Final Report:

Conservation Agriculture Capacity Needs Assessment in Western Kenya

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Acronyms and Abbreviations

ACT	African Conservation Tillage Network
ADS	Anglican Development Services, Kenya
ATDC	Agricultural Technical Development Centres
AFC	Agricultural Finance Cooperation, Kenya
ASDSP	Agricultural Sector Development Support Programme
ATC	Agricultural Training Centre
BAC	Bukura Agricultural College
BMZ	Bundesministerium für Wirtschaftliche Zusammenarbeit und Entwicklung
CA	Conservation Agriculture
CA CNA	Conservation Agriculture Capacity Needs Assessment
CA-SARD	Conservation Agriculture for Sustainable Agriculture and Rural Development
CBO	Community Based Organisation
CDA	County Director for Agriculture, MoA
CDP	Capacity Development Programme/Plan
CESUD	Community Education for Sustainable Development
CNA	Capacity Needs Assessment
CIAT	Centre for Tropical Agriculture (Spanish Acronym) (CGIAR)
CIMMYT	Centre for International Research on Maize and Wheat (Spanish Acronym) (CGIAR)
CFGB	Canadian Food and Grains Bank
CGIAR	Consultative Group on International Agriculture Research
CORPS	Community Resource Persons
CSA	Climate Smart Agriculture
CSB	Cross Slope Barriers
DAC	District Agricultural Committee
DFID	Department for International Development, UK
EI	Educational Institution
FADC	Focal Area Development Committee
FAO	Food and Agriculture Organization of the United Nations
FBO	Faith Based Organisation
FGD	Focus Group Discussions
FFS	Farmer Field School (extension approach)
FITCA	Farming in Tsetse Controlled Areas
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit mbH (formerly GTZ)
GoK	Government of Kenya
GOPA	GOPA Consultants Worldwide
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit mbH (now GIZ)
ICIPE	International Centre for Insect Physiology and Ecology, Maseno
ICRAF	World Agroforestry Centre (CGIAR)
IITA	International Institute for Tropical Agriculture
IP	Innovation Platform
IPM	Integrated Pest Management
IR	Inception Report
ISFM	Integrated Soil Fertility Management
ISTE	International Short Term Expert
KALRO	Kenyan Agriculture and Livestock Research Organisation
KEFRI	Kenyan Forestry Research Institute
KENDAT	Kenya Network for Draught Animal Technology
KII	Key Informant Interviews
LF	Lead Farmer
M+E	Monitoring and Evaluation
MoA	Ministry of Agriculture
MCC	Mennonite Central Committee
MFI	Micro-finance Institution
MoU	Memorandum of Understanding

NGO	Non-governmental Organisations
NSTE	National Short Term Expert
PAFID	Participatory Approaches for Integrated Development Kenya
PEA	Participatory Extension Approach (developed by GTZ in Zimbabwe)
PES	Public Extension Service
PPP	Public Private Partnership
REFSO	Renewal Energy and Food Security
RI	Research Institution
SACCO	Saving & Credit Cooperative Society
SCAO	Sub-county Agricultural Officer
SEWOH	Sonderinitiative Eine Welt Ohne Hunger (One World No Hunger Initiative, BMZ)
SIMLESA	Sustainable Intensification of Maize and Legume Systems for Food Security in Eastern and Southern Africa (a CIMMYT managed project)
SOFDI	Sustainable Organic Farming Development Initiative
T+V	Train and Visit (Extension Approach)
TCP	Technical Cooperation Project
TNA	Training Needs Assessment
TVET	Technical and Vocational Education and Training
TOR	Terms of Reference
ToT	Training of Trainers
UCRC	Ugunja Community Resource Centre
UNDP	United Nations Development Program
VCSB	Vegetative Cross Slope Barriers
VW	Validation Workshop
WAC	World Agroforestry Centre
WAO	Ward Agricultural Officer
WHH	Welthungerhilfe
WRMA	Water Resource Management Authority
WRUA	Water Resource User Association
WUA	Water User Association

Executive Summary

This report presents the results of a Conservation Agriculture Capacity Needs Assessment (CA CNA) of the GOPA implemented Soil Protection and Rehabilitation Programme component in three Counties (Bungoma, Kakamega and Siaya) in Western Kenya. Conservation Agriculture (CA) is one of four components (the other being Integrated Soil Fertility Management, Cross Slope Barrier and Catchment Protection) of GOPA's work package which is part of the larger GIZ agricultural support programme. As a further partner, Welthungerhilfe also implements CA in Western Kenya, which works directly with farmers. GOPA's project activities are managed from Kisumu. In the three counties, the implementation is done through partners who are monitored by three GOPA county coordinators, in coordination with the respective Ministry of Agriculture.

GOPA has supported different CA stakeholder groups in their environment since 2016, but does not work directly with farmers; this is the expected project approach for a bilateral development organisation or a subcontractor like GOPA. The key actors for achieving the main goal in GOPA's CA approach—the successful practice of CA by farmers—are those organisations that train, and through this, enable the technical staff level; the latter are either MoA extension officers or field staff of NGOs, CBOs or FBOs, which then again train and work with farmers in CA. Furthermore, GOPA supports directly both research institutes and cover crops seed producers, because they either provide training or enable farmers to use cover crops on their farms, which is an important part of CA. It is furthermore clear that training and the different CA training providers are the central activity actors. Two CA stakeholder groups are not working with GOPA, the education institutions (i.e. universities) and the micro-finance sector, which could provide loans to farmers that are willing to adopt CA.

During the implementation of the CA activities in the project, it became clear that many of the required capacities for a successful implementation did not yet exist or that CA training efforts did not yield in the desired outcomes. Therefore, it was decided to carry out a CA CNA in order to improve the impact of the project's work and to improve the decision making in the future.

Overall, a total of four weeks was invested into the CA CNA in Kenya, between the 16th of January and the 12th of February 2017, which included three phases, 1) the inception phase, 2) the fieldwork phase and 3) the analysing and report writing phase. The CA CNA followed a gap-analysis approach to identify the missing CA capacities of all CA stakeholder groups in the project region.

The fieldwork phase began on Tuesday 24 January with the interviews of stakeholders relevant to the CA CNA. The fieldwork ended on Wednesday 1 February 2017, after eight days of intensive fieldwork. The CA CNA covered 116 Key Informant Interviews (KII) and Focus Group Discussions (FGD). This includes representatives from all relevant CA stakeholder groups (see Annex 5). Special focus was given to CA farmers (15) and non-adopters (6), as farmers are the key-implementers of CA, among them were 10 women farmers.

The main findings during the CA gap-analysis of the different stakeholders are that some capacity gaps have been found to exist on all levels and within all stakeholder groups, including the GOPA team, too. In spite of this, the fieldwork also showed that there are many existing capacities that will help with the spread of CA in the project region and with the achievement of GOPA project's CA goal. This is really 'good news', because in many countries this is not the case. We found that there is a good CA foundation in the three counties, because several CA experts exist (in the best case with hands-on CA experience of more than 15 years) and that there are many organisations that have worked, work or at least know about CA, and have a positive attitude towards CA.

Furthermore, we could identify several different 'ways of doing CA' and, most importantly, we found CA farmers that have practiced CA for many years, convinced that CA is the 'only way of farming'—this was reconfirmed during the validation workshop, which was held on the 9th of February 2017. These farmers will be assets for any future CA activity in Western Kenya. Likewise, we found that most stakeholders possess some good soft capacities. Most prevalent among these are the focus on farmers demands and the practicality of development interventions, the will to adopt or spread CA (both are indicators for a positive attitude), and an openness to change, e.g. cultural values and customs, gender equality, which is indicated by the gender equality employment rules and female staff numbers.

Nevertheless, several core-gaps were identified, which count for the GOPA team, too. Many people describe CA by 'how it is done' and by 'what its benefits are', but they could not give a proper CA

definition. On many occasions, principles were stipulated that have nothing to do with CA *per se*, e.g. terrace building and counter banks. During the interviews, it became clear that a vision, a 'picture in front of their eyes' of good and correct CA, does not exist. There are mixed-messages spreading about CA throughout the project region.

Many stakeholders have a limited perception of CA practice ('the how to do it')—which is indicated through their pre-packaged CA approach which is independent from their limited budgets—where only parts of CA principles are practised (minimum tillage is the most prevalent term used and practised). Mostly, farmers are only supported for a short time. This has very often resulted in a failure of on-farm CA and, consequently, in a misconception of CA and farmers ceasing to practice CA.

Another core-gap detected belongs to the enabling environment. Several stakeholders highlighted the absence of a CA strategy for the counties. This derives from the fact that there is no national agricultural strategy related to CA yet or even a national CA related policy. Moreover, we found that none of the stakeholders have special CA plans in place. This includes strategies, county development plans, and CA staff appointments or CA development plans, or how to extend CA activities in different institutions, organisations or the private sector.

The last core or overarching gap identified is training. Not only does the project in its CA approach have training as a central pillar, but it is also understandable that a 'new' agricultural practice needs to be learnt and training activities on all levels are the means to do this. We found that several institutions work in CA and non-CA training. And yet, during the study of CA training materials and the interviews, it became clear that many training courses had low-impact in the field. This had many causes, but two main causes for the low-impact of training are the duration of training courses, which is mostly only a couple of days, and the absence of CA training plans and/or CA training strategies.

The core-gap identified for the GOPA team was that the ability to describe CA is sometimes just a replica of written or textbook passages. Furthermore, we found limitations in the capacity to differentiate between 'how CA could be done' and 'how to do CA' and 'what belongs to CA and what not', which is of great importance. In the CA CNA team's experience, all staff need to understand CA in detail, in all its forms and practices. This would then enable them to make the right decisions about all aspects of the CA project work, including its strategic approach, the required trainings, and how all stakeholders could resolve their own capacity gaps.

A second gap identified for GOPA is the timeframe of this project itself. CA requires an experiential learning process, and it takes several years, approx. five to seven, depending on soil type, farm history and activities, until a good CA system is up and running, which can reap most of its potential benefits. The approach—given by GIZ regulations on local subsidies—to use six-month contracts with e.g. NGOs or training service providers is too short; farmers need continuous support throughout several seasons. We identify this as an institutional capacity gap, certainly a general one for GOPA and GIZ.

This finding is to be seen in connection to the next identified gap. During the four-week period, the CA CNA team was not able to find a clear CA strategy and CA training strategy, in which the integration of all four project components were displayed. It was found that there are still mixed messages received by stakeholders in the field, coming from GOPA, about CA and ploughing; this counts for GIZ, too. One could attribute this missing CA strategy to the limited understanding of CA among GOPA staff, perhaps, already by the experts that put this project approach into action in the first place. Other gaps in relation to this are the lack of any cohesive CA action plan, we could not obtain any CA specific report and the absence of a specific CA M+E system. The latter would indicate that the performance of CA on field is understood, monitored and an improvement of the CA farmers practice is desired.

Based on the findings of this CA CNA, the next step for GOPA and GIZ is to enter into the process of the formulation of a capacity development programme/plan (CDP), which includes the capacity development responses. These responses need to include, or at least consider, all of our recommendations and a sufficient timeframe for CA implementation, which is one of our core recommendations. The CDP should be based on the strength of the project, GOPA and GIZ, and set response priorities. Since the process of setting priorities is normally political, too, it should be managed carefully and transparently, with the involvement of all relevant CA stakeholders; otherwise those that stand 'to lose out' may withhold support during implementation and question the relevance of the response action.

Indicators should be set to monitor progress in implementation of the CDP. The process itself of defining progress indicators is useful as a way of generating strategy discussion, enhance the project's monitoring and evaluation system, and as a learning exercise for the involved project staff and other participants. The indicators need to be linked to good CA practices, the basket of CA options, and to a CA performance based monitoring and evaluation system.

The following main recommendations need to be considered for the CDP:

- The GOPA staff, i.e. management and coordinators, needs to undergo a thorough CA training course, which should include visits to existing CA examples in Kenya, the region and, for the best impact, to South America, especially Paraguay. Here, GIZ has more than 25 years working experience with CA and smallholders. The latter would fast-track the learning and understanding of CA and it seems the most cost-effective way to achieve the desired change among GOPA staff. The CA definition of different CA practices and the 'Need to know or be able to do', developed and used for this CA CNA (see Annex 3), should only be the starting point. All this will lead to a more focused and useful use of project resources and improve the impact of GOPA's work.
- In a next project phase, the timeframe of CA activities needs to be extended, which might require that activities need to be planned well beyond the project phase mentality, set by the German government.
- For the next project phase or even for this phase, GOPA needs work out a proper CA strategy with a CA action plan and a CA M+E system, focused on field performance and on-farm results. This strategy needs to have a clear response plan to improve farmers' actions, e.g. have plans for crop rotations, use of cover crops, etc. The strategy needs to be elaborate in conjunction with the project partners, e.g. MoA, GIZ, WHH and other implementing agents. This will lead to a more focused and effective use of project resources and improve the project's impact.
- GOPA needs to draw up a CA training strategy, based on modern training approaches, including experiential learning (e.g. on on-the-job training of extension officers or field staff), and a CA exposure study tour within Western Kenya. A training expert needs to be employed for this task. The training courses as part of the training strategy need to be adapted to the agricultural season and have several training units/sessions, which are aligned to the required CA action on farms. It is mandatory that all training providers are supported in setting up CA fields in their respective organisations and that all their trainer staff is streamlined to and able to train the CA basket of options. Once the training is up to the highest standards, the project impact will be improved, in general and on-farm, and its resources will be used more effectively and efficiently.
- Plan for or identify the most easily accessible CA information system available and make this information available, both in hard and soft copy, to all CA stakeholder groups, especially farmers. Identifying an existing CA information system is more cost-effective than creating a new system. We recommend that the planning or identification of a CA information system should be done by the GOPA staff itself, as it presents a good opportunity to test the system for their own learning. In this context, GOPA needs to define the indicators for a good and sufficient CA information system, which can only be done once GOPA staff has been trained in the full basket of CA options.
- All cover crop seed bulking must be done under CA. The farmers themselves should be enlisted for this activity, compensated and through this motivated to convert to and to do CA.
- The use of cover crops needs to be diversified, and winter or off-season cover crops need to be introduced. This should first happen with farmers that have fenced fields or that have no livestock pressure. They would become role-models from which other farmers can learn. In relation to extending the varieties of cover crops, we could see an important role for a closer collaboration with RI like KALRO and CIAT. We recommend that RIs should be supported in winter cover crop trials and in the probing and testing of new cover crop varieties. Again, the GTZ experience from Paraguay sets the tone and provides the role-model.
- GOPA, and perhaps GIZ, should address the soft-capacity gaps, such as self-reflection, learning from experience and behavioural self-analysis, by providing a good example and invite stakeholders to participate in their (GOPA or GIZ) efforts in order to improve these soft capacities.

- A special effort by the project to streamline CA understanding, using the FAO CA principles and the CA definition of different CA practices and the 'Need to know or be able to do', developed and used for this CA CNA (see Annex 3), to be the guideline for future project work and for all stakeholders. Simultaneously, some of the soft capacity gaps would be addressed, because stakeholders would understand the full basket of CA options and enhance or overcome their negative attitude towards CA.
- GIZ, supported by GOPA, uses its 'good name' to continue the support of CA related national and county strategies in Kenya. This should be in the area of soil conservation, improved agriculture productivity, protection of the environment and the agricultural mechanisation strategy, especially those strategies that currently are being developed.
- Counties need to be supported in developing a CA strategy, or at least CA plans, which could be done already through a discourse between the MoAs and GOPA, and also through the implementation or support of County stakeholder forums or Innovation Platforms.
- GOPA should offer to each of the CA stakeholders support in the development of CA plans, which would lead to CA being embedded in strategies of each of these stakeholders.
- Training activities need to be longer (time wise), because CA takes several years to be applied correctly. Training courses need to be adapted to the agricultural season and have several training units/sessions, which are aligned to the required CA action on farms, with an emphasis on ecological understanding; the empowerment of farmers (good decision makers) would be the desired outcome. CA training strategies need to be put in place, for and by the counties, and for and by the different CA stakeholders. This must include that all CA training providers have designated CA fields on which trainees discover and learn CA and that CA trainers or CA lecturers should be taken on exposure visits to CA farmers and other CA stakeholders for their improved and widened CA understanding. For the future project activities, this will need to become a priority and holds great potential to improve the project's impact (effectiveness) and make its work more efficient, too. A CA training expert should be engaged to help with this endeavour.

1. Introduction and Background Information

The German BMZ initiative 'One World No Hunger' (SEWOH) is a multilateral programme in Benin, Burkina Faso, Ethiopia, Kenya and India. BMZ's Soil Protection and Rehabilitation Project for food security is implemented by GIZ in Siaya, Kakamega and Bungoma counties. It has three components:

A. Soil protection and rehabilitation measures (promoting adoption) —implemented by GOPA and WHH

B. Soil Management Policy at national and county level—by GIZ

C. Knowledge Management/Accompanying Research—by GIZ

This GOPA project (component A) started 1 August 2015 and is to end on 31 December 2017. In Western Kenya, it is part of the larger GIZ agricultural support programme, including projects on food security, dairy, and sweet potato.

For GOPA, Conservation Agriculture (CA) is where most of the project's ambitions are. It has clear links to the 3 other work-packages:

- CA can combine well with use of compost and liquid organic fertilizer (work package 1: Integrated Soil Fertility Management, ISFM)
- CA benefits from a shift towards *Vegetative* Cross Slope Barriers (work package 2: Cross Slope Barriers, CSB)
- CA can be promoted in different ways, through public agricultural extension as well as directly through Lead Farmers, possibly with some support from NGOs or WRUA (work package 4: Catchment Protection)

The GOPA project defines three principles of CA as follows:

i. Minimal tillage

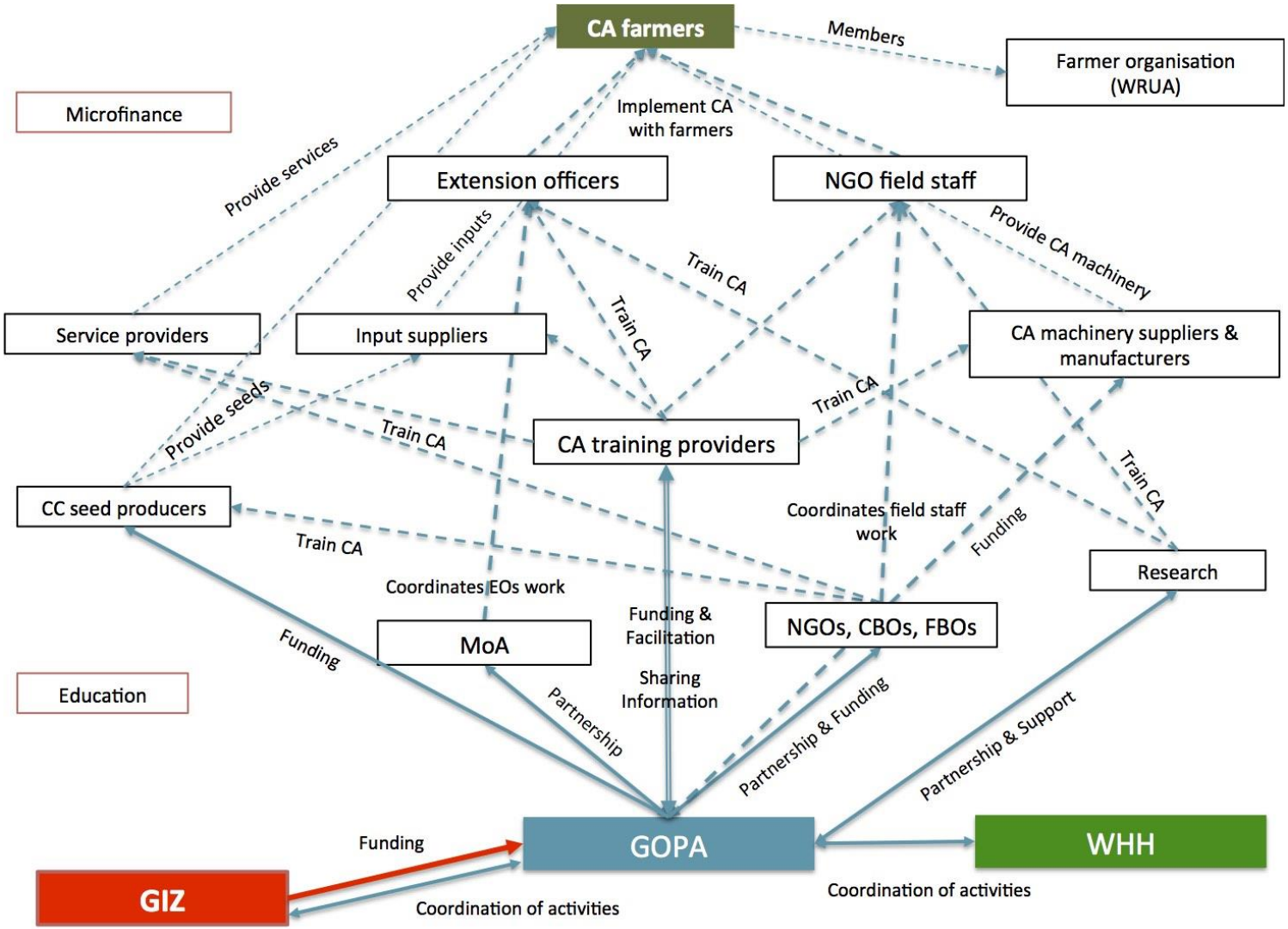
ii. Soil cover

iii. Cover crops

The project activities are managed from Kisumu. In the three counties, the implementation is done through three GOPA county coordinators. However, CA is only one of their tasks, as they have to work on the other three components of the GOPA programme and attempt to integrate the four components into their daily activities. The county coordinators have their offices in the respective Ministry of Agriculture (MoA)[1] county headquarters, which is the main partner for GOPA. Its approach for its CA work with the different stakeholders is depicted in Figure 1.

[1] The term Ministry of Agriculture (MoA) is used in this report, because each of the three County ministries have different official names: Bungoma = Ministry of Agriculture, Livestock, Fisheries and Cooperative Development; Kakamega = Ministry of Agriculture, Livestock, Cooperatives and Fisheries; and in Siaya = Ministry of Agriculture, Livestock and Fisheries.

Figure 1. GOPA's approach for CA implementation



As can be seen from Figure 1, GOPA supports different CA stakeholder groups in its environment, but does not work directly with farmers; this is the expected project approach for an international development organisation. The key-actors for achieving the main goal in GOPA's CA approach—the successful practice of CA by farmers—are those organisations that train, and through this enable the technical staff level; the latter are either MoA extension officers or field staff of NGOs, CBOs or FBOs, which then again train and work with farmers in CA. Furthermore, GOPA supports directly both research institutes and cover crops seed producers, because they either provide training or enable farmer to use cover crops on their farms, which must be seen as an important part of CA. It is furthermore clear that training and the different CA training providers are the central activity and actors. Only two CA stakeholder groups are not working with GOPA, the education institution (i.e. universities) and the micro-finance sector, which could provide loans to farmers that are willing to adopt CA.

2. Purpose and Objectives of the CA CNA

During the implementation of the CA activities in the project, it became clear that many of the required capacities for a successful implementation did not yet exist or that CA training efforts did not yield in the desired outcomes. Therefore, it was decided to carry out a CA Capacity Needs Assessment (CNA) in order to improve the impact of the project's work and to improve the decision making in the future (please see Annex 1 for the TOR). The purpose of the CNA assignment is to guide GOPA and its partners, e.g. MoA, in directing its resources (e.g. local subsidies and funds for consulting, training and workshops) in the most effective manner, and to achieve adoption of CA both in quality (guided by CA principles & setting up capacity to achieve adoption by many small-scale farmers) and quantity (sustainable higher yield results).

The objectives of this assignment were two deliverables. The first was an inception report and the second is this final report that gives a comprehensive overview of existing CA capacities and capacity gaps for the development of CA in the three counties, and recommendations on how to overcome or diminish these gaps that would contribute to the proposal for a next project phase.

The work of the CA CNA was to be carried out in the three counties, looking at:

- Personnel technical capacity, and potential to develop this capacity.
- Organisational/institutional capacity, and potential to develop this capacity.

at 4 levels:

1. NGO/CBO capacity to deliver training and backstopping.
2. Public extension capacity to deliver training and backstopping.
3. Private sector capacity to deliver inputs (cover crop seeds, CA-equipment) and services (tillage & CA).
4. Lead Farmer capacity to apply CA and share CA knowledge and skills.

Furthermore, during the inception phase it became clear that the CNA should also include an assessment and identify capacity gaps of other stakeholder groups and the enabling environment for a successful CA implementation in Western Kenya. Some of the CA capacity gaps that exist in the GOPA project and its partners, GIZ and Welthungerhilfe (WHH), were also looked at.

3. Methodology and Implementation

During the fieldwork phase, the CA CNA team addressed the assignment, as defined in the TORs (see Annex 1), by applying a mixed methodological approach that consisted of different methods and tools appropriate to the CA CNA's tasks, with particular attention to gender equality and youth empowerment. A summarized description of the methodological approach and specific methods applied can be found in Annex 2 of this report. Even more detailed information can be found in the Inception Report (IR) for this exercise, which is available upon request.[2]

[2] Please contact sebastian.seitz@gopa.de

During the inception phase, the technical approach was elaborated, namely the working definitions for CA and capacity (divided into hard and soft capacities), the definition of a gap-analysis that the CA CNA team follows, a relevant stakeholder group list, the different desired capacities for each CA stakeholders (including indicators that would allow to determine if a certain capacity does or does not exist), and the draft interview partner lists and working schedules for each county. These can be found in the Annexes 3, 4, 5 and 6 or in more detail in the IR. The final interview list and the work schedule can be found in Annex 7 and 8.

Overall, a total of four weeks were invested into the CA CNA in Kenya, which included three phases, 1) the inception phase, 2) the fieldwork phase and 3) the analysing and report writing phase.

Photo 1. Courtesy call at the Bungoma MoA office

The inception phase ended and the fieldwork phase started with a 'kick-off' for the fieldwork phase, a visiting tour was conducted to make courtesy-calls at each County's Ministry of Agriculture office on Friday, January 20. During the visits, the CA CNA team was introduced to the highest-ranking officer available for their 'blessings'; the government officials expressed severe interest in the CNA and its results. The fieldwork phase began on Tuesday 24 January with the interviews of stakeholders relevant to the CA CNA and as selected in the inception phase. The fieldwork ended on Wednesday 1 February 2017, after eight days of intensive work. The CA CNA covered 116 Key Informant Interviews (KII) and Focus Group Discussions (FGD). These included representatives from all relevant CA stakeholder groups (see Annex 5). Special focus was given to CA farmers (15) and non-adopters (6), as farmers are the key-implementers of CA, among them were 10 women farmers. The list of all interviewees can be found in Annex 9[3] of this report and a list of CA farmers, of which unfortunately only some could be interviewed due to the CA CNA timeframe, as well as identified CA experts that were identified, can be found in Annex 10.

Photo 2. Validation workshop participants, Kakamega

For the fieldwork phase, two weeks were spent in a considerable scale of work, almost entirely in the three counties, consisting of the interviews, farm visits, and many conversations with stakeholders and farmers. The fieldwork ended with a validation workshop (VW) held in Kakamega on Thursday 9 of February 2017. Almost 60 participants attended this event in which the CA CNA team presented their preliminary findings. At the workshop, representatives from all CA stakeholder groups and the three Counties provided their feedback and suggestions for the final report. In general, the audience confirmed the preliminary findings and, only on a few occasions, some findings were clarified upon request; farmer participation was very active and all attending farmers were given the chance to contribute. Unanimously, the farmers praised CA and emphasised its benefits.

Both the fieldwork and report writing phase encountered two limitations. These will have to be taken into consideration, but do not invalidate the findings of this CA CNA. Most notable, the short fieldwork preparation time did not allow for arranging interviews with all identified stakeholders. The short notice did, on a few occasions, lead to a few key-interviewees not being available. However, the good work of

[3] The names of CA equipment producers and seed suppliers are included in this list.

the GOPA County coordinators, the support by MoA, and the flexibility of the consultants resulted in an acceptable representation of all stakeholder groups as interview partners. Furthermore, the task of collecting CA training literature was limited by the unavailability of hard copies of such materials and the soft copies promised by a few stakeholders were not submitted in time for the finalisation of this report (see Annex 11).

4. General Findings with Recommendations

This chapter will focus on general, overarching findings (CA capacity gaps) that could be identified and observed during the fieldwork phase. Furthermore, there are some core issues, or core-gaps, that were found which concerned the project approach or the enabling environment. Accordingly, the CNA team gives recommendations to both, the core-gaps and the overarching gaps, and the specific ones in each County are stipulated in Chapter 5. A sub-chapter is dedicated to the GOPA project, because a) it is implementing the CA work and b) one of the objectives of this report is to include recommendations for a future project phase.

This general findings chapter is also indispensable, because on all levels in a CA project and the project environment, certain CA capacities are paramount as was defined in the desired hard capacities for CA that can be found in Annex 6. The resolution of these could have a wider and deeper impact. Likewise, the identified soft capacities are common among all stakeholder groups, and therefore these need to be separated from the County findings, unless they have a special meaning in which case they are also treated in the County gap-analysis. Our assumptions and experiences in relation to these overarching or core-gaps were confirmed during the fieldwork.

Difficulties, however, arose because gaps could often not be attributed to a single issue, but must be seen in context. For instance, short timeframes or low budget or a combination of the two, lead to organisation's pre-fabricated, short-intervention or limited timeframes, with limited field action and especially inadequate training activities, indicated by the common two or three-day CA courses. Nevertheless, we highlight single gaps in order to find solutions and recommendations for a future project phase.

4.1 General observations and recommendations

As mentioned before, during the CA gap-analysis of the different stakeholders, some capacity gaps had been found to exist on all levels and within all groups. In spite of this, the fieldwork also showed that there are many good findings that will help for the spread of CA in the project region. This is really 'good news' because in many countries this is not the case. We found that there is a good CA foundation in the three counties, because several CA experts exist (in the best case with hands-on CA experience of more than 15 years) and that there are many organisations that have worked, work or at least know about CA, and have a positive attitude towards CA.

Furthermore, we could identify several different 'ways of doing CA' and, most importantly, we found CA farmers, that have practiced CA for many years, convinced that CA is the 'only way of farming'—this was reconfirmed during the validation workshop. These farmers will be assets for any future CA activity in Western Kenya.

Likewise, we found that most stakeholders possess some good soft capacities. Most prevalent among these are the focus on farmers demands and the practicality of development interventions, the will to adopt or spread CA (both are indicators for a positive attitude), and an openness to change, e.g. cultural values and customs, gender equality, which is e.g. indicated by the gender equality employment rules and female staff numbers. Unfortunately, the brevity of most interviews did not allow for going into more details of soft capacities; issues like conflict resolution or problem identification skills could not be assessed.

And yet, some of the soft capacities were not found and are consequently a capacity **gap**. Most of them are issues like self-reflection, learning from experience and analysing their own behaviour. This does not mean that this is the case on a personal level, but rather on an institutional level. An indicator for

this is a missing CA performance-based M+E system that has clear performance indicators and a description of how to solve these rather internal work challenges and related plans of action.

We cannot give any **practical recommendation** for these institutions or organisations here, because this has all too often to do with the settings of the institution/organisation itself. However, we could **recommend** that GOPA, and perhaps GIZ, address this by providing a good example and invite stakeholders to participate in their (GOPA or GIZ) efforts in order to improve these mentioned soft capacities.

One core hard capacity that we found to have a **gap** is that many people describe CA by 'how it is done' and by 'what its benefits are', but they could not give a proper CA definition. On many occasions, principles were stipulated that have nothing to do with CA *per se*, e.g. terrace building and counter banks. During the interviews, it became clear that a vision, a 'picture in front of their eyes' of good and correct CA, does not exist. There are mixed-messages spreading about CA throughout the project regions, which again was confirmed during the validation workshop. In the case of 'how to do CA' this could be expected, but it is unacceptable, when it comes to the definition of CA and what its principles are. We identified this to be a **core-gap**, which, if solved, would make it clearer 'how CA could be done' and, consequently, provide a basket of CA options. This difference between 'how it could be done' and 'how to do it' is of great importance and addresses another core-gap that was detected. Many stakeholders have a limited perception of CA practice ('the how to do it')—which is indicated through their pre-packaged CA approach which is independent from their limited budgets—where only parts of CA principles are practised (minimum tillage is the most prevalent term used and practised) and farmers are only supported for a short time. This has very often resulted in a failure of on-farm CA and consequently in a misconception of CA and farmers ceasing to practice CA.

To resolve these capacity gaps, we **recommend** a special effort by the project to streamline CA understanding, using the FAO CA principles, which are applied simultaneously and continuously:

- Continuous minimum mechanical soil disturbance
- Permanent organic soil cover
- Diversification of crop species grown in sequences and/or associations

This definition has been developed over the last 15 years, and has been tested and proven in practice to yield in successful CA, but only if correctly applied for a longer period. Furthermore, we **recommend** the CA definition of different CA practices and the '**Need to know or be able to do',** developed and used for this CA CNA (see Annex 3), to be the guideline for all stakeholders in the future. One of the main benefits for the GOPA project and CA dissemination would be that, if considering the FAO definition and the different CA practices succeeds, then the decision making—in terms of CA—would be improved by all stakeholders; even CA strategies or CA plans would be enhanced once they are elaborated. Simultaneously, some of the soft capacity gaps would be addressed, because stakeholders would understand the full basket of CA options and enhance, or overcome, their negative attitude towards CA.

Another **core-gap** was detected during the fieldwork and belongs to the enabling environment. The absence of a CA strategy for the counties was also highlighted by several stakeholders during the validation workshop. This derives from the fact that there is not a national agricultural strategy related to CA or even a national CA policy. The 'CA-Strategy' would enable the different MoA to act and to developed a required CA strategy, it would especially help to allocate funds to CA. Currently, there are two national strategies developed and are up for public review; one is the agricultural mechanisation strategy and the second is the sustainable land management strategy. CA would need to be included in both strategies.

We **recommend** that GIZ on a national level, supported by GOPA, uses its 'good name' to continue the support of CA related strategies. This should be in the area of soil conservation, improved agriculture productivity, protection of the environment and the agricultural mechanisation strategy that is currently developed as mentioned. The latter (mechanisation) is a focus of the National Ministry of Agriculture and receives large financial attention. It would be helpful if CA machinery such as jap-planters, rippers, shallow weeders, animal drawn planters or mechanised no-till planters become part of the 'mechanised thinking' in Kenya. Once this process is on its way, the counties would need to be supported in

developing a CA strategy, or at least CA plans, which could be done already through a discourse between the MoAs and GOPA and also through the implementation of support of County stakeholder forums or Innovation Platforms (IP)[4].

Gap: in addition, we found that none of the stakeholders have special CA plans in place. This includes strategies, county development plans, and CA staff appointments or CA development plans, or how to extend CA activities in different institutions, organisations or the private sector.

We **recommend** that GOPA offers support for the development of CA plans to each of these stakeholders on the County level, which would lead to CA being embedded in strategies of each of these stakeholders.

The last core or overarching **gap** identified is training. Not only does the project in its CA approach have training as a central pillar, but it is also understandable that a 'new' agricultural practice needs to be learnt and training activities on all levels are the means to do this. We found that several institutions work in CA and non-CA training. And yet, during the study of CA training materials and the interviews, it became clear that many training courses had low-impact in the field. This had many causes, but two main causes for the low-impact of training are the duration of training courses[5], which is mostly only a couple of days, and the absence of CA training plans and/or CA training strategies.

Therefore, we **recommend** that the training activities need to be longer (time wise), because CA takes several years to be applied correctly; this was reconfirmed during the validation workshop. The training courses need to be adapted to the agricultural season and have several training units/sessions, which are aligned to the required CA action on farms, with an emphasis on ecological understanding, i.e. ecological literacy or *ecolacy*; the empowerment of farmers (good decision makers) would be the desired outcome.

As a consequence of this, it seems obvious that we **recommend** also that a CA training strategy needs to be put in place, for and by the counties and for and by the different CA stakeholders. This must include that all CA training providers have designated CA fields on which trainees discover and learn CA and that CA trainers or CA lecturers should be taken on exposure visits to CA farmers and other CA stakeholders for their improved and widened CA understanding. For future project activities, this will need to become a priority and holds great potential to improve project impact (effectiveness) and will thereby make its work more efficient, too. A CA training expert should be engaged to help with this endeavour.

4.2 The GOPA CA gap-analysis

GOPA is the implementing agent for this project in which CA is its most ambitious component (see TOR). It therefore is valid that a special GOPA CA gap-analysis was conducted. In order to do so, the project manager/team leader and the three County coordinators where included into the interviews. Likewise, the key-staff of GIZ was interviewed, because they set the enabling project activities environment. In this sub-chapter, we only focus on some, but very important core-gaps that have the potential to generate a significant improvement of the projects sustainable impact. Some more of the detailed findings of GOPA in each County will be described in Chapter 5.

The first finding in this regard is very positive. The GOPA project has embraced CA, which is an indicator of a positive attitude, a soft capacity. This counts for the CA CNA itself, too; having commissioned this assessment shows that GOPA is willing to learn and improve its work. This is a good and important soft capacity. We also found that CA is part of the planning and part of regular meetings, within GOPA and

[4] An innovation platform is described as a forum established to foster interaction among a group of relevant stakeholders around a shared interest. The stakeholders perform different but complementary roles in the development, dissemination and adoption of knowledge for socio-economic benefit. This could be in the form of new ideas, methodologies, procedures, concepts or technologies used or adapted from other locations (ACIAR, 2013).

[5] In conjunction with this is the high number of course participants, which do not allow for an equal participation in practicals. Therefore, the number of participants needs to be reduced to 15 to 25, depending on the training subject.

together with GIZ and WHH. Furthermore, County coordinators and the project management, as well as GIZ key-staff, are able to explain what CA is and what CA's benefits are.

Gaps: we found that this ability is sometimes just a replica of written or textbook passages. Furthermore, we found limitations in the capacity to differentiate between 'how it could be done' and 'how to do it' and 'what belongs to CA and what not', which is of great importance and addresses a core-gap that was detected. In our experience, all staff needs to understand CA in detail, in all its forms and practices. This would then enable them to make the right decisions about all aspects of the CA project work, including its strategic approach, the required trainings, and how all stakeholders could resolve their own capacity gaps.

Therefore, we **recommend** that the GOPA staff, i.e. management and coordinators, undergo a thorough CA training course, which should include a visit to existing CA examples in Kenya, the region and, for the best impact, to South America, especially Paraguay[6]. Here, GIZ has more than 25 years working experience with CA and smallholders. The latter would fast-track the learning and understanding of CA and it seems the most cost-effective way to achieve the desired change among GOPA staff. The CA definition of different CA practices and the '**Need to know or be able to do',** developed and used for this CA CNA (see Annex 3), should only be the starting point. All this will lead to a more focused and useful use of project resources and improve the impact of GOPA's work.

The second most eminent **gap** identified is the timeframe of this project itself. CA requires an experiential learning process, and it takes several years, approx. five to seven, depending on soil type, farm history and activities, until a good CA system is up and running which can reap most of its potential benefits. The approach—given by GIZ regulations on local subsidies—to use six-month contracts with e.g. NGOs or training service providers is too short; farmers need continuous support throughout several seasons. We identify this as an institutional capacity gap, certainly a general one for GOPA and GIZ.

Our **recommendation** is clear, in a next project phase, the timeframe of CA activities needs to be extended, which might require that activities need to be planned well beyond the project phase mentality, set by the German government[7].

This finding is to be seen in connection to the next identified **gap**. During the four-week period, the CA CNA team was not able to find a clear CA strategy, in which the integration of all four project components was displayed. It was found that there are still mixed messages received by stakeholders in the field, coming from GOPA, about CA and ploughing; this counts for GIZ, too. One could attribute this missing CA strategy to the limited understanding of CA among GOPA staff, perhaps, already by the experts that put this project approach into action in the first place. Other gaps in relation to this are the lack of any cohesive CA action plan, we could not obtain any CA specific report and the absence of a specific CA M+E system. The latter would indicate that the performance of CA on field is understood, monitored and an improvement of the CA farmers practice is desired.

Photo 3. John Mukulama (right) interviewing Michael Sande, WHH

The **recommendation** therefore is also clear, for the next project phase or even for this phase, work out a proper CA strategy with a CA action plan and a CA M+E system focused on field performance and

[6] These exposure tours within Kenya and to Paraguay need to be planned well and be educational study tours. The tours need to include relevant CA elements, take place during agricultural on- or off-season, where one is able to see CA practices and, in the case of Kenya, make use of the best CA examples in the country. Likewise, GOPA can test these CA examples for future use for exposing CA stakeholders from the project region in Western Kenya and develop a standard CA exposure/study tour.

[7] We are aware that this certainly presents the biggest challenge to GOPA and GIZ for sustainable CA impact on field level. Nevertheless, it is our recommendation based on our experience and findings.

results on-farm. This strategy needs to have a clear response plan to improve farmers' actions, e.g. have plans for crop rotations, use of cover crops, etc. The strategy needs to be elaborated in conjunction with the project partners, e.g. MoA, GIZ and other implementing agents, but only after the GOPA staff has received its own CA training or has undertaken the CA study tours mentioned above. This will lead to a more focused and effective use of project resources and improve the impact of GOPA's work.

The GOPA approach used in the project and described in Chapter 2 shows clearly that training is the central or core activity. However, one **gap** that was spotted is that there is no CA training concept in writing. The trainings conducted are too short; as mentioned before, CA takes several years to be applied correctly.

Therefore, the **recommendation** is that GOPA draws up a CA training strategy, based on modern training approaches, including experiential learning (e.g. on-the-job training of extension officers or field staff), and a CA exposure study tour within Western Kenya[8], but only after the GOPA staff has received its own CA training or has undertaken the CA study tours as already mentioned. A training expert needs to be employed for this task. The training courses as part of the training strategy need to be adapted to the agricultural season and have several training units/sessions, which are aligned to the required CA action on farms. It is mandatory that all training providers are supported in setting up CA fields in their respective organisations and that all their trainer staff is streamlined to and able to train the basket of CA options. Once the training is up to the highest standards, the project impact will be improved in general and on-farm, and its resources will be used more effectively and efficiently.

The penultimate **gap** identified and mentioned in this sub-chapter is the lack of CA knowledge and information system of GOPA and GIZ. Most strikingly, both the project manager of GOPA and programme manager of GIZ did not know that the former-GTZ had already worked in CA in Western Kenya. An Internet search did not yield much result, however, one of the CA CNA team members had actually worked in a GTZ supported project in Western Kenya. Furthermore, most CA stakeholder stated that they have a lack of CA information and that they cannot access any helpful CA information without spending much time on the Internet—only a few hard copies are available and mostly confined to the producing organisation.

The **recommendation** is to plan for or identify the most easily accessible CA information system available and make this information obtainable, both in hard and soft copy, to all CA stakeholder groups, especially farmers. Identifying an existing CA information system is more cost-effective than creating a new system. We recommend that the GOPA staff itself should do the planning or identifying of a CA information system, because it presents a good opportunity to test the system through their own learning. In this context, GOPA needs to define the indicators for a good and sufficient CA information system, which can only be done once GOPA staff has been trained in the full basket of CA options (see first recommendation in this sub-chapter).

The last finding concerns the use and bulking of cover crops, which is one of the main activities in the project's CA approach. In theory, this is a very good approach as cover crops will and have to play an important role in any CA system. However, in practice we found two **gaps**. First, most of the supported cover crop seed bulkers produce the seeds in conventional, plough-based systems. This is a clear contradiction to the 'CA message' sent out by GOPA. Second, the cover crops produced by seed bulkers and also found to be used on-farm or even at research institutes (e.g. KALRO) are, in general, limited to a few species: *mucuna, desmodium,* and/or *dolichos lab-lab*. Other species have been used such as pigeon pea, but not on a wider scale. Another indicator for this gap is also that not one stakeholder ever mentioned the difference between summer and winter cover crops. Finally, only legumes are seen and used as cover crops, but the use of grasses such as black oats is also almost unknown.

The **recommendation** for resolving this gap is obvious, all cover crop seed bulking must be done under CA. The farmers themselves should be enlisted for this activity, compensated and through this motivated to convert to and to do CA.

Likewise, we **recommend** that the cover crop use needs to be diversified and that winter or off-season cover crops need to be introduced. This should first happen with farmers that have fenced fields or that

[8] For this study tour, GOPA needs to identify the best CA examples in the region, and plan a tour that includes all aspects of a CA planting season—'seeing is believing'—and through this tour, many stakeholders will be convinced that CA works and what the basket of options is.

have no livestock pressure, which would create role-models from whom other farmers can learn. In relation to extending the varieties of cover crops, we could see an important role for a closer collaboration with research institutions (RI) like KALRO and CIAT.

We **recommend** that these RI should be supported in winter or off-season cover crop trials and in the probing and testing of new cover crops varieties. Again, the GTZ experience from Paraguay sets the tone and provides the role-model[9]. This needs to be considered for the next project phase's design.

After having described the overarching gaps and the gap-analysis for GOPA in this sub-chapter, the following chapter focuses on the findings in the three counties, and with it, a more detailed and specific CA Capacity Needs Assessment on County level.

5 Capacity Needs Assessment for the Three Counties—Findings, Discussion and Recommendations

5.1 Bungoma

5.1.1 Overview of CA in Bungoma

Conservation Agriculture was introduced in Bungoma in 2004 by the Food Agriculture Organization of the United Nations (FAO) in association with the National Government of Kenya and Tanzania, and funded by the German Government, which launched the CA-SARD project. It aimed to ensure food security and poverty eradication by enhancing CA adoption by smallholder farmers. The project covered Bungoma, Mbeere, Laikipia, Siaya and Nakuru Districts.

Today, CA in Bungoma is being funded and coordinated by GIZ, with GOPA and WHH as implementing partners, working with other stakeholders i.e. MoA, NGOs, CBOs, FBOs, and private organizations, to promote CA with smallholder farmers in Bungoma County.

In all areas of Bungoma County, CBOs, farmers' groups and farmers were implementing CA in different methods, some were using herbicides for weed control and others were using shallow weeders, hoes and rippers for minimum tillage, they were practicing crop rotations, and the use of mulch and/or crop covers. Very often, jab planters were used for planting. However, the majority of them were faulty with no spare parts available, and the majority of the farmers did not have proper CA tools and implements. Most homesteads used family labour for CA while others hired labourers.

Lead farmers in CA used minimum tillage, cover crops/mulch in bananas, sugarcane, kales and in maize crops. Maize stover was well spread in some fields and farm yard manure was applied as well. However, some non-adopter farmers burned their maize stover while others used it as animal fodder. There is no proper livestock management system in place as most homesteads have livestock in tethering system and improvised zero grazing units.

The County had only one service provider. This service provider had 2 Fitarelli planters for hire services, but the implements were not in working condition due to lack of spares. The service provider has limited knowledge in CA and needs to be retrained in CA tools and implements operations.

GOPA has partnered with the MoA and has a MoU at County office level. GOPA coordinates CA activities in the field, while MoA through its extension service promotes and trains CA farmers. The Government has various institutions to support CA, e.g. research, an Agricultural Training Centre (ATC) and an Agricultural Technical Development Centre (ATDC), in addition to the provision of the extension service through a subject matter specialist (CA experts) at National and County levels. During the CNA, the MoA extension staff was demonstrating the operations of CA tools and implements, such as jab planters, shallow weeders and rippers.

In Sangalo area, seed bulking on demonstration plots for cover crop seeds like *lab-lab*, *desmodium* and *pigeon peas* was doing well, though production was under conventional agricultural practices. ATC had trained 1,500 farmers in CA according to Henrick Wakochwe, Deputy Manager Mabanga ATDC and CA

[9] The results of the GTZ CA Paraguay research, Florentin et al., 2001, *ABONOS VERDES Y ROTACIÓN DE CULTIVOS EN SIEMBRA DIRECTA. PEQUEÑAS PROPIEDADES, GTZ Paraguay,* was translated by FAO into English and can be downloaded at: http://www.fao.org/fileadmin/user_upload/agp/icm12.pdf

expert. In addition, the institution trained 70 extension staff in CA, had 40 demonstration plots and had held four workshops.

The training methodology used by the MoA, Vi Agroforestry, Anglican Development Service (ADS), ATC and ATDC was through individual coaching and farmer groups, using Farmer Field Schools (FFS), field days, on-farm field demonstrations, agricultural shows, lectures in classrooms and exchange programmes. A few staff were trained in CA and had qualified as CA experts like Maurice Emuria, a MOA extension staff, Makanda Khisa of Vi Agroforestry and James Musito of ATC Mabanga; these three are training farmers in CA. There is a proposal for CA curriculum development and CA courses at ATC, ATDC and at institutions of higher learning according to Dr David Mbakaya of KARLO.

Photo 4. Maurice Emuriaa CA expert in a CA plot of kales well covered by mulch, Tembalea

During the initial stages when CA started with FAO, GIZ, African Conservation Tillage Network (ACT) and KARI (now KALRO) in 2004, the CA adoption rate was in the ratio of 1:1 men and women; CA adaptation and adoption by farmers in the District followed the FFS methodology. In Bungoma District, 10 CA-FFS had then been registered which are still in place and have 300 farmer-members. The MoA successfully trained 6 facilitators and provided them with insights in CA techniques, monitoring skills and the equipment needed.

At the moment, the adoption rate is low due to financial constraints with CBOs, NGOs and a lack of budget allocation for CA by MoA. The number of extension staff involved in training farmers is low, which is further aggravated by a lack of CA certified seeds and proper CA tools and implements. GOPA has partnered with MoA to implement the CA component through a local subsidy and this should promote CA adoption.

During the field interview on CNA with Lead Farmers (LF), they said that they had adopted CA because of the following benefits: increased yields per unit area of land savings on labour and costs on ploughing and weeding, moisture conservation, and improved soil fertility and soil structure.

5.1.2 CA gap-analysis of the CA stakeholders

Farmers

Findings

- Non CA adopters had no adequate knowledge and skills of CA.
- Lack of tools and implements for CA farmers.
- Source and access to CA information did not cover all farmers.
- Both CA and non-CA Farmers had free grazing or tethering systems of livestock management.
- Lack of cover crop seeds, like *lab-lab*, *mucuna*, *pigeon peas* and *desmodium* as well as lack of CA certified seeds.
- Lack of proper planning and record keeping by farmers.
- Shortage of labour.
- Traditional norms, such as a resistance to adopt new technologies.

Recommendations

- A programme for re-training of CA non-adopters and new CA farmers on CA knowledge, practices and skills should be developed by stakeholders, with management information system being stored in soft copies, through radio broadcasts, use of pamphlets, flyers, brochures, CA field demonstrations and the use of FFS approach, and learning from lead farmers' experience as well as exchange programmes.
- The manufactures of CA tools and implements, artisans, ATDC, ATC and agro-input dealers are requested to come up with affordable tools for CA and be supported, too.
- The number of extension staff will need to be increased to cover all farmers.
- All farmers should be trained on livestock management systems in favour of CA in order to prevent animals from feeding on crop residues, roaming on CA farms, and on the use of proper zero grazing units with no burning of crop residues.
- The MoA should continue with the seed bulking exercise with farmers for sustainability of seed sources, the stakeholders can give a start-up package for CA certified seeds, then thereafter farmers are trained in producing their own seeds.
- Farmers will need to be trained in farm-planning and record-keeping.
- Training draft animals for CA farm operations will save family labour.
- Training in CA can change farmers' attitude in order to adopt CA technology.

Photo 5. Beatrice Wamalwa of Tembelea Location displays her farm records and planning of her farm enterprises in CA

Farmer organizations (WRUAs, WUAs, CBOs)

Findings

- The group lacks a FFS training approach in CA.
- The CBO is selling its value-added products and farm produce locally with no outside market due to the lack of transport facilities for the goods.
- The CBO has no access to credit and finances for CA expansion, and is over-depending on donor-funding for CBO programmes in CA.

Recommendations

- The FFS training-approach in CA should be re-introduced, as members were using a group approach and were not practicing FFS in their CA training. CA training packages should be re-introduced and cover new CBO members.
- The CBO should be trained in marketing of their products as a group, which reduces transportation costs, and become better in bargaining skills in order to get better prices for their products. This can promote CA among the group.
- A Savings & Credit Co-operative Society (SACCO) should be formed and registered to provide credit and financial services to members at a lower interest rate than the Bank interest rates and create farmers' awareness on source of credit among members, rather than depending on donor funding.

Extension officers and technical advisors of NGOs and CBOs/FBOs (SCAO, WAO, NGOs and CBOs/FBOs)

Findings

- Not all extension staff was trained in CA and almost all lacked CA trainer skills.
- Records of farmers trained in CA missing at ward and County level.
- Lack of enough extension staff and transport for the field staff.
- Lack of CA input information on seeds and cover crop seeds.

Recommendations

- A training schedule for all extension staff in CA should be organized by different organizations with refined CA principals to harmonize on CA training extension skills. And records should be kept for CA trainees and CA practitioners who have graduated. Certificates should be awarded to graduates.
- Farmer/Staff ratio could be improved by recruiting more field staff, considering gender equality in recruitment. All field staff should utilise adequate means of transport as motorbikes to facilitate CA training and promotion in the field.
- Continuous training of staff in CA and exchange programmes on best CA practices.
- Radio programmes on CA.

Suppliers of inputs (Agro-input dealers)

Findings

- The suppliers of inputs do not have knowledge on CA or give CA advice or train clients in CA and had no CA seeds except for maize in stock.
- They stock herbicides, which are expensive and not affordable to farmers.
- The suppliers do not have cover crops seeds, which are consequently not available to farmers.

Recommendations

- All stakeholders promoting CA can train agro-input dealers in CA seeds and cover crop seeds sourcing and CA knowledge.
- Farmers should be trained by extension staff to produce their own CA cover crop seeds, as a way of CA sustainability.

Cover crop seed producers (ADS, Ace Africa, MoA)

Findings

- The MoA extension staff had distributed *lab-lab* and *mucuna* seeds to farmers for seed bulking, however production of cover crops seed was done under conventional methods.
- ADS and Ace Africa relied on donor funding and had no CA training activities.

Recommendation

- Staff training on cover crop production under CA should be encouraged.
- Contract farming to be introduced to promote cover crop production and marketing, and promote CA.

Suppliers and manufacturers of CA implements (Artisans, ATDC)
Findings

- No availability of CA implements on the local markets from suppliers and manufacturers.
- Price list was not available for prospective buyers for orders of CA tools and implements.
- No CA tools and implements were undergoing repairs and maintenance.

Recommendations

- Sensitization on sources of tools and implements should be done to all stakeholders who are prospective buyers and users.
- Tools and implements can be fabricated by ATDC and artisans through PPP, and public price lists need to be available for CA tools and implements.
- Artisans should be empowered to manufacture CA tools and implements.

Photo 6. Mr Japheth Wekesa displays his skills in planting by using a jab-planter

CA service providers (private)

Findings

- CA service providers are very few compared to the farmers who need CA services.
- Lack of knowledge in CA, tools and implements operations, and a fully equipped office.
- No spare parts were available for the service providers, for their tools and implements in the local market, and CA tools are very expensive, e.g. Fitarelli, ox-drawn planter, jab planter and sub-soilers.

Recommendations

- The service providers should have a representation at ward and village level with an operational office.
- The service providers should be trained in CA, tools and implements, repairs and maintenance.
- Local artisans shall be encouraged to come up with affordable CA tools and implements and spare parts, as well as partner with other stakeholders for the sourcing of affordable tools.

CA training providers (ATDCs, ATCs, BAC, Agritex)

Findings

- Lack of curriculum development for CA courses and modules.
- No records of CA farmers trained in CA.

Recommendations

- Curriculum for CA courses to be developed and shared among training providers.
- At the end of a training course, an inventory of all trainees in CA should be kept for easy reference and follow-ups.
- CA training providers should facilitate training of CA to all stakeholders.

Micro-finance institutions or projects (Banks, Credit NGOs, Agrics)

Findings

- Credit officers have no knowledge of CA and could not appraise CA farmers or formulate affordable loan products for these farmers.
- There is no policy environment favouring microcredit for CA farmers.

Recommendations

- The credit officers should be trained in CA to enable them to appraise CA farmers and formulate loan products for CA farmers as well as providing brochures or information materials on CA products.
- Microcredit products favouring CA farmers to be introduced.

NGO/CBO/FBO (ADS, Tembea, CESUD, Kimaeti, REFSO, One Acre Fund, UCRC, World Vision, Vi Agroforestry, SOFDI)

Findings

- CA is promoted and practiced differently by stakeholders.
- CBOs/ADS were relying on donor funding for the CA activities.

Recommendations

- A stakeholder workshop to harmonize CA principles is necessary.
- An exit strategy and long-term approach to CA should be in place for sustainability instead of relying on donor funding.

Research institutions (KALRO, ICRISAT, CIAT, CIMMYT)

Findings

- No budget allocation for CA research.
- On-farm research is of seasonal nature and requires several years for good results for confirmation.
- Small plots in Western Kenya do not favour CA research.

Recommendations

- Budget allocation for CA research work to be provided and CA FAO principals for research to be defined by researchers.
- CA on-farm research to be a long-term approach for CA promotion.
- Where land plots are small for research, the hiring of land is recommended.

Education institutions (Bukura Agricultural College, Maseno, Masinde Muliro, JOOUST)

Findings

- General agriculture courses are offered at different levels without CA as contents.

Recommendations

- CA courses and curriculum to be incorporated with accompanying policy to promote CA.

MoA-County offices

Findings

- A MoU between GOK/GOPA at County offices was available and County extension staff and GOPA staff was working together in CA coordination and promotion.
- There were no records of numbers of famers trained in CA.
- No policy on CA in the County integrated development Plan and no budget allocation for CA.

Recommendations

- A database for CA activities and number of farmers practicing CA should be installed at MoA and readily available to all parties at all times.
- A long-term approach is necessary for CA promotion at County level.

GOPA, GIZ, WHH

Findings

- A short-term project with MoA and GOPA is only for six months and is not enough for CA sustainability.
- Vital documents on farmers trained in CA are not available, yet training is on-going.
- The MoA has no CA policy at County and national level.

Recommendations

- A long-term approach with an exit strategy is necessary to promote CA and its sustainability.
- Sharing and availability of CA farmers and staff trained in CA and data management between MoA and GOPA should be documented for public utility.
- GIZ-GOPA has to lobby for CA policy at County and national level.

5.1.3 Discussion

The gap-analysis results noted among farmers and farmers groups that the adoption rate was low and can be attributed to lack of adequate CA knowledge. Hence the need for continuous training of farmers in CA knowledge according to the three FAO principles, as the farmers had a positive attitude towards CA adoption. The low adoption rate is also attributed to different stakeholders practicing CA in different methods and a need has arisen to harmonise the CA practices among the stakeholder groups.

CA non-adopter farmers did not adopt all components of CA due to various reasons such as limited access to inputs (*mucuna* and other cover crop seeds), labour constrains, or insufficient resources.

Inputs and cover crops seeds like *mucuna* and *lab-lab* were not available to all farmers, calling for CA seed bulking to address the gap and training courses in seed multiplication. Farmers also requested to be trained in seed selection, training skills in CA tools and implement operations and sourcing, and motivation by being awarded certificates and be involved in exchange programmes.

The suppliers of agro-inputs had the infrastructure, but had no stocks of cover crop seeds and legumes. The suppliers had no knowledge of CA and therefore will need training in CA skills, so that they can learn CA, and possibly can identify seeds sourced from CA farmers.

Lack of knowledge in CA by artisans, tools and implements manufacturers and service providers was noted and trainings in CA will need to follow to bridge the gap and the availability of CA tools and implements. A group was requested to fabricate affordable CA tools and implements for the farmers since banks were not offering credit to CA farmers, but only to farmers in general with high credit interest rates. ATDC and local artisans were identified so that farmers know them as source of CA tools and

implements. The service providers have the potential of manufacturing CA tools for the farmers as per demand and make them available in the local markets for CA promotion.

5.1.4 Conclusion

A number of recommendations were given for various stakeholder groups, however it is important to emphasize that the success of CA in Bungoma will require the participation of all stakeholders. The policy makers will need to provide an enabling CA working environment by formulating a CA policy at National and County level, including budget allocation for CA. The donors and the MoA should continue supporting CA programmes for the CA sustainability like training local leaders and professionals in CA who will take over CA training when the donor exits. The MoA will also allocate budget for CA activities.

All stakeholders should adopt the FAO CA-principles, so that CA can be trained and practiced the same way by all stakeholders. The stakeholders should hold regular meetings on the way forward in CA and share success stories. The training and education institutions should develop a curriculum for CA.

5.2 Kakamega

5.2.1 Overview of CA in Kakamega

The GOPA project in Kakamega targets, trains and coaches LF to adopt CA; supports the private sector (local artisans, tillage service providers and equipment suppliers, etc.) to provide equipment relevant to CA; and supports some farmers to specialise in cover crop seed production for CA (see Figure 1 for the general GOPA CA approach). In Kakamega, these tasks are implemented by three major stakeholders namely Community Education for Sustainable Development (CESUD) for training LF, the ATDC Bukura for training artisans and tillage service providers, and ADS for bulking cover crops.

A total of 41 respondents were interviewed, which included farmers (8), education institutions (3), GOPA & WHH (2), NGOs (8), input suppliers (3), farmer organisation (1), county staff (3), fabricators (3), service provider (1), researchers (2) and MoA extension officers (7).

Information on when CA was first introduced in Kakamega is scanty, as most of the respondents in the extension service have no idea on the history of CA in the county. KALRO in Kakamega recalls that CA was introduced in the county in 2010 by the 10-year SIMLESA project implemented by KALRO, Kakamega itself. This was followed by Sustainet East Africa which partnered with ADS to implement the “Scaling up sustainable agricultural practices for smallholder farmers in Western Kenya” project, funded through a local subsidy by the then GTZ (now GIZ) from July 2010 to 2012. Thereafter, the Ministry of Agriculture (through ATDC) implemented other CA projects/activities in the county and likewise did other stakeholders such as Sustainable Organic Farming Development Initiative (SOFDI) and CESUD.

Photo 7. Johnstone Malenya (far right) of Eshibeye, Lurambi, at his CA farm

The GOPA CA project is being implemented by CESUD and ADS, with PAFID (Participatory Approaches for Integrated Development) and ATDC engaged to train the implementing partners. The project targeted to train 950 farmers in 19 wards between July 2016 and January 2017 through demonstrations, group trainings, field days and exchange visits. The target has not been met as a result of a drought and delay in start-off, especially in Likuyani Sub-county.

Though the above interventions have been made since 2010, CA adoption by farmers has been largely piecemeal and disjointed due to various reasons as further described below. A major bottleneck has been the approach taken by the implementing agencies where they emphasise on only some CA

practices while ignoring (or giving less emphasis to) others, which leaves the farmer with partial information. This has been evidenced from the training modules used by the field officers and farmer trainers.

Discussions with the MoA extension staff in the wards and sub-counties attest to the lack of backstopping support to the farmers after previous projects ended, because the County MoA did not facilitate them. This left the farmers in a helpless situation whenever they required technical advice and eventually they fell back to the conventional system, which they understand best. The unavailability of CA service providers and cover crops in the local input shops worsened the situation. While farmers clearly state the benefits of CA, they seem handicapped in applying the practices in their farms, mainly because of their inadequate skills to overcome emerging challenges.

5.2.2 CA gap-analysis of the CA stakeholders

The majority of the stakeholders interviewed showed a hard capacity of knowledge of some CA options that they were practising or implementing in the on-going projects. Most of the respondents expressed some soft capacities mainly positive attitude towards CA and willingness to learn and disseminate CA skills if well equipped.

The **gap** identified here was the lack of knowledge of the whole basket of CA options available. This has been mainly due to inadequate training that focuses on some CA aspects only and not the complete basket of CA options.

Recommendation: CA trainings should offer the full basket of CA options, there should be regular and consistent experience sharing forums/meetings and adequate information materials should be availed. Practical skills need to be emphasised for all the stakeholders to ensure that they apply/train what they have tested and gained satisfaction. Awareness creation through print and electronic media programmes will boost the dissemination of information. This will ensure that the CA trainings conducted are harmonised across all stakeholders and farmers get uniform information that adequately covers the full basket of CA options.

The farmers visited had mainly adopted minimum tillage and annual cover crops and, except for the demonstration plots, there was no evidence to show that they were having residue retention in their farms.

Photo 8. Focus group discussion with KALO CBO members

The farmers expressed some soft capacities like their willingness and positive attitude to adopt the practices (as witnessed in the demonstration plots) in the coming seasons and the lack of confidence in the application of the learnt skills, mainly due to the fear of making mistakes, which would make them a laughing stock of their neighbours. A soft capacity **gap** observed was the lack of the ability to self-reflect and learn from experience (memory of the learnt skills). The farmers who were earlier trained by previous projects showed some hard capacity **gaps** like lack of adequate residue and unavailability of CA tools, such as weed scrappers and rippers and failure to plan and keep records about the CA activities (and their farm in general). The farmers within the project had the implementers as the major sources of information. The farmers who were not part of the running projects lacked information. Therefore this indicates a major gap in knowledge and skills about CA practices and application at the farmers' level. A focussed group discussion (Photo 8) also yielded similar results.

Recommendation: conduct regular and consistent CA trainings, avail information materials, training on economics of CA, crop diversification and crop/livestock integration. Regular backstopping by the extension staff will enhance the farmers' confidence in the CA. These interventions will ensure that farmers are fully equipped with CA skills and understand the economic as well as the other benefits of

CA. The backstopping activities will provide farmers with a constant point of reference and support where they come across challenges in the implementation of the production system.

The **local farmer association** interviewed (Kakamega FFS Network) was a very vibrant organisation a few years back. Unfortunately, the network is now inactive due to poor leadership, lack of transparency and accountability, and poor management of the network resources. These problems arose mainly due to lack of the oversight role that was being played by the MoA extension staff as well as lack of frequent backstopping of the organisation by relevant stakeholders.

The r**ecommendation** is that these soft capacity gaps need to be addressed by training on leadership skills, group dynamics, transparency and accountability, resource mobilization and financial literacy.

The hard capacity **gaps** identified were the lack of CA knowledge and skills, and no access to CA knowledge and information. This will ensure that the group leaders are accountable to their members and the backstopping authorities, which will enhance the leadership processes.

The **recommendation** to fill this gap is to include empowering the farmer group with CA knowledge and skills, and provide regular backstopping services.

The **extension officers and technical advisors of NGOs and CBOs/FBOs** interviewed (MoA and NGOs) have been exposed to CA knowledge through training and on-the-job experiences. The knowledge they have is only on some CA aspects. The NGOs interviewed, CESUD, SOFDI and ADS, rely on donor funding for agriculture/CA activities. Most of the respondents only talked about minimum tillage and had little information on the other CA practices. The MoA only trains the farmers on CA when there are projects supporting them with transport. This was attested by the fact that the activities implemented by previous stakeholders, who worked with the same MoA extension staff, cannot be seen in the field (i.e. the extension staff does not continue disseminating the CA technology to the farmers or backstopping them on the same after the project ends, despite their continued presence and interaction with the farmers).

Photo 9. Focus group discussion with extension staff at Lugari SCAO office

Gaps: the hard capacities lacking are a long-term CA strategy, limited CA skills, lack of adequate funding for CA activities, no reliable data and knowledge management structures, no staff development plans, no guiding policies on CA, projects implementation limited to donor specifications and funding, delayed funding hence late start of project activities (e.g. current cover crop bulking project), and a delay in the release of project/operations. The soft capacities lacking include low enthusiasm and self-drive to apply CA skills learnt, in their daily extension activities, a negative attitude/apathy for CA ('don't believe that CA works'), and low transparency and accountability.

The r**ecommendation** to resolve the hard capacity-gaps are backstopping by CA experts (see Annex 10) and others from outside the county, adequate funding by the donors and county government—based on performance/deliverables to cater for all implementation activities—, a quality assurance mechanism (e.g. MoA) for the basket of CA options, regular refresher courses for experience sharing and updates on new developments/success stories, and concrete plans for an exit strategy by each organisation. Project funds should always be released in time by the donors/Government to allow for timely field activities based on the season. Data and knowledge management systems need to be enhanced and operational. And finally, mechanisms for adequate data collection for socio-economic aspects of CA should also be put in place.

The recommendations to address the soft capacity gaps include training on positive attitude and self-drive by the extension staff (to be proud of their achievements) as well as professional ethics.

Suppliers of inputs are major players in information dissemination to their customers on best practices. Due to their capital base and given the seasonal cycle of demand for inputs, they are unable to stock all the varieties of inputs required by the farmers, especially at planting time. This results in farmers having little choice on the variety of inputs to use and farmers end up applying less or inferior inputs, and sometimes even inappropriate ones.

Gaps: the three suppliers interviewed were found to have limited knowledge of CA with only one having been sensitized about it. Additionally, inputs in their stock lacked cover crop seeds and other CA related inputs, and limited access to affordable credit to adequately stock their shops.

Photo 10. Kakamega Farmers Agency, an Agrovet in Kakamega town

Recommendations (hard capacities): the stockists/suppliers should be sensitized on the variety of CA inputs and equipment to stock as well as on business skills. GOPA should also train the suppliers on financial literacy and link them to credit providers. The suppliers also need to be exposed to practical CA skills/activities to understand the dynamics of CA and lead in setting up CA demonstrations. These capacities will enhance the suppliers' skills and enable them to stock the necessary CA inputs that the farmers require. They can also be able to stock CA equipment after they are sensitized and realise there is an avenue for further business on CA equipment. As farmers make consultations with the stockists, the latter will be able to sensitize the farmers on the benefits of CA and encourage them to adopt the practice.

Soft capacities identified were positive attitude towards the CA technology; suppliers were eager to learn more on the CA concepts and skills to expand their knowledge base and to attract and train more clients.

The **cover crop seed producer** interviewed in Kakamega was ADS. The GOPA partner was tasked with bulking *dolichos lab-lab*, *desmodium*, *groundnuts*, *beans*, *grain amaranth* and *soybeans* (though some are not cover crops *per se*). The bulking activity was carried out with conventional plough-based agriculture and within 6 months. This contradicts the project's efforts of CA application in practice. The issues of late release of funds and lack of adequate funds for all data collection activities arose leading to delayed farm operations, whose results were made worse due to the prolonged dry spell. This is a clear example of inadequate time for planning and execution of the activities.

The hard capacity **gaps** identified were the inadequate knowledge on "what is a cover crop" and the full basket of CA options, inadequate training for the project implementation staff, inadequate facilitation/funds allocation for data collection, a lack of harmonised/clear roles of the MoA extension staff and their deliverables, delayed start of the activities, and inadequate knowledge of CA practice for cover crop bulking.

Therefore, the **recommendations** are the need for timely planning, funding and execution of field operations, cover crops agronomy and management. Roles for various partners need to be clearly defined and their deliverables stated before the start of implementation of the project. Results of these interventions will be better skills and knowledge on cover crop seed production and bulking as well as on the CA practices.

Suppliers and manufacturers of CA implements were scarce in the county. The GOPA project has recently trained some equipment fabricators/artisans who are now producing the demanded CA tools and equipment for the farmers, which include weed scrappers, shallow weeders, chaka jembe and animal drawn rippers. The soft capacities identified were their willingness to learn, they believed in themselves to deliver (confidence) and appreciation for the knowledge gained.

Nevertheless, some hard capacity **gaps** were identified, including the lack of finances to invest in commercial equipment production, inadequate skilled technicians, poor infrastructure for fabrication and marketing, record keeping skills and management.

The **recommendations** are to train practical skills on equipment use and maintenance, financial literacy, record keeping skills, and linkage with equipment suppliers/outlets. There will be a need to put in place a quality assurance mechanism to ensure the equipment fabricated is of high quality. These skills will enhance the artisans' capacity to produce quality tools and equipment and link them to markets.

CA service providers are scarce in the county. Only one private service provider is known to be providing CA ripping services. The CA service provider confirmed that the demand for CA services is growing quickly and there is need for more providers to come on board. ATDC< also provides CA services to fill the supply gap. But this is dependent on the funds available for running the service from the Government.

The hard capacity **gaps** include the lack of adequate equipment for the services required, lack of knowledge on CA, no access to affordable credit (has only one ripper) and does not disseminate CA knowledge to the farmers he serves.

Recommendations: recruitment and sensitization of more service providers, training on entrepreneurial skills, financial literacy and marketing skills. The conventional service providers should be trained on CA to induct them to the CA opportunities and to increase the numbers of CA service providers in the County. The ATDC requires to be funded by the County Government to support training of the service providers and provide CA services to farmers who fail to get services from the service providers.

The **CA training providers** interviewed in Kakamega included ATDC and ATC Bukura, both of which are Government institutions. The ATC only hosts other organisations and the County training activities. It was observed that, save for the demonstration plot at ATDC, all the farming activities at the vast ATC farm include maximum soil disturbance/conventional practice, i.e. ploughing. Private training providers (NGOs) limit their training services to the kind of services they are offering farmers and do not necessarily train on full CA options. The positive hard capacities observed were that the ATDC has CA trainings in their curriculum, and that one ATC staff and the ATDC staff are trained in CA. The County mainly relies on ATDC for CA equipment training.

The capacity **gaps** include inadequate numbers of CA trained personnel on CA, no policy guidelines on CA, inadequate infrastructure for CA training, lack of funds for CA training, and no CA demonstration plots at ATC for training purposes.

The recommendations are to sensitize all the training providers to include CA principles and concepts in their curriculum, the County Government to develop policy guidelines on CA, provision of adequate funds to invest in CA training, establish demonstration plots for CA at the ATC, integrate CA in their curriculum, and support with proper infrastructure for CA training programmes by the Government or stakeholders/donors. When this is done, the CA training providers will be better equipped and disseminate more comprehensive CA techniques including CA demonstrations for farmers to learn from the practices. The CA policy guidelines will ensure that all the stakeholders are reading from the same script and disseminating related content to the farmers that adequately addresses the needs of the farmers to be able to adopt the technology.

The soft capacity **gaps** observed were staff apathy and attitude towards CA. This has resulted in CA trainings no longer being organised by ATC.

The **recommendation** is that the ATC management, or County Government, exposes the staff to successful CA farmers for them to appreciate the benefits of the technology.

The Micro-finance institutions (MFIs) or input credit NGOs. The input credit NGOs (e.g. Agrics) only focus on conventional practices for production. They have introduced some positive hard capacities, like soil testing, to inform on the types of fertilizer and management practices that are required for better yields (though CA is not taken as an option).

The hard capacity **gaps** identified were the lack of CA knowledge, inadequate extension personnel, no CA related financial packages, and few farmers reached in the county.

The **recommendations** are that the MFI should formulate CA friendly packages for farmers with a grace period before the start of repayment, a need to increase the number of personnel for the credit NGOs to cover more areas and farmers, more publicity and awareness of available packages through local meetings, print and electronic media, and partnerships with other organisations promoting CA.

The Research Institution interviewed was KALRO, Kakamega. The discussion revealed that research funds are mainly donor funded. It was noted that the staff running the CA project are the only ones trained on CA skills. Other staff is only sensitized during result sharing workshops. Soft capacities observed were the positive attitude and passion by the researchers towards CA.

The hard capacity **gaps** were inadequate capacity on CA concepts and skills, limited funds for CA research, limited CA research issues being addressed, lack of vibrant CA knowledge and information management system, poor infrastructure for CA research and promotion, and weak linkage with extension for research knowledge dissemination.

The **recommendations** are to have targeted research funding for CA, widely sharing research results with all stakeholders for dissemination to the farmers, including publicity, long-term CA research activities and demonstrations at the research centre.

The Education Institution interviewed in Kakamega was the Bukura Agricultural College (BAC). The college has introduced CA in their teaching topics, but it has not been officially added to the curriculum. There is however a positive soft capacity on the willingness to mainstream CA in the academic institution. The college also has open days (Thursdays) during which the surrounding community (farmers, pupils, and students) visits the institution for consultations on all aspects of farming, including CA.

The hard capacity **gaps** identified include lack of CA practical skills, limited funding for training, no CA demonstrations and no CA equipment.

Recommendations: mainstreaming CA concepts and principles in the curriculum, introduce comprehensive short courses on CA, funding for training and research on CA options, CA demonstrations, and linkages with other stakeholders involved in CA knowledge dissemination.

The **MoA county office** is the custodian of the policies in the agriculture sector. Interviews with the county heads revealed that the hard capacity **gaps** are inadequate CA knowledge and skills, no CA policy at the county and national level, no quality control on CA basket of options being introduced in the county, no long-term plan for CA for the county and no funding for CA activities by the County.

Recommendations: sensitizing the County executives on the CA knowledge and skills and its potential to improve food security, increasing the number of extension staff, funding CA extension services, and establish mechanisms for CA quality control.

Some soft capacities observed were a positive attitude with some staff while others did not believe in CA, which consequently is a soft capacity **gap**.

The **recommendation** is to encourage attitude change towards CA promotion and confidence building in the potential for CA through refresher courses and staff tours to successful CA farmers. This will enable the county and extension staff gain knowledge and skills in CA and further knowledge on its application after interacting with practising farmers. It will also help to inculcate a positive attitude towards CA after the staff sees it working at the farmers' fields.

GIZ has funded **GOPA** and **WHH** to implement CA among other activities. The major hard capacity **gaps** identified on the project implementation were that the CA package by GOPA and WHH is incomplete as it did not cover the whole basket of CA options and CA practices, the field staff of implementing partners lack adequate capacity for full dissemination of CA to farmers, field coordinators not adequately equipped with the full basket of options of CA, field backstopping not adequately done, late contracting and funds release in relation to the season, and very short project duration for tangible CA benefits to be appreciated by farmers.

Photo 11. Monica Nekesa at her CA demo plot in Eenje, Mumias

Therefore, the **recommendations** are the need for consultations with the implementing and supporting partners, adequate funding levels for targeted activities including data collection, training on complete basket of CA options including skills development, data and knowledge management guidelines, information sharing forums, facilitation of LF trainers for effective training of fellow farmers and adequate project preparation time and timely implementation. This will ensure that the implementing and supporting partners are in agreement of the roles and deliverables for each party, are well equipped with the full CA basket of options, and are adequately facilitated to deliver the objectives of the project adequately and within the established timelines.

5.2.3 Discussion

The glaring knowledge gap has been contributed to by the practice of training staff and farmers based on the practices that the project wishes to apply as opposed to training the whole CA package and expose the participants to the practical skills.

CA is learning and knowledge intensive. CA technology revolves around the sustainability of soil productivity and resilience of both soils and farms, and is a process that takes time to learn and to give full benefits (depending on the precision of its application/practice). Thus, there is a need in the County for projects to be designed with this in mind and allow ample time for the farmers to observe the full potential of CA, which will enable them to make informed decisions to adopt. The minimum duration for a CA project should be 3 to 5 years with the 1st half year being used for farmer mobilisation and sensitization (for ownership and village immersion).

There is a need for cover crop seed producers to grow the cover crops using CA to ensure resilience to weather changes and not contradict or send mix-messages about agricultural production practices the GOPA project supports. This enhances farmers and staff confidence in the technology they are planning to disseminate.

GIZ has funded GOPA and WHH to implement CA, among other activities. Its predecessor (GTZ) has previously funded other entities like Sustainet EA to implement CA activities in the county and neighbouring Busia County, all implemented by ADS. The lessons learnt from those interventions need to be considered while implementing the current projects.

Farmers have always embraced projects with the hope of handouts and when these are not forthcoming, they tend to dissociate with the projects/technologies being promoted despite the accruing benefits. This creates a negative attitude on the technology by the farmers and eventually discourages even those already implementing the technology. The situation is worsened by lack of backup support at the end of the project from the remaining extension staff. Eventually all the gains are lost and farmers return back to their original status that they were before the project. This is mainly because without adequate knowledge of CA, it is very difficult to practice and succeed in it since there are no shortcuts.

For successful implementation of CA projects, my **recommendation** is that there is a need for adequate consultations between the donors, implementing partners and farmers for the activities to start when all

tasks and obligations are discussed and agreed and a common work plan is developed with stipulated roles of each partner and realistic timelines documented.

5.2.4 Conclusion

The greatest bottlenecks to CA adoption by farmers are inadequate knowledge and change of mind-set/attitude. The extension service providers are mainly constrained by lack of transport, subsistence allowance and inadequate skills on CA. These can only be addressed through adequate facilitation of extension service providers, intensive capacity building and exposure to practical skills and success stories.

Delay in the current project funds release should be addressed through adjustment of the project work plan to accommodate the delay rather than rush activities against unfavourable weather or circumstances.

5.3 Siaya

5.3.1 Overview of CA in Siaya

Conservation Agriculture (CA) was initiated in Siaya County in 2001 by FAO, which had two projects, Technical Cooperation Programme (TCP) (2001-2004) which promoted the three principles of CA on pilot scale with one FFS in Karemo division. Conservation Agriculture for Sustainable Agriculture and Rural Development (CA-SARD) had two phases-Phase I (2004-2006) phase II (2007-2010). The project was part of a scaling-up and refocusing process for CA continuing from pioneer project. The CA-SARD advanced CA interventions specifically through FFS, training support staff and farmers, bringing CA equipment, training artisans and forging links with the private sector. They collaborated with the World Agroforestry Centre (WAC) who promoted improved fallows in agroforestry. The project Farming in Tsetse Controlled Areas (FITCA) promoted draught animals in farming and worked closely with the Kenya Network for Draught Animal Technology (KENDAT). FITCA introduced legume cover crops, i.e *mucuna* and *canavalia*. Monsanto and Bayer East Africa promoted herbicides to control weeds. The International Centre for Insect Physiology and Ecology (ICIPE) and KALRO promoted the push-pull technology to control *striga*, stem borer and to improve soil fertility. Methods used for promoting CA in the County included FFS, demonstrations, Farmer-to-Farmer extension, field days and farmer exchange tours. CA implementation in the mentioned projects had some challenges, e.g. missing links between farmers and service providers. Trained CA personnel were few, and could not train all farmers in the County. Recommendation made at the end of the CA-SARD project was to promote CA to spread and reach all farmers.

With new CA initiatives implemented by GOPA and WHH, and supported by GIZ under the soil protection and rehabilitation programme, the focus is still to spread and reach all farmers in Siaya County. The two implementing organizations have different approaches of accomplishing this objective. WHH is covering the two Sub-counties-Bondo and Rarieda, which are drier areas of the County while GOPA is covering Alego-Usonga, Gem, Ugunja and Ugenya Sub-Counties. The approach used by WHH to reach farmers is through trained CORPS who are elected by farmers. GOPA on the other hand supports partners to implement its CA activities. They both started their CA activities in 2016. GOPA's core activity in Siaya is training of CA stakeholders to improve their capacities in service delivery. Agritek Solutions, Africa is being supported by GOPA to train key stakeholders as follows: 95 lead farmers on CA, 38 Tillage service providers on the basic CA equipment and tool use, 70 Technical officers from MoA, 19 artisans trained on metallic implements and 19 artisans are yet to be trained on wooden implements. All these efforts are supplementing activities that were initiated by earlier CA projects.

5.3.2 CA gap-analysis of the CA stakeholders

Farmers (CA-adopters, non-adopters)

CA farmers have a good grasp of some CA principles and skills as observed from their CA fields. Generally, this good foundation was laid by the FFS approach, which was a season long training with constant follow-ups by MoA. Soft capacities, which CA farmers exhibit during their work, are passion, commitment and hard work, which motivate them to continue working with CA.

Gap: the current training for farmers takes only two days, which is a very short time for equipping the famers with necessary knowledge and skills for CA.

Photo 12. Options for early weed control- scrapping and mulching by Cosmas Otieno, Sidindi

Recommendation: extend the training period for farmers to at least 6 months to adequately prepare them in a holistic application of CA. CA farmers are constrained with getting sufficient materials for mulching.

Gap: most of the mulching materials are crop residues, which have competing uses, e.g. animal feed. Termite attack on mulching materials poses also a threat to permanent soil cover.

Recommendation: inclusion of cover crops in the CA fields should be considered.

Gap: the legume cover crops used in the previous CA projects *mucuna* and *canavalia* are not suitable for human consumption and animal feed without processing, hence their adoption is low. Issues of limited access, availability of the cover crops were identified. There is also inadequate availability of CA equipment and tools for CA at local level.

Recommendation: establish links with cover crop producers, farm inputs suppliers, artisans and suppliers, and manufacturers of CA-equipment and tools using Innovation Platforms (IP). Farm records, which are important instruments for farm planning of CA work, are missing among the practising CA farmers.

Gap: CA non-adopters who were trained under FFS know the benefits of CA, but continue to use conventional tillage practices due to lack of consultations with experienced CA farmers, extension officers and other development workers. Community attitude towards CA is negative as adopting CA farmers are perceived to perform an 'act of madness' or doing 'childish work'.

Recommendation: After training CA farmers, they require continuous technical backstopping and community support for CA adoption.

Farmer organisations (Kisama WRUA, Tembea CBO Gem Horticulture Cooperative)

Organizations with CA trained staff are able to articulate CA principles and practises well, but others without training are unable to articulate concepts and practices of CA. Good group qualities (visionary, good leadership, self-discipline and respect) are essential for group survival. In Tembea CBO, CA falls under ecosystem based adaptation for food security project in Africa. In order to reach more people, they have a community mobilizer responsible for mobilizing community members for collective work. They involve the beneficiaries from problem identification to monitoring and evaluation stage. In capacity building, they use a Training of Trainers (ToT) approach to train village environmental conservation scouts, which are elected by the community, who in turn train farmers on CA. For each meeting held at community level and feedback report given to the office, a stipend is given to the scouts as a token of appreciation. The CBO has a local saving and credit scheme to cater for members financial needs.

Recommendations: Tembea CBO is a show-case on how a project can engage communities for collective action in CA. This example can be replicated in the on-going CA work for the GOPA project.

Extension officers and technical advisors (SCAO, WAO, NGOs, CBOs and FBOs)

Those who have received CA training understand the principles and practices of CA, but most have no hands-on experience. Previous CA projects trained three CA experts, a number of MoA staff and

farmers, but no records are available at the County to show this. This reinforces an indication of poor documentation in their respective work. They mainstream gender issues in their CA work, though documents to show this could not be presented. Some organisations, like Renewal Energy and Food Security (REFSO), translated CA flyers into a local language—Dholuo—for information sharing with their farmers. Other methods used for information sharing and skills transfer are on-farm demonstrations, field days and farmer exchange tours. The farmer exchange tours inspired CA farmers to introduce the commercial farming skills in their CA activities, e.g. bananas, legumes and horticultural crop production. Various extension approaches are used by different agencies, e.g. groups, value chain and IP are used by MoA, and other organisations use farmer groups.

Gap: this category of stakeholders face a number of challenges while promoting CA, e.g. lack of coordination and harmonization of CA activities at Sub-County level as each partner implements activities independently, resulting at times in duplication and mixed CA messaging to farmers.

Recommendation: support and strengthen appropriate approaches, e.g. IP, which encourages joint planning, information sharing, technical support, and availing farm inputs to CA farmers.

Gap: most staff has not received supportive training in value addition, farm planning, IP approach, business management and documentation.

Recommendation: conduct training needs assessment prior to the training to determine how to overcome the deficit capacities. Support and organize with implementing partners on how to train the CA supporting staff.

Gap: both the public and private sector involved in CA dissemination have lean staff numbers, who operate thinly which results in low outreach. Current staff ratio is low and dwindling.

Recommendations: support and strengthen farmer-to-farmer extension system to complement the existing extension approaches. Also, encourage clustering of small groups of CA practising farmers for closer supervision and technical backstopping. Sensitize staff on use of various sources of information, i.e. the Internet, SMS, social media, local newspapers and other electronic media.

Gap: there is inadequate facilitation to work with farmers, i.e. transport and subsistence allowance.

Recommendations: support and facilitate CA activities at both Sub-location and ward levels. Encourage partners to have joint planning through IP to leverage available resources**.** Generally, staff is willing to promote CA, have good facilitation skills, teamwork spirit and ability to analyse and adapt.

Gap: some still exhibit negative attitude and lack of confidence in CA.

Recommendations: enhance attitude change of staff through sensitization workshops and educational tours to Counties where CA is widely adopted such as Laikipia County.

Suppliers of inputs (Agro-input dealers: Avepo-Agrovet)

Agro-input dealers have no knowledge about CA content and practice. They are linked to farmers by seed companies, who display their products in shops, farm demonstrations, field days and agricultural shows. They have a wide range of maize seed varieties and a narrow range for legume seed varieties. The range of legume seed sold is confined to dual purpose grain legumes, i.e. *common beans* and *cowpeas*. They have trained technicians and a good business structure; staff is trained by seed companies offering short courses. The suppliers have good storage facilities for seeds and CA equipment.

Gap: currently, they don't stock cover crop seeds and *pigeon peas* for fear of losing viability. They have limited inputs for CA. Input suppliers fear stocking CA equipment, because of high investment and long shelf time before they are purchased. Potential for stocking CA equipment and tools is there, i.e. they have bank credit facilities. Agro-dealers do little to let farmers know the range of farm inputs available. Currently, the link between farmers and input suppliers is weak.

Recommendations: Agro-dealers should broaden the range of dual-purpose grain legumes to include *pigeon peas* and *green grams,* which are preferred by farmers. Agro-dealers should mount aggressive promotions during field days, demonstrations and use IP to display their products to farmers. Agro-vets should be linked to legume seeds companies, i.e. Dryland Seed Company and Kenya Seed Company, to avail the required legume seed types and varieties locally.

Cover crop seed producers (Ace Africa, Agritek Solutions, Africa)

Previous projects put much emphasis on *lab-lab* for CA promotion, because of its multiple benefits, i.e. soil cover, biomass production and food, which other cover crops like *mucuna* and *desmodium* do not have. *Lab-lab* became popular with CA farmers, but its spread was limited by seed supply shortage.

Gap: The same problem is being experienced today. Agritek has just trained 95 CA farmers who are going to be used to produce cover crop seeds through an informal seed production system.

Recommendation: diversity in cover crops should be used in the promotion of CA. Seed multiplication for cover crops should be aligned to end users preference e.g. human food, livestock fodder, soil surface cover and income generation, drought tolerance, *striga*-control and salinity.

Suppliers and manufacturers of CA implements (Artisans, ATDC)

Artisans are good in the fabrication of CA equipment and tools. Those artisans visited displayed their skills in the fabrication of the equipment and tools, e.g. scrapers, shallow weeders, chaka jembes and jab-planters. For animal draught power equipment, none was displayed by artisans, except at Siaya, ATDC, where they have jigs for making them.

Photo 13. Assorted CA equipment and tools at the

Gap: artisans have very little knowledge about principles and practices of CA.

The cost of fabrication pushes the cost of these equipment and tools near to the price of the imported equipment. This is increased by the high cost of transportation of the fabrication material from Kisumu to Siaya, which leaves the artisan with a small profit margin. The current tax policy favours the import of agricultural equipment (tax free), making their price lower than the locally fabricated equipment and tools, which in essence hinders local mass production of such equipment. Previous CA projects trained 16 artisans to ease the shortage of this equipment, but no records are available to show this. The artisans do not have these basic CA equipment and tools in stock as CA farmers keep buying on demand. The artisans, who were trained recently at ward level, are yet unknown to the CA farmers. Credit facilities for businesses like this are available at Kenya Industrial Estates office but artisan are aware of this information.

Photo 14. Animal draught power implement at the ATDC Siaya

Gaps identified were the trained artisans are not aware of the existence of such facility; no stockists for CA equipment and tools are available at the County level. Some CA equipment and tools on local markets, like plastic jab planters, are of poor quality standards and are not suitable for local conditions.

Recommendations: local stockists for hardware should be identified to get the raw material for CA equipment fabrication. Agrovets could be used as alternatives for CA equipment and tools outlets. Agritek should link CA equipment stockists to suppliers and manufacturers of CA equipment, e.g. ATDC, Ndume in Gilgil, to ease access and acquisition.

CA service providers (Private-Tilllage)

Since inception of CA work 16 years ago, tillage service providers have used animal drawn mouldboard ploughs while rendering their services. It was only recently when they were trained in CA by Agritek after a need arose to change to CA equipment and tools. They train 38 Tillage service providers of whom 19 have been trained on metallic implements and 19 will be trained on wooden implements. Availability and accessibility to CA equipment and tools at local level is still an issue, despite earlier efforts made by previous projects. Also, artisans and suppliers do not stock CA equipment and tools for farmers to purchase, making the tillage providers unable to change their ox plough to desired CA equipment. Some CA members of FFS who acquired jab-planters are rendering hire services to farmers and frequently require spare parts, repair and maintenance services, but these are not available at local level.

Gap: tillage service providers are not networking among themselves, artisan, and CA farmers.

Recommendation: support and facilitate establishment of a communication network of trained artisans, CA farmers and tillage service providers.

CA training providers (ATDCs, ATCs, BAC, AGRITEK)

In the previous CA-SARD project, training was a core activity where the FFS approach was extensively used. A group of 20-30 farmers underwent CA training for one cropping season. On graduation, trained farmers were supposed to train follower farmers, but this almost never happened, because of inadequate financial support and follow-ups. Agritek Solutions Africa and ATDC, Siaya, are using a similar training approach–the ToT. They anticipate this approach will have bigger multiplier effects than FFS. Their starting point is to get an inventory of people who were trained by earlier CA projects and do a training needs assessment to identify areas of capacity areas needed. Agritek staff is articulate well in the principles and practices of CA, but lack training facilities where they rely on Siaya ATC and ATDC.

Recommendations: before outsourcing, check for a pool of CA experts and CA resource farmers existing in Siaya County who can facilitate these trainings effectively.

ATDC has a lean core team for design and fabrication of CA equipment, tools and value addition machines. Their products are promoted during demonstrations, field days, agricultural shows and roadside shows. A **gap** identified was inadequate promotion of these CA equipment and tools outside their station.

Recommendation: more exposure of CA equipment and tools to farmers is required to popularize them in the farming communities.

Micro-finance institutions or projects (Banks, Credit NGOs, KIE)

Staff of these institutions has no idea about CA, but have financial products that support value addition. They have brochures and credit records for financial products for agriculture. They provide credit facilities for any value addition enterprise and in Siaya they are concentrating on flour milling, milk processing, fish processing, mango processing and cereal banking, but not on CA activities. Before giving loans to beneficiaries, they organize trainings for them, which expose the clients to business enterprise selection, business planning, and record keeping. They give credit facilities to individuals, groups and companies. So far, they have loaned fifty individuals, three groups and one company by end of last year. Their feedback mechanism is through telephones, website, and complains from beneficiaries. Their main source of funding is through the Treasury. Their challenge is the low access to credit facilities by farmers, lack of business entrepreneurship and a poor attitude to credit giving institutions.

Recommendation: sensitise CA farmers on available credit facilities.

NGO/CBO/FBO (Tembea, REFSO, UCRC, World Vision)

CA has only been promoted in supporting partners' project areas in the County and are only restricted to a few sites.

Gaps: there is a low level of CA understanding, in content and application. Minimum inclusion of CA in their work plans due to limited knowledge, resources and programme objectives.

Recommendations: sensitize the management to include CA in their work plans and provide more resources to CA. They should partner in resource mobilisation and support each other technically on CA.

Research Institutions (KALRO, ICRISAT, CIAT, CIMMYT)

Gaps: limited knowledge exists on CA principles and practices among institutions that are not dealing directly with CA. There is inadequate screening of cover crop varieties for adaptability to dryland areas with regard to drought tolerance, salinity problems and *striga*-control. Furthermore, inadequate knowledge exists on the spatial arrangement of cover crops in different cropping system and their management under CA.

Recommendation: conduct demonstration trials for cover crop varietal screening for adaptability and spatial arrangement and management regimes for cover crops in different cropping systems.

Gap: minimal collaboration among research and education institutions on biophysical research in dryland areas and socio-economic issues affecting CA adoption are a gap, too.

Recommendation: both local and international institutions, and other stakeholders, should work in partnership to address the above issues and IP offer opportunities for developing a common research agenda.

Gap: none of the research institutions had a strategy for CA and there is no long-term approach to CA.

Recommendation: research institutions should develop a CA research strategy and long-term approach to CA research for addressing emerging issues.

Education Institutions (Jaramogi Oginga Odinga University Science and Technology)

Promoters of CA reckon that CA is knowledge intensive technology, which requires site-specific recommendations. In order to build the capacity and change the attitude of the extension and development workers, early exposure to CA through formal education is necessary.

Gap: CA is hardly included in the educational curriculum of primary, secondary and tertiary institutions. From their school times, punishments are always directed to garden work and youth perceive agricultural career as a career for failures in life. Hence, most youth shy away from Agriculture and opt for other careers. This has led to low enrolment of students in soil science courses and inadequate University staffing in a Soil Science Department. Likewise, there are limited staff numbers with soil science background. At the moment, there are no CA courses offered at the university level.

Photo 15. George Ouma happy with many appreciation certificates, Sidindi

Recommendations: offer CA courses in agricultural departments for manpower development in CA and contribute to CA curriculum development for tertiary institutions.

MoA (County offices)

Gaps: there exists a lack of co-ordination of various actors working on CA, which was identified as a major gap. There is a good pool of people with experience in CA in the County, which is not fully tapped and utilized. Many institutions in the County have tried dissemination approaches with successful examples e.g. IP. At County level, MOA does not have staff assigned specifically to CA and it lacks of local structure to oversee CA activities.

Recommendation: MoA should appoint a subject matter specialist, knowledgeable on CA practices, as a responsible officer for CA.

Recommendation: There is need for proper involvement of key stakeholders in a decision making organ of the County in order to address their felt needs. This will ensure successful and sustainable project implementations. Establish a County CA committee, which should have a contact person being

the Secretary of the CA committee. The committee should have oversight and regulatory roles of CA work in Siaya County.

Gap: currently, there is no CA policy in place, but the County Agricultural Engineer and other stakeholders are currently contributing to the national soil management policy formulation and domesticating it to suit the County needs and aspirations, which is already at an advanced stage. Another policy direction on issues relating to importation of farm machinery, CA equipment and tools has been articulated.

Recommendation: establish and support these local structures, i.e. a County CA committee, to oversee and regulate CA work.

Gap: poor data and knowledge management system exist in the County. A close view on available documents from stakeholders shows that a culture of documentation is lacking at all level of project implementation, and there is no feedback mechanism in place.

Recommendation: establish data and a knowledge management system and build capacity for documentation skills.

GOPA, WHH, GIZ

Gap: GOPA does not have a CA monitoring and evaluation system in place for field activities implemented by GOPA supported partners.

Recommendation: GOPA should establish a monitoring and evaluation system to keep track of CA progress made. GOPA lacks a clear, written strategy for CA implementation in the County.

Gap: no CA policy exists in the County.

Recommendation GIZ should fast-track, or support, the CA policy formulation at County level.

5.3.3 Discussion

CA work in Siaya County started on a pilot basis by FAO project with one FFS in Karemo division, with 25-30 farmers introduced to the three principles of CA. In the two phases of CA-SARD project, the focus was the scaling-up of CA in two divisions Ugunja and Ugenya. With the new project, the focus is scaling-up CA to the whole County. Hence, the need to look at human resource capacities, institutional capacities and communities to enable the spread of CA in the whole county. The gap-analysis was done on different categories of stakeholders, operating at different levels of County structures. One core gap is a missing link between CA farmers and other partners offering services, farm inputs and providing an enabling working environment. Very weak and loose linkages currently exist between partners i.e. farmers and other actors, from both public and private sectors. Stronger public and private partnership is desirable to address constraints to the scaling-up CA work in the County. A rarely recognised gap, but important one, is the lack of community engagement with both the formal and informal sector for partnership and synergy in promotion of CA project activities. A soft capacity gap identified, while interacting with stakeholders, was inadequate capacity to establish and maintain mutually beneficial stakeholder relations.

Another gap witnessed from stakeholders was the lack of local institutional structures to offer leadership for CA activities at County Government administrative units. Before devolution, there existed a District Agricultural Committee (DAC) with representation of key stakeholders, whose role was to oversee implementation and regulate agricultural activities in the District; a similar arrangement was done at the Divisional level. For effective collaboration among stakeholders, a contact person was identified and given the responsibilities. With current partners concerns on collaboration for better CA work in the County, there is need to have such arrangements in the public sector again.

As you scale up CA work in the County, partners mentioned the need to have an enabling environment under which to operate. This calls for the establishment of a legal framework under which CA can best operate. There are policy related barriers, which need to be addressed, e.g. cover crop, livestock management in dry areas, CA curriculum development in tertiary institutions, and CA mechanisation.

To effectively implement CA work, the stakeholders require service support mechanisms like capacity building for the community members in other areas like training in IP, business skills, participatory monitoring and facilitation in terms of resources sharing arrangements, budget allocation to CA which

is currently lacking. This could easily be implemented through a multi-stakeholder dissemination approach, which addresses networking and advocacy issues.

Training of CA farmers should take a longer period than two days used for residential course. On-site training, like modified FFS, is suitable for adult learners. In CA practice, smaller groups could be put into clusters, for purposes of sharing knowledge, intensive supervision and members supporting each other, especially against social and traditional challenges.

To enhance public and private sector partnerships, there is a need to strengthen IPs existing in the County and where they are missing, the support of their formation could be achieved through retraining of extension staff and other development workers for IP establishment, including mainstreaming these in budgeting and planning processes.

For effective CA promotion, we require a change in the mind-set of all stakeholders supporting CA in the County. It should start with implementers from MoA and other technical CA advisors to be trained personally with hands-on experiences. They should have a passion and commitment for CA and be hard working in order to convince the farmers to have a positive attitude. The current situation is that a few staff in scattered places in the County know about CA very well, but the majority does not know. An example, you get a staff in ATDC with rich knowledge on CA while his counterpart in the MoA knows little about CA principles and practices. Even in the design of training curriculum at the ATC, there is little mentioning of CA.

5.3.4 Conclusion

With a good foundation of CA work established by TCP, CA-CASRD, WHH and GOPA projects, the County leadership has what it takes to scale-up CA throughout the County. Addressing the most limiting gaps, improvement of the institutional capacity through establishment of public functioning platforms (e.g. IPs) that exist in the County is mandatory. Empowering stakeholders through sensitization workshops and training for better service delivery can further improve these capacities. Using the existing effective dissemination approach, which brings key stakeholders on board to address constraining factors to CA adoption and putting local structures in place to monitor and evaluate CA progress throughout the county would be helpful. With the good will of all participating CA partners, it is anticipated that the whole County will be cautious not to repeat mistakes made by the previous projects, and advance CA on to a sustainable level.

6 Next Step and Summary of the General and County Recommendations

Based on the findings of this CA CNA, the next step for GOPA and GIZ is to enter into the process of the formulation of a capacity development programme/plan (CDP), which includes the capacity development responses. These responses need to include, or at least consider, all of our recommendations and a sufficient timeframe for CA implementation, which is one of our core recommendations. The CDP should be based on the strength of the project, GOPA and GIZ, and set response priorities. Since the process of setting priorities is normally political too, it should be managed carefully and transparently, with the involvement of all relevant CA stakeholders; otherwise those that stand 'to lose out' may withhold support during implementation and question the relevance of the response action.

Indicators should be set to monitor progress in implementation of the CDP. The process itself of defining progress indicators is useful as a way of generating strategy discussion, enhance the project's monitoring and evaluation system, and as a learning exercise for the involved project staff and other participants. The indicators need to be linked to good CA practices, the basket of CA options, and to a CA performance based monitoring and evaluation system.

The following main recommendations need to be considered for the CDP[10]:

GOPA (and GIZ-Western Kenya) Recommendations

[10] Specific recommendations are in the country recommendation section.

- The GOPA staff, i.e. management and coordinators, needs to undergo a thorough CA training course, which should include visits to existing CA examples in Kenya, the region and, for the best impact, to South America, especially Paraguay[11]. Here, GIZ has more than 25 years working experience with CA and smallholders. The latter would fast-track the learning and understanding of CA and it seems the most cost-effective way to achieve the desired change among GOPA staff. The CA definition of different CA practices and the 'Need to know or be able to do', developed and used for this CA CNA (see Annex 3), should only be the starting point. All this will lead to a more focused and useful use of project resources and improve the impact of GOPA's work.
- In the next project phase, the timeframe of CA activities needs to be extended, which might require that activities need to be planned well beyond the project phase mentality, set by the German government[12].
- For the next project phase or even for this phase, work out a proper CA strategy with a CA action plan and a CA M+E system, focused on field performance and results on-farm. This strategy needs to have a clear response plan to improve farmers' actions, e.g. have plans for crop rotations, use of cover crops, etc. The strategy needs to be elaborate in conjunction with the project partners, e.g. MoA, GIZ Head Office and other implementing agents. This will lead to a more focused and effective use of project resources and improve the project's.
- GOPA needs to draw up a CA training strategy, based on modern training approaches, including experiential learning (e.g. on on-the-job training of extension officers or field staff), and a CA exposure study tour within Western Kenya[13]. A training expert needs to be employed for this task. The training courses as part of the training strategy need to be adapted to the agricultural season and have several training units/sessions, which are aligned to the required CA action on farms. It is mandatory that all training providers are supported in setting up CA fields in their respective organisations and that all their trainer staff is streamlined to and able to train the CA basket of options. Once the training is up to the highest standards, the project impact will be improved, in general and on-farm, and its resources will be used more effectively and efficiently.
- Plan for or identify the most easily accessible CA information system available and make this information available, both in hard and soft copy, to all CA stakeholder groups, especially farmers. Identifying an existing CA information system is more cost-effective than creating a new system. We recommend that the planning or identification of a CA information system should be done by the GOPA staff itself, as it presents a good opportunity to test the system for their own learning. In this context, GOPA needs to define the indicators for a good and sufficient CA information system, which can only be done once GOPA staff has been trained in the full basked of CA options.
- All cover crop seed bulking must be done under CA. The farmers themselves should be enlisted for this activity, compensated and through this motivated to convert to and to do CA.
- Cover crop use needs to be diversified, and winter or off-season cover crops need to be introduced. This should first happen with farmers that have fenced fields or that have no livestock pressure, which would create role-models from which other farmers can learn. In relation to extending the varieties of cover crops, we could see an important role for a closer collaboration with RI like KALRO and CIAT. We recommend that these RI should be supported in winter cover crop trials and in the probing and testing of new cover crops varieties. Again, the GTZ experience from Paraguay set the tone and provides the role-model.

[11] These exposure tours within Kenya and to Paraguay need to be planned well and be educational study tours. The tours need to include relevant CA elements, take time during agricultural on- or off-season where one is able to see CA practices and, in the case of Kenya, make use of the best CA examples in the country. Likewise, GOPA can test these CA examples for future use for exposing CA stakeholders from the project region in Western Kenya and develop a standard exposure tour.

[12] We are aware that this certainly presents the biggest challenge to GOPA and GIZ for sustainable CA impact on field level. Nevertheless, it is our recommendation.

[13] For this study tour, GOPA needs to identify the best CA examples in the region, and plan a tour that includes all aspects of a CA planting season – 'seeing is believing' and through this tour, many stakeholders will be convinced that CA works and what the basket of options is.

General Recommendations

- GOPA, and perhaps GIZ, should address the soft-capacity gaps, such as self-reflection, learning from experience and behavioural self-analysis, by providing a good example and invite stakeholders to participate in their (GOPA or GIZ) efforts in order to improve these mentioned soft capacities.
- A special effort by the project to streamline the CA understanding, using the FAO CA principles and the CA definition of different CA practices and the 'Need to know or be able to do'**,** developed and used for this CA CNA (see Annex 3), to be the guideline for future project work for all stakeholders. Simultaneously, some of the soft capacity gaps would be addressed, because stakeholders would understand the full basket of CA options and enhance or overcome their negative attitude towards CA.
- GIZ, supported by GOPA, uses its 'good name' to continue the support of CA related national and County strategies in Kenya. This should be in the area of soil conservation, improved agriculture productivity, protection of the environment and the agricultural mechanisation strategy, especially those strategies that currently are being developed.
- Counties need to be supported in developing a CA strategy, or at least CA plans, which could be done already through a discourse between the MoAs and GOPA, and also through the implementation or support of County stakeholder forums or Innovation Platforms.
- GOPA offers to each of the CA stakeholders support in the development of CA plans, which would lead to CA being embedded in strategies of each of these stakeholders.
- Training activities need to be longer (time wise), because CA takes several years to be applied correctly. Training courses need to be adapted to the agricultural season and have several training units/sessions, which are aligned to the required CA action on farms, with an emphasis on ecological understanding, i.e. ecological literacy or *ecolacy*; the empowerment of farmers (good decision makers) would be the desired outcome. CA training strategies need to be put in place, for and by the counties, and for and by the different CA stakeholders. This must include that all CA training providers have designated CA fields on which trainees discover and learn CA and that CA trainers or CA lecturers should be taken on exposure visits to CA farmers and other CA stakeholders for their improved and widened CA understanding. For the future project activities, this will need to become a priority and holds great potential to improve the projects impact (effectiveness) and make its work more efficient, too. A CA training expert should be engaged to help with this endeavour.

County Recommendations

Farmers

Bungoma

- A programme for re-training of CA non-adopters and new CA farmers on CA knowledge, practices and skills should be developed by stakeholders, with management information system being stored in soft copies, through radio broadcasts, use of pamphlets, flyers, brochures, CA field demonstrations and the use of FFS approach, and learning from lead farmers' experience as well as exchange programmes.
- The manufactures of CA tools and implements, artisans, ATDC, ATC and agro-input dealers are requested to come up with affordable tools for CA and be supported too.
- The number of extension staff will need to be increased to cover all farmers.
- All farmers should be trained on livestock management systems in favour of CA in order to prevent animals from feeding on crop residues, roaming on CA farms, and on the use of proper zero grazing units with no burning of crop residues.
- The MoA should continue with the seed bulking exercise with farmers for sustainability of seed sources, the stakeholders can give a start-up package for CA certified seeds, then thereafter farmers are trained in producing their own seeds.

- Farmers will need to be trained in farm-planning and record-keeping.
- Training draft animals for CA farm operations will save family labour.
- Training in CA can change farmers' attitudes in order to adopt CA technology.

Kakamega
- There is a need to conduct regular and consistent CA trainings, avail information materials, training on economics of CA, crop diversification and crop/livestock integration. Regular backstopping by the extension staff will enhance the farmers' confidence in the CA. These interventions will ensure that farmers are fully equipped with CA skills and understand the economic as well as the other benefits of CA. The backstopping activities will provide farmers with a constant point of reference and support where they come across challenges in the implementation of the production system.

Siaya
- Extend the training period for farmers to at least 6 months to adequately prepare them in holistic application of CA.
- Inclusion of cover crops in the CA fields should be considered. The legume cover crops used in the previous CA projects *mucuna* and *canavalia* are not suitable for human consumption and animal feed without processing, hence their adoption is low.
- Establish links with cover crop producers, farm inputs suppliers, artisans and suppliers, and manufacturers of CA-equipment and tools using Innovation Platforms (IP). Farm records, which are important instruments for farm planning of CA work, are missing among the practising CA farmers and should therefore be introduced.
- After training CA farmers, they require continuous technical backstopping and community support for CA adoption.

Farmer organisations

Bungoma
- The FFS training-approach in CA should be re-introduced, as members were using a group approach and were not practicing FFS in their CA training. CA training packages should be re-introduced and cover new CBO members.
- The CBO should be trained in marketing of their products as a group, which reduces transportation costs, and become better in bargaining skills in order to get better prices for their products. This can promote CA among the group.
- A Savings & Credit Co-operative Society (SACCO) should be formed and registered to provide credit and financial services to members at a lower interest rate than the Bank interest rates and create farmers' awareness on source of credit among members, rather than depending on donor funding.

Kakamega
- Soft capacity gaps need to be addressed by training on leadership skills, group dynamics, transparency and accountability, resource mobilization and financial literacy. This will ensure that the group leaders are accountable to their members and the backstopping authorities, which will enhance the leadership processes.
- Include empowering the farmer groups with CA knowledge and skills, and provide regular backstopping services.

Siaya
- Tembea CBO is a show-case on how a project can engage communities for collective action in CA. This example can be replicated in the on-going CA work for the GOPA project.

Extension officers and technical advisors of NGOs and CBOs/FBOs

Bungoma

- A training schedule for all extension staff in CA should be organized by different organizations with refined CA principals to harmonize on CA training extension skills. And records should be kept for CA trainees and CA practitioners who have graduated. Certificates should be awarded to graduates.
- Farmer/Staff ratio could be improved by recruiting more field staff, considering gender equality in recruitment. All field staff should utilise adequate means of transport such as motorbikes to facilitate CA training and promotion in the field.
- Continuous training of staff in CA and exchange programmes on best CA practices.
- Radio programmes on CA.

Kakamega

- To resolve the hard capacity-gaps, backstopping by CA experts (see Annex 10) and others from outside the County, adequate funding by the donors and County government—based on performance/deliverables to cater for all implementation activities—, a quality assurance mechanism (e.g. MoA) for CA basket of options, regular refresher courses for experience sharing and updates on new developments/success stories, and concrete plans for an exit strategy by each organisation.
- Project funds should always be released in time by the donors/Government to allow for timely field activities based on the season.
- Data and knowledge management systems need to be enhanced and operational.
- Mechanisms for adequate data collection for socio-economic aspects of CA should also be put in place.
- To address the soft capacity gaps, include training on positive attitude and self-drive by the extension staff (to be proud of their achievements) as well as professional ethics.

Siaya

- Support and strengthen appropriate approaches, e.g. IP, which encourage joint planning, information sharing, technical support, and availing farm inputs to CA farmers.
- Conduct training needs assessment prior to the training to determine how to overcome the deficit capacities. Support and organize with implementing partners on how to train the CA supporting staff.
- Support and strengthen farmer-to-farmer extension system to complement the existing extension approaches.
- Encourage clustering of small groups of CA practising farmers for closer supervision and technical backstopping.
- Sensitize staff on use of various sources of information, i.e. the Internet, SMS, social media, local newspapers and other electronic media.
- Encourage partners to have joint planning through IP to leverage available resources.
- Enhance attitude change of staff through sensitization workshops and educational tours to Counties where CA is widely adopted such as Laikipia County.

Suppliers of inputs

Bungoma

- All stakeholders promoting CA can train agro-input dealers in CA seeds and cover crop seeds sourcing and CA knowledge.
- Farmers should be trained by extension staff to produce their own CA cover crop seeds, as a way of CA sustainability.

Kakamega

- The stockists/suppliers should be sensitized on the variety of CA inputs and equipment to stock as well as on business skills. They can then be able to stock CA equipment after they are sensitized and realise there is an avenue for further business on CA equipment.
- GOPA should also train the suppliers on financial literacy and link them to credit providers.
- The suppliers also need to be exposed to practical CA skills/activities to understand the dynamics of CA and lead in setting up CA demonstrations. These capacities will enhance the suppliers' skills and enable them to stock the necessary CA inputs that the farmers require. They can also be able to stock CA equipment after they are sensitized and realise there is an avenue for further business on CA equipment. As farmers make consultations with the stockists, the latter will be able to sensitize the farmers on the benefits of CA and encourage them to adopt the practice.

Siaya

- Agro-dealers should broaden the range of dual-purpose grain legumes to include *pigeon peas* and *green grams,* which are preferred by farmers.
- Agro-dealers should mount aggressive promotions during field days, demonstrations and use IP to display their products to farmers.
- Agro-vets should be linked to legume seeds companies, i.e. Dryland Seed Company and Kenya Seed Company, to avail the required legume seed types and varieties locally.

Cover crop seed producer

Bungoma

- Staff training on cover crop production under CA should be encouraged as they were using conventional methods.
- Contract farming to be introduced to promote cover crop production, marketing and promotion of CA.

Kakamega

- Timely planning, funding and execution of field operations, cover crops agronomy and management. Roles for various partners need to be clearly defined and their deliverables stated before the start of implementation of the project. Results of these interventions will be better skills and knowledge on cover crop seed production and bulking as well as on the CA practices.

Siaya

- Diversity in cover crops to be used in the promotion of CA. It should also be considered to use seed multiplication according to end users preference e.g. human food, livestock fodder, soil surface cover and income generation, drought tolerance, *striga* control and salinity.

Suppliers and manufacturers of CA implements

Bungoma

- Sensitization on sources of tools and implements should be done to all stakeholders who are prospective buyers and users.
- Tools and implements can be fabricated by ATDC and artisans through PPP, and public price lists need to be available for CA tools and implements.
- Artisans should be empowered to manufacture CA tools and implements.

Kakamega

- Train practical skills on equipment use and maintenance, financial literacy, record keeping skills, and linkage with equipment suppliers/outlets. There will be a need to put in place a quality assurance mechanism to ensure the equipment fabricated is of high quality. These skills will enhance the artisans' capacity to produce quality tools and equipment and link them to markets.

Siaya

- Local stockists for hardware should be identified to get the raw material for CA equipment fabrication. Agrovets could be used as alternatives for CA equipment and tools outlets. Agritek should link CA equipment stockists to suppliers and manufacturers of CA equipment, e.g. ATDC, Ndume in Gilgil, to ease access and acquisition.

Service providers (tillage and CA)

Bungoma

- The service providers should have a representation at ward and village level with an operational office.
- The service providers should be trained in CA, tools and implements, repairs and maintenance.
- Local artisans shall be encouraged to come up with affordable CA tools and implements and spare parts, as well as partner with other stakeholders for the sourcing of affordable tools.

Kakamega

- Recruitment and sensitization of more service providers.
- Training on entrepreneurial skills, financial literacy and marketing skills.
- The conventional service providers should be trained on CA to induct them to the CA opportunities and to increase the numbers of CA service providers in the County.
- The ATDC requires to be funded by the County Government to support training of the service providers and provide CA services to farmers who fail to get services from the service providers.

Siaya

- Support and facilitate establishment of a communication network of trained artisans, CA farmers and tillage service providers.

CA training providers

Bungoma

- Curriculum for CA courses to be developed and shared among training providers.
- At the end of a training course, an inventory of all trainees in CA should be kept for easy reference and follow-ups.
- CA training providers should facilitate training of CA to all stakeholders.

Kakamega

- Sensitize all the training providers to include CA principles and concepts in their curriculum. The County Government to develop policy guidelines on CA, provision of adequate funds to invest in CA training, establish demonstration plots for CA at the ATC, integrate CA in their curriculum, and support with proper infrastructure for CA training programmes by the Government or stakeholders/donors. When this is done, the CA training providers will be better equipped and disseminate more comprehensive CA techniques including CA demonstrations for farmers to learn from the practices. The CA policy guidelines will ensure that all the stakeholders are reading from the same script and disseminating related content to the farmers that adequately addresses the needs of the farmers to be able to adopt the technology.

Siaya

- Before outsourcing, check for a pool of CA experts and CA resource farmers existing in Siaya County who can facilitate these trainings effectively.
- More exposure of CA equipment and tools to farmers is required to popularize them in the farming communities.

Micro-finance institutions or projects

Bungoma

- The credit officers should be trained in CA to enable them to appraise CA farmers and formulate loan products for CA farmers as well as providing brochures or information materials on CA products.
- Microcredit products favouring CA farmers to be introduced.

Kakamega

- The Micro-finance institutions should formulate CA friendly packages for farmers with a grace period before the start of repayment, a need to increase the number of personnel for the credit NGOs to cover more areas and farmers, more publicity and awareness of available packages through local meetings, print and electronic media, and partnerships with other organisations promoting CA.

Siaya

- Sensitise CA farmers on available credit facilities.

NGOs, CBOs, FBOs

Bungoma

- A stakeholder workshop to harmonize CA principles is necessary.
- An exit strategy and long-term approach to CA should be in place for sustainability instead of relying on donor funding.

Kakamega

- Regular refresher courses for experience sharing and updates on new developments.
- Concrete plans for an exit strategy by each organisation.
- Data and knowledge management systems need to be enhanced and operational.
- Mechanisms for adequate data collection for socio-economic aspects of CA should be put in place.

Siaya

- Sensitize the management to include CA in their work plans and provide more resources to CA. They should partner in resource mobilisation and support each other technically on CA.

Researches Institutions

Bungoma

- Budget allocation for CA research work to be provided and CA FAO principals for research to be defined by researchers.

- CA on-farm research to be a long-term approach for CA promotion.
- Where land plots are small for research, the hiring of land is recommended.

Kakamega

- Targeted research funding for CA.
- Widely sharing research results with all stakeholders for dissemination to the farmers, including publicity.
- Long-term CA research activities and demonstrations at the research centre.

Siaya

- Both local and international institutions, and other stakeholders, should work in partnership to address the above issues and IP offer opportunities for developing research agenda.
- They should develop a CA research strategy and long-term approach to CA research for addressing emerging issues.
- Conduct demonstration trials for cover crop varietal screening for adaptability and spatial arrangement and management regimes for cover crops in different cropping systems.

Education Institutions

Bungoma

- CA courses and curriculum to be incorporated with accompanying policy to promote CA.

Kakamega

- Mainstreaming CA concepts and principles in the curriculum.
- Introduce comprehensive short courses on CA.
- Funding for training and research on CA options, CA demonstrations.
- Linkages with other stakeholders involved in CA knowledge dissemination.

Siaya

- Offer CA courses in agricultural departments of EIs for manpower development in CA and contribute to CA curriculum development for tertiary institutions.

Ministry of Agriculture-County offices

Bungoma

- A database for CA activities and number of farmers practicing CA should be installed at MoA and readily available to all parties at all times.
- A long-term approach is necessary for CA promotion at County level.

Kakamega

- Sensitize the County executives on the CA knowledge and skills and its potential to improve food security.
- Increasing the number of extension s, funding CA extension services, and establishing mechanisms for CA quality control.
- Encourage attitude change towards CA promotion and confidence building in the potential for CA through refresher courses and staff tours to successful CA farmers. This will enable the County and extension staff to gain knowledge and skills in CA and further knowledge on its application

after interacting with practising farmers. It will also help to inculcate a positive attitude towards CA after the staff sees it working at the farmers' fields.

Siaya

- There is need for proper involvement of key stakeholders in a decision making organ of the County in order to address their felt needs. This will ensure successful and sustainable project implementations.
- Establish a County CA committee, which should have a contact person being the Secretary of the CA committee. The committee should have an oversight and regulatory roles of CA work in Siaya County.
- Establish and support local structures, i.e. a County CA committee, to oversee and regulate CA work.
- Establish data and a knowledge management system and build capacity for documentation skills.

GIZ, GOPA and WHH

Bungoma

- A long-term approach with an exit strategy is necessary to promote CA and its sustainability.
- Sharing and availability of CA farmers and staff trained in CA.
- Data management between MoA and GOPA should be documented for public utility.
- GIZ-GOPA has to lobby for CA policy at County and national level.

Kakamega

- Need for consultations with the implementing and supporting partners and adequate funding levels for targeted activities including data collection, training on complete basket of CA options. The basket of options should include skills development, data and knowledge management guidelines, information sharing forums, facilitation of LF trainers for effective training of fellow farmers. In addition, consideration should be made for adequate project preparation time and timely implementation. This will ensure that the implementing and supporting partners are in agreement of the roles and deliverables for each party, are well equipped with the full CA basket of options, and are adequately facilitated to deliver the objectives of the project adequately and within the established timelines.

Siaya

- Establish a data and knowledge management system and build capacity for documentation skills.
- GOPA should establish a monitoring and evaluation system to keep track of CA progress made.
- GOPA lacks a clear, written strategy for CA implementation in the County.
- GIZ should fast-track, or support, the CA policy formulation at National level.

Annex

Annex 1. Final TOR Capacity Needs Assessment for Conservation Agriculture

1. Introduction

The German BMZ initiative 'One World No Hunger' (SEWOH) is a multilateral programme in Benin, Burkina Faso, Ethiopia, Kenya and India. Its Soil Protection and Rehabilitation Project for food security is implemented by GIZ in Siaya, Kakamega and Bungoma counties. It has 3 components:

A. Soil protection and rehabilitation measures (promoting adoption) – by a GOPA-led consortium[14]

B. Knowledge Management / Accompanying Research – by GIZ

C. Soil Management Policy at national and county level – by GIZ.

This GOPA project started 1 August 2015 and is to end on 31 December 2017. In Western Kenya, it is part of a larger agricultural support programme, including projects on Food Security, Dairy, and Sweet Potato.

The project targets smallholder farmer households, with a farm size of ≤ 2.5 acre (>50% of farms fall into this category). Within the farms, the focus is on the annual food cropping system[15].
Main impact indicators and targets that this project should contribute to are:

- Yield increase of +30% for maize and +25% for beans
- Conserving or rehabilitating 5,000 ha of land, cultivated by smallholders
- Beneficiary households are to include at least 20% female-headed households.

The project has 4 work packages:

1. Integrated Soil Fertility Management (ISFM):
   i. promoting soil testing
   ii. supporting on-farm demonstrations showing the effect of lime (many fields have low pH)
   iii. supporting training and on-farm demos showing the effect of farm-made liquid organic fertilizer
   iv. supporting youth (groups) to set up a compost business, sourcing organic matter on- and off-farm (raising awareness on separating waste).
2. Cross Slope Barriers (CSB): development of a training module that focuses on Vegetative Cross Slope Barriers (VCSB), as this integrates well in the current Western Kenya farming system as well as in Conservation Agriculture. VCSB (contrary to physical structures) is in line with the principles of Conservation Agriculture to provide crop diversity and minimise soil disturbance; VCSB can be highly effective in reducing runoff and soil loss, providing a better spread of moisture to benefit crops (compared to physical structures), as well as having a beneficial impact on crop pests and diseases and providing highly relevant by-products, e.g. mulch and/or fodder. In short: better cost-benefits.

3. Conservation Agriculture (CA): so far three projects in Kakamega:
   i. training and coaching Lead Farmers (LF) to adopt Conservation Agriculture
   ii. supporting private sector (local artisans, tillage service providers and equipment suppliers) to provide equipment relevant to Conservation Agriculture

[14]Other members in the consortium are AFC, ADCL and ACTS.
[15]A typical smallholder farming system has four systems: 1. **home or kitchen garden system** with trees (fruit trees, bananas, some timber), nurseries and vegetables (tomato, cabbage, pumpkin); this area also includes livestock; compost is made here and mostly used in this system. 2. **main food cropping** system, with predominantly annual crops (grains – predominantly maize, pulses, tuber crops). 3. **cash crop** (system), with commercial tree farming, fruit orchards, sugarcane, cotton or tea. 4. **livestock** (different systems).

iii. supporting some farmers to specialise in cover crop seed production for Conservation Agriculture.

4. Catchment protection: so far 20 Water Resource User Associations (WRUA) and 9 Water User Associations (WUA) received a Local Subsidy to carry out catchment protection activities; most of the activities are promotion of Vegetative Cross Slope Barriers (VCSB), tree planting and gully rehabilitation. Concurrently a Training Needs Assessment was carried out and it identified the need to develop a training to enable WRUA (and others) to facilitate community-level spatial planning.

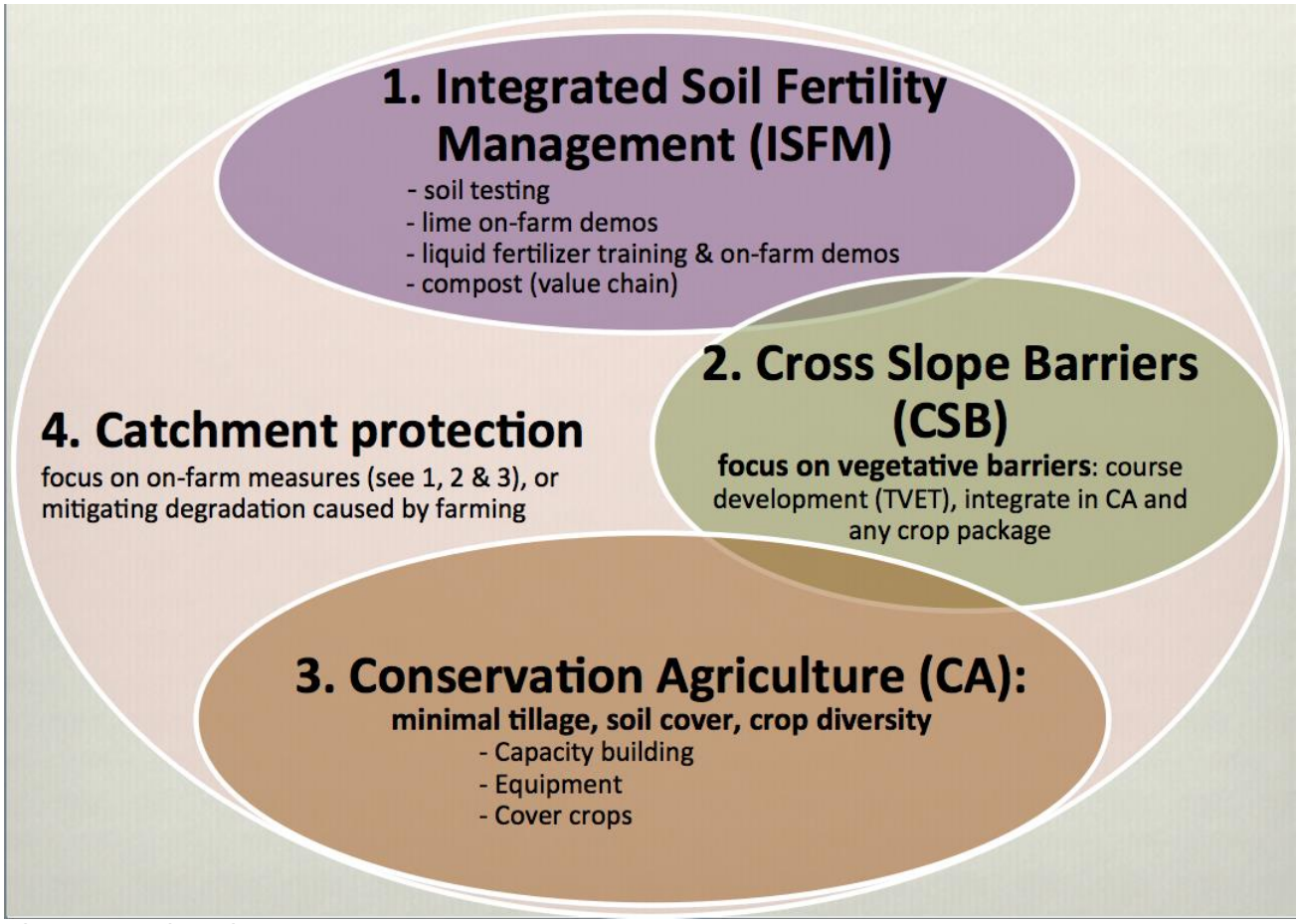


Figure 2: Work packages

Conservation Agriculture (CA) is where most of the project's ambitions are. It has clear links to all 3 other packages:

- CA can combine well with use of compost and liquid organic fertilizer (work package 1)
- CA benefits from a shift towards *Vegetative* Cross Slope Barriers (work package 2)
- CA can be promoted in different ways, through public agricultural extension as well as directly through Lead Famers, possibly with some support from NGOs or WRUA (work package 4).

2. Scope of the assignment

The Capacity Needs Assessment is to be carried out in 3 counties, looking at:

- personnel technical capacity, and potential to develop this capacity
- organisational/institutional capacity, and potential to develop this capacity

at 4 levels:

1. NGO/CBO capacity to deliver training and backstopping
2. Public extension capacity to deliver training and backstopping
3. Private sector capacity to deliver inputs (cover crop seed, equipment) and services (tillage)
4. Lead Farmer capacity to apply and share CA knowledge and skills.

In all three counties, different organisations promoted Conservation Agriculture. These include local organisations (Ministry of Agriculture (MoA), ADS (CBO), PAFID (NGO), African Conservation Tillage Network ACTN (NGO), Kenyan Agriculture and Livestock Research Organisation KALRO, etc.) and international organisations (GIZ, GOPA, FAO, etc.).

CA does not yet appear in a County Integrated Development Plan or a national policy.

3. Purpose and objectives

The purpose is to guide this project in directing its resources (local subsidies and funds for consulting, training and workshops) in the most effective manner, to achieve adoption of Conservation Agriculture both in quality (guided by CA principles & setting up capacity to achieve adoption by many small-scale farmers) and quantity (Sustainable yield results).

Objectives: At the end of this assignment, there will be a report that gives a comprehensive overview of respective capacities and gaps for development of CA in the 3 counties, and recommendations that contribute to the proposal for the next phase.

The report is presented to relevant stakeholders in a validation workshop.

4. Deliverables

Inception report including:

- Work programme
- Methodology used
- Final TOR
- Reading list (reports on CA in Western Kenya but also drawing lessons learnt elsewhere)
- Potential interview partner or CA activities/training providers that need to be visited in the 3 counties and in other parts of the country (e.g. Nairobi)
- Outline of the final report

Final report, with a discussion, conclusions and recommendations on how to improve capacity in:

- Public and/or private extension, or PPP: discussing cost-effectiveness and sustainability of different CA options; who provides what, and who is to pay? Provide a comparative assessment of suitability of different organisations
- Recommendations on how to address weak links in cover crop seed bulking
- Recommendations on how to promote improve knowledge and professionality of CA equipment producers
- The final report should also include photos of relevant on-farm CA practices, names and contact details of farmers practicing CA, and any other person with CA relevant expertise (CA-farming, -equipment), and a list – as much as possible exhaustive – of any reports on CA capacity building in Western Kenya, and a small selection of most relevant CA reports from elsewhere.

5. Consultant team, profile

The team is composed of 1 team leader (ISTE) and 3 NSTE (to have one for each county). During fieldwork, the team is to work in close collaboration with a person assigned by the Ministry of

Agriculture of that county, and also seek out other actors that have contributed to any existing capacity on CA.

The consultant reports to GOPA Team Leader in Kisumu.

Profile of the Team Leader (ISTE):

- At least 10 years work experience in the agricultural sector
- Expert on capacity building, experience with TNA or CNA in public and private sector
- **Expert on all technical matters of CA, with hands-on experience training farmers on CA**
- Expertise on service delivery value chains: extension, cover crops, tillage service and–equipment
- Good report writing skills: ability to tailor writing to audience, effective style.
- Proficiency in English, knowledge of Kiswahili would be an asset

Profile of the NSTE:

- At least 8 years work experience in the agricultural sector
- Expert on capacity building, experience with TNA or CNA in public and private sector
- **Expert on all technical matters of CA, with hands-on experience training farmers on CA**
- Expertise on service delivery value chains: extension, cover crops and equipment for minimum tillage
- Report writing skills
- Proficiency in English and Kiswahili

6. Activities and time schedule

Tentative time schedule
The timeframe for this assignment of the ISTE reaches from mid-January to mid-February 2017.

The inception phase should include 5 working days of preparation in which the Inception Report is elaborated, which will be commented by the project and finalised by the team. This includes input by the NSTE (1-3).

The second phase (field phase) of the assignment should be the fieldwork. This includes a visit to the three counties and other areas in order to make the capacity needs assessment and to identify potential training providers, CA examples, CA experts, CA research and service providers that will be help for future project activities in CA. To finish off the second phase, a workshop will be held in order to discuss preliminary results. This phase will take 14 working days, including travel. This phase includes the fieldwork by the NSTE (1-3).

The third phase will be the reporting phase. This includes the elaboration of a draft report, the comments by the projects and other stakeholders–the later selected by the project–and the writing of the final report. This includes input by the NSTE (1-3). This phase will take 5 working days.

Activity/Outcome/Deliverable	**1st Week**				**2nd week**				**3rd week**				**4th week**			
	ISTE	NSTE 1	NSTE 2	NSTE 3	ISTE	NSTE 1	NSTE 2	NSTE 3	ISTE	NSTE 1	NSTE 2	NSTE 3	ISTE	NSTE 1	NSTE 2	NSTE 3
1. Contract begin—Desktop review of key documents (e.g. review of policy documents, project documents, CA documents, etc.)																
2. Elaboration and writing of Draft Inception Report (incl. Interview schedule, list of planned interviews, methodology, reading list, etc.)																
3. Review and approval of Inception Report																
4. Field work																
5. Presentation of preliminary results in a workshop																
6. Writing of Draft Report and commenting																
7. Draft Report review and Final Report submission																

The Final Report should be submitted by the 16 February 2017.

Annex 2. Methodology

According to the CA CNA Team's understanding, especially qualitative methods tell the program's tale by capturing and communicating the participants' stories. They encompass interviews, focus groups, narrative data, field notes from observations, and other written documentation. Our qualitative methods were used to provide relevant information necessary to assess the capacity needs of stakeholder that have participated or potentially could be of relevance for a future programme phase.

The methodology implemented for this CA CNA included a range of data-gathering methods:

- **Document Review**, including the package of CA reports and project documents submitted by GOPA and other CA documents available on the Internet prior to work begin will be revisited. General contextual analyses, training materials, strategy, policies and other CA related documents will be collected and evaluated for their relevant contents;
- **Individual semi-structured Key Informant Interviews** (KII) with key stakeholders (e.g. GOPA, GIZ, WHH staff), government officials in different capacities, NGOs, CBOs and FBOs. Furthermore, they will also include CA lead farmer beneficiaries and non-CA farmers (e.g. during site visits) as well as suppliers and producers of inputs and equipment, and CA service providers. Finally, staff of training and research institutions will be interviewed. For the KII special emphasise will be given to have female interview partners;
- **Focus Group Discussions** in multiple rounds with CA farmer groups and if possible with none-CA farmer groups, extension officers, or technicians of GoK, NGOs, FBOs, CBOs or training institutions. Special attempts will be made to ensure even participation (also in gender) and careful wording of the key lead questions; and
- **Direct observations** will be carried out to better understand the context and achievements of CA stakeholders, especially CA practices by farmers, as well as the dynamic of the perception of CA and interaction of stakeholders in programme activities. Field visits to farms will play a key-role in determining capacity gaps.

The principles of **triangulation**—use of multiple sources, including stakeholder participation—was implemented for this CA CNA. Qualitative researchers generally use triangulation to ensure that an account is rich, robust, comprehensive and well-developed. However, triangulation did not necessarily mean that the CA CNA team cross-checked data or findings from at least two sources or methods and confirming it is correct or not. It was more to increase the level of knowledge about something and to strengthen the expert's standpoint from various aspects.

Annex 3. Definition of Conservation Agriculture

'How you can do CA', 'the need to know' and 'be able to do'

Principle	How to do it
1. Continuous minimum mechanical soil disturbance	• Basin planting • Jab-planter • Animal drawn planting • Mechanised • Planting stick; dibble stick, dibbler • Hand hoe • Chaka hoe • Broadcasting • Ripping and sub-soiling (hand, animal drawn or tractor)
2. Permanent organic soil cover	• Cover crops • Living plants (intercropping) • Cut-and-carry • Mulch/residue • Crop management • Residue management • Cover crop management
3. Diversification of crop species grown in sequences and/or associations	• Crop rotation • Intercropping • Diversification of crops and crop rotations • Mixed cropping, • Division of fields with different crops • Relay cropping • Alley cropping

Need to know or be able to do:

General CA knowledge and perception

- Soil health and fertility improvement e.g. organic matter, moisture retention,
- Food security improved
- Stability of yields
- Labour and time saving
- Cost reduction
- Increased income
- Mitigation of climate change (carbon sequestration, GHG emission reduction, fuel reduction, reduction in use of agro-chemicals)
- Improved diversification of crops, food and income
- Good for soil rehabilitation
- Erosion reduction/soil conservation
- Less run-off and cleaner water (streams and rivers)

Challenges and misconceptions of CA

- Starting costs for inputs and specific CA implements
- Knowledge and learning intensive
- Competing uses of crop resides for fodder or firewood
- Attitude and mind-set
- Dependence on agro-chemicals

- Partial adoption of CA principles
- Inadequate service providers and support services
- Inadequate technical advice
- Lack of supporting research
- Lack of supporting policies
- Lack of access to or dissemination of CA information and CA knowledge
- Lack of continuity/sustainability or good exit strategy

Practices and methods used in CA

Land preparation

- Ripping (hand ripper)
- Sub-soiling (animal drawn)
- Knife roller
- Herbicide application
- Shallow or hand hoe

Planting

- Timeliness
- Seed and variety choice
- Proper spacing (use of planting line)

Weed management

- Knowledge of different types of weeds
- Chemical method (herbicides-sprayer and roller)
- Biological methods (plants, soil cover, allelopathy)
- Cultural method (mulching)
- Physical methods (slashing, shallow hoe/scrapping, conventional hoe, uprooting, portable mower,
- Integrated weed management
- Timeliness
- Safe use of pesticides

Cover crops

- Different types of cover crops and their properties
- Purposes of cover crops (food, fodder, market, soil cover, water conservation, fertility, hard pan breaking, carbon sequestration, organic matter)
- Seed systems (multiplication,
- Importance of legumes
- Productivity
- Value chains (processing, utilization, marketing)
- Timelines of cover crop planting
- Correct spacing of cover crop

Pest and disease management

- Integrated Pest Management (IPM)
- Crop rotation
- Diversification
- Chemical
- Biological (natural enemies, repelling plants, use of organic pesticides)
- Intercropping
- Timeliness
- Safe use of pesticides

Agroforestry

- Fodder trees
- Intercropping

- Legume trees
- Carbon sequestration
- Shading (water conservation, soil moisture improvement)
- Diversification of income
- Firewood, timber, construction
- Wind breaks
- Soil improvement

CA implements and equipment
- Maintenance
- Storage
- Use
- Availability (borrowing, hire and purchase)
- Timeliness
- Affordability & financing
- Different types
- Manufacturers/artisans and repair
- Service providers
- Policy
- Research
- Training

Soil fertility
- Organic, e.g. manure, compost, crop residues, cover crops, cut-and-carry cover, vermiculture
- Chemical
- Liming
- Soil analysis

Financing of
- Equipment
- Inputs
- Labour

Soil rehabilitation
- Soil and water conservation methods
- Liming
- Agroforestry
- Breaking hardpans
- Fertilizer, manure
- Soil amendments (micro nutrients)
- Cover crops

Crop-livestock or animal integration
- Manure/compost
- Fodder/pasture production
- Controlled grazing
- Livestock as part of the rotation (paddocking)
- Farm power/animal draught
- Special grazing areas
- Livestock and animal diversification

Annex 4. Definition for Capacity and Gap-Analysis

For this assignment, the CA CNA team adopted the UNDP 2009 capacity definition for this assignment:

> "The ability of individuals, institutions and societies to perform functions, solve problems, and set and achieve objectives in a sustainable manner."
>
> (UNDP 2009, p. 53)[16]

For the assignment, we will make be difference between hard and soft capacities. The definition of these is described in the following table:

Hard capacities	**Soft capacities**
Capacities that are generally considered to be technical, functional, tangible and visible such as: • Technical skills, explicit knowledge and methodologies (which for individuals can be considered as competencies) • Organisational capacity to function: appropriate structures; systems and procedures for management, planning, finance, human resources, monitoring and evaluation, and project cycle management; the ability to mobilise resources • Laws, policies, systems and strategies (enabling conditions) • Infrastructure, budget, buildings, equipment and documentation	Operational capacities such as: • Organisational culture and values • Leadership, political relationships and functioning • Implicit knowledge and experience • Relational skills: negotiation, teamwork, conflict resolution, facilitation, etc. (e.g. extension approach) • Problem solving skills • Intercultural communication Adaptive capacities such as: • Ability and willingness to self-reflect and learn from experience • Ability to analyse and adapt • Change readiness and change management • Confidence, empowerment and or participation for legitimacy to act

The following working-definition for a gap-analysis was applied for the CA CNA:

> "A gap analysis starts with definition of how things 'should be', the desired capacity, then looking at how they are, the actual capacity, and defining the difference between the two as what is missing, i.e. **'the gap'.**"

[16] UNDP, 2009, Capacity Development: A UNDP Primer, United Nations Development Programme, Capacity Development Group.

Annex 5. Stakeholder Groups

Micro level group

- Farmers and local farmer association
- Extension officers, technical advisors of NGOs and CBOs/FBOs

Meso level group

- Farmer organisations
- Government extension service ward, Sub-county and County offices
- Suppliers of inputs
- Suppliers and manufacturers of CA implements
- Service providers (tillage and CA)
- Micro-finance institutions or projects
- NGOs, CBOs, FBOs

Macro-level group

- International development organisations (GIZ, GOPA, WHH)
- International NGO/CBO/FBO
- Researches institutions
- Education institutions
- Government

Annex 6. Definition of the Desired Capacities

Desired Capacity for each of the stakeholder groups—What capacity should they have?

NB: CA skills, knowledge, implements, inputs are understood according to CA definition in Annex 3.

On all level, certain hard capacities are paramount. Likewise, the identified soft capacities are common among all stakeholder groups. Therefore, the following hard and soft skills are valid for each group:

Capacity	What capacity should they have?	Indicator (examples)
Hard capacities	• Knowledge about CA	Farmer can demonstrate or explain CA practices, farmers field
	• Access to information	Sources of information
	• Planning	Existence of planning records
Soft capacities	• Willing to adopt CA • Open to change, e.g. cultural values and customs, gender equality, behaviour • Positive attitude • Teamwork skills • Conflict resolution skills • Facilitation skills • Leadership • Problem identification and solving skills • Ability and willingness to self-reflect and learn from experience • Ability to analyse and adapt • Confidence, empowerment and or participation	During the interview, the interviewee gives examples for the soft capacity. The indication for the soft capacity will be at the discretion of the CA CNA team member. Coordinators will assist with the verification of the soft capacity if possible.

Micro level group.
Farmers and local farmer association

Capacity	What capacity should they have?	Indicator (examples)
Hard capacities	• CA skills, 'to do it'	Farmer can demonstrate or explain CA practices
	• CA implements	Implements present or accessible, e.g. at neighbour
	• CA inputs, e.g. seeds and cover crop seeds	Has inputs or knows how to access to inputs
	• Land	Has land or access to land
	• Access to technical advice, e.g. extension service	Knows technical advisor and can proof regular visits or contact
	• Labour	Access to labour, family or hired, animals,
	• Access to financing or own financial means	Can explain where to get the finances from
	• Knowledge and access to markets	• Sells on the market • Can explain where market is or how to sell
	• Value addition	• Process produce • Can explain how to do it
	• Livestock management	• No animals visible in the CA fields, • Can explain the management regime

		• Fencing (living or dead)

Meso level group

Farmer organisations

Capacity	What capacity should they have?	Indicator (examples)
Hard capacities	• Members have adopted CA	Can give examples of farmer practicing CA, could be verified by coordinator
	• Gives advice, train and support on CA	• Has technicians working with member in CA • Provide CA training course verified through participants lists or other records • Provide CA information materials to members or others
	• CA skills, 'to do it'	• Interviewees can demonstrate or explain CA practices • Have CA technician
	• CA implements	• Have CA implements and give them to members • Can explain how to access CA implements • Can explain which CA implements exist
	• CA inputs, e.g. seeds and cover crop seeds	• Have CA inputs and give them to members • Can explain how to access CA inputs • Can explain which CA inputs exist
	• Infrastructure, e.g. CA demo fields, phones, office, meeting room, personnel, seed bulking and storage facilities, training facilities, etc.	• Can present infrastructure
	• Organizational structure	• Organisation has vision, mission, constitution, keeps records of meetings, bookkeeping, hold elections, has officials (e.g. treasurer, secretary, chairman, members of committees, etc.)
	• Access to technical advice, e.g. farmer-to-farmer training, extension service, private sector, NGO, donor	• Knows technical advisor and can proof regular visits or contact
	• Access to financing or own financial means	• Can explain where to get the finances from
	• Knowledge and access to markets	• Sells on the market, • Can explain where market is or how to sell
	• Value addition	• Process produce for members (infrastructure) or can explain how to do it
	• Livestock management	• Can explain the management regime • Presence of farmer committees and their meeting records

Suppliers of inputs

Capacity	What capacity should they have?	Indicator (examples)

Hard capacities	• Practical experience with CA	• Use CA demonstrations plots for the presentation of their products • Produce seeds on CA fields
	• Gives advice, train and support on CA	• Has technicians working with clients in CA • Provide CA training course verified through participants lists or other records • Provide CA information materials to clients or others
	• CA skills, 'to do it'	• Interviewees can demonstrate or explain CA practices • Have technicians working with clients in CA
	• CA implements	• Have CA implements and give them to clients • Can explain how to access CA implements • Can explain which CA implements exist
	• Sell and deliver CA inputs, e.g. seeds and cover crop seeds	• Have CA inputs in stock or can order • Sales records and delivery records of CA inputs • Can explain which CA inputs exist
	• Infrastructure, e.g. CA demo fields, phones, office, sales facilities, personnel, storage facilities, training facilities, etc.	• Can present infrastructure
	• Company structure	• Part of a bigger company or network
	• Access to technical advice, e.g. extension service, private sector, NGO, donor, Internet	• Knows technical advisor and can proof regular visits or contact, internet connection, training certificates, training or information materials
	• Access to financing or own financial means	• Can explain where to get the finances from

Suppliers and manufacturers of CA implements

Capacity	**What capacity should they have?**	**Indicator (examples)**
Hard capacities	• Practical experience with CA	• Use CA demonstrations plots for the presentation of their products
	• Gives advice, train and support on CA implements	• Has technicians working with clients in CA • Provide CA implement training course verified through participants lists or other records • Provide CA implement information materials to clients or others
	• CA implements manufacturing skills	• Presentation CA implements • Workshop with tools • Can explain which CA implements exist
	• CA implements repair and maintenance services	• Workshop and tools • Spare parts • Visible CA implements in repair • Can explain how to repair CA implements

		• Can explain which CA implements exist and how to repair
	• Sell, distribute and deliver CA implements	• Have CA implements in stock or can order • Sales records and delivery records of CA implements • CA implements catalogues • Can explain which CA implements exist • Transportation, e.g. pickup, truck
	• Infrastructure, e.g. CA demo fields, phones, office, sales facilities, personnel, storage facilities, training facilities, workshop, etc.	• Can present infrastructure
	• Company structure	• Single person or part of a bigger company or network
	• Access to technical advice, e.g. extension service, private sector, NGO, donor, Internet	• Knows technical advisor and can proof regular visits or contact, internet connection, training certificates, training or information materials
	• Access to financing or own financial means	• Can explain where to get the finances from

Service providers (tillage, etc.)

Capacity	**What capacity should they have?**	**Indicator (examples)**
Hard capacities	• Practical experience with CA	• Use CA demonstrations plots for the presentation of their services • Records of work with farmers and provide CA services
	• Gives advice, train and support on CA	• Has staff working with clients in CA • Provide CA training course verified through participants lists or other records • Provide CA information materials to clients or others • Pricelist of CA services
	• Have own CA implements	• Presentation CA implements • Workshop with tools • Can explain which CA implements exist
	• CA implements repair and maintenance services	• Records • Workshop and tools • Spare parts • Visible CA implements in repair • Can explain how to repair CA implements • Can explain which CA implements exist and how to repair
	• Infrastructure, e.g. CA demo fields, phones, office, sales facilities, personnel, storage facilities, training facilities, workshop, etc.	• Can present infrastructure
	• Company structure	• Single person or part of a bigger company or network

	• Access to technical advice, e.g. extension service, private sector, NGO, donor, Internet	• Knows technical advisor and can proof regular visits or contact, internet connection, training certificates, training or information materials
	• Access to financing or own financial means	• Can explain where to get the finances from

Micro-finance institutions or projects

Capacity	What capacity should they have?	Indicator (examples)
Hard capacities	• Have special CA and/or CSA financial products	• Brochures or information materials on CA products • Credit records • Staff has CA skills and can demonstrate these
	• Gives advice and support on CA	• Have staff working with clients in CA • Provide CA information materials to clients or members
	• Infrastructure	• Can present infrastructure, e.g. M-Pesa connectivity demonstrated
	• Company structure	• Single person or part of a bigger company or network or cooperative
	• Access to technical advice, e.g. extension service, private sector, NGO, donor, Internet	• Knows technical advisor and can proof regular visits or contact, internet connection, training certificates, training or information materials
	• Access to financing or own financial means	• Can explain where to get the finances from
	• Policy environment favouring microcredits for smallholders or farmers	• Policy documents

Macro-level group

International Development Organisations

Capacity	What capacity should they have?	Indicator (examples)
Hard capacities	• Organisation has adopted CA in their work	• Can give examples and documents of projects implementing CA
	• Organisation has a policy and/or strategy for implementing a CA programme/project	• CA policy or strategy documents
	• Organisation has a CA implementation plan, including extension approach and gender equality	• CA plan document
	• Long-term approach to CA implementation and practice	• Document
	• Organisation has an exit strategy for its CA project and brings sustainability into its projects	• Document • Examples for successful exit • Examples for sustainability
	• Organisation has staff responsible for CA	• Number of staff assigned to CA

	• Staff development plan for CA	• Written proof of plan
	• Organisation coordinates CA activities with other donors, national, regional and international	• Written proof of coordination mechanism • Attendance lists
	• Organisation is a member of a CA network, national or international	• Number of memberships and names of CA networks
	• Organisation supports the development of CA policies on local, national, regional and international levels	• Policy papers
	• Organisation supports research in CA	• Number and names of research institutions • CA research documents supported by organisation • Number of students supported
	• Organisation has own CA publications	• Number, types and titles of publications
	• Organisation implements or supports CA training courses	• Number of CA training courses • Number of trainees • Categories of training course • Categories of trainees • Budget spend or allocated for training • Training materials developed
	• Support the development of CA curricula and courses	• Curricula documents • Course registration document • University courses developed • Students enrolled in CA courses • Students graduating from CA courses
	• Support of CA equipment manufacturers or suppliers	• Number and names of CA equipment producers or suppliers • Training courses for CA equipment sector • Number of prototypes, photos of them
	• Support of CA input suppliers and producers	• Number and names of CA input suppliers and producers • Number of training courses
	• Support of CA farmers	• Number of farmers supported and trained • Number and area in ha of CA farms • Number CA demonstration plots • Number CA field days • Number of visits to CA fields
	• Organisation and/or support of workshops, congresses, conferences	• Number of workshops, congresses and conference publications
	• Support of CA knowledge management	• Types of knowledge management systems supported • CA information material presented
	• Access or enough financing	• Can explain or proof where to get the finances from. • Project documents, business plans, and annual reports

NGO/CBO/FBO (church)

Capacity	What capacity should they have?	Indicator (examples)
Hard capacities	• Organisation has adopted and promotes CA in their work	• Can give examples and documents of projects implementing CA
	• Organisation has a policy and/or strategy for implementing a CA programme/project	• CA policy or strategy documents
	• Organisation has a CA implementation plan, including extension approach and gender equality	• CA plan document
	• Long-term approach to CA implementation and practice	• Document
	• Organisation has an exit strategy for its CA project and brings sustainability into its projects	• Document • Examples for successful exit • Examples for sustainability
	• Organisation has staff responsible for CA	• Number of staff assigned to CA
	• Staff development plan for CA	• Written proof of plan
	• Organisation coordinates CA activities with other partners on local, national, regional and international level	• Written proof of coordination mechanism • Attendance lists
	• Organisation supports the development of CA policies on local, national, regional and international levels	• Policy papers
	• Organisation is a member of a CA network, local, national or international	• Number of memberships and names of CA networks
	• Organisation supports research in CA, on-farm research by farmers or researchers	• Number and names of research institutions • CA research documents supported by organisation • Number of students supported • Number of on-farm research plots
	• Organisation has own CA publications	• Number, types and titles of publications
	• Organisation develops, implements and/or supports CA training courses	• Number of CA training courses • Written CA training strategy • Number of trainees • Categories of training course • Categories of trainees • Budget spend or allocated for training • Training materials developed
	• Support of CA equipment manufacturers or suppliers	• Number and names of CA equipment producers or suppliers, especially local • Training courses for CA equipment sector • Number of prototypes, photos of them
	• Support of CA input suppliers and producers	• Number and names of local CA input suppliers and producers • Number of training courses

	• Support of CA farmers	• Number of farmers supported and trained • Number and area in ha of CA farms • Number CA demonstration plots • Number CA field days • Number of visits to CA fields • Number of CA exposure tours
	• Organisation and/or support of workshops, congresses, conferences	• Number of workshops, congresses and conference publications
	• Support of CA knowledge management	• Types of knowledge management systems supported • CA information material presented
	• Access or enough financing	• Can explain or proof where to get the finances from. • Project documents, business plans, and annual reports

Public extension officers, technical advisors of NGOs and CBOs/FBOs

Capacity	**What capacity should they have?**	**Indicator (examples)**
Hard capacities	• CA skills, 'to do it'	Officer can demonstrate or explain CA practices
	• CA implements	Officer can demonstrate or explain the use and repair of different CA implements
	• CA inputs, e.g. seeds and cover crop seeds	Officer can demonstrate or explain the use of different CA inputs
	• Habilitated to work with farmers, e.g. transport, subsistence allowance, time, support by superiors, part of his/her job description, working equipment	Works with farmers, reports, visible transportation, annual work plans
	• Received training in CA	Existence of training records or certificates
	• Received supportive training course, e.g. value addition, farm budget planning, fertilizer regime calculations, etc.	Existence of training records or certificates
	• Able to plan and implement CA training courses with farmers	• ToT certificate • Training curriculum • Training materials • Attendance list
	• Good communication skills, written and oral	• Farmers testimony • Personal impression • Use of communication devices • Training certificates
	• Access to technical advice, e.g. extension service, organisations, Internet	• Can name technical advisor/expert • Can demonstrate Internet sources
	• Can use different extension approaches, e.g. FFS, PEA, T+V, lead farmer (LF), farmer to farmer, etc.	• Can explain or has used different approaches with his farmers

Public extension service (PES) on County level

Capacity	**What capacity should they have?**	**Indicator (examples)**

Hard capacities	• PES has adopted and promotes CA in their County	• Can give examples and documents of projects implementing CA
	• PES has a policy and/or strategy for implementing a CA programme/project in the County, based on the national policy if existent	• CA policy or strategy documents
	• Organisation has a CA implementation plan, including extension approach and gender equality for the County	• CA plan document
	• Long-term approach to CA implementation and practice	• Document
	• PES has an exit strategy for its CA activities and brings sustainability into its activities	• Document • Examples for successful exit • Examples for sustainability
	• PES has staff responsible for CA and use other subject matter specialist for support of CA activities	• Number of staff assigned to CA
	• PES staff development plan for CA	• Written proof of plan
	• PES coordinates CA activities with other partners on local level	• Written proof of coordination mechanism • Attendance lists
	• PES partners with a CA network, local or national	• Number of memberships and names of CA networks
	• PES supports research in CA, on-farm research by farmers or researchers	• Number and names of research institutions • CA research documents supported by organisation • Number of students supported • Number of on-farm research plots
	• PES has own CA publications	• Number, types and titles of publications
	• PES develops, implements and/or supports CA training courses	• Number of CA training courses • Written CA training strategy • Number of trainees • Categories of training course • Categories of trainees • Budget spend or allocated for training • Training materials developed
	• Support of CA equipment manufacturers or suppliers	• Number and names of CA equipment producers or suppliers, especially local • Training courses for CA equipment sector • Number of prototypes, photos of them
	• Support of CA input suppliers and producers	• Number and names of local CA input suppliers and producers • Number of training courses
	• Support of CA farmers through its extension officers	• Number of farmers supported and trained • Number and area in ha of CA farms • Number CA demonstration plots • Number CA field days

		• Number of visits to CA fields • Number of CA exposure tours
	• PES supports workshops, congresses, conferences	• Number of workshops, congresses and conference publications
	• Support of CA knowledge management	• Types of knowledge management systems supported • CA information material presented
	• Access or enough financing, budget allocated for CA	• Can explain or proof where to get the finances from. • Documents such as annual budgets

Researches Institutions (RI)

Capacity	**What capacity should they have?**	**Indicator (examples)**
Hard capacities	• RI has adopted and promotes CA in their work	• Can give examples and documents of research projects implementing CA
	• RI has a strategy for research on CA	• CA research strategy documents
	• RI has a CA research implementation plan, including dissemination approach and gender equality	• CA plan document • Number of women researchers
	• Long-term approach to CA research	• Document
	• RI has staff responsible for CA and use other subject matter specialist for support of CA activities	• Number of staff assigned to CA
	• RI staff development plan for CA	• Written proof of plan
	• RI coordinates CA activities with other research partners	• Written proof of coordination mechanism • Attendance lists
	• RI is part of a CA network, local, national or international	• Number of memberships and names of CA networks
	• RI conducts on-farm research	• Number and locations of research plots • CA research documents published by RI • Number of farmers supported
	• RI has own CA publications	• Number, types and titles of publications
	• RI develops, implements and/or supports CA training courses	• Number of CA training courses • Written CA training strategy • Number of trainees • Categories of training course • Categories of trainees • Budget spend or allocated for training • Training materials developed
	• Support of CA equipment manufacturers or suppliers or development of CA equipment	• Number and names of CA equipment producers or suppliers, especially local • Training courses for CA equipment sector • Number of prototypes, photos of them
	• Support of CA input suppliers and producers	• Number and names of CA input suppliers and producers • Number of training courses

	• RI supports and participates in workshops, congresses, conferences	• Number of workshops, congresses and conference publications
	• Support of CA knowledge and data management	• Types of knowledge management systems supported • CA information material presented • Data base on CA
	• Access or enough financing, budget allocated for CA research	• Can explain or proof where to get the finances from. • Documents such as annual budgets

Education Institutions (EI)

Capacity	**What capacity should they have?**	**Indicator (examples)**
Hard capacities	• EI has adopted and promotes CA in their teaching or training	• Can give examples and documents of CA education • CA curricula • Number of CA academic courses • Number of other CA courses
	• CA is part of the strategy for education and training	• CA strategy documents
	• Contribution to CA policies	• Policy documents
	• EI has staff responsible for CA	• Number of staff assigned to CA
	• EI staff development plan for CA	• Written proof of plan
	• EI partners with other CA stakeholders	• Written proof of collaboration
	• EI is part of a CA network, local, national or international	• Number of memberships and names of CA networks
	• EI conducts CA on-farm research and training	• Number and locations of CA plots • CA research documents published by EI • Number of farmers supported
	• EI has own CA publications	• Number, types and titles of publications
	• Training of and collaboration with CA equipment manufacturers or suppliers	• Number and names of trained of CA equipment producers or suppliers, especially local • Training courses for CA equipment sector • Number of prototypes, photos of them
	• Training of and collaboration with CA input suppliers and producers	• Number and names of trained CA input suppliers and producers • Number of training courses
	• EI supports and participates in workshops, congresses, conferences	• Number of workshops, congresses and conference publications
	• Support of CA knowledge and data management	• Types of knowledge management systems supported • CA information material presented • Data base on CA
	• Access or enough financing, budget allocated for CA research	• Can explain or proof where to get the finances from • Documents such as annual budgets and business plans

Government

Capacity	What capacity should they have?	Indicator (examples)
Hard capacities	• GoK has adopted and promotes CA in the country	• Can give examples and documents of projects implementing CA
	• GoK has a policy and/or strategy for implementing a CA programme/project in the country	• CA policy or strategy documents
	• GoK has a CA implementation plan, including extension approach and gender equality for the country	• CA plan document
	• Long-term, permanent approach to CA implementation and practice	• Document
	• GoK has staff responsible for CA and use other subject matter specialist for support of CA activities	• Number of staff assigned to CA
	• GoK staff development plan for CA	• Written proof of plan
	• GoK coordinates CA activities with other partners on national and international level	• Written proof of coordination mechanism
	• GoK partners with a CA network, on national and international level	• Number of memberships and names of CA networks
	• GoK supports research in CA	• Number and names of research institutions • CA research documents supported by GoK
	• GoK has supported CA publications	• Number, types and titles of publications
	• GoK supports CA training courses	• Number of CA training courses • Written CA training strategy • Number of trainees • Categories of training course • Categories of trainees • Budget spend or allocated for training • Training materials developed
	• Support of CA equipment manufacturers or suppliers	• Number and names of CA equipment producers or suppliers, especially local • Training courses for CA equipment sector • Number of prototypes, photos of them
	• Support of CA input suppliers and producers	• Number and names of local CA input suppliers and producers • Number of training courses
	• Support of CA farmers through its extension programmes	• Written proof of support and implementation in CA
	• GoK supports workshops, congresses, conferences	• Number of workshops, congresses and conference publications
	• Support of CA knowledge management	• Types of knowledge management systems supported

		• CA information material presented
	• Enough budget allocated for CA programmes and activities	• Can explain or proof where to get the finances from • Documents such as annual budgets

Annex 7. Interview Guidelines

A. Farmers, Local Farmer Associations

1. Do you know CA? Explain CA? How did you know about it? Do you practice it, for how long? How much of your land is under CA? What are the benefits of CA?
2. None-CA adopter: Do you know CA? What happened now, you're not practicing CA? What do you need for sustainability?
3. What implements and tools do you use for CA? Where did you get the tools? Are they available locally? Which tools would you like to acquire?
4. What inputs do you use for CA? How do you access them?
5. Do you produce seeds for CA? Own use or for sale or both?
6. How do you access CA information? How often do you access this information?
7. How can you describe labour availability in your farm? How do you source it?
8. How do you access credit and finances?
9. Where do you market your yields/produce/goods?
10. Do you process your produce? If yes, how do you do it? For own use or sale?
11. Do you own livestock? How do you manage your livestock? What support would you need to properly manage your livestock? Do you use your animals for draft?
12. How do you manage your farm yard manure? How much do you apply? How much do you require to sufficiently supply the whole farm?
13. Do other farmers come to learn CA from you/do you train other farmers on CA? How do you train (approach)? How do you rate yourself as a CA trainer? After training, do you make follow-ups/Do the trainees come back for further advice or consultations?
14. How can you rate the level of CA adoption in your area? What hinders CA adoption in your area? What gaps need to be filled to promote CA adoption?
15. What must happen that you apply CA on your entire field? If you apply CA on your entire farm, what do you expect?

B. Farmer Organisations

1. Do you know CA? How did you know about it? How much of your land is under CA? What are the benefits of CA? Do your group members practice CA? If yes, what proportion/% of the group? How many men and women do practice?
2. What services do your organisation provide to members? How do you advertise your products to farmers?
3. What implements and tools do your members use for CA? Does your organisation supply implements to members? If yes, which ones?
4. What inputs do your members use for CA? How do your members access them? Do you have seed multiplication activity in your organisation? If yes, which seeds do you produce? Are they for sale or for supply to members or both?
5. Do you keep records? Give examples!
6. Does your organisation have a leadership structure? How often do you have meetings? Do you keep meeting records? How often do you hold elections?
7. How do you access CA information? How often do you access this information?
8. Do you members experience any challenges in practising CA? If yes give examples?

9. How do your members relate in their farms? Do they work together? Do they market their goods collectively?
10. How do you access credit and finances?
11. Where and how do you market your goods?
12. Do you process your produce? How do you do it?
13. How do your membership manage their livestock? Are there any crop-livestock conflicts among members and neighbours? What are the conflict resolution mechanisms used? What support do the members need to properly manage their livestock? Do you confine your animals or you have communal grazing land?
14. Do you have a vision and mission? Does your organisation have a constitution? How do you solve conflicts in your organisation? Do you have a conflict resolution strategy?
15. Does your organisation train farmers/members on CA? What shows that you train? How do you source the trainers? Do you have training facilities? Can we see them? Where do you source your CA information? How do you train (approach)? How do you control the impact of your trainings?
16. Do you provide CA information materials to farmers? If yes, what kind of materials?
17. What hinders CA adoption in your organisation? What gaps need to be filled to promote adoption?
18. What infrastructure do you have that enables you to promote CA? E.g. artisans, tools and implements, communication apps, garages, workshops,
19. How do farmers give feedback on services provided?

C. Suppliers of CA Inputs and CA Implements and Tools Manufacturers (Suppliers, manufacturers, service providers, producers)

1. Do you know about CA? How did you know about it? What are the benefits of CA?
2. How do you access CA information? How often do you access this information?
3. How do you access credit and finances?
4. Do you have a vision and mission? Do you have a code of ethics? How do you solve conflicts in your organisation? Do you have a conflict resolution strategy?
5. What hinders the distribution and availability of CA inputs and implements to the farmers?
6. Do you provide CA services and/or technical advice to farmers?
7. How do you advertise your products to farmers? Do you produce seeds for CA?
8. What CA inputs/implements and cover crop seeds do you have in stock? Do you keep sales and delivery records for the inputs/implements?
9. What infrastructure do you have that enables you to promote CA?
10. Which CA implements do you manufacture? How do you provide repair and maintenance services? How are farmers involved in implement design and testing? How do farmers give feedback for services provided?

    (Observe whether there is a workshop with tools and implements)
11. Please describe your company structure?
12. How is your organisational leadership structure? How often do you hold meetings? Do you keep meeting records? How often do you hold elections?

D. Financial Institutions
(MFI, AFC, Equity Bank, Cooperative Bank, Family Bank, Faulu)

1. Do you know CA? How did you know about it? Can you describe how CA should be practised? How do you empower your clients?
2. What financial products do you have? Type and number? What products are for CA farmers? How do you involve your clients in formulation of your financial products?
3. Do you have a strategy/policy/gender equality document for incorporating CA in your work? Are the documents publicly available?
4. What do you do to address gender inequality, cultural values and farmers behaviour in formulation of your products? How do you integrate the youth in your product formulation? How do you capture feedback from your clients?
5. Does your organisation support CA development programmes at local and National levels? No. of farmers and programmes supported and trained? Workshops, conferences and congresses? Examples? Publication?
6. Do you support CA input and equipment manufacturers, suppliers or service providers? Number and names supported?
7. Access and allocation of enough finances for CA programmes? Sources of finances? Annual reports, Business plans, project documents?
8. What infrastructure do you have that enables you to support/promote CA?
9. What are your terms of lending? Collateral? Repayments?
10. How many clients come for your services?
11. What are your successes and failures for the CA products and programmes? How do you address your challenges and/or failures?

E. Public and Private Extension Services
(Extension staff, NGO/CBO/FBO)

1. Do you know CA? How did you know about it? Can you describe how CA should be practised?
2. Do you have a strategy/policy/gender equality documents for incorporating CA in your work? What is your long-term approach to CA implementation and practice? Exit strategy? Documents publicly available?
3. Do you train your staff in CA? Do you have a staff development plan for CA? Proof and number of staff trained in CA? Gender consideration in staff recruitment?
4. Does your organisation work in partnership with other organisations in promoting CA? Is your organisation in PPP with other local, national and international organisations? At partnership level who coordinates CA activities? Any memorandum of understanding- MoU and partners/working documents?
5. Does your organisation produce/publish and provide CA information materials to other stakeholders and farmers? If yes what kind of materials? Knowledge management systems in place? CA information materials available?
6. Does your organisation support CA development programmes at local and National levels? No. of farmers supported and trained? No. & area (ha) of CA farms? No of CA demonstration plots? Workshops, conferences and congresses? Examples? Publication?
7. Does your organisation support and collaborate with research organisations in CA? Any CA research extension documents? Names of research institutions you collaborate with.
8. Does your organisation train farmers in CA? Do you have training modules used? Courses offered? How do you make follow-ups of the trainees/How do you capture feedback? How do you identify your trainees? Gender, etc.
9. Do you offer trainings for manufacturers and suppliers of CA implements and services? Which training courses for CA equipment? Number of prototypes? Photos of implements?

10. Do other partners come to learn CA from you/do you train other partners on CA? How do you rate yourself as a CA trainer? How do you train (approach)?
11. What extension approaches do you use in your organisation? What challenges and successes do you encounter? How do you address the challenges and/or failures?
12. Do you support CA input and equipment manufacturers, suppliers or service providers? Number and names supported? No. of prototypes?
13. Access and allocation of enough finances for CA programmes? Sources of finances? Annual reports, Business plans, project documents?
14. Do you have CA implementation plans for the counties/country? Policies? Gender mainstreaming? Budget allocation? What % of agric. budget is allocated to CA promotion?
15. What hinders CA adoption in your organisation? What gaps need to be filled to promote adoption?
16. What infrastructure do you have that enables you to support/promote CA? e.g. offices, engineering workshops, equipment, trained staff, vehicles, motorbikes, bicycles, technology development centres, etc.
17. Is there government policy for CA at the County and/or national level?

F. International Organisation and Government Extension Service

1. Does the organisation have a mission and vision statement? Is it available as a working document? Avail a copy/photo.
2. Do you have an agricultural policy? (Available). Does the policy document have a CA component? (Gender mainstreaming, youth empowerment, Long-term approach to CA implementation, Exit strategy?) Documents publicly available?
3. Do you train your staff in CA? Do you have a staff development plan for CA? Proof and number of staff trained in CA? Gender consideration in staff recruitment?
4. Is your organisation supporting CA networks? Who coordinates CA activities at National level?
5. Does your organisation produce/publish and provide CA information materials to other stakeholders and farmers? If yes, what kind of materials? Are there knowledge and data management systems in place? CA information materials available?
6. Does your organisation support CA development programmes at local and National levels? No. of farmers supported and trained? No. & area (ha) of CA farms? No of CA demonstration plots? Workshops, conferences and congresses? Examples? Publication?
7. Does your organisation support research in CA? Any CA research documents? No. of students supported for research? Names of research institutions supported?
8. Do you support CA input and equipment manufacturers, suppliers or service providers? E.g. specify—training materials and finances? Number and names supported? No. of prototypes?
9. Do you allocate enough finances for CA programmes? Sources of finances? Annual reports, Business plans, project documents?
10. Do you have CA implementation plan for the counties/country?
11. What infrastructure do you have that enables you to support/promote CA?
12. What hinders CA adoption in your organisation? What gaps need to be filled to promote adoption?
13. Do you have any procedure for CA programme identification? How do you do it? Involvement of stakeholders?
14. Do you have an M&E system in place for CA activities at County and National levels?
15. Does your organisation have a code of conduct/ethics?

G. Education and Research Institutions

1. Does the organisation have a mission and vision statement? Is it available as a working document? Available as copy/photo.
2. Do you have a strategy/policy/gender equality documents for incorporating CA in your work/curriculum? Long term approach to CA implementation and practice? Documents publicly available?
3. Do you train your staff in CA? Do you have a staff development plan for CA? Proof and number of staff trained in CA? Gender consideration in staff recruitment?
4. What areas of CA does your organisation focus on in research/education?
5. Is your organisation a member of a CA network? Is your organisation in PPP with other local, national and international organisations? At partnership level who coordinates CA activities? How do you disseminate CA packages to other partners? How do you capture feedback from the partners? How do you rate yourself in terms of knowledge and data sharing?
6. Does your organisation produce/publish and provide CA information materials to other stakeholders and farmers? If yes, what kind of materials? Knowledge and data management systems in place? CA information materials available?
7. Does your organisation support CA development programmes at local and National levels? No. of farmers supported and trained? No. & area (ha) of CA farms? No of CA demonstration plots? Workshops, conferences and congresses? Examples? Publication?
8. Does your organisation support research activities in CA? Any CA research documents available? No. of students supported for research and development? Names of institutions supported?
9. Does your organisation support CA curricula development and courses? Training modules used?
10. Do you support CA input and equipment manufacturers, suppliers or service providers? Specify support provided, number and names supported? No. of prototypes?
11. Do you have access and allocation of enough finances for CA programmes? Sources of finances? Annual reports, Business plans, project documents?
12. What gaps need to be filled to improve adoption?
13. What infrastructure do you have that enables you to support/promote CA?
14. How do you contribute to CA policy development for the country?
15. How do you identify topical CA research issues?
16. Do you have an M&E system in place for CA research activities? Does your organisation have a code of conduct/ethics?
17. How many students are graduating in CA courses per year?

Annex 8. Work Schedule

General Work Schedule for the GOPA CA CNA, Kenya 16 to 22 January 2017

Time approx.	Mon 16 Jan	Tue 17 Jan	Wed 18 Jan	Thur 19 Jan	Fri 20 Jan	Sat 21 Jan & Sun 22 Jan
8:00 to 10:00	Preparation	Preparation work, GOPA office, Kisumu	Preparation work, GOPA office, Kisumu	Preparation work, GOPA office, Kisumu	Introduction Meeting with MoA, Bungoma	Writing of Inception Report and preparation of fieldwork phase, Kisumu
10h00 to 12h00					Introduction Meeting with MoA, Kagameka	
13h00 to 15h00	Inception Meeting, GOPA office				Introduction Meeting with MoA, Siaya	
15h00 to 17h00	Preparation work, GOPA office, Kisumu			Travel to Bungoma	Travel to Kisumu	

General Work Schedule for the GOPA CA CNA, Kenya 23 to 28 January 2017

<table>
<tr><th>Time approx.</th><th>Mon 23 Jan</th><th>Tue 24 Jan</th><th>Wed 25 Jan</th><th>Thur 26 Jan</th><th>Fri 27 Jan</th><th>Sat 28 Jan</th></tr>
<tr><td>8:00 to 10:00</td><td rowspan="3">Writing of Inception Report and preparation of fieldwork phase, Kisumu</td><td>Interview Flora Ajwera, GIZ Senior Soil Advisor, Kisumu
& fieldwork in counties</td><td>Interview, Gerrit Gerdes, GIZ Programme Manager
& fieldwork in counties</td><td>Fieldwork</td><td>Fieldwork</td><td rowspan="4">Finalisation and submission of Inception Report & fieldwork in counties</td></tr>
<tr><td>10h00 to 12h00</td><td rowspan="2">Writing of Inception Report
& fieldwork in counties</td><td>Fieldwork</td><td>Fieldwork</td><td>Fieldwork</td></tr>
<tr><td>13h00 to 15h00</td><td>Fieldwork</td><td>Fieldwork</td><td>Fieldwork</td></tr>
<tr><td>15h00 to 17h00</td><td>NSTE</td><td>Interview Sebastian Seitz, GOPA Team Leader, Kisumu
& fieldwork in counties</td><td>Fieldwork</td><td>Fieldwork</td><td>Fieldwork</td></tr>
</table>

General Work Schedule for the GOPA CA CNA, Kenya 30 January to 4 February 2017

<table>
<tr><th>Time approx.</th><th>Mon 30 Jan</th><th>Tue 31 Jan</th><th>Wed 1 Feb</th><th>Thur 2 Feb</th><th>Fri 3 Feb</th><th>Sat 4 Feb</th></tr>
<tr><td>8:00 to 10:00</td><td rowspan="3">Fieldwork</td><td rowspan="3">Fieldwork</td><td rowspan="2">Fieldwork</td><td rowspan="3">Analysing and draft report writing, Kisumu</td><td rowspan="3">Analysing and draft report writing, Kisumu</td><td rowspan="3">Analysing and draft report writing, Kisumu</td></tr>
<tr><td>10h00 to 12h00</td></tr>
<tr><td>13h00 to 15h00</td></tr>
<tr><td>15h00 to 17h00</td><td></td><td>Travel back to Kisumu</td></tr>
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General Work Schedule for the GOPA CA CNA, Kenya 6 to 12 February 2017

Time approx.	Mon 6 Feb	Tue 7 Feb	Wed 8 Feb	Thur 9 Feb	Fri 10 Feb	Sat 11 Feb and Sun 12 Feb
8:00 to 10:00	Draft report writing and preparation of Validation Workshop	Draft report writing and preparation of Validation Workshop	Draft report writing and preparation of Validation Workshop	Validation Workshop, Kakamega	Report writing, Kisumu	Report writing, Kisumu
10h00 to 12h00						
13h00 to 15h00						
15h00 to 17h00						

Draft submission by 17 February 2017
Commenting by GOPA by 20 February 2017
Submission of final report by 24 February 2017

Fieldwork Schedule for the GOPA CA CNA in Bungoma, Kenya, 24 to 29 January 2017

Time approx.	Tue 24 Jan	Wed 25 Jan	Thur 26 Jan	Fri 27 Jan	Sat 28 Jan	Sun 29 Jan
8:00 to 10:00	Rev. Johnstone Nyongesa, ADS, Bungoma Town, 0721315056	Antony Bakari, Seedco, Bungoma 0721327236	Alfred Olang - M&E Officer, MoA, Bungoma, 0712617934	Hellen Masibo, CA farmer, Kabuchai, 0712314533	Everlyn Juma, CA farmer, Kisulini, 0719346744	
10h00 to 12h00	Oscar Kula, Credit Officer Equity Bank Kenya, Bungoma, 0763212151	David Shivonje, ASDP Sub-county Agriculture Officer, Bungoma County, 0729810757	Martin Barasa, Coordinator, Vi Agroforestry, Bungoma, 0716300880	Stephen Malumba Wambile, Research officer, KALRO, Coffee Research Inst., Nambela, 0721795813	Ferdnard Wangila, CA farmer, Tembelela Village, 0737488763	
13h00 to 15h00	David Kale, Manager, KFA Ltd, Supplier/manufacturer CA implements, Bungoma, 0724680809	Edmond Wabwile, CBO/farmer group, Kimaeti, 0729979012	Magret Ooko, Principal ATC Mabanga, Mabanga, 0720718683	Beatrice Wamalwa. CA farmers, chairlady CA adopter group- Tembellea tissue culture women group Tembeleaa 0700362024	Pharis Walulkhu, CA farmer, Kisuluni, 0714692712	
15h00 to 17h00	Anthony Okoti , Ace Africa, Bungoma, 0721315056	John Nyanja, Mavuno SHG, CA farmer group, Bumula, 0724102509	Moses Wanyonyi, CA farmer, Namauanga, 0703959705	Maurice Emuria, CA farmer & extension officer, Sirisia Sub-county, 0723411059	Pius Inaagai, CA none-adopter, Kimaeti Market, 0714743497	

Fieldwork Schedule for the GOPA CA CNA in Bungoma, Kenya, 30 January to 1 February 2017

Time approx.	Mon 30 Jan	Tue 31 Jan	Wed 1 Feb	Thur 2 Feb	Fri 3 Feb	Sat 4 Feb
8:00 to 10:00	Robin Baraza, CA farmer, West Sangalo, 0722471725	Japheth Wekesa, Service Provider, Sitikho-Webuye West, 0712398613	Chrisantus Mang'oli, Research and Extension Liaison, Principal Agriculture officer, MoA, Bungoma, 0720778468			
10h00 to 12h00	Catherine Maennde CA farmer Siangwe Kwandenye village 0710475755	Dr David Mbakaya, KALRO Alupe 0725813463	Ibrahim Patel, Ronak Agro-vet Ltd, Bungoma, 0710277777			
13h00 to 15h00	Gilbert Mugwana, CA none-adopter farmer, Kwandunye village 0727834087	Henrick Wakochwe, Deputy manager mechanization, ATDC Mabanga, Mabanga, 0725147311	James Sibalile, CA Non-adopter farmer, Miendo, 0715239485			
15h00 to 17h00	Celestine Kwoba, CA farmer, Siangwe Sangalo, 0714783837	Peter Khaoya, County Agricultural Engineer, MoA, Bungoma, 0713093451	Travel to Kisumu			

Fieldwork Schedule for the GOPA CA CNA in Kakamega, Kenya, 24 to 29 January 2017

Time approx.	Tue 24 Jan	Wed 25 Jan	Thur 26 Jan	Fri 27 Jan	Sat 28 Jan
8:00 to 10:00	Johnstone Malenya, CA adopter farmer, Lurambi-Eshibeye, 0721256104	Caleb Oranga, CESUD, Mumias, 0723287211	Wycliff Namisi Omari, Secretary Kakamega FFS network, 0725219968	Joseph Wasike, SCAO, Mumias West, 0722634313	Sarah Maiyo, Welthungerhilfe, Kakamega, 0720771158
	Daniel Katiech, CA non-adopter farmer, Lurambi-Eshibeye, 0721974485	Phillip Omukono, Field Officer, CESUD, Mumias, 0729374592	Khamala Habakkuk, Agrovet, Shibuli, 0720833431	Herbert Luseno, Mumias Agrocare, Agro vet, Mumias town, 0724518453	
10h00 to 12h00	Isaack Eshilaro Ekwomi, CA adopter farmer, Emulundu, Lurambi, 0724824912	Violet Lutomia, Field Officer, CESUD, 0711926603	Rukia Makhoha, KALO CBO, Khalaba, Matungu, 0703688056	Onesmus Chiteri, CA equipment Fabricator, Marama (s)shiatsala, 0729088969	Immaculate Imboba, ADS Kakamega, 0725368233
		Michael Otando, Field Officer, CESUD, 0700636682		Benjamin Omusinde, CA equipment fabricator, Butere-sabatia, 0710741329	
13h00 to 15h00	Rueben Opati, CA non-adopter, Emulundu, 0714847842	Nyangweso Bonventure Nyatsi, CA Service Provider, Mumias East-shianda, 0710616547	Anthony Ekesa, WAO, Khalaba, Matungu, 0723214032	Sammy Litunda, CA adopter farmer Marama South, Butere, 0727585461	Lydia Wafula, Field Officer, ADS, 0722990046
	George Odongo Otete, CA equipment fabricators, Lurambi Matioli, 0711342674			Ernest Olwangu, CA adopter, Khisa East, Khwisero, 0726078179	
15h00 to 17h00	Eng Dave Khasakala, Mechanization, Bukura ATDC, 0721569842	Sospiter, Family Bank, Mumias, 0720334569	Monicah Nekesa Makhoha, CA farmer adoptor, Etenje, Mumias, 0721995688	Mildred Sande, SCAO, Khwisero, 0729795784	
				John Nandwa, CA equipment supplier, Khwisero, 0705508644	

Fieldwork Schedule for the GOPA CA CNA in Kakamega, Kenya, 30 January to 1 February 2017

Time approx.	Mon 30 Jan	Tue 31 Jan	Wed 1 Feb	Thur 2 Feb	Fri 3 Feb	Sat 4 Feb
8:00 to 10:00	Stella Iyadi, Kakamega, Farmers Agency, 0719284742	Jacob Masimba Musitwa, D/SCAO-Lurambi, Kakamega, 0711997460	Mr. Imbira Johnstone, CDA, Kakamega, 0711152036			
10h00 to 12h00	Joseph Khamala, WAO-Malava, 0722941238	Albert Ochenje, Monitoring and evaluation officer, ASDSP, Kakamega, 0712824130	Rev. Ekesa, ADS, Kakamega, 0722580347			
13h00 to 15h00	Jonathan Makau, SCAO Malava, 0725311125	Dr. Okitoi, KALRO, Kakamega, 0724348347,	Jack Onyango, Project Officer, AGRICS Kakamega 0721801549			
		Emmanuel Wakhungu, MoA, Agric Mech Coordinator, Kakamega, 0723760556	Joseph Chiteri, ATC Bukura, 0727357552			
15h00 to 17h00	Milton Muchuma, D/SCAO, Eliud Wepukhulu, SCAO-Lugari, 0727439725	Martin Kumbe, Director Sofdi, Chavakali, 0721263665	Joseph Mugo Mutuku, Bukura Agricultural College, 0723936613			
			Aggrey Ambani, GOPA, Kakamega			

Fieldwork Schedule for the GOPA CA CNA in Siaya, Kenya, 24 to 29 January 2017

Time approx.	Tue 24 Jan	Wed 25 Jan	Thur 26 Jan	Fri 27 Jan	Sat 28 Jan	Sun 29 Jan
8:00 to 10:00	Kenneth O. Othieno, ASDSP co-ordinator, Siaya Town, 0710977104, Kenowuori11@yahoo.com	Foster Ronoh, KIE Branch Manager, Siaya Town, 0720407908, Fosterronoh@yahoo.com	Elvis Otieno, Avepo Enterprises, stock controller, Agrovet, Siaya Town, 0723040227, Elvisongare2@gmail.com	Wycliffe Obiero, Ugunja Community Resource Centre (UCRC), 0719111503	John Victor Omondi, CBO Tembea, Ugunja, 0711448487, Omondivictor21@gmail.com	Report compilation
10h00 to 12h00	Charles M.Kakuku, ASDSP institutional fev. officer, Siaya Town, 0729937700, Mackophilip@gmail.com	Willis Atiang, ATC, Siaya Town, 0722943269	David Njoroge, AGRITEK Solutions, Africa, 0722278992 agriteksolutions@gmail.com	George Ouma Odiembo, CA Lead Farmer, Gem, 0717875344	Jeniffer Awino Achacha, CA Lead Farmer, Ugunja, 0718804269	Report compilation
13h00 to 15h00	Peter Owino, 0716328986 Vicent Okoth Otieno, 0705804892 CA equipment artisans, Siaya Town	Omondi Kanyango, ATDC, mechanization officer, Siaya Town, 0786115699	George Onyango, Tillage service providers, Siaya, 0723615358	Betty Waringa, CA FAO farmer, Gem, 0722677465	George Obok, CA FAO farmer, Sigomere, 0713345236, oduorobok@gmail.com	Report compilation
15h00 to 17h00	Michael Odongo, REFSO Director, 0722688765, David Oloo, 0727149362	Faith Innocent, ICRISAT, 0718340894, Innocentfaith28@gmail.com, Sarah Mango, SCAO, Gem Sub-County, 0728039782, Scaoge16@gmail.com	Eng Daniel O. Okia, County agric. engineer, MoA, Siaya Town, 0722273238, Jakawino2003@yahoo.co.uk	Cosmas Odour Otieno, CA Lead Farmer, Sigutie, 0713588798	John Ondago, CA FAO farmer, Sigomere, 0724692686	Report compilation

Fieldwork Schedule for the GOPA CA CNA in Siaya, Kenya 30 January to 4 February 2017

Time approx.	Mon 30 Jan	Tue 31 Jan	Wed 1 Feb	Thur 2 Feb	Fri 3 Feb	Sat 4 Feb
8:00 to 10:00	Dr John Achieng', Head of cereal and grain legume crops, KALRO, Alupe, 0722371873, Joachieng2004@yahoo.com	Joshua Okomo SCAO Alego Usonga MoA 0720676629	Michael Sande Welthungerhilfe 0736417238 Siaya Michael.chitechi@welthungerhilfe.de			
10h00 to 12h00	Cornel Kanyango, Kisama WRUA, Sigomere, 0720344634, cornelanyango@gmail.com	Richard Onyango Okiyo, WAO, MoA, Siaya Town, 0715126656	Jared Awiti, World Vision, Siaya, 0728425164, awitijared@yahoo.com			
13h00 to 15h00	Lawrence Godiah Non-adopter farmer 0721272311 Sidindi	James Ngonga, Agric. engineer and agribusiness development officer, 0729877206 Ngongajames7@gmail.com Godrick Ogola, WAO, MoA, Ugenya, 0707878977	Prof Arnold O. Watako, JOOUST-University, Bondo, 0728269440 arnoldwatako@yahoo.com			
15h00 to 17h00	Joseph Wajina Aduda, Gem Hort. Co-op society, Yala, 0714751481, adudajoseph@gmail.com	Augustine Otieno, ACE Africa, Ugenya, 0721821517, aowino@aceafrica.org	Brian Kiprotich, County Coordinator Siaya, 0721248188 briancherutich@gopa.de			

Annex 9. Interview List

116 Interviews

Date	Name	Institution/Company/ Organization/Individual	Title and contact details
24/1	Flora Ajwera	GIZ, Kisumu	Senior Soil Expert, 0723875175, flora.ajwera@giz.de
	Sebastian Seitz	GOPA, Kisumu	Team Leader, 0704643197, sebastian.seitz@gopa.de
	Rev. Johnstone Nyongesa	ADS Bungoma	Reverent, 0721315056
	Oscar Kula	Equity Bank Kenya Ltd, Bungoma	Credit officer, 0763212151
	David Kale	KFA LTD, Bungoma	Manager, 0724680809
	Anthony Okoti	ACE AFRICA, Bungoma	Manager, 0721315056
	Johnstone Malenya	CA adopter farmer	Lurambi-Eshibeye, 0721256104
	Daniel Katiech	CA non-adopter farmer	Lurambi-Eshibeye, 0721974485
	Isaack Eshilaro Ekwomi	CA adopter farmer	Emulundu, Lurambi, 0724824912
	Rueben Opati	CA non-adopter	Emulundu, 0714847842
	George Odongo Otete	CA equipment fabricators	Lurambi, Matioli, 0711342674
	Eng Dave Khasakhala	Bukura ATDC	Mechanization Officer, 0721569842
	Peter Owino	Ngaji CA equipment fabricators, Siaya	Artisan, 0716328986
	Michael Odongo	REFSO NGO	Project Director, Siaya, 0722688765
	Kenneth O. Othieno	MoA	ASDSP Co-ordinator, Siaya, 0710977104, Kenowuori11@yahoo.com
	Charles M.Kakuku	MoA	ASDSP Institutional Dev. Officer, Siaya. 0729937700, Mackophilip@gmail.com
25/1	Gerrit Gerdes	GIZ, Kisumu	Programme Manager, 0723875175, gerrit.gerdes@giz.de
	Antony Bakari	Seedco. Kenya Ltd, Bungoma	Manager, 0721327236
	Shivonje David	ASDP, Bungoma	County Agriculture Officer, 0729810757
	Edmond Wabwile	CBO Kimaeti/farmer group	Chairman, 0729979012
	John Nyanja	Mavuno SHG farmer group	CA adopter, 0724102509
	Caleb Oranga	CESUD, Mumias	Director, 0723287211
	Phillip Omukono	CESUD, Mumias	Field Officer, 0729374592
	Violet Lutomia	CESUD, Mumias	Field Officer, 0711926603
	Michael Otando	CESUD, Mumias	Field Officer, 0700636682
	Nyangweso Bonventure Nyatsi	CA Service Provider	Mumias, East-shianda 0710616547
	Faith Innocent	ICRISAT	Field Officer, Siaya, 0718340894, Innocentfaith28@gmail.com

	Omondi Kanyango	ATDC	Mechanization officer, Siaya, 0786115699
	Willis Atiang	ATC	Principal, Siaya, 0722943269
	Sarah Mango	MoA	SCAO-GEM, Siaya, 0728039782, Scaoge16@gmail.com
	Foster Ronoh	KIE	Branch Manager, Siaya, 0720407908, Fosterronoh@yahoo.com
26/1	Alfred Olang	MoA	M & E Officer, 0712617934
	Martin Barasa	Vi Agroforestry, Bungoma	Coordinator, 0716300880
	Magret Aoko	ATC MABANGA	Principal, 0720718683
	Moses Wanyonyi	CA farmer	0703959705
	Wycliff Namisi Omari	Kakamega FFS network	Secretary, 0725219968
	Khamala Habakkuk	Agrovet, Shibuli	Kakamega 0720833431
	Rukia Makhoha et al.,	KALO	CBO, Khalaba, Matungu, 0703688056
	Anthony Ekesa	WAO	Khalaba, Matungu, 0723214032
	Monicah Nekesa Makhoha	CA farmer adopter	Etenje, Mumias, 0721995688
	Eng. Daniel O. Okia	MoA	County Agric. Engineer, Siaya, 0722273238, Jakawino2003@yahoo.co.uk
	Elvis Otieno	Avepo Enterprise Agrovet	Stock controller, Siaya, 0723040227, Elvisongare2@gmail.com
	Charles Ogolo	Farmer & Tillage Service provider	Sidindi, 0720038277
	George Onyango	Farmer & Tillage Service provider	Alego Usonga, 0723615358
	David Njoroge	AGRITEK Solutions, Africa	Specialist, Siaya, 0722278992, agriteksolutions@gmail.com
	John Wakoli	CA farmer	0714743497
27/1	Hellen Masibo	CA farmer	Kabuchai, 0712314533
	Stephen Malumba Wambile	Coffee Research Institute (KALRO)	Nambela, 0721795813
	Beatrice Wamalwa	Women group chairlady/CA adopter, Farmers Group Tissue Culture Tembeleaa	Tembeleaa, Bungoma, 0700362024
	Maurice Emuria	CA farmer adopter	0723411059
	Electrina Wadangana	CA farmer	0704065895
	Joseph Wasike	SCAO	Mumias West, 0722634313
	Herbert Luseno	Mumias Agrocare Agro vet	Mumias town, 0724518453
	Onesmus Chiteri	CA equipment fabricator	Marama (s)shiatsala, 0729088969
	Benjamin Omusinde	CA equipment fabricator	Butere-sabatia, 0710741329
	Sammy Litunda	CA adopter farmer	Marama South, Butere, 0727585461
	Ernest Olwangu	CA adopter	Khisa East, Khwisero, 0726078179
	Mildred Sande	SCAO Khwisero	0729795784
	John Nandwa	CA equipment supplier	Khwisero,

			0705508644
	Wycliffe Obiero	Ugunja Community Resource Centre (UCRC)	Field officer, Siaya, 0719111503
	George Ouma Odiembo	CA adopter farmer, Sidindi FFS	Lead Farmers, 0717875344
	Betty Waringa	CA adopter farmer, Sidindi FFS	Lead Farmers, 0722677465
	Cosmas Odour Otieno	CA adopter farmer, Sidindi FFS	Lead Farmers, 0713588798
28/1	Everlyn Juma	CA farmer	Kisulini, 0719346744
	Ferdnard Wangila	CA farmer	0737488763
	Pharis Walulkhu	CA farmer	0714692712
	Pius Inaagai	CA non-adopter	0714743497
	Fred Wamalwa	CA farmer adopter	0711191732
	Sarah Maiyo	Welthungerhilfe, Kakamega	0720771158
	Immaculate Imboba	ADS	Field Officer, Kakamega, 0725368233
	Lydia Wafula	ADS	Coordinator, Kakamega, 0722990046
	Jeniffer Awino Achacha	CA adopter farmer Sigomere FFS	Lead Farmers, 0718804269
	George Obok	CA adopter farmer Sigomere FFS	Lead Farmers, 0713345236, oduorobok@gmail.com
	John Ondago	CA adopter farmer Sigomere FFS	Lead Farmers, 0724692686
	Jeniffer Aoko	Farmer, Sigomere FFS	Non-Adopter, 0702812840
	Vicent Okoth Otieno	Jua Kali Sacco	Artisan, Siaya, 0705804892
	Victor Omondi John	Tembea CBO	Head of Training and Applied Science, 0711448487, Omondivictor21@gmail.com
30/1	Robin Baraza	CA farmer	Chief, 0722471725
	Catherine Maennde	CA farmer	0710475755
	Gilbert Mugwana	CA non-adopter farmer	0727834087
	Celestine Kwoba	CA farmer	0714783837
	Stella Iyadi	Kakamega Farmers Agency	Sales, Kakamega, 0719284742
	Joseph Khamala	WAO-Malava	South Kabras Ward, 0722941238
	Jonathan Makau	SCAO Malava	Malava, 0725311125, daokknorth@yahoo.com
	Eliud Wepukhulu (Milton Muchuma)	SCAO (DSCAO)	Lugari, 0727439725
	Cornel Kanyango	WRUA Kisama	Chairman, 0720344634, cornelanyango@gmail.com
	Lawrence Godiah	Farmer, FFS Sidindi	Non-adopter, 0721272311
	Dr John Achieng'	KALRO, Siaya	Head of food crops, 0722371873, Joachieng2004@yahoo.com
	Joseph Wajina Aduda	Gem Horticulture Co-op Society	Chairman Credit and Marketing committee, Siaya, 0714751481, adudajoseph@gmail.com
31/1	Japheth Wekesa	Service Provider	0712398613
	Dr David Mbakaya	KALRO	Senior Research Officer, 0725813463, David.mbakaya@karlo.org

	Henrick Wakochwe	ATDC Mabanga	Deputy Manager Mechanization, 0725147311
	Peter Khaoya	MoA County Agricultural Engineer	0713093451
	Jacob Masimba Musitwa	D/SCAO	Lurambi, Kakamega, 0711997460
	Albert Ochenje Tobias	ASDSP	Monitoring and Evaluation Officer, Kakamega 0712824130 Environmental and resilience Officer
	Eng Emmanuel Wakhungu	MoA	County Agricultural Machinery Coordinator, Kakamega, 0723760556
	Dr. Okitoi Morris Mudheheri Roselyne Juma	KALRO, Kakamega	Centre Director, 0724348347 Acting Deputy Centre Director, 0733957586, Plant breeder, 0721441397, rjoside@yahoo.com
	Martin Kumbe	SOFDI	Director, Chavakali, 0721263665
	James Ngonga	MoA	SCAO-Ugenya, 0729877206, Ngongajames7@gmail.com
	Joshua Okomo	MoA	SCAO- Alego Usonga, 0720676629
	Richard Onyango Okiyo	MoA	WAO-Township, 0715126656
	Godrick Ogola	MoA	WAO-Ugenya, 0707878977
	Augustine Otieno	ACE Africa	Field Officer, Siaya, 0721821517, aowino@aceafrica.org
1/2	Chrisantus Mang'oli	MoA	Principal Agriculture Officer, 0720778468, Chrismangoli63@gmail.com
	Ronak Patel	Ronak Agro-vet Ltd	0710277777, ronakgroupbgm@yahoo.com
	James Sibalile	CA non-adopter farmer	0715239485
	Mr Imbira Johnstone	CDA, Kakamega	0711152036, imbirason@yahoo.com
	Rev Oscar Ekesa	ADS, Kakamega	Programme Manager, 0722580347
	Jack Onyango	AGRICS	Projects Officer, 0721801549, jakeonyango@gmail.com
	Joseph Chiteri	Agriculture Training Centre Bukura	Farm Manager, 0727357552
	Joseph Mugo Mutuku	Bukura Agricultural College	Head of research and coordination, 0723936613, mugobai@gmail.com
	Stephen Oyamo	Agriculture Lecturer, Bukura Agricultural College	0724059588, steveoyamo@gmail.com
	Aggrey Ambani	GOPA	Kakamega County Coordinator, 0728962283

			Aggrey.ambani@gopa.de
	Brian Cherutich	GOPA	Siaya County Coordinator, 0721248188, brian.cherutich@gopa
	Jared Awiti	World Vision	Project Manager, Siaya, 0728425164, awitijared@yahoo.com
	Michael Sande	Welthungerhilfe	Field Officer, Siaya, 0736417238, michaelchitechi@welthungerhilfe.de
	Prof Arnold O. Watako	Jaramogi Oginga Odinga University of Science and Technology (JOOUST)	Chairman of School of Agriculture, Bondo, 0728269440, arnoldwatako@yahoo.com

Annex 10. Names and Contact Details of Farmers Practicing CA and Other CA Experts

Name & type	Location	Contact details
CA farmers interviewed		
Johnstone Malenya	Lurambi-Eshibeye, Kakamega	0721256104
Isaack Eshilaro Ekwomi	Emulundu, Lurambi, Kakamega	0724824912
Monicah Nekesa Makhoha	Etenje, Mumias, Kakamega	0721995688
Sammy Litunda	Marama South, Butere, Kakamega	0727585461
Ernest Olwangu	Khisa East, Khwisero, Kakamega	0726078179
John Nyanja	Bumula, Bungoma	0724102509
Robin Baraza	Sangalo West, Bungoma	0722471725
Catherine Maende	Siangwe, Bungoma	0703959705
Moses Wanyonyi	Namauanga, Bungoma	0703959705
Edmond Wabwile	Kimaeti, Bungoma	0729979012
John Wakoli	Kimaeti, Bungoma	0714743497
Helen Masibo	Kabuchai, Bungoma	0712314533
Beatrice Wamalwa	Tembeleaa, Bungoma	0700362024
Maurice Emuria	Sirisia, Bungoma	0723411059
Electrina Wadangana	Tembeleaa, Bungoma	0704065895
Beatrice Mugwana	Kwandunye, Bungoma	0727834087
Pius Inaagai	Kimaeti, Bungoma	0714743497
Everlyn Juma	Kisulini, Bungoma	0719346744
Ferdinand Wangila	Tembelea, Bungoma	0737488783
Pharis Walulkhu	Kisulini, Bungoma	0714692712
Celestine Kwoba	Siangwe, Bungoma	0714783837
James Sibalile	Miendo, Bungoma	0715239485
Fred Wamalwa	Bunge East, Bungoma	0711191732
George Ouma Odiembo	Madeya, Siaya	0717875344
Betty Waringa	Madeya, Siaya	0722677465
Cosmas Odour Otieno	Sigutie, Siaya	0713588798
Jeniffer Awino Achacha	Sigomere, Siaya	0718804269
George Obok	Sigomere, Siaya	0713345236, oduorobok@gmail.com
John Ondago	Sigomere, Siaya	0724692686
Other CA farmers identified		
Mohammed Makhoha	Matungu, Kholera, Kakamega	0700501842
Andrew Mulaha	Matungu, Khalaba, Kakamega	0723857349
Raitum Kupwoni	Matungu, Khalaba, Kakamega	0705278146
Rukia Makhoha	Matungu, Khalaba, Kakamega,	0703688056
Alex Ochoya	Mumias West, Etenje, Kakamega,	0732867673
Luke O Keya	Mumias West, Musanda, Kakamega	0715556124
Hellen Wafula	Lurambi, Butsotso Central, Kakamega	0702902450
Julias Musachi	Malava, South Kabrass, Kakamega	0725544731
Racheal E Ruboya	Navakholo, Shieywe, Kakamega	0711107333
Jerusa Lunjinga	Khwisero, Kisa East, Kakamega	0702828208
Imelda Doninsio	Khwisero, Kisa North, Kakamega	0727295312
Wycliffe Amukoya	Mumias West, Etenje, Kakamega	0727223751
Evans Odero	Madeya, Siaya	
Amos Odero	Madeya, Siaya	
Odongo	Madeya, Siaya	
Charles Ogola		
Pamela	Madeya, Siaya	
Wilfred	Madeya, Siaya	

Gaudencia Anyango	Madeya, Siaya	
Odongo Henry	Madeya, Siaya	
Ouma Oloo	Madeya, Siaya	
Topister Yamo	Madeya, Siaya	
Otachi	Ugunja, Siaya	0711815147
Thomas Okelo	Abok, Siaya	0707144545, Mzeedotcom@gmail.com
Tomas Opondo	Sega, Siaya	0707145450
CA experts		
Henrick Wakochwe	ATDC Mabanga, MoA, Bungoma	0725147311
Makanda Khisa	Vi Agroforestry, Bungoma	0716300880
Maurice Emuria	Extension officer & CA farmer, Sirisia, Bungoma	0723411059
Caleb Oranga	CESUD, Mumias, Kakamenga	0723287211
Oscar Ekesa	ADS, Kakamega	0722580347
Dave Khasakhala	ATDC, Bukura, Kakamega	0721569842
Kanyango Omondi	ATDC, Siaya	0786115699
David Njoroge	Nakuru	0722278992
Jacqueline Wanjala	Nakuru	0725429689
Simon K. Mwinzi	Bungoma	0721763425
Nyongesa	Busia	
Kennedy Owuor Okelo		0710977104

Annex 11. List of Reports on CA Capacity Building in Western Kenya and assorted CA Literature

No Reports on CA Capacity Building in Western Kenya could be collected due to unavailability.

Assorted CA Literature:
Please see Inception Report for a list of CA Literature in Kenya, which can be requested from GOPA Team Leader, Sebastian Seitz.