



Howard G. Buffett Foundation

**EVALUATION OF THE IMPACT OF CONSERVATION AGRICULTURE
PROJECT (CAP) IN THE KOINADUGU DISTRICT, SIERRA LEONE**

FINAL EVALUATION REPORT SUBMITTED TO:

CARE SIERRA LEONE

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List of Abbreviations

CAP	Conservation Agriculture Project
CA	Conservation Agriculture
DM&E	District Monitoring and Evaluation
FFS	Farmer Field School
FIOH	Future in Our Hands
IVS	Inland Valley Swamp
MAFFS	Ministry of Agriculture, Forestry and Food Security
SLARI	Sierra Leone Agricultural Research Institute
VSLA	Village Savings and Loans Association

Executive Summary

Through the Conservation Agriculture Project (CAP), CARE sought to address the underlying causes of poverty and embarked on promoting a significant change through the introduction of Conservation Agriculture (CA) to benefit 11,000 people in 50 communities in Koinadugu district, Sierra Leone in a 3-year project that began in January 2009 and ended in January 2012. The objectives of the evaluation were to conduct a comprehensive analysis and updated assessment in the four targeted chiefdoms in Koinadugu district on the impact of the Conservation Agriculture.

To this end, a combination of approaches was used to collect data for the evaluation. Both qualitative and quantitative approaches were employed. Key informant interviews, focus group discussions, randomly selected beneficiary discussions, semi-structured interviews, field visits and active observation were used. Additionally, a formal survey was conducted to complement the qualitative results. The consultant also worked closely with CARE Sierra Leone's CAP Project Team and reviewed relevant literature and project's documents.

Productivity: Yields of all crops handled by CAP such as maize, rice and pigeon pea with farmers had increased yields when CA practices were used. The yields also increased with time from Year 1 to Year 2 indicating a positive correlation between yield and time. This shows fertility build-up as time goes on with CA techniques. There were increases in yields ranging from 10% to 1010% among the various crops. Comparing the mean yields of the CA plots to the baseline showed over 200% increase. Thus, farmers' productivities have increased with the use of CA technologies.

Land area covered: The land area covered with CA can be used as a measure of the effectiveness of CA activities. The overall total land area covered with CA technologies by CAP was 1,070 ha and therefore CA was effective.

Adoption of CA practices: Technologies are developed for people to use and therefore the number of users can also be used as proxy to adoption. The total target set by the CAP was 1,500 farmers and 2,049 farmers were using any of the CA technologies. CAP exceeded its target by 37%. The most adopted CA technologies were Zero/minimum tillage, followed by mulch and cover crop in that order. CAP trained 2,167 farmers of which 2,049 used the CA technologies. Therefore, the adoption rate for CA technologies was 95%.

Soil properties: One of the basic aims of CA was to improve the soil properties such that they became more productive. Through CA practices, soils that were acidic had had their acidity reduced by the increase in their pH levels between 2010 and 2011. Similarly, the % organic carbon increased from 2010 to 2011 suggesting that the organic matter also increased. Greater increases in organic carbon were observed in the IVS than in the upland.

Village Savings and Loan Association (VSLA): The involvement of CAP in Village Savings and Loan Association resulted in increased access to loans by women and youth. By the end of Year 2, total savings equivalent to US\$26,949 had been saved by the associations. Total loans obtained by the same associations were US\$11,403 showing the business-like attitude of the group.

Livestock: CAP supported livestock farmers by providing the farmers with veterinary services that prevented livestock diseases. One hundred and twenty farmers benefited from veterinary services

reaching a total of 2,566 animals as against a planned target of 1,556 animals exceeding CAP's target by 64%.

Seed accessibility: Women and youth were supported to have access to inputs. Seven hundred and twenty women and youth were targeted for access to seeds. Out of this total, 1,800 women and youth had increased access to input representing 250% achievement.

Advocacy and Policy on Land rights and access: CAP was able to achieve 38% of its land agreement activities and 35% of tree crop establishment of the planned targets. Thus the effectiveness was low to moderate. It however met its target in the by-laws/policy issues and over-achieved in environmentally friendly land use.

Farmer knowledge: In the absence of a formal academic knowledge score, the number of farmers actually using the CA technology can be used as proxy to the knowledge acquired by them on the CA. Once the farmer was using the technology, then it implied that he or she knew something about it. Therefore, out of the target set by CAP to reach 1,500 farmers, 2,049 farmers actually practiced the CA technologies and therefore, had knowledge about the practices.

Use of fertilizer: 75% of the FFS farmers used range organic manure such as animal droppings, green manure and 35% used inorganic fertilizer in 2010. In 2011, none of the farmers used inorganic fertilizers as most of them saw the benefits of CA from earlier observations. This further indicated the shift of fertilizer use to CA technologies by farmers who had been exposed to the technologies.

Training: CAP met all its targets on training.

Impacts of CAP:

Reduced cost of production

With reduced land preparation, seed costs, non-use of fertilizer and herbicides by farmers, their cost of production were drastically reduced. Farmers became more efficient in their productive activities as their cost of production were being minimized per unit of production. The CAP helped farmers to save time, reduce labour for land preparation, reduce the quantity of seed, reduced cost of fertilizer use by applying organic fertilizer while, at the same time, increased farmers' yield.

Farmers saved 1 hour a day when they applied CA technologies by working 3 hours instead of 4 hours a day using traditional methods and that amounted to 6 hours a week of saved time. This was because CA practices had made their work simpler and easier. The saved time was equivalent to 1.5 days of traditional working period which could be used productively, social net working or for leisure. This also contributed to the lowering of production cost.

Labour was an important input in agricultural production and a major contributor to the overall cost of production in farming enterprise. During land preparation farmers saved 10 man-days of labour by using 5 man-days with CA technologies as against 15 man-days on their traditional non-CA practice. Farmers saved 50,000 to 100,000 Leones per unit of farm for just land preparation. This was a big saving for a poor farmer and helped to reduce the cost of production.

Farmer reported that they used fewer quantities of seed in planting when they used CA practice because seeds were not lost to birds and squirrels and that they planted in rows putting in 2 to 3 seeds

per hill as compared to broadcasting and putting in more seeds per hole. With pigeon pea using a CA practice, farmers used 150 cups of pigeon pea to plant the same area as compared with 200 cups applied in their traditional Non- CA fields making a saving of 50 cups of seed at planting. This again contributed to the reduced cost of production.

Increased yield and income

Farmers reported of, at least, doubling their yields if they used CA technologies. This emphasizes the yield advantage of applying CA technologies. The ratio of yields “with” CA and “without” CA estimated by farmers was 1.8:1 using a CA practice. This showed that farmers adopting CA got nearly twice the yield. With increased yield, farmers reported of improved income. Eight-four percent of CA users reported increased incomes. With increased income, easier or reduced work load, some farmers expanded their farm size and used their family labour more effectively.

Increased opportunity for women

Women were among the disadvantaged in the society. By engaging in CA technologies, women had the opportunity for reduced burden from the use of labour as CA reduced some labour requirements on land preparation and brushing. It was reported that farmers could save some 1.5 days per week of their normal time in farming activities if they used CA technologies. This saved time could be used by the women for social networking such as meetings and VSLA activities. There was also increased economic opportunity for women as they got higher yields and could afford to sell more. The time saved could also be used for some economic ventures by the women.

Increased food security

By increasing crop productivity through CA, the availability of food was complementary. That also meant that food was more available to the family as a whole than they did without the use of CA. Thus, CA provided some increased food security to the farmers.

Improved standard of living

Some farmers had improved access to health services, education of their children, improved housing and could also access credit for crucial needs through the VSLA. Those issues provided opportunities for improvement of their living standards.

Self- induced CA technology transfer

Many farmers who had seen the CA technology worked, had formed themselves into informal groups being assisted by the FFS groups to learn and apply the CA technology. That was a positive sign for the spread of the CA technologies. In addition, other NGOs such as Christian Relief Service had learnt the benefits of CA and were now implementing it in their area of jurisdiction.

Development for tools for adoption (Nutrient Deficiency Symptoms Guide)

CAP developed some simple tools to deliver extension knowledge to farmers. It developed the Nutrient Deficiency Symptoms Guide on maize, for example and provided the FFS groups with that guide. This simple guide with pictures had allowed farmers to identify nutrient deficiencies in plants and applied the necessary remedies to the soil. This was an excellent extension material for farmers. Each farmer had

passed on the information from the guide to 6.2 farmers on the average. That underscored the importance of what simple extension material could do.

Experience gained from CA training

The impact of the experience gained from the training in CA technologies by staff of CARE, FIOH, MAFFS and farmers cannot be quantified as they will live with that experience beyond the life of the project and probably in their live time. The experience can be used and passed onto others over a long period of time.

Building of partnerships through Linkages and Collaboration

CAP has built friendships with other partners such as MAFFS, FIOH, SLARI, Communities, Councils, Chiefdoms and other stakeholders and those friendships would continue even after the end of the project. Support on CA could go on voluntarily.

Impact on the environment

CA technologies were more environmentally friendly than farmers' traditional clear and burn activities. Farmers who used the CA did not burn and therefore saved the environment from smoke. Additionally, the CA practice controlled erosion and improved soil fertility. By also staying on the same piece of land over time because of the continued use of CA technologies, the environment was spared of clearing of new fields and its attendant burning and land degradation activities.

Lessons learned were on:

Farm destruction by livestock and fire - FFS participants identified the construction of living fences and fire belts around the demonstration plot sites and private farms as essential to minimize conflicts and uncontrolled burning. There was also an emerging fire volunteers group in some of the villages to help quell fires and to educate others on the dangers of fire. This should be encouraged.

High livestock density in Koinadugu District as free roaming livestock presented a very big problem and a potential source of conflicts. Continued dialogue was essential. Equal attention could also be given to livestock owners and livestock management in subsequent projects.

Innovative learning of Conservation Agriculture practices- Since CA was a new concept introduced, CARE staff, partners and farmers were learning together. The willingness to learn together and make the necessary adjustments along the line made the CA very innovative for CAP. The CA team was very open to seeking advice and recommendations from consultants and other CA experts and that increased the field staff ability to train farmers to transfer the knowledge gained from CA to other farmers.

Pilfering on demonstration plots- The produce from the demonstration plots were pilfered by thieves and other farmers as they saw the better performance from the CA plots. Some of the FFS participants also consumed some of the produce probably tasting the quality. The pilfering also saw farmers harvest the produce from the plots early which could have affected the yield information. Since most farmer groups recorded the overall yield themselves, the final yield data might have been underestimated. Nevertheless, the pilfering and unauthorized activities by some unscrupulous farmers all depicted the potential adoption of the CA technologies – a positive development on CA technologies.

Use of organic manure- Many more women participants in CAP was using more organic manure in their backyard gardens than inorganic fertilizers because of cost differences and sustainability. This seems to suggest that women were up-taking CA practices very quickly.

VSLA as a motivating factor for CA adoption- The VSLA activities had increased women and youth participation in CA and also increased their access to seeds and other productive resources such as land, tools and other agricultural inputs.

Demand for VSLA groups- There was high demand for the creation of VSLAs in other communities because of the advantages of the system. The enthusiasm for the VSLA could be capitalised and mainstreamed into incoming agricultural projects.

Difficulty in cultivating rice under mulch- It was observed that it was difficult to plant rice under mulch and new ways must be found. This calls for a closer collaboration with SLARI and the Universities.

Joint project planning, implementation, monitoring and reporting- The joint project planning, implementation, monitoring and reporting increased the collaboration of partners and linkages for the growth of the project. Additionally, the capacities of partner staff built by CARE provided an equal platform for understanding, corporation and sharing of ideas.

Sharing of information- In partnership, sharing of information was very important. This would allow for informed decisions and improved relationships. The information flow between partners was not as frequent as expected and could be improved in the near future. This is understandable considering the electricity problem at Koinadugu that did not allow the frequent use of internet but rather hard copies. It was further important to share results with other donors who might be interested to support funding such a useful project. CAP in Sierra Leone could link up with other CAP activities in the sub-region to share experiences probably through in-country or sub regional workshops.

Remittance of funds to partners- The administrative procedures involved in the transfer of funds to partners did not allow for prompt remittances for some project activities that were time bound. In such critical situations, partners pre-financed those activities.

Use of Nutrient Deficiency Symptoms Guide- A simple farmer extension material was an important tool for technology transfer and adoption. It was important to have more copies of such simple flyers for farmers to propagate the news. Other simple farmer handbooks could be developed on CA for distribution to farmers.

CARE's overall approach to Conservation Agricultural Development in Koinadugu District with respect to the specific objectives were greatly met and contributed to the overall objectives. The project implementation strategies and methodologies were appropriate and relevant to the target group. Nevertheless, portions of the design presented problems along the line that called for a review. Major challenges likely to constrain adoption and up-scaling of CA were identified to be land use, grazing, uncontrolled burning, behavioral change and limited time for CA promotion. The Farmer Field School approach has been very effective offering more farmers to access CA technologies. Coordination mechanisms and networks established by the CA project to inform government policy and strengthen collaboration at district, Chiefdom have been moderately effective. There was a potential for sustainability of CA since the exit rate of the FFS groups was very low. There was understanding among

members in the groups, continued enthusiasm of the farmers and the training being offered to other farmers by the FFS farmers all contributed to sustainability.

Introduction

CARE Country Office's long-range mission statement is to address the root causes of poverty and suffering through capacity building, advocacy, and partnership so that vulnerable, disadvantaged, and marginalized people are empowered to participate effectively in achieving livelihood security and realizing their right to live with dignity.

Evaluations of a selection of CARE projects have shown that CARE has been successful in some aspects of agricultural development. Communities and farmer groups (men, women, mixed, youth) have been well organized and trained in farmer field school (FFS) methodology, and have undertaken productive activities, especially rice, cassava, groundnut and vegetable cultivation. The participation of women and youth in village-level decision-making has markedly improved. However, building and strengthening organizational capacities of Farmer to become independent and sustainable institutions has not been a key focus, and needs more attention.

Through the Conservation Agriculture Project (CAP), CARE sought to address the underlying causes of poverty and embarked on promoting a significant change through the introduction of innovative agricultural practices that were more productive and more environmentally sustainable to benefit 11,000 people, including all land users and marginalized groups, in 50 communities in Koinadugu district, Sierra Leone in a 3-year project that began in January 2009 and ended in January 2012.

Project Background

With funding from The Howard G. Buffett Foundation, CARE Sierra Leone implemented the Conservation Agriculture Project (CAP) in Koinadugu District, Northern region, Republic of Sierra Leone. The project was being implemented in collaboration with the Ministry of Agriculture, Forestry and Food Security (MAFFS) and Future in Our Hands (FIOH) in four Chiefdoms (Wara Wara Yagala, Sengbeh, Folosaba Dembelia and Dembelia Sinkunia). The specific objectives of the project (CAP) were:

Objective 1: Increase the adoption of sustainable agriculture practices by 11,000 people in 50 communities to increase productivity and incomes through environmental-friendly use of land.

Objective 2: Improve the social and economic position of women (income) and other marginalized groups (e.g. youth) by fully and directly involving them in agricultural development.

Objective 3: Establish land use agreements for marginalized groups, including women, livestock farmers, immigrants and youth

Strategies of the project

The project implementation methodology was built on the platform of the existing CARE Sierra Leone projects and lessons learned and used the following strategies to achieve impact:

- 1) Promoting conservation agriculture (CA) techniques;
- 2) Encouraging agricultural production diversification;
- 3) Economically empowering women;
- 4) Improving access to land for women and other marginalized groups and,
- 5) Preventing and mitigating land conflicts.

The project was implemented by a team of staff from CARE and Future in Our Hands (FIOH) with ad-hoc technical assistance in innovative practices (conservation techniques, livestock, fish farming, beekeeping and land access) from Agro Eco and Wageningen University.

The expected results and main outputs are presented in Table 1.

Table 1: Expected results and main outputs of CAP

#	Expected results	Main outputs
ER1	1. Increase the adoption of sustainable agriculture practices by 11,000 people in 50 communities in order to increase productivity and incomes through environmental-friendly use of land.	<p>Output 1.1: Expose 3000 farmers to conservation farming practices through establishment of 50 demonstration plots;</p> <p>Output 1.2: Improve animal husbandry through access to veterinary services for 120 livestock farmers and animal feed, establishment of 20 fish ponds, and improvement of beekeeping practices for 20 farmers.</p>
ER2	2: Improve the social and economic position of women (income) and other marginalized groups (e.g. youth) by fully and directly involving them in agricultural development	<p>Output 2.1: Assist 40 women's groups in the establishment of profitable fruit and vegetable processing enterprises;</p> <p>Output 2.2: Assist 500 youth (members of FFS and VSLA) in getting sustainable access to the inputs and technical skills necessary to increase agricultural productivity and value addition.</p>
ER3	3: Establish land use agreements for marginalized groups, including women, livestock farmers, immigrants and youth.	<p>Output 3.1: Improve long term access to land for women and other marginalized groups</p> <p>Output 3.2: Prevent and mitigate land conflicts related to gender and ethnicity</p>

Objectives and Activities of the Evaluation

The objectives of the evaluation were:

To conduct a comprehensive analysis and updated assessment in the Four (4) targeted chiefdoms in Koinadugu district on the impact of the innovations of Conservation Agriculture. Using current reports as the basis of progress towards Overall & Specific Objectives, Expected Results, Main Outputs and activities as per the project document, the Consultant was to:

- Evaluate CARE's overall approach to Conservation Agricultural Development in Koinadugu District in terms of level of effort on each specific objective and their potential contributions towards the Overall Objective.
- Review the appropriateness of the project implementation strategies project design and methodologies used and their relevance to the practical needs of the impact group.
- Identify major challenges constraining the adoption and up-scaling of CA and the opportunities to address these.

- Assess the effectiveness of the Farmer Field School (FFS) approach as implemented to result in understanding and adoption of CA by farmers.
- Assess the effectiveness of the existing coordination mechanisms and networks established by the CA project to inform government policy and strengthen collaboration at district, Chiefdom and national levels on CA.
- Assess the potential for sustainability of CA efforts based on current strategies promoting community ownership, stakeholder's involvement and advocacy efforts at the districts, chiefdom and MAFSS levels.

To provide information to Howard G. Buffett Foundation and other stakeholders to encourage learning regarding the planning, implementation, and evaluation of similar economic development, food security and agricultural productivity projects. .

Document any broader impact of the program

Methodology

Conceptually, the end-of-project evaluation is an assessment of how and to what extent progress was made on the given interventions, what changes have occurred and the effect of these changes. This implies that not only should the immediate outputs or the effects of the programs be considered, but also, the sustainability of the changes made. The outcomes there were to be measured are presented in Table 2.

Table 2: Parameters to be assessed

	Dimension/Parameter	Indicators measured
1.	Productivity changes	Yield/Ha
2.	Land area covered with CA	Ha by technology
3.	Adoption rate of CA technologies	CA technologies – seeds, practices, tools, systems
4.	Technologies tested	Technologies, results
5.	Soil properties changes	NPK, moisture, hardness, pH, temperature
6.	Supporting activities	VSLA, Seed systems, irrigation, post-harvest technologies
7.	Advocacy and policy	Activities and changes (land rights, land access)
8.	Farmer knowledge	Pre/post knowledge testing
9.	Fertilization use	Organic, inorganic
10.	Farmers/trainers trained	#s trained

Given these parameters, a combination of approaches was used to collect data. Both qualitative and quantitative approaches were employed. The qualitative methods involved key informant interviews, focus group discussions, randomly selected beneficiary discussions, semi-structured interviews and active observation.

A formal survey was also conducted. From a list of 8 communities from 4 Chiefdoms provided by CAP, 10 farmers were randomly chosen from each community. Out of this 10, four were female Farmer Field School participants (FFS), 3 male FFS, 2 Non-FFS females and 1 non-FFS male. All these category of

farmers were randomly picked. This sample frame was taken in cognisance of CAP's focus on gender issues focusing more on women and the youth. Another point was to have some control group of Non-FFS farmers for comparison in a similar proportion of female to male. Thus the overall sample size was 80 (32 FFS female; 24 FFS males; 16 Non FFS female and 8 non-FFs males). This sample size was arrived at because of limited time and budget. Results of the formal survey were used to complement those obtained from other sources such as farmer interviews, focus group discussions and CAP reports.

For the assessment of the performance of the programs, issues relating to relevance, effectiveness, impact and sustainability were considered. This was mainly qualitative assessment.

Semi-structured interviews with key stakeholders were undertaken to access a range of informative issues. These included interviews of MAFFS staff, Koinadugu District Council and local leaders of the operational districts. Furthermore, project participants, individual community farmers and other stakeholders were interviewed. Random sample of villages where CAP operated were made and visited for focus group discussions and some key informants including chiefs of the villages. These villages were Kamasokola, Foronaya and Kamaso. Production data were collected from their interviews and used in part of the analysis.

The consultant also worked closely with CARE Sierra Leone's CAP Project Team and reviewed relevant literature and project's documents. The Technical Coordinator-Food Security was the primary contact within CARE Sierra Leone.

The Project Staff of CARE, FIOH, MAFFS, District Agriculture Officers were debriefed with the results of the evaluation.

The final report was submitted to the Technical Coordinator-Food Security for approval upon completion of the assignment.

CARE Sierra Leone Program DM&E Advisor was responsible for day-to-day supervision of the consultant's work with technical guidance from Technical Coordinator who ensured relevance and appropriateness of evaluation methodology, tools and sampling.

The consultant received administrative support from CARE as reasonably needed such as photocopying, Internet connection, movement etc.

FINDINGS

Productivity

Productivity is a measure of impact in production activities. Table 3 shows yield of various crops in Years 1 and 2 for farmer managed plots using conservation agriculture (CA) techniques. With all the crops, there were increases in yields from Year 1 to Year 2 indicating a positive correlation between yield and time. This shows that fertility builds up as time goes on using CA techniques. There was tremendous increase ranging from 10% to 1010% among the various crops. Comparing the mean yields of the CA plots to the baseline shows over 200% increase. This again shows the benefits of using CA techniques in crop production. Thus, farmers' productivity have increased if they used CA technologies. CAP has provide the evidence in productivity increase.

Table 3: Farmer-managed plots with CA

Crop	Yield (kg/ha)							% increase (mean over baseline)
	Baseline	Year 1	Year 2	Difference Year1 – Year 2	% increase Yr2 over Yr1	Mean Yr1 and Yr2	Mean minus Baseline	
Maize	47	148.3	226.6	78.3	53	187	140	298
Pigeon pea	N.A	49.9	100.8	50.9	102	75	N.A	N.A
Cow pea	N.A	28.3	168.1	139.8	494	98	N.A	N.A
Rice	193	355.8	991.3	635.5	179	674	481	249
Pepper (hot)	N.A	855.4	9502.9	8647.5	1,010	518	N.A	N.A
Ground Nuts	144	399.6	438.9	39.3	10	839	695	483

Sources of data: 2009 CAP Baseline survey; CARE-Sierra Leone Annual Report 2012

Land area covered with CA

The land area covered with CA can be used as a measure of the effectiveness of CA activities. The overall total land area covered with CA technologies by CAP was 1,070 ha as presented in Table 4. The consultant's discussions with project staff, FIOH, MAFFS and other partners suggested that there were very little conscious CA practices that existed prior to the establishment of CAP in the district. Although, some farmers could have been practicing some of the CA technologies consciously or unconsciously, the baseline report did not mention the area covered by such CA practices. However, the Baseline report showed that just 3% of the farmers used zero/minimum tillage; 9% mulch cover and 24% cover crop. The fact remains that very few farmers used CA practices. The project must be commended for putting over a thousand hectares of land in CA. The progression of the area under CA from Year 1 to 3 underscores the vim with which CA technologies were being adopted.

Table 4: Land area covered by CA (Ha)

CA technology	Year 1	Year 2	Year 3	Total
Mulch cover	40	107	110	257
Zero/minimum tillage	25	150	200	375
Reduced burning	N.A	73	N.A	73
Early burning	N.A	40	N.A	40
Cover crop	20	88	150	258
Crop rotation	5	27	35	67
Total	90	485	495	1,070

Source of data: 2009 CAP Baseline survey; CARE-Sierra Leone

Adoption of CA technologies

Technologies are developed for people to use and therefore the number of users can be used as proxy to adoption if the adoption rate cannot be obtained. The total target set by the CAP was 1,500 farmers. Data from CARE-Sierra Leone Annual report, 2011, showed that a total of 2,049 farmers were using any of the CA technologies. Table 5 presents the number of farmers using CA technologies and the percentage on the total. The table shows that CAP exceeded its target by 37%. The most adopted CA technologies were Zero/minimum tillage, followed by mulch and cover crop in that order. CAP trained 2,167 farmers of which 2,049 used the CA technologies. Therefore the adoption rate for CA technologies was 95%.

Table 5: Number of farmers using CA technologies

CA Technologies	No. of farmers	% of total target
Mulch	482	32
Zero/Minimum tillage	732	49
Reduced burning	155	10
Early burning	191	13
Cover crop	339	23
Crop rotation	150	10
Total	2,049	137

Source of data: CARE Sierra Leone

Note: Total target =1,500 farmers; 2,167 farmers were trained in CA technologies and 2,049 used it.

Changes in soil properties

One of the basic aims of CA was to improve the soil properties such that they became more productive. In 2010 and 2011, thirty- nine soil samples were collected by CARE CAP from eight Inland Valley Swamp (IVS) sites and 31 upland sites from a depth of 0 – 20 cm. Soils were air dried and analyzed for pH water (1:2.5 ratio). The Organic carbon was also measured by the Walker Black method.

The pH values in 2010 ranged from 4.28 at Bambukoro upland to 5.75 at Gbentu upland indicating varying acidity from location to location. In 2011, pH values indicated the value of 4.06 in Kamasapie upland ranging to 5.79 in Laboya Upland 2 as given in Table 6. These suggested that the soils that were acidic had had their acidity reduced by the increase in their pH levels.

Similarly, % Organic Carbon varied widely from 1.84 at Mannah II upland to 14.29 at Laboyo IVS in 2010 (Table 7). In the 2011, the % organic carbon ranged from 2.38 at Nyfradoh uplands to 16.26 at Laboya IVS. Thus, in general, the % organic carbon increased from 2010 to 2011 suggesting that the organic matter also increased. Greater increases in organic carbon were observed in the IVS than in the upland. This suggests that lowland soils were becoming more fertile than upland soils and could be easier to manage than upland soils.

Although, it was the second year of cropping, the results manifested the changes in soil fertility status. It must be pointed out that it is only after a couple of years of cropping that one would clearly see the full effects of conservation agriculture on the changes in soil fertility status. Nevertheless, positive indicators to the soil properties were being shown.

Table 6: pH-Water Analysis of Koinadugu soils, 2010 and 2011

No	Site	Community	Ecology	pH-Water (1:2.5)	
				2010	2011
1	Jedia	CAP	Upland 1	5.05	5.10
2	Jedia	CAP	Upland 2	4.95	4.78
3	Jedia	CAP	IVS	4.46	4.52
4	Mannah 2	CAP	Upland 1	5.55	5.21
5	Mannah 2	CAP	Upland 2	5.57	5.49
6	Mannah 2	CAP	IVS	4.72	4.81
7	Musala Junction	CAP	Upland 1	5.03	4.95
8	Musala Junction	CAP	Upland 2	5.14	5.08
9	Musala Junction	CAP	IVS	4.92	5.10
10	Laboya	CAP	Upland 1	5.44	5.62
11	Laboya	CAP	Upland 2	5.81	5.79
12	Laboya	CAP	IVS	5.43	5.72
13	Bambukoro	CAP	Upland 1	4.28	4.30
14	Bambukoro	CAP	Upland 2	4.67	4.44
15	Bambukoro	CAP	IVS	4.52	4.61
16	Faronoya	CAP	Upland 1	4.37	4.26
17	Faronoya	CAP	Upland 2	4.55	4.32
18	Faronoya	CAP	IVS	4.61	4.09
19	Sarako	CAP	Upland 1	4.76	4.21
20	Sarako	CAP	Upland 2	4.62	4.92
21	Sarako	CAP	IVS	5.07	4.62
22	Kamabonkia	CAP	Upland 1	4.75	4.68
23	Kamabonkia	CAP	Upland 2	4.68	4.81
24	Kamabonkia	CAP	IVS	5.61	4.81
25	Affia	SADev	Upland	5.18	5.06
26	Mannah 1	SADev	Upland	5.38	5.18
27	Gbentu	SADev	Upland	5.75	5.69
28	Musaia Town	SADev	Upland	5.01	4.61
29	Kanuka	SADev	Upland	5.18	5.09
30	Madina	SADev	Upland	5.09	5.12
31	Kompala	SADev	Upland	4.62	4.51
32	Nyfradoh	SADev	Upland	4.78	4.69
33	Malforiya	SADev	Upland	5.00	5.09
34	Kamasapie	SADev	Upland	4.76	4.06
35	Masainde	SADev	Upland	4.54	5.19
36	Sangbagba	SADev	Upland	5.24	4.93
37	Kamanso	SADev	Upland	5.11	4.76
38	Simbeck	SADev	Upland	5.06	4.89
39	Timbo Sukrala	SADev	Upland	4.73	4.78

Source: SLARI

Table 7: Percent Organic Carbon Analysis of Koinadugu soils, 2010 and 2011

No	Site	Community	Ecology	% Organic Carbon	
				2010	2011
1	Jedia	CAP	Upland 1	2.95	3.65
2	Jedia	CAP	Upland 2	2.31	3.53
3	Jedia	CAP	IVS	3.16	4.06
4	Mannah 2	CAP	Upland 1	1.93	2.87
5	Mannah 2	CAP	Upland 2	1.84	2.42
6	Mannah 2	CAP	IVS	2.55	3.25
7	Musala Junction	CAP	Upland 1	1.72	2.68
8	Musala Junction	CAP	Upland 2	1.92	2.15
9	Musala Junction	CAP	IVS	3.18	4.52
10	Laboya	CAP	Upland 1	4.51	5.43
11	Laboya	CAP	Upland 2	4.79	5.27
12	Laboya	CAP	IVS	14.29	16.26
13	Bambukoro	CAP	Upland 1	2.42	5.37
14	Bambukoro	CAP	Upland 2	2.11	3.78
15	Bambukoro	CAP	IVS	5.82	8.30
16	Faronoya	CAP	Upland 1	4.15	5.89
17	Faronoya	CAP	Upland 2	1.99	2.63
18	Faronoya	CAP	IVS	5.55	11.47
19	Sarako	CAP	Upland 1	4.53	4.56
20	Sarako	CAP	Upland 2	2.96	3.17
21	Sarako	CAP	IVS	4.87	5.62
22	Kamabonkia	CAP	Upland 1	3.79	2.85
23	Kamabonkia	CAP	Upland 2	2.94	3.52
24	Kamabonkia	CAP	IVS	3.37	6.21
25	Affia	SADev	Upland	1.76	2.37
26	Mannah 1	SADev	Upland	2.02	2.15
27	Gbentu	SADev	Upland	2.07	2.35
28	Musaia Town	SADev	Upland	2.49	3.03
29	Kanuka	SADev	Upland	1.22	2.27
30	Madina	SADev	Upland	1.79	2.01
31	Kompala	SADev	Upland	2.34	2.66
32	Nyfradoh	SADev	Upland	2.11	2.38
33	Malforiya	SADev	Upland	2.08	2.25
34	Kamasapie	SADev	Upland	2.14	2.66
35	Masainde	SADev	Upland	2.27	2.57
36	Sangbagba	SADev	Upland	2.01	2.19
37	Kamanso	SADev	Upland	2.17	2.54
38	Simbeck	SADev	Upland	2.43	2.63
39	Timbo Sukrala	SADev	Upland	1.87	2.04

Source: SLARI

Apart from the changes in soil properties mentioned earlier, other soil parameters showed an improvement in the soil status of CA plots compared with Non-CA plots as seen in Table 8. There was seven times improvement in soil moisture levels in plots using CA technologies than plots that did not use CA technologies. Similarly, CA plots prevented the soil from hardening more than Non-CA plots. Furthermore, the acidity of the soil was improved more in the CA plots than in the Non-Ca plots.

Table 8: Comparison of Soil parameters in CA and Non-CA plots

Soil parameter	Mean values		% change
	CA plot	Control plot	
Soil moisture	2.8	0.4	700
Hardness	0.6	1.7	-35
pH	5.0	4.3	16

Source of data: SLARI and CARE Sierra Leone

Supporting activities:

The CAP put in place some supporting activities to help push the adoption of CA practices and to make farming attractive. Some of these programs that were supported by CAP included the seed systems and Village Savings and Loans Association.

Village Savings and Loans Association (VSLA)

The involvement of CAP in Village Savings and Loan Association resulted in increased access to loans by women and youth. By the end of Year 2, total savings equivalent to US\$26,949 had been saved by the associations. Total loans obtained by the same associations were US\$11,403. This shows that the associations were in good business. Through the activities of the VSLA, a farmer at Kamasokpla was able to put up a house for him and his family.

Twenty youth VSLA groups with 600 participants (252 men and 348 women) were set up and trained in business skills. The project team again conducted refresher training for all youth VSLA groups.

The youth VSLA groups had a source of credit to buy seeds, tools and allowed them to meet their labour expenses for CA. Furthermore, they were able to meet other unforeseen expenses that previously caused them to sell standing crops in the field in advance at lower prices.

Livestock

CAP supported livestock farmers by providing the farmers with veterinary services. One hundred and twenty farmers benefited from veterinary services reaching a total of 2,566 animals as against a planned target of 1,556 animals exceeding CAP's target by 64%. The veterinary services prevented the animals against diseases and worm infestation. Those healthy animals provided animal manure for farmers to use in their fields. In addition, 65 fodder farms were established and provided feed for the animals in the dry season.

Seed Access

Women and youth were supported to have access to inputs. Seven hundred and twenty women and youth were targeted for access to seed by Year Three. However, 1,800 women and youth had increased access to inputs. Furthermore, four seed market days were organized by CA participants in Year 3 and that helped other farmers to have access to improved seeds and other inputs with minimal support from the CAP. Additionally, the VSLA activities supported farmers to access inputs such as seed and tools for CA activities. Those activities also provided some platforms for farmer interactions on CA activities and to learn more about improved seeds.

Advocacy and policy on land rights and access

CAP organized Land tenure and conflict training for CARE staff, FIOH, MAFFS, district councils, and local community leaders. The training was on how to manage land-related conflicts locally, livestock and crop farmer conflict, advocacy skills on long term access to land, and the development of land use agreements. The training resulted in a considerable decrease in farmers reporting conflicts. In addition, several advocacy meetings were also held to increase long term access to land for women, youths, and cattle farmers. These meetings resulted in the development of 7 land use agreements; 4 by-laws amended and 14 tree crops established and owned by women and youth. A summary of the effectiveness of the advocacy and policy issues is given in Table 9. CAP was able to achieve 38% of its land agreement activities and 35% of tree crop establishment of the planned targets. Thus the effectiveness was low to moderate. It however met its target in the by-laws/policy issues and over-achieved in environmentally friendly land use. The effectiveness is thus, rated moderate.

Table 9: Advocacy and policy issues

Type of advocacy/policy	Planned target	Actual number completed	% Achievement
Land agreements (signed)	50	19	38
By-laws or policies to enforce equitable land use agreements amended and passed at the local level and awaiting government approval	4	4	100
Tree crops established and owned by women or youth	40	14	35
Engagement in environmentally friendly use of land such as slash but no burn, early burning)	850	1,456	171
Being party to agreements	222	333	150
Local leaders actively and equitably mitigating land-use conflicts to the satisfaction of all parties	87	67	77

Nevertheless, there were some important outcomes from CAP advocacy and policy activities that must be shared. Local by-laws were amended to allow for equitable land use in four Chiefdoms through the collaborative efforts of CAP and Enhancing the Interface and Interaction between the Civil Society and the State (ENCISS) and the Koinadugu district assembly. Although this law has not been approved by the government, it has shown a great effort, understanding and the willingness of the rural people to live in peace.

The idea behind CAP's objective was to reduce the number of conflicts reported by farmers. The percentage of farmers reporting of conflicts in the baseline survey period and Year 3 of CAP is summarized in Table 10. Out of a target of 18% set for farmers who were expected to report on conflicts, 14% reported. This shows that CAP activities have helped to prevent conflicts. The Percent achievement was 122% showing an over-achievement. Again, this shows the effectiveness of CAP's conflict management.

Table: 10 Percentage of farmers reporting of conflicts

Indicator	% of farmers reporting of conflicts
Baseline result	38
Target (Revised)	18
Actual	14

A recent survey conducted by CARE and the consultant in February 2012, showed that the reporting of conflicts between livestock farmers and crop farmers was decreasing. The results of the survey showed that 83% (from a sample size of 75) of the farmers reported decrease in conflicts in the past 3 years; 11% reported "same;" while 3% said there was increase. The other 4% did not know. Clearly, there has been a downward trend in reported cases of conflicts.

It was reported that 40 percent of the communities were observing by-laws and regulations and had reported a relative reduction in conflict compared to first year of implementation.

As a way of encouraging farmers to adopt environmental friendly use of land, MAFFS established tree crop nurseries in the 11 chiefdoms in the district, totaling of 24,000 tree seedlings for distribution to interested farmers free of cost. Nearly all communities within the project area have a tree crop farm.

Community volunteer fire forces worked closely with fire monitors and reported of reduction of uncontrolled bush fires especially in tree crops established areas. Fire belts were also constructed and enforced prior to burning. More community volunteers have been established in other communities and violators of the regulations on bush fires were prosecuted and fined.

Discussions with some key informants and chiefs showed that the level of dialogue between land owners, crop farmers, cattle farmers, and local authorities has increased through the meetings. A number of local authorities have brought together land owners, crop farmers, and cattle farmers to determine where to establish cattle settlements, farm and the responsible person for fencing. Local authorities in 22 communities of the project's operational chiefdoms have successfully completed settlement arrangements emphasizing on fencing between cattle farmers and crop farmers.

The paramount chief of Dembelia Sinkunia chiefdom is reported to have pronounced that cattle farmers or strangers who wanted to settle on land near any farm settlement should meet the land owner or farmer first before going to him for an agreement. Since then, two other paramount chiefs in Folosaba Dembelia and Dembelia Wara Wara Yagala chiefdoms also pronounced that all crop farmers were to fence their farms before planting and cattle farmers were to increase their number cowboys to control cattle. Since the pronouncements, some cattle farmers (5) and crop farmers (4) were prosecuted and fined for breach of regulations.

All the evidence shown above emphasizes some of the changes that have taken place with CAP in advocacy and policy activities. It must, however, be pointed out that some of the targets for these

activities were difficult to meet because at best, the outputs/results of these activities should have been the “number of meetings” held with Council, Chiefdoms, local community leader and the like. The outcomes could then have been the change (decrease) in conflicts the CAP helped to bring about. As the results stood, CAP cannot be held responsible for not achieving its target. Conflicts cannot be created by projects so that they could be solved to meet their set targets but the number of meetings to be held can be under the control of CAP and can therefore be held responsible for failing to meet its target.

Farmer knowledge

In the absence of a formal academic knowledge score, the number of farmers actually using the CA technology can be used as proxy to the knowledge acquired by them on the CA. Once the farmer was using the technology, then it implies that he or she knows something about it. Therefore, out of the target set by CAP to reach 1,500 farmers, 2,049 farmers actually practiced the CA technologies showing that CAP overshoot its target by 37%. In Table 11, the number of farmers using the different CA technologies is presented.

Table 11: Number of farmers applying CA technologies in their fields

CA technology	Number of farmers applying technology
Mulch	482
Zero/Minimum tillage	732
Reduced burning	155
Early burning	191
Cover crop	339
Crop rotation	150
Total	2049

Source of data: CARE Sierra Leone report 2011

From the results of the formal survey conducted in February 2012 by CARE and the consultant, all the 80 farmers in the sample knew something about some CA technologies. This meant that the farmers of the control group (24) had knowledge about CA and all of them were practicing one or more of the CA technologies. This is interesting and shows how fast and far the CA technologies have moved.

Use of fertilizer

Fertilizer may be organic or inorganic. In a summary report from CAP in Kabala, 75% of the FFS farmers used range organic manure such as animal droppings, green manure and 35% used inorganic fertilizer in 2010. During discussions with farmers by the consultant none of the farmers used inorganic fertilizers in 2011 as most of them saw the benefits of CA from earlier observations. This again shows the shift of fertilizer use to CA technologies by farmers who have been exposed to the technologies. In the formal survey of February 2012 conducted by CARE and the consultant, 60 out of 75 farmers (80%) used some form of fertilizer. For those who used fertilizer, just 3% of them used inorganic fertilizer. This meant that 97% of those using fertilizer did so with organic fertilizer. This suggests that inorganic fertilizer was giving way to organic fertilizer of which CA is a part.

Training

Training is an important ingredient to the understanding and use of technologies. CAP trained some staff and farmers in CA techniques and the results are summarized in Table 12. CAP met all its targets in training and this also contributed to the impacts observed. The skills gained through training will remain with the trainees for a very long time.

Table 12: Number and categories of beneficiaries trained by CAP

Type of training	Target group	Planned target	Actual			% Achievement
			Male	Female	Total	
Conservation Agriculture (CA)	Staff	26	24	2	26	100
Conservation Agriculture (CA)	Farmers	1,500			2,167	144
CA farmer facilitators	Farmers	100	50	50	100	125
Participatory Technology Development (PTD)	Farmers	1,500	-	-	2,167	144
Animal husbandry and fodder crop production	Livestock farmers	120	-	-	120	100

Evaluation of CARE's overall approach to Conservation Agriculture Development in Koinadugu District

Milestones can be used to measure the level of effort (LOE) if the work has a definable objective. The definable objective is complete when the milestone is recorded complete. LOE can also be non-discrete and therefore subjective. The passage of time measures LOE performance. In other cases, LOE is used as a support-type project activity that must be done to support other work activities or the entire project effort. It usually consists of short term amounts of work that must be repeated periodically. In this evaluation, milestone was used. The level of effort is shown in Table 13.

Table 13: Specific objectives and level of effort

Specific objective	Level of effort
Objective 1: Increase the adoption of sustainable agriculture practices by 11,000 people in 50 communities to increase productivity and incomes through environmental-friendly use of land.	The introduction of CA in 50 communities was completed. 2,049 farmers reached directly with CA. Using the average number of secondary adopters as 4, the number of farmers adopting CA would be 8,196 leaving a deficit of 2,804. This emphasizes the need for CAP to have had a little more time to hit the target. Alternatively, the target might have been overestimated.
Objective 2: Improve the social and economic position of women (income) and other marginalized groups (e.g. youth) by fully and directly involving them in agricultural development.	500 youth; 1,200 in VSLA; 2,049 FFS totaling 3,749 were involved in agricultural development as against project's target of 3,000. Completion percentage was 126%
Objective 3: Establish land use agreements for marginalized groups, including women, livestock farmers, immigrants and youth	19 out of 50 were developed. Completion percentage was 38%.

Review of project implementation strategies, design and methodologies (appropriateness, relevance to target group)

The initial design of CAP involved many activities that were outside the main focus on CA such as fish farming, beekeeping and irrigation and made the project more complex. This did not allow enough time for the main activity on CAP. No wonder the log frame was revised and simplified in Year 2. Indeed, the project lost some time but it is gratifying that it was able to meet its FFS target. A simplified design could have allowed the project to expand its activities to other communities for a wider coverage and adoption.

Relevance is the extent to which a project and its strategies are consistent with policies and how it is responsive to the problem that is being addressed. It must be in consonance with the implementation strategies of other related government programs and be meaningful to the target group. The strategies adopted by CARE to introduce CAP were:

1) Promoting conservation agriculture (CA) techniques:

This was a very relevant strategy and it is assessed "High". It was consistent with the government's policy of increasing food production and availability to all Sierra Leoneans and the creation of employment in the rural areas by improving farming practices to make farming more attractive. CAP also addressed the concerns of best practices on CA technologies. The strategy was appropriate and relevant because it addressed the key needs of farmers on soil fertility, labour use, production, and income issues. These would invariably lead to improved living standards of farmers. Furthermore, CA also fell within the long range mission of CARE that addresses the root causes of poverty by promoting a significant change in production practices through innovation. The target set on the number of communities to reach with CA techniques (50) with FFS was met 100%. Fifty CA demonstration plots were set representing 100% achievement of the target set.

2) Encouraging agricultural production diversification:

This is also rated "High". It is thus appropriate and relevant to the aspirations of CAP. To minimise the risk of failure, it is appropriate to diversify farmers' agricultural production but this must be a related diversification. Introducing CAP farmers to beekeeping looked a bit awkward but intercropping and rotation would be a better diversification for their production practices from monocropping. Thus, care must be taken to choose appropriate diversification.

3) Economically empowering women:

This was very relevant and appropriate strategy and it was in line with government policy. Females play active roles in the family structure but they are the weaker side of the two in terms of income acquisition. They also form the majority of the population. Therefore any activity that seeks to raise females' wellbeing is a welcome approach. The CAP design also focused more on women and the youth representing the vulnerable in the society. The introduction of FFS and the VSLA of which women were the majority was more than appropriate and very relevant. Thus the strategy was appropriate and relevant for the target group.

4) Improving access to land for women and other marginalized groups.

Many of the conflicts all over the world relate land issues. Since farmers practising CA technologies needed time and continuous stay on a piece of land to realise its full benefits, it made this issue very relevant and appropriate. It was important to improve land access particularly, to women and the marginalized groups in the society. There existed women and marginalized people in the district and

most of them were farmers. Therefore, the strategy adopted by CAP was relevant and appropriate. The strategy saw 19 land right agreements developed through CAP.

5) Preventing and mitigating land conflicts.

Farming cannot be done productively in the presence of conflicts. The idea behind CAP's objective of reducing the number of conflicts reported by farmers was appropriate and relevant. CAP activities helped to prevent some conflicts. The percent achievement for CAP on conflicts was 122% showing an over-achievement. Again, this shows the effectiveness of CAP's conflict management. The advocacy role that CAP played reduced some conflicts and provided consciousness in settling conflicts locally and peacefully.

Major challenges constraining adoption and up-scaling of CA and opportunities

Land use: The full benefits of CA are observed with a longer stay on the same piece of land. Short-lived access to land does not make it as attractive as expected. With continued land access, conflict resolving meetings and the development of land use agreements in the operational communities, there seemed to be a gradual progress towards conflict mitigation. Nevertheless, the process was slow and needed to be hastened so that many farmers could have longer term access to land to achieve significant success in their production activities.

Grazing: Livestock and crop farming were the two most common farming practices in the project's four operational chiefdoms. These cattle and small ruminants were free range and roamed extensively to find fodder. Herders in these areas did not grow fodder and depended on wild grasses to feed their cattle. To avoid food crops destruction by those cattle, farmers practicing CA spent most of their time fencing their land to prevent damage caused by those roaming animals. The high cost of labour in fencing put an unnecessary financial burden on the farmers and seriously limited farmers in expanding their field sizes to take advantage of CA practices.

Uncontrolled burning: Cattle farmers widely set bushfires, especially in the early part of the dry season when crops are still in the fields, to allow new grass to grow for cattle feed. Those fires seriously damaged crops including demonstration plots put up by CAP. Demonstration plots were meant for people and passer-by to observe and learn about CA practices and if they were burnt down, nothing would be left and thus, could hamper a wider adoption of CA. Crop farmers could not also realize the effects of mulch on yields as there would be no mulch due to burning and cattle damage to their crop fields. CAP's efforts in addressing this problem have been the development of local by-laws and regulations facilitated by the chiefdom administration but some of these were not effective in most areas due to the negative behaviour of some local authorities.

Behavioural change: It was pointed out by some of the farmers during the field visit by the consultant that sometimes it was the same people entrusted with power were the people who owned most animals and were the culprits in such activities. There would be need for more and continuous dialogue with those people. As pointed out by a farmer in Foronaya: "Set up CA in their fields and let us see if they will be happy if fire or cattle comes to destroy their crop." The challenge is how to promote CA and influence behavioural change of the local authorities to enforce by-laws appropriately.

Limited time for promotion of CA: Virtually, CAP had a little over 2 years to promote CA practices after the initial pilot programme and the re-designing of portions of the original proposal. The enthusiasm with which farmers have embraced the CA concept calls for some continuous involvement of some lead

institution to provide the necessary back up support for further adoption. MAFFS could take a leading role in this direction by incorporating some budget line for its CA activities. CARE could also lead the advocacy role to include CA activities in MAFFS.

Effectiveness of Farmer Field School approach

Farmer Field School (FFS) approach was a group-based learning technique, in which groups of about 30 farmers were gathered on a designated piece of land either on a participant’s plot or a specially shared plot), to learn about various crops, practices, and the factors affecting soil fertility and crop productivity. For CA Farmer Field School, a continuously cultivated land was preferred for the demonstration. The FFS approach was pillared on experimental learning with field observations and group analysis. The knowledge gained from these activities allowed the farmers to make their own decisions about crop management and could adopt or adapt them to their conditions. FFSs empowered farmers to implement their own decisions in their own fields. Facilitators were however, needed in the FFS to help farmers make informed choices. In CAP, field staff worked closely with the entire group. The project built the skill base of a lead and deputy lead farmer chosen by their peers within each group. Those leaders were to provide support to the group and facilitate the formation of new groups and adoption of new techniques beyond the project’s direct beneficiaries. Information on FFS activities is shown in Table 14.

Table 14: FFS information

Characteristic	Planned target	Actual	% achievement
Number of communities of FFS	50	50	100
Number of CA demonstration plots	50	50	100
Youth participants (16-35 years) in CA	No target set	1,038	
Participants (36 years and above) in CA	No target set	462	
Total number of farmers to reach with CA	1,500	2049	137

In the youth category, a total of 494 males and 544 females were involved in the FFS demonstration. Similarly, for farmers who were 36 years and above, 271 were males and 191 females. This shows that gender issues were considered. The FFs approach was effective since all the targets were met or exceeded.

Effectiveness of coordinating mechanisms and networks to inform policy and strengthen collaboration

CARE International in Sierra Leone worked in partnership with FIOH-SL in the implementation of the CAP and in collaboration with the Ministry of Agriculture and Forestry and Food Security (MAFFS) in the Koinadugu District Council reaching 50 remote rural communities in the district. CARE Sierra leone provided the lead role in CAP and supported by FIOH and MAFFS. CARE also provided some logistical support to FIOH and MAFFS to enhance their delivery processes. There was joint planning sessions at the beginning of the year to plan for the year’s activities, budgeting, and reporting. Monitoring of fields were in most cases, done together. There was capacity building of partner staff by CARE. The evidence of good collaboration between CARE and FIOH is a manifest of key results of FIOH which were:

Year 1:

- 240 Farmer Field School (FFS) participants from 8 communities received an indepth training in Conservation Agriculture (CA) principle.
- 8 demo plots, no burning and mulch cover were established by FIOH-SL and 240 FFS participants in 8 communities.
- 640 stands of assorted seedlings (moringa, acacia, dwarf coconut and pineapple were planted on 8 demo plots.
- 10 CA demo plots fertilizer crop response were established in 8 communities.
- 8 seed multiplication plots

Year 2:

- 15 Youths Village Savings & Loan Associations (VSLAs) were set-up in 15 communities.
- 30 Women VSLAs were set-up in 26 communities.
- 20 local beekeepers received training in modern beekeeping.
- A total of 100 beekeeping equipments have been distributed in CAP operational chiefdoms.
- A total of 120 assorted farm tools distributed in 40 CAP operational communities.
- 4 Peace and Right Days occasion conducted in CAP operational chiefdoms.
- 1,200 FFS established 40 demo plot in 40 communities.
- 100 assorted seedling (dwarf coconut, avocado and moringa) have been distributed distributed in 10 communities.
- 400Kg. Of assorted seeds (maize, pigeon pea) have been distributed to 40 communities.
- A total of 30 Women VSLAs and 15 Youth VSLAs been esgtablished in 45 communities.
- 80 FFS participants (40Female & 40 Male) received training in conservation agriculture.
- 40 Women drawn from 15 VSLAs received training in conservation agriculture.
- 3 demo plots early burning in grazing areas were established in Folosaba Dembelia and Dembelia Sinkunia chiefdoms.
- 240 FFS participants were trained in the use of Nutrient Deficiency guide.
- A total of 150 participants received training in CA farming techniques.
- 45 VSL were established in 45 communities.
- 20 Fish ponds rehabilitated in 4 CAP operational communities.

Year 3

- 50 CA demo plot established no buring and with mulch cover.
- 120 large herders identified and 1,313 assorted farmers treated against common prevailing disease.
- 32 CA demo plots green manure/improved fallow established.
- 18 Livestock farmers trained in idegenous Livestock management.
- 4 seed market days conducted in 4 CAP operational chiefdoms.
- 60 youths from 20 VSLA received training in food processing and preservation.
- 120 VSL women received training in the construction and managdemengtd of solar driers.
- 4 maize experimental seed mutlplication plot established in 4 communities.

During the pilot phase, FIOH-SL provided motorbikes used in past projects to field staff to carry out CAP activities. Clearly, all these issues provide example of evidence that there was a very good collaboration between CAP and its collaborators.

As a way of encouraging farmers to adopt environmental friendly use of land, MAFFS also established tree crop nurseries in the 11 chiefdoms in the district, totaling of 24,000 tree seedlings for distribution to interested farmers free of cost. Nearly all communities within the project area had a tree crop farm. On policy, the involvement of chiefs, opinion leaders, the council and the community at large helped in the delivery of CA technologies and resolution of some conflicts. In summary, the collaboration was effective as most activities were completed on schedule.

Nevertheless some problems that existed in the collaboration were:

- Timely sharing of information from CARE to FIOH versely versa
- Prompt remittance of funds to FIOH for project activity
- Late arrival of motor bikes and vehicles that initially affected project activities.
- The conservation training module developed earlier was bulky and difficult to understand and translate to farmers.
- Wide wild fire damage that destroyed CA plots.

Assessment of sustainability of CA

Sustainability is the extent to which the achievements of intervention can continue beyond the program period. The likelihood of sustainability of CA lies in the groups of farmers using the practice. This depends on the number of FFS groups remain operational or functional. The consultant's field visit revealed that most of the original groups formed were still intact. All the groups had their executives and were governed by their constitution. New groups of farmers were developing around the existing CAP groups and were being trained by the CAP FFS farmers at no cost. Many more farmers had shown the enthusiasm to join the group but for group management, the farmers had fixed the number to about 30 and were encouraging the other farmers to constitute themselves to groups of 30. That was an indication that the number of members could have being going up if it was allowed. Additionally, the exit rate was quite low or non-existent for most of the groups. Farmers had seen practical yield increases and cost reduction from their farms and were happy to maintain their association even if the project ended. The groups had regular meetings. Furthermore, the introduction of the VSLA to provide credit members had increased further the unity of farmers in the groups. All these indicators point out that CA in the communities would to be sustainable.

Impacts of CAP

1. Reduced cost of production

Farmers' cost of production centres on labour costs in land preparation, farm maintenance, use of inputs such as seeds, fertilizer and agrochemicals, among others. A higher cost of production tends to reduce the net returns to farmers. Similarly, lowering the cost of production increases the net returns, all other things remaining constant. With reduced land preparation, seed costs, non-use of fertilizer and herbicides by farmers, their cost of production were drastically reduced. Farmers were becoming more efficient in their productive activities as their cost of production were being minimized per unit of production. The CAP helped farmers to save time, reduce labour for land preparation, reduce the quantity of seed, reduced cost of fertilizer use by applying organic fertilizer while, at the same time, increase the yield of farmers' outputs.

Time saving- Time is of essence. Taking time off to rest is an important impact on farmers as farming activities are usually labourous. Farmers reported that they spent 1 hour more in their traditional fields than they did in CA fields. So they saved 1 hour a day as shown in Table 15 and that amounted to 6 hours a week. This was equivalent of 1.5 days of work which had been saved per week. Farmers could use those extra days productively or for leisure. Farmers attributed that to the fact that CA practices had made their work simpler and easier.

Table 15: Time saving in CA practices

Technology	No. of hours spent in the field by farmers
Traditional (Non- CA)practice	4
CA practice	3
Difference	1
Hours saved in a week	6

Source: Field visit discussions with farmers, Feb. 2012

Labour saving - Labour is an important input in agricultural production and a major contributor to the overall cost of production in farming enterprise. Land preparation also takes a chunk of farmers' money in the labour component of costs. During field interviews and discussions with farmers, farmers said that they employed about 15 man-days of labour to prepare the land for cultivation using their traditional (Non-CA) practice but used 5 man-days if they applied the CA method. This is shown in Table 16 and meant that farmers saved 10 man-days of labour for only land preparation. Given the cost of man-day as ranging between 5,000 to 10,000 Leones depending on where the farmer lived, farmers saved 50,000 to 100,000 Leones per unit of farm for only land preparation. This was a big saving for a poor farmer.

Table 16: Labour saving in CA practices

Technology	No. of man-days used in Land preparation by farmers per unit of farm
Traditional (Non- CA)practice	15
CA practice	5
Difference	10

Source: Field visit discussions with farmers, Feb. 2012

Reduced quantity of seeds used by farmers - Farmer reported that they used fewer quantities of seed in planting when they used CA practice because seeds were not lost to birds and squirrels and that they planted in rows putting in 2 to 3 seeds per hill as compared to broadcasting and putting in about 10 seeds per hole they did with pigeon pea, for example. Using a CA practice, farmers reported that they used 150 cups of pigeon pea to plant the same area as compared with 200 cups applied in their traditional Non- CA fields. Again, that showed a saving of 50 cups of seed at planting.

2. Increased yield and income

Farmers reported of increased yields after applying the CA practices. A farmer who was curious planted a portion of his field with cassava using a CA practice and another portion his own practice. He harvested a bagful of cassava from 4 sticks of cassava plants in the CA portion as against a third of the one planted traditionally. That showed a three times increase in yield. Similarly in pigeon pea production, farmers used to get 1 bag per their standard plot if they used their traditional practice but

were now getting 3-4 bags of pigeon pea with CA practice. Again, this emphasizes the yield advantage of applying CA technologies. With increased yield, farmers reported of improved income. This was supported by the results from the February 2012 survey conducted by CARE and the consultant, 84% of the CA users reported of increased incomes (N = 64); 2% same income and 14% could not tell. In the same survey, farmers were asked to estimate the yields they got "with" and "without" CA practice. The total estimated units of production "with" CA were 21,919 units compared to "without" CA of 12,375. Therefore, the ratio between the two was 1.8:1 using a CA practice. This again showed that farmers adopting CA got nearly twice the yield from production as compared with non-users – a clear indication of productivity gains from CA.

Expansion of farm - With increased income, easier and reduced work load due to CA technologies, some other farmers reported that they had expanded their farm to a larger size and that they could now use their own family labour more than the hiring of labour.

3. Increased opportunity for women

Women play very vital roles in the family set up as well as in farm activities but in most cases, are disadvantaged. By engaging in CA technologies, women had reduced burden from the use of labour because some of the labour requirements were reduced such as land preparation and brushing.

It had been reported earlier that farmers could save some 1.5 days per week of their normal time in farming activities if they used CA technologies. This saved time could be used for social networking such as meetings and VSLA activities.

There was also increased economic opportunity for women as they got higher yields and could afford to sell more. Again, as pointed out earlier, the time saved could also be used for some economic ventures by the women.

4. Increased food security

By increasing crop productivity through CA, the availability of food was complementary. That also meant that food was more available to the family as a whole than they did without the use of CA. Thus, CA provided some increased food security to the farmers using CA technologies.

5. Improved standard of living

It was reported by a farmer at Kamasokola that through the VSLA activities and the adoption of CA technologies, he had been able to put up a better house at Kamasokola for his family. Other farmers reported of being able to pay for their children's school fees, hospital bills and able to purchase things they needed for home and farm as and when necessary. They could also access credit for crucial issues. Those were all opportunities to improve their living standards.

6. Self-induced CA technology transfer

Many farmers who had seen the CA technology worked, had formed themselves into informal groups being assisted by the FFS groups to learn and apply the CA technology. That was a positive sign for the spread of the CA technologies. In addition, other NGOs such as Christian Relief Service had learnt the

benefits of CA and were now implementing it in their area of jurisdiction such as Diang and Nenie Chiefdoms.

7. Development for tools for adoption (Nutrient Deficiency Symptoms Guide)

CAP developed some simple tools to deliver extension knowledge to farmers. It developed the Nutrient Deficiency Symptoms Guide and provided the FFS groups with that guide on the symptoms of nutrient deficiency of some crops notably maize. This simple guide with pictures had allowed farmers to identify nutrient deficiencies in plants and applied the necessary remedies to the soil. This was an excellent extension material for farmers. The results of the formal survey 2012 conducted by CARE and the consultant, 54 of the 80 (68%) farmers in the sample had access to the Nutrient Guide. A total of 337 farmers had been given some information by their counterparts who have had the opportunity in using the Guide. Averagely, 6.2 farmers had been passed with some information from the Guide by a farmer. This underscores the importance of what simple extension material could do. From the results of the same survey, 90% of the farmers who used the Guide reported that it was either very useful (54%) or useful (36%).

8. Experience gained from CA training

The impact of the experience gained from the training in CA technologies by staff of CARE, FIOH, MAFFS and farmers cannot be quantified as they will live with that beyond the life of the project and probably in their live time. The experience can be used and passed onto others over a long period of time.

9. Building of partnerships through Linkages and Collaboration

CAP has built friendships with other partners such as MAFFS, FIOH, SLARI, Communities, Councils and other stakeholders and those friendships would continue even after the end of the project. Support on CA could go on voluntarily.

10. Impact on the environment

CA technologies were more environmentally friendly than farmers traditional clear and burn activities. Farmers who used the CA did not burn and therefore saved the environment from smoke. Additionally, the CA practice controlled erosion and improved soil fertility. By also staying on the same piece of land over time because of the continued use of CA technologies, the environment was spared of clearing of new fields and its attendant burning and land degradation activities.

LESSONS LEARNED

Farm destruction by livestock and fire

FFS participants identified the construction of living fences and fire belts around the demonstration plot sites and private farms as essential to minimize conflicts and uncontrolled burning. Some had begun that although cost was high. Farmers had realized having single plots of land where they could have effective control of the livestock and bush fire and were making long term investment in that direction. This decision encourages CA practices with its attendant benefits. There is also an emerging fire volunteers group in some of the villages to help quell fires and to educate others on the dangers of fire. This should be encouraged.

High livestock density in Koinadugu District as free roaming livestock.

That presented a very big problem and a potential source of conflicts. Continued dialogue was essential. Equal attention could also be given to livestock owners and livestock management in subsequent projects.

Innovative learning of Conservation Agriculture practices

Since CA was a new concept introduced, CARE staff, partners and farmers were learning together. The willingness to learn together and make the necessary adjustments along the line made the CA very innovative for CAP. At the same time, the team was very open to seeking advice and recommendations from consultants and other CA experts. That increased the field staff ability to train farmers to transfer the knowledge gained from CA to other farmers.

Pilfering on demonstration plots

The produce from the demonstration plots were pilfered by thieves and other farmers as they saw the better performance from the CA plots. Some of the FFS participants also consumed some of the produce probably tasting the quality. The pilfering also saw farmers harvest the produce from the plots early which could have affected the yield information. Since most farmer groups recorded the overall yield themselves, the final yield data might have been underestimated. Nevertheless, the pilfering and unauthorized activities by some unscrupulous farmers all depicted the potential adoption of the CA technologies – a positive development on CA technologies.

Use of organic manure:

Many more women participants in CAP were using more organic manure in their backyard gardens than inorganic fertilizers because of cost differences and sustainability. This seems to suggest that women would uptake CA practices very quickly.

VSLA as a motivating factor for CA adoption: The VSLA activities have increased women and youth participation in CA and also increased their access to seeds and other productive resources such as land, tools and other agricultural inputs.

Demand for VSLA groups

There was high demand for the creation of VSLAs in communities because of the advantages of the system. The enthusiasm for the VSLA could be capitalised and mainstreamed into incoming agricultural projects.

Difficulty in cultivating rice under mulch.

It was observed that it was difficult to plant rice under mulch and new ways must be found. This calls for a closer collaboration with SLARI and the Universities.

Joint project planning, implementation, monitoring and reporting

The joint project planning, implementation, monitoring and reporting increased the collaboration of partners and linkages for the growth of the project. Additionally, the capacities of partner staff built by CARE provided an equal platform for understanding, corporation and sharing of ideas.

Sharing of information

In partnership, sharing of information was very important. This would allow for informed decisions and improved relationships. The information flow between partners was not as frequent as expected and

could be improved in the near future. This is understandable considering the electricity problem at Koinadugu that did not allow the frequent use of internet but rather hard copies.

It was further important to share results with other donors who might be interested to support funding such a useful project. CAP in Sierra Leone could link up with other CAP activities in the sub-region to share experiences probably through in-country or sub regional workshops.

Remittance of funds to partners

The administrative procedures involved in the transfer of funds to partners did not allow for prompt remittances for some project activities that were time bound. In such critical situations, partners pre-financed those activities.

Use of Nutrient Deficiency Symptoms Guide

A simple farmer extension material is an important tool for technology transfer and adoption. It was realized that farmers were happy to use those guides but were not sufficient for all farmers. Again they found such materials very useful and informed many more farmers about the guide. It may be important to have more copies of such simple flyers given to as many farmers as possible and they would in turn propagate the news. Other simple farmer handbooks could be developed on CA for distribution to farmers.

Some CAP Challenges:

- The late arrival of motor bikes and vehicles initially affected project activities.
- The conservation training module developed earlier was bulky and difficult to understand and translate to farmers. It was however, reviewed and simplified.
- Wide wild fire damages on CA and farmer plots.
- Construction of live fences around demonstration plots to control cattle damage.
- Enforcement of bye-laws set by communities to control wide fire.
- Poor road network

FUTURE CONSIDERATIONS

The benefits from Conservation Agriculture take some time to be fully realized and the return to investment tends to increase with time (as farmers usually learn stepwise). With time, efficiency in the system is built up lowering costs but increasing benefits. It may be very beneficial to consider extending CA projects that have proved successful for a few more years particularly for agricultural projects.

CAP's period of effective operation was probably shortened to about 2 years because of changes in its initial design and the number of activities that needed to be performed. There seems to have been too much burden and heterogeneous activities going on concurrently and did not allow the project to focus on its main CA activities. No wonder, it was reviewed in Year 2. This left the project a little time to deliver and had to rush to meet its target. Those resources could have been channeled to make CAP cover many more districts for which a lot of impact could have been made. Furthermore, conflicts take some time to solve. In summary, CAP needed some more time to deliver.

It must further, be pointed out that some of the targets for some of those advocacy activities were difficult to meet because at best, the outputs/results of these activities should have been the “number of meetings” held with Council, Chiefdoms, local community leader and the like or number of facilitations of meetings. The outcomes could then have been the change (decrease) in conflicts the CAP helped to bring about. As the results stood, CAP could not be held responsible for not achieving those targets. Conflicts cannot be created by projects so that they could be solved to meet their set targets but the number of meetings to be held could be under the control of CAP and could therefore be held responsible for failing to meet its target.

Monitoring costs and benefits allows the farmer to know how he or she is faring in their farming enterprise. Simple Farm Record Books could be introduced to farmers to help them enter production records and monitor costs and benefits of their practices as part of training curriculum. In addition, simple financial analysis could be done at the harvesting with farmers to show the economic benefits of the CA practices.

In an attempt for projects to deliver, targets are overstated and more activities are planned than actually can be done. This puts unnecessary pressure on the project. Projects must be well focused so that the activities will be fewer and more effective. Care must also be taken on setting targets for advocacy and policy issues.

The involvement of Elementary Schools using School gardens as part of the target group will be a good idea. Charity begins at home and when children learn a practice from their teachers, they tend to stick in their minds and pass on to others particularly, their parents. It may be important to also play an advocacy role with the school authorities to ensure that such CA practices are taught and demonstrated or experimented with by the students. This will go a long way in spreading the news on CA.

There was high demand for the creation of VSLAs in communities because of the advantages of the system. The enthusiasm for the VSLA could be capitalised and mainstreamed into incoming agricultural projects.

Sharing of results or information is a catalyst for sponsorship. It was therefore, important to share results with other donors who might also be interested to support the project. CAP in Sierra Leone could link up with other CAP activities in other countries of the sub-region to share experiences probably through in-country or sub regional workshops.

CARE could also build partnerships with other local partners to train them on CA technologies.

CONCLUSIONS

CAP has largely met its objectives and has built on farmer development in promoting conservation agriculture (CA). It has created the appetite for conservation agricultural practices among farmers and extension workers. It leaves behind skilled human resources for CA.

To effectively ensure skill transfer and expansion, CAP was highly participatory, built partners' capacities to sustain and scale up interventions. It allocated sufficient time and staff resources for community mobilization and issues of gender and land security. Field staff took their time to demonstrate the economic advantage in adopting conservation agriculture techniques.

Skill transfer took place at the farmer level through the farmer field schools (FFSs) through the participatory technology development (PTD) approach. Farmers were led by CARE and its partner field staff to demonstrate CA technologies. CA demonstrations showed positive results in the farming outcomes and the communities. This has triggered on a broader scale adoption of the new CA technologies.

CARE, through CAP, has taken the lead in Conservation Agriculture in Sierra Leone and others are copying. CARE should imprint its name in Sierra Leone as the originator of CA and be part of imminent agricultural revolution in the country. The project has opened the window that addresses the root causes of poverty and suffering of rural poor but more is needed to be done to reach many more farmers in Sierra Leone.

APPROVAL

Technical Coordinator-Food Security: ANDREW KATTA

Signature:

Date:

ANNEXES

Annex 1: Terms of Consultancy

- The consultant will work closely with CARE Sierra Leone 's CAP Project Team and will have the Technical Coordinator-Food Security as primary contact within CARE Sierra Leone
- The Consultant will have the overall responsibility for the implementation of the evaluation, preparation of the final report and adhering to deadlines.
- Qualifications and experience. The consultant(s) must have demonstrated knowledge and several years of experience in evaluating development projects, preferably those related to, (especially Conservation Agriculture, biodiversity Conservation and Agro Forestry), In-depth knowledge of agriculture and, preferably, a good understanding of Sierra Leone. The consultant must be fluent in English.
- Technical M&E skills (Including Designing and conducting Assessment, Survey, Data Analysis) and report writing
- The consultant should present a proposal to CARE Sierra Leone briefly outlining a methodology for conducting the work under this consultancy (max 2 pages);
- a proposed work plan (max 1 page);

CARE Sierra Leone Program DM&E Advisor will be responsible for day-to-day supervision of the consultant's work with technical guidance from Technical Coordinator who will ensure relevance and appropriateness of evaluation methodology, tools and sampling.

The consultant shall receive administrative support from CARE as reasonably needed such as photocopying, Internet connection, movement etc.

Payment Method

The consultancy will cost a lump sum of USD xxxx. ***(to be determined)***. CARE will provide a daily local per diem subject to CARE SL's approved per diem rate, transportation and accommodation if required.

Manner of payment

The Consultant shall receive payment upon submission of all the key deliverables specified above with the approval of the Technical Coordinator Food Security.

Annex 2: List of documents reviewed

1. Interim CAP report, July 2011
2. Soil Properties report. CARE- Koinadugu Soils
3. CAP Sierra Leone Revised Log-frame, 2010
4. Conservation Agricultural Project, Narrative, Koinadugu, Sirra Leone
5. Sierra Leone CAP Annex 1-5, July, 2011
6. Report – Baseline CAP SADev, December 2009
7. FIOH Learning Event Report, February 2012

Annex 3: List of people consultant interacted with

Name	Position	Institution
Younoussou Tangara	Head of Program Operations	CARE
Edmond Kposowa	Project officer	FIOH
Jonathan D. Kamara	Field staff	CARE
Alhassan Bampia	Program DM&E Advisor	CARE
Edward Sophie	Land Tenure Advisor	CARE
Sam S. K. Ganda	Agric Value Officer	CARE
Andrew Kattah	Technical Coordinator, Food Security	CARE
Henry Sandy	Admin/Log Officer	FIOH
Samuel J. Koroma	Crops Officer	MAFFS
Abdul R. Jalloh		SCP/FSCA
Ahmed Kamara		CARE
Brima A. Kabba		MAFFS
Francis B. Mawaray		FIOH
Elizabeth Brandon		FIOH
Sallieu A. Jalloh		MAFFS

Annex 4: Project work plan with recommended adjustments, 2011

Table 10. Showing Project work plan with recommended adjustments			
(Yr 3)	Description of project activities	Original Timeline	Recommended adjustment
A1.1.1	Training in Conservation Farming		
1	Staff training in FFS Participatory Technology Development	Done	
2	Training staff in Conservation Farming	Done	
3	Soil analysis in Lab	July – Sept 2011	
4	Training of Farmers in Conservation Agriculture (On farm training)	Done	
A1.1.2	Organize Field visit		
1	Field visit to conservation farming site in Bo, Sierra Leone	Done	
2	Visit from other Farmers and staff to project areas	Done	
A1.1.3	Analyze Soil Fertility		
1	Two soil analysis tool kits purchase	Done	
2	Use mobile soil analysis kits and nutrient deficiency symptoms guide	April/May/Sept/Dec 2011	
A1.1.4	Set up and evaluate demo plots		
1	Set up/Evaluate Demo Plots Early Burning in Grassing Areas	Oct - November 2011	
2	Set up/Evaluate Demo Plots green manure/improved fallow	March – November 2011	
3	Set up/Evaluate demo plots no burning and mulch cover in arable areas	March – November 2011	
4	Set up/evaluate Demo Plots Fertilization and crop response	March/Sept-October 2011	
A1.1.5	Assuring planting materials		
1	Support tree nurseries	Done	
2	Set up seed Multiplication scheme	Done	
A1.2.1	Support farming diversification through animal husbandry and development		
1	Identify problems faced by Fula and discuss possible solutions	Done	
2	Train staff in animal husbandry	Done	
3	Veterinary support	Done	
4	Train farmers in animal husbandry	Done	
5	Support cultivation of fodder crops	Done	
A1.2.2	Develop fish farming		
1	Training of staff in aquaculture	Done	
2	Training of farmers	Done	
3	Rehabilitation of existing ponds, build new ponds	Done	
4	Improve availability of feed and fertilizer	Done	
5	Conduct fish farming experiments, include feasibility	August – October 2011	
A1.2.3	Improve beekeeping		
1	Evaluate beekeeping different projects	Done	
2	Training of Farmers in beekeeping	Done	
A2.1.1	Support women with processing of Vegetable & fruit		
1	Training staff in selection of processing of vegetables and fruit	Done	
2	Organizing and training women groups (vegetable & fruit processing)	Sept – October 2011	
3	Processing solar dryers/Processing equipment	September 2011	
4	Set-up demonstration of processing equipment selected by women	October - November 2011	

Table 10. Showing Project work plan with recommended adjustments			
(Yr 3)	Description of project activities	Original Timeline	Recommended adjustment
A2.1.2 Support women with business development			
1	Training Women and Youths in business skills	Done	
2	Set-up VSLA (for processing and adding) for 40 women groups	October – November 2011	
A2.2.1 Identify best option (s) for the sustainable provision of inputs for youth in consultation of stakeholders			
1	Training staff in selection of processing activities	Done	
2	Organizing and training youth groups (vegetable & fruit processing)	Sept – October 2011	
A2.2.2 Test & disseminate processing techniques for youth and value adding appropriate technology			
1	Training youth in business skills	Done	
A3.1.1 Facilitate long-term agreements on land access			
1	Facilitate land-access agreements for (nomadic) livestock farmers (1 per village)	Done	
2	Facilitate land-access agreements for recent immigrants (arable farmers) per village	Done	
3	Facilitate land-access agreements for women	Done	
4	Final Conference on Land Tenure and Conflict	November 2011	
A3.2.1 Capacity building materials for Land Tenure & conflict mitigation			
1	Inventory of land tenure issues & conflict		
2	Detailed study land tenure and conflicts		