBJECTIVELY VERIFIABLE INDICATORS</b>	<b>– MEANS OF VERIFICATION</b>	<b>ASSUMPTIONS</b>
<b>Objective 1: Participatory on-farm evaluation and adaptation of CA-based technologies and analysis of farm level economic incentives (including profitability and risk</b>			

<b>mitigation benefits) under risk-prone mixed smallholder systems in eastern and southern Africa</b>			
1. 1. Rapid appraisals and characterization of target communities and households in CA hubs in three target countries	<ul style="list-style-type: none"> <li>• Socio-economic and biophysical profiles of at least 10 communities (3-5 per hub) in each target country diagnosed and documented by the end of the first year</li> <li>• GIS characterization and mapping of research hubs (first half of the 2<sup>nd</sup> year)</li> </ul>	<ul style="list-style-type: none"> <li>– Rapid Appraisals reports in targeted countries</li> <li>– GIS maps for target environments</li> </ul>	Socio-political conditions will continue to be conducive for field work
1. 2. Establish on-farm demonstration trials and participatory evaluation of alternative CA-based technologies along with conventional tillage systems in target countries	<ul style="list-style-type: none"> <li>• At least 10 demonstration trials(DTs) conducted annually in each target country and performance data collected on CA technologies</li> <li>• At least one field day conducted per hub and country annually for participatory evaluation and demonstration of CA technologies</li> </ul>	<ul style="list-style-type: none"> <li>– Progress and annual project reports, farmers evaluation reports</li> <li>– Field day reports and media coverage of events</li> </ul>	-do-
1. 3. Analysis of on-farm trial data to estimate farm level economic and risk mitigation benefits of CA technologies and practices in risk prone mixed smallholder systems	<ul style="list-style-type: none"> <li>• The economic and risk mitigation benefits of alternative CA technologies and practices documented across three target countries by the end of the project period</li> </ul>	<ul style="list-style-type: none"> <li>– Research report on the economic returns and risk mitigation benefits of CA</li> </ul>	- do-
1.4. Analysis of existing farm household survey datasets (linked to SIMLESA and DIIVA surveys) to assess farmers' economic incentives and constraints to adopting CA-based practices	<ul style="list-style-type: none"> <li>• The potential economic incentives and constraints for farmers to adopt CA technologies documented from analysis of existing household datasets in each target country (mid second year)</li> </ul>	<ul style="list-style-type: none"> <li>– Research reports on the economic and adoption analysis in the targeted countries</li> </ul>	- do -
<b>Objective 2: Enhance the pro-poor and gender sensitive targeting of CA based interventions through analysis of farmer perceptions, sustainability gains, and tradeoffs in utilization of crop residues in mixed smallholder systems</b>			
<b>Narrative summary</b>	<b>Objectively verifiable indicators</b>	<b>Means of verification</b>	<b>Assumptions</b>
2.1: Disaggregated stakeholder analysis by resource endowment and gender to assess differential impacts and implications for more equitable inclusion (stakeholder consultation).	<ul style="list-style-type: none"> <li>• At least one stakeholder analysis conducted per country on impact indicators differentiated by resource endowment (poor vs. rich farm households) and gender.</li> </ul>	<ul style="list-style-type: none"> <li>– Study report</li> <li>– Project progress reports</li> </ul>	Proactive participation of stakeholders in differentiated

	<ul style="list-style-type: none"> <li>Recommendations for R&amp;D for more equitable inclusion.</li> </ul>		impact targeting
2.2: Analysis of crop residue use in contrasting mixed smallholder systems to quantify opportunity costs and sustainability benefits and to reduce economic and environmental trade-offs in CA systems.	<ul style="list-style-type: none"> <li>Existing situation on crop residue use and opportunity costs and benefits for each hub or farming system and country documented.</li> </ul>	<ul style="list-style-type: none"> <li>Study report</li> <li>Project progress reports.</li> <li>Presentation at regional policy/stakeholder workshop(s).</li> </ul>	Price data for crop residue can be estimated from revealed or stated preferences (community survey)
2.3: Geo-referenced analysis and mapping of key indicators and associated attributes to enhance delineation of recommendation domains and enhance targeting of CA based interventions.	<ul style="list-style-type: none"> <li>Maps and geo-referenced scenarios for key indicators and associated attributes (end of second year).</li> <li>Geo-referenced delineation of prospective recommendation domains (first half of 3<sup>rd</sup> year).</li> </ul>	<ul style="list-style-type: none"> <li>Project progress reports</li> <li>Maps fed into knowledge sharing network.</li> </ul>	- National partners provide high resolution admin maps with farming system and population data
2.4: Conduct adoption studies and identify constraints and scaling up/out opportunities from initial uptake of CA practices	<ul style="list-style-type: none"> <li>Adoption surveys completed around each hub in each country (year 3).</li> <li>Report synthesizing survey findings (year 3).</li> </ul>	<ul style="list-style-type: none"> <li>Datasets on adoption surveys</li> <li>Research report on use of CA by farmers and adoption constraints</li> </ul>	- Socio-political conditions will remain stable to conduct adoption studies
<b>Objective 3. Improve the delivery of information, technologies and market opportunities through institutional innovations and value chains for active participation of low income farmers and women and for stimulating CA based intensification of mixed smallholder systems</b>			
<b>ACTIVITIES</b>	<b>OBJECTIVELY VERIFIABLE INDICATORS</b>	<b>MEANS OF VERIFICATION</b>	<b>RISKS AND ASSUMPTIONS</b>
3.1. Identification and mapping of farmer organizations, extension and other value chain actors that condition the development and delivery of CA innovations.	<ul style="list-style-type: none"> <li>Input suppliers, knowledge brokers, and service providers for delivery of CA innovations at each hub in target countries identified (year 2).</li> </ul>	<ul style="list-style-type: none"> <li>Progress report</li> <li>Stakeholder maps fed into knowledge sharing network</li> </ul>	- Socio-political conditions will remain stable
3.2. Conduct market and value chain studies on selected	<ul style="list-style-type: none"> <li>At least one survey completed on CA related value</li> </ul>	<ul style="list-style-type: none"> <li>Market and value</li> </ul>	- do -

service delivery systems (inputs, credit, CA equipment, crop residue and outputs)	<p>chains in each target country (Year 2).</p> <ul style="list-style-type: none"> <li>At least one market and value chain analysis report completed in each target country (Year 2).</li> </ul>	<p>chain survey datasets</p> <ul style="list-style-type: none"> <li>Research report on market and value chain analysis</li> </ul>	
3.3. Identify pro-poor institutional innovations for enhancing the flow of information and access to technologies and markets for women and low income farmers.	<ul style="list-style-type: none"> <li>At least one promising pro-poor and gender sensitive institutional innovation for CA (e.g. farmer organizations, marketing groups, extension providers) identified in each country (Year 2)</li> </ul>	<ul style="list-style-type: none"> <li>Progress reports</li> </ul>	-do -
3.4. Enhance the integration of low income and women farmers into equitable and efficient value chains for stimulating CA based intensification and income growth	<ul style="list-style-type: none"> <li>At least one pro-poor and inclusive farmer association/group from each CA hub linked to promising value chains in each country (Year 3)</li> </ul>	<ul style="list-style-type: none"> <li>Progress reports</li> </ul>	-do-
<b>Objective 4:</b> Develop policy options and recommendations that create an enabling environment for scaling up/out and widespread farmer investments in CA based productivity growth to increase food security and adaptation to climate change			
<b>ACTIVITIES</b>	<b>OBJECTIVELY VERIFIABLE INDICATORS</b>	<b>MEANS OF VERIFICATION</b>	<b>RISKS AND ASSUMPTIONS</b>
4.1. Document current policies to identify policy gaps, impediments and/or opportunities for CA based intensification in mixed smallholder systems	<ul style="list-style-type: none"> <li>Situation analysis of CA-relevant policies of target countries documented (Year 2)</li> </ul>	<ul style="list-style-type: none"> <li>Project progress report</li> <li>EC-IFAD evaluation reports</li> </ul>	Governments are willing to provide reliable data and information
4.2. Evaluate alternative policy options and generate evidence based recommendations for promoting pro-poor CA technologies	<ul style="list-style-type: none"> <li>At least two alternative policy options per target country evaluated (Year 3)</li> <li>At least one CA relevant policy recommendation proposed per target country (Year 3)</li> </ul>	<ul style="list-style-type: none"> <li>Working paper on synthesis of CA relevant policies and options in the region</li> <li>EC-IFAD evaluation reports</li> </ul>	- do -
4.3 Facilitate policy dialogue on CA systems through regional policy/stakeholder workshop, policy briefs and advocacy	<ul style="list-style-type: none"> <li>At least one CA relevant policy dialogue or in-country traveling workshop conducted per country (Year 2 and 3)</li> <li>One regional CA relevant policy workshop</li> </ul>	<ul style="list-style-type: none"> <li>Policy brief</li> <li>Progress report</li> </ul>	- do -

	conducted (Year 3)		
4.4 Enhance synergies and complementarities with other development programs to facilitate CA scaling out/up	At least one development program operating in each target country engaged for partnership in CA scaling out/up (Year 3)	- Annual work plans - Progress reports	Development partners interested in scaling up/out CA innovations
<b>Objective 5:</b> Enhance the capacity of R&D stakeholders for participatory learning and k-sharing by developing client oriented knowledge management systems that facilitate generation of national and regional public goods.			
<b>ACTIVITIES</b>	<b>OBJECTIVELY VERIFIABLE INDICATORS</b>	<b>MEANS OF VERIFICATION</b>	<b>RISKS AND ASSUMPTIONS</b>
5.1. Regional synthesis of and lessons learned from existing knowledge, best practices and experiences with CA innovations in smallholder mixed systems	<ul style="list-style-type: none"> <li>• A review of CA relevant experiences and lessons in target countries completed (Year 2)</li> </ul>	<ul style="list-style-type: none"> <li>- Research brief</li> <li>- Progress report</li> </ul>	Comparative literature or information available from target countries
5.2. Facilitate participatory knowledge sharing and learning on CA systems	<ul style="list-style-type: none"> <li>• Inventory of interested CA clients and stakeholders developed (Year 2)</li> <li>• At least one regional CA learning and k-sharing network established or strengthened (Year 3)</li> </ul>	<ul style="list-style-type: none"> <li>- Progress report</li> <li>- Annual report of partners/stakeholders</li> </ul>	- Socio-political conditions will remain stable
5.3. Enhancing the skills and capacity of R&D partners and stakeholders on-farm research, targeting and economic analysis of CA innovations	<ul style="list-style-type: none"> <li>• One training conducted on sustainable intensification using CA based innovations</li> <li>• One training conducted on design and analysis of on-farm CA trials</li> <li>• One training provided on pro-poor targeting and economic analysis of CA innovations</li> </ul>	<ul style="list-style-type: none"> <li>- Progress reports</li> <li>- EC-IFAD evaluation reports</li> </ul>	- do -

## **Annex 2: International Public Goods**

Kindie Tesfaye, Moti Jaleta, Pradyot Jena, Munyaradzi Mutenje. Identifying Potential Recommendation Domains for Conservation Agriculture in Ethiopia, Kenya and Malawi. *Environmental Management*, 55(2):330-346.

*Moti Jaleta, Menale Kassie, Tilaye Teklewold, Kindie Tesfaye, and Pradyot Jena, Paswel Marennya, and Olaf Erenstein.* Resource Saving and Productivity Enhancing Impacts of Conservation Agriculture in Ethiopia. *Submitted to Agricultural Economics*.

*Pradyot Jena and Moti Jaleta.* Can conservation tillage reduce labour demand and enhance productivity? Evidence from Smallholder Farmers in Kenya. *Submitted to Ecological Economics journal for publication*.

*Paswel Marennya et al.* Predicting the adoption of conservation agriculture under alternative agricultural policy environments in Eastern and Southern Africa. *Submitted to Land Use Policy for Publication*.

*Munyaradzi Mutenje et al.* Impact of Conservation Agriculture on household food security and labour productivity in manual farming systems: Evidence from Malawi. *Draft paper under internal review*.

*Paswel Marennya et al.* Testing alternative information delivery systems for farm level CA adoption and community upscaling. *Draft manuscript in the process of development*.

Annex 3A. CASFESA-Ethiopia Closing workshop program (Bahar Dar, Ethiopia, 23<sup>rd</sup> February 2015)

Time	Activity	Presenter	Chair/Organizer
8:30-9:00	Registration	Daniel/Sewmehon/Alemu	
9:00-9:30	Welcoming Address and introduction of participants	Dr. Biru/Dr. Tilaye Teklewold	Dr. Tilaye
9:30-9:40	Official opening	Guest of the day	
9:40-10:10	Overview of CASFESA Project and Preliminary Results	Dr. Moti Jaleta	
10:10-10:30	Experience of SIMLESA Project on CA/SIPs	Dr. Mulugetta Mekuria/Yeshitla	
10:30-11:00	Health Break/Group Picture		
11:00-11:20	Economic and Environmental Benefits of Sustainable Intensification Practices	Dr. Menale Kassie	Dr. Biru
11:20-11:50	Farmers' Experience and witness on the opportunities and challenges of CA in South Achefer and Jabitehnan Districts	Demo-Hosting Farmers	
11:50-12:45	General discussion on the way forward: Views from Extension, Agricultural Experts, NGOs, Farmers, Researchers, etc. ( <i>on results, lessons, and gaps</i> )	Participants	Dr. Tilaye
12:45-14:00	Lunch Break		
14:00-15:00	General discussion on the way forward: What is expected from whom and when?	Participants	Dr. Tilaye
15:00-15:10	Vote of Thanks	Dr. Tilaye/Dr. Moti	
15:10-15:30	Closing remarks	Guest of the day	
15:30-16:00	Health Break/Networking		
16:00	Meeting ends		

Annex 3B. List of participants in CASFESA-Ethiopia closing workshop at Bahar Dar (23<sup>rd</sup> February 2015).

No.	Name	Sex	Organization	Responsibility
1	Adane Hirpa	M	Hawassa University	Assistant Professor
2	Alemu Tolemariam	M	CIMMYT	Research Assistant
3	Anteneh Abewa	M	Adet Agricultural Research Center	Director
4	Asresse Yitayeh	M	Andasa Res. Center	Socio Economics Researcher
5	Ayana Dinberu	M	ARARI	Public Relation
6	Azmeraw Tessema	M	Jabitehnan Woreda Agri. Office	Focal person
7	Belete Tilahun	M	AMMA	Reporter
8	Daniel Tilahun	M	ARARI	Researcher
9	Damot Mosie	M	Jabitehnan Woreda	Farmer
10	Demeke Atilaw	M	Amhara Region Agriculture Bureau	Deputy Head
11	Dessalew Mulat	M	Jabitehnan Woreda Agri. Office	Development Agent
12	Dilmeta Dires	M	South Achefer Woreda	Farmer
13	Ejigu Yeshaneh	M	Jabitehnan Woreda	Farmer
14	Enquahone Alayu	M	Jabitehnan Woreda	Farmer
15	Ewunetu Mekonnen	M	South Achefer Woreda	Farmer
16	Gelaneh Ayanaw	M	South Achefer Woreda Agricultural Office	Head
17	Getahun Nigussie	M	South Achefer Woreda Agricultural Office	Project Focal Person
18	Getachew Gebeyehu	M	Regional Agriculture Bureau	Forestry
19	Getnet Zeleke	M	ARARI	Livestock research
20	Girma Kibret	M	MoA	Sustainable land Management (SLM)
21	Habtamu Belay	M	South Achefer Woreda Agricultural Office	Development Agent
22	Hunegnaw Wubie	M	South Achefer Woreda	Farmer
23	Kassahun Motbaynor	M	Jabitehnan Woreda Agricultural Office	Development Agent
24	Kibru Michael	M	MoA	Soil Fertility Improvement
25	Legesse Getaneh	M	Jabitehnan Woreda Agricultural Office	Agronomist
26	Lijalem Tilahun	M	Andasa Res. Center	Director
27	Likawent Yeheyis	M	ARARI	Livestock Research Director
28	Mantegbosh Getle	F	South Achefer Woreda	Development Agent

			Agricultural Office	
29	Manaye Bekolo	M	Amhara Seed Enterprise	Agronomy
30	Menale Kassie	M	CIMMYT	Socio Economics Researcher
31	Moti Jaleta	M	CIMMYT	Socio Economics Researcher
32	Mulugeta Alemayehu	M	ARARI	Public Relation Head
33	Mulugetta Mekuria	M	CIMMYT	SIMLESA project coordinator
34	Siefu Mahifere	M	CIMMYT	Communication
35	Tadesse Misganaw	M	ARARI	Journalist
36	Tadesse Adigo	M	NABU	Manager
37	Temesgen Melaku	M	Jabitehnan Woreda	Farmer
38	Tesfaye Feyisa	M	ARARI	Soil research Director
39	Tesfaye Mengistie	M	Ministry of Agriculture	Extension Director
40	Tewabe Asmare	M	South Achefer Woreda Agricultural Office	Farmer
41	Tilahun Abie	M	Jabitehnan Woreda	Farmer
42	Tilahun Tadesse	M	ARARI	Researcher
43	Tilaye Teklewold	M	ARARI	Deputy Director
44	Sewmehon Demissie	F	ARARI	Socio Economics Research Director
45	Wogayehu Bekele	M	ATA	Director
46	Wolelaw Amare	M	Jabitehnan Woreda Agri. Office	Head
47	Wondimagegn Mekonnen	M	Andasa Res. Center	Researcher
48	Wondimu Bayu	M	ICARDA	Project Focal Coordinator
49	Yeshtila Merene	M	ARARI	Crop Research Director
50	Yeshiwas Tilahun	M	Andasa Res. Center	Socio Economics Researcher